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Pedagogical issues arising from the introduction of educational technology at two South African universities of technology: a comparative study

by
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DECLARATION

I, Sheila Xakaza-Kumalo, declare that this thesis contains research that is my original unaided work and that it has not previously been submitted for any other academic qualification. The content of the thesis represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed: _____   Date: 15 August, 2017

ABSTRACT

Educational technology can improve teaching and learning in universities of technology in developing countries. Due to various factors, there is no readymade "one-size-fits-all" solution for facilitating the successful implementation of educational technology. Tedre, Apiola and Cronjé (2011) identified 100 educational, socioeconomic and technical attributes that can influence the successful integration of educational technology in developing regions. While exploring the issues arising from technology integration at two universities of technology, the aim of this research was to evaluate the effectiveness of Tedre, Apiola and Cronjé's framework in order to contribute to its refinement. The central research question concerned the extent to which Tedre, Apiola and Cronjé's framework was useful for a situational analysis at two South African universities of technology. The sub-questions concerned the framework's ability to distinguish between the two universities on the one hand and on the other hand, the overlaps or shortcomings of the model as it assisted in describing those situations.

The findings revealed that the two universities in this inquiry are not similar. Although the universities' educational strategies and policies were very analogous, differences were found in the manner and approach to the implementation of educational technology. The pedagogical considerations for e-learning uptake in both universities corroborated with each other to a certain extent. The findings further showed that most of the educational factors that affect technology integration, and subsequent educational technology adoption, resonate with pedagogical issues found in other developing countries.

ABSTRAKTE

Pedagogiese oorwegings vir die integrasie van opvoedkundige tegnologie in twee Suid-Afrikaanse universiteite vir tegnologie: 'n Vergelykende studie

Opvoedkundige tegnologie kan onderrig en leer aan universiteite vir tegnologie in ontwikkelende lande bevorder. Weens verskeie faktore is daar egter nie 'n handpasgemaakte metode om tegnologie suksesvol te integreer nie. Tedre, Apiola en Cronjé (2011) het 100 opvoedkundige, sosio-ekonomiese en tegniese eienskappe geïdentifiseer wat die integrasie van tegnologie in ontwikkelende lande beïnvloed. Die doel van hierdie navorsing was om die bruikbaarheid van die raamwerk te evalueer. Die navorsing het gesentreer rondom die bruikbaarheid van Tedre, Apiola en Cronjé se raamwerk vir 'n situasie-analise aan twee Suid-Afrikaanse universiteite vir tegnologie. Die navorsing het gesentreer rondom die bruikbaarheid van Tedre, Apiola en Cronjé se raamwerk vir 'n situasie-analise aan twee Suid-Afrikaanse universiteite vir tegnologie. Daar is bevind dat die twee universiteite nie dieselfde is nie. Alhoewel die opvoedkundige strategieë en beleid soortgelyk was, is verskille ten opsigte van die wyse van en benadering tot die implementering van opvoedkundige tegnologie gevind. Die pedagogiese oorwegsings vir die opneem van tegnologie aan beide universiteite vir tegnologie het ooreengekom. Daar is ook bevind dat die meeste van opvoedkundige faktore wat die integrasie en aanneem van tegnologie kan beïnvloed, ooreenkom met opvoedkundige aangeleenthede wat in ander ontwikkelende lande bepaal is.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

- ASD: Academic support and development
- CK: Content knowledge
- CPUT: Cape Peninsula University of Technology
- CSF: Critical success factor
- DOI: Diffusion of innovation
- DUT: Durban University of Technology
- EdTech: Educational Technology
- FET: Further Education and Training
- HEIs: Higher Education Institutions
- ICT: Information and communication technology
- LMS: Learner management system
- NSFAS: National Student Financial Aid Scheme
- NGOs: Non-profit governmental organizations
- OERs: Open Educational Resources
- OCW: Open Course Ware
- PCK: Pedagogical content knowledge
- TAM: Technology acceptance model
- TPACK: Technological pedagogical content knowledge
- TRA: Theory of reasoned action
- Unisa: University of South Africa

CHAPTER 1

BACKGROUND TO PROBLEM STATEMENT

1.1 INTRODUCTION

"New technology is common, new thinking is rare." – Sir Peter Blake (n.d.)

Educational technology can improve teaching and learning in universities of technology in developing countries. Due to various factors, there is no readymade "one-size-fits-all" solution for facilitating the successful implementation of educational technology. Tedre, Apiola and Cronjé (2011) identified 100 educational, socioeconomic and technical attributes that can influence the successful integration of educational technology in developing regions. This research sought to evaluate the usefulness of Tedre et al's., (2011) framework in order to contribute to its refinement. The central research question concerns the extent to which the framework is useful for a situational analysis at two South African universities of technology. In order to understand the phenomena the theory building in this research specifically cycled between Tedre framework and the two universities of technology. For the purpose and convenient reading in this thesis, Tedre et al's., (2011) framework is referred to as 'Tedre framework'.

The sub-questions for this research concern the framework's ability to distinguish the situation between the two universities on the one hand, and on the other hand, the overlaps or shortcomings of the framework as it assisted in describing those situations. For this research the qualitative approach was employed, however, some sections contain a small amount of numerical data analysis in order to supplement the qualitative findings and also to triangulate research findings. As an example, limited and basic quantitative secondary data analysis was carried out to illustrate variables in order to provide description for their (variables/attributes) frequencies. Although this quantitative

approach was limited, it yielded more insights and added value to the interpretation of qualitative data.

The findings in both universities revealed that the educational strategies and policies were very similar, however, the differences were found in the manner and approach in the implementation of educational technology. The pedagogical considerations for e-learning uptake in the two universities corroborated with each other to a certain extent. The findings further showed that a large number of educational factors that affect technology integration and subsequent educational technology adoption, resonate with pedagogical issues found at some universities in other developing countries. This assertion is backed by the summary in Appendix B, as well as the research findings that account for all forty (40) variables that were investigated in relation to current thesis's four-theme research premise in Chapter 4. For the purpose of this research the integration of technology refers to utilisation of ICT tools, computers and technology features for the purpose of teaching, learning and research.

The consideration of ICT in education has however, become a subject of great significance and concern to policy and curriculum developers, and to educational technology practitioners in higher education. The adoption of new instructional technologies remains a multidimensional problem like the introduction of any innovation to education (Moser, 2007; Shen & Khalifa, 2008; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012). The growing issues of concern are typically about technology transfer and educational technology adoption, particularly in developing countries' contexts (Bork, 2003; Brunello, 2010; Tedre et al., 2011).

The universities integrate technology for various reasons. While some adopt technology to vary their instructional methods, others are more for empowering the students with 21st-century knowledge and skills (Hung, 2001). The usage of technology for teaching, learning and research at institutions of Higher Learning in South Africa has undeniably brought far-reaching changes. These changes have influenced the higher education landscape in the twenty-first century (Department of Education, 2004). It is, however, a

challenge to implement e-learning in a situation where many educational issues such as the lack of infrastructure appear as a hindrance to effective adoption. Notwithstanding, addressing the pedagogical issues in context first, can improve technology integration in an e-learning uptake situation. This thesis intended to determine the context-unique pedagogical considerations that are necessary in the process technology adoption.

Developing regions across the world essentially face similar educational transformation challenges, but each developing country might have its own unique historical, political and cultural background. The implementation of educational technology at higher education institutions is highly influenced firstly, by local circumstances (Shirazi, Ngwenyama & Morawczynski, 2010) and secondly, by the political ramifications (Qureshi, 2009). Thus, for this thesis it was equally necessary to investigate and discover; (a) what are the challenges and issues of educational technology uptake at the two South African universities, and; (b) how do the elements resonate with pedagogical aspects at other universities in a similar situation in other developing countries?

1.2 PROBLEM STATEMENT

The adoption of new instructional technologies could be a multidimensional challenge mainly to curriculum development, resources, strategies, methods (what) and techniques (how). These factors might be relevant drivers of successful integration because of their direct impact on the adoption of technologies for teaching and learning. In their paper "Towards a Systemic View of Educational Technology in Developing Regions", Tedre, Apiola and Cronjé (2011) discuss some pedagogical, socio-economic, and technical considerations that educational technology developers may need to re-think in projects in developing regions. Their study presented a thematic framework encompassing 100 attributes that were classified under 10 themes. These themes were based on three aspects of pedagogical, socio-economic and technical considerations as has been already indicated. In their study, they concluded that since each developing country's context differs greatly from the other, there are no specific rough-and-ready solutions for

such highly varying and complex socio-technical systems as those frequently found in educational technology.

For the purpose of this research, the focus was on educational (pedagogical) factors related to the pedagogical framework, motivational and cognitive aspects, content as well as the country's educational context surrounding the adoption of technology, particularly in a developing country context. Out of the total 100 attributes in the Tedre preliminary framework, 40 attributes were classified under the four mentioned educational (pedagogical) consideration factors. These 40 dimensions in the Tedre framework guided an investigation into the processes of educational technology adoption and implementation both at the Cape Peninsula University of Technology (CPUT) and Durban University of Technology (DUT). Addressing the gap in the knowledge of educational technology, the qualitative approach allowed nuances for this research to establish the extent to which the Tedre framework attributes fit within the pedagogical dimensions of the two universities of technology in the context of a developing environment in South Africa.

1.3 THE PURPOSE

The current qualitative research goal was to establish to what extent the Tedre framework criteria apply, measure or fit in the educational technology dimensions as they emerge at two universities in a developing country. To provide the rich detail of the context, the Tedre framework was interrogated, by comparing pedagogical elements that contribute to the success or constraints of educational technology uptake at the two universities, the similarities and differences were analysed; and the implications were evaluated in order to establish the extent to which the 40 attributes presented in the framework were applicable. The purposeful comparative study sampled the CPUT and DUT also referred to as Case-1 and Case-2 respectively in this research. The sample comprised 14 participants from each inquiry site; one senior manager and six lecturers from each

faculty. In line with Yin (2013), the qualitative multiple data sources employed were less-structured open interviews, observation, field notes, photos, and document analysis.

1.4 SIGNIFICANCE OF THE STUDY

The contribution of this thesis to the body of knowledge refers to the research process that explored and compared the situations regarding educational technology in a comparative study of two universities of technology. While the findings determined fewer differences but similar issues between the two universities, commonalities were also found in the pedagogical considerations stated in the Tedre framework. Therefore, it can be concluded that the pedagogical considerations in the two South African universities' educational technology uptake corroborated with each other. They also resonated with the pedagogical considerations in other developing regions as defined in the Tedre framework.

This research benefits the field of education that relates to e-learning, with particular focus on technology integration in universities of technology in developing countries. The findings largely benefit higher education institutions in developing regions, as well as policy makers and educational technology practitioners to prompt them to re-think factors of educational technology adoption in a developing country's context. Furthermore, in this thesis, the research presents

1) Distinct process on how to use such models as the Tedre framework, in this case, to analyse educational technology uptake in a developing environment.
2) The implications that provide a broader understanding of the key and common factors determined as essential pedagogical considerations for educational technology adoption in universities of technology.
3) Literature and empirical data on how to determine pedagogical considerations in the adoption of technology in a developing country context.

4) Identification of varied dimensions that demonstrate attributes' *intra-theme* and *inter-theme* dynamics, which may form part of the essential processes for refining similar frameworks and models.

Additionally, the conclusions as drawn from the four-theme premise in this research and fully elaborated later in Chapter 4, are briefly discussed in the next sections.

a) Pedagogical framework

One of the purposes stated in Case-1 in the Teaching and Learning policy (2006) is that the universities of technology commit to parameters and guidance for quality practices in teaching and learning, which in return leads to improved student access, retention, and success. Therefore, it is important to adhere to guidelines and to what some researchers (Mumtaz, 2000; Kituyi & Tusubira, 2013) point out as a distinguishing context-influenced framework. The latter should be developed and used to guide the management of areas on which to concentrate in order to achieve positive effects of educational technology adoption in the context. In the findings reflected in Chapter 4, it is evident that participants were able to distinguish between the challenges they experience and what they consider to be important pedagogical factors.

In the midst of a lack of adequate infrastructure it was apparent that both universities had in some ways adopted technology integration for varied purposes as per reasons pointed out earlier (Hung, 2001), and that the two universities were at different levels of implementation. Notably, the results as shown in Table 4.3 indicate that Case-1 was exposed to a greater variety of technologies than its counterpart was.

b) *Motivational and cognitive aspects*

In accordance with Kahiigi (2012), the adoption issues should firstly take cognisance of the context-dependent motivational and cognitive characteristics of faculty. Higher education institutions in developing countries are generally anticipative that the adoption

of educational technology will improve the quality of education (Tedre et al., 2011). Quality education can be realised once technology is adopted to change teaching practices (Andersson, 2010). This notion was supported in the current study by the eagerness reflected in faculties' behavioral belief to continue implementing the e-learning, even with few resources at their disposal. The findings suggest that positive attitudes might strengthen the adoption of educational technology. However, developing the online learning activities was perceived by some lecturers as time-consuming, and in corroboration with the Tedre framework, incentives and staff recognition were found to be the motivating factors.

c) Content

In accordance with Laurillard, (2002), the successful creation and transmission of knowledge through educational technologies is a universal understanding of the nature of knowledge. In this thesis, both universities fundamentally embraced the use of the internet content for various reasons. The findings demonstrated some level of pedagogical content knowledge (PCK) described by Nawaz and Kundi, (2010), as the ability of teachers to integrate technology for the purpose of teaching and learning. Similar issues as found in the Tedre framework were mainly attributed to language, contextualisation and suitability of delivery mode as an enabler. For instance, foreign information such as inches, feet and ounces, was adapted to centimeters, meters and liters to suit the South African context. Additionally, the use of high volume podcast and video content for teaching was identified as inadequate, due to unstable connectivity and the lack of suitable bandwidth, amongst others.

d) Country's educational context

The means to sustainable funding in higher education institutions as seen in the Higher Education (HED) subsidy and in the National Student Financial Aid Scheme (NSFAS) is currently the most essential aspect for South Africa's educational stability (Ministry of Education, 2006). The investment incentives and government initiatives alone cannot

have sustainable competitive advantage in e-learning, but its value, as pointed out by Peppard and Ward, (2004), emerges from the manner in which e-policies relate to real issues in the context and in addressing the country's vocational needs. In this research, although faculty members in both universities were sometimes not fully conversant regarding national policies on the country's e-education position, the two participating senior managers were able to express a clear insight into the relevant policies in the country's context. As a result, it became clear that an in-depth knowledge about a country's context of education is an important consideration for an effective educational technology integration (Tedre et al., 2011).

1.5 OBJECTIVES AND MAIN RESEARCH QUESTION

The purpose of this comparative study was to explore the challenges and issues of educational technology uptake in two universities of technology in South Africa as a typical developing country.

The objectives sought:

- To obtain an overview of the situation at the two universities of technology.
- To compare the two universities to each other along each of the Tedre framework's dimensions.
- To determine the extent to which the Tedre framework dimensions are adequate for providing a comparative framework.
- To determine any shortcomings of the framework and to recommend improvements.

To achieve the objectives, this research sought to determine the extent to which pedagogical elements related to technology adoption resonate between Case-1 and Case-2 along the pedagogical considerations in other developing countries as identified in Tedre framework. The two universities were compared with each other along each of Tedre framework's criteria. The aim was to define the extent to which the dimensions resonate with pedagogical issues at universities in other developing countries. The

differences and commonalities clearly determined whether the attributes were validated as viable pedagogical elements for consideration. Firstly, the attributes were rejected when the situation in both universities was the same and the Tedre framework did not help to differentiate between the two institutions. Secondly, the attributes were accepted for consideration in technology adoption, for example, where there was evident noncompliance with policy implementation. In addition, where a variable was silent or missing and there was no evidence in either or both universities.

1.6 MAIN RESEARCH QUESTION

The main research question for this study is, *To what extent are criteria in the Tedre framework useful in analysing two South African higher education institutions?*
This question was answered by four sub-questions.
The four sub-questions were as follow:

a)   How did the two South African universities of technology compare in their technology uptake challenges and issues?

b)   How did those elements resonate with the pedagogical aspects as proposed in Tedre framework in other developing regions?

c)   Does the Tedre framework differentiate adequately between its framework categories; (Or were there any overlaps?)

d)   Is the Tedre framework a comprehensive framework? (Or are there key elements that might have been overlooked?)

1.7 LIMITATIONS OF THE STUDY

The study was carried out in two universities of technology with 14 participants. Different levels of voluntary participation included two senior managers and twelve lecturers from both institutions. Six faculties represented each institution. For that limitation, the study might not be fully representative of all lecturers within these two universities and other universities in South Africa. Furthermore, the research duration might have yielded better

results if the two weeks per site data sourcing was extended. In this case, a longitudinal research approach could result in enriched findings in order to provide a deeper understanding of the considerations related to educational technology adoption in developing countries.

For the purpose of the study, this thesis reports only on the educational considerations of technology adoption in the Tedre framework and excludes the framework's socio-economic and technical aspects. It would be useful to broaden the scope of this research as some of the findings inevitably touched on socio-economic and technical aspects. Qualitative inquiry, in general, proposes to reduce power differences and encourages disclosure and authenticity between researchers and participants. Creswell and Miller (2000) points out that the dynamics in a qualitative research are brought about the reality change when people's perceptions begin to change in the subject topic. Unlike in grounded theory approach, the theory building in this research was particularly driven by 40 predetermined variables which cycle between Tedre framework and the two universities.

Finally, although this study might not be fully generalisable, the transferability nature of this study aims to challenge readers to make connections between elements of the study and their own experience in a similar situation (Creswell & Miller, 2000).

1.8 CURRENT STATUS OF THE RESEARCH AREA

Technology integration has been a continuing dialogue for over 30 years among educators, policy makers and educational technology (EdTech) practitioners (Lowther, Osin, 1998; Inan, Strahl & Ross, 2008; Roztocki & Weistroffer 2011; Qureshi, 2012). Several articles (EBSCO Publishing, 2011) have been published recommending effective strategies to facilitate effective integration by using technology to support a student-centered and student-directed curriculum (Becker & Riel, 1999). However, not enough is

known regarding key factors of pedagogical consideration in the adoption of technology at a typical university of technology and in a developing country's context.

For quality education and economic growth in developing regions Winthrop and Smith (2012) believe that the potential for technology to help improve education has more significance beyond teaching children reading and Math. In addition, Tedre, et al. (2011) argue that unless attention is paid to essential educational issues of technology uptake and in developing countries' contexts, pure technology transfer cannot work. Because there is no one-size fits all, a successful solution for the implementation of educational technology in a developing country's context is still essential.

A large portion of research articles propose strategies for eliminating or circumventing the barriers that schools and teachers encounter during the process of technology adoption. Consequently, the large volumes of research about critical success factors (CSFs) are mainly analytical studies which may sometimes yield a substantial proportion of the variance in behaviour and the intentions to use (Venkatesh & Davis, 2000; Bhuasiri, Xaymoungkhoun, Rho & Ciganek, 2012). In contrast, the current research adopted a systemic approach in observing educational issues of technology adoption.

1.9 PREVIOUS STUDIES

TABLE 1.1: RELEVANT STUDIES ON FACTORS AFFECTING EDUCATIONAL TECHNOLOGY ADOPTION IN DEVELOPING COUNTRIES' CONTEXTS

	Author(s)	Research context(s)	Factors of consideration
1.	Tedre et al.,(2011)	Tanzanian educational context	Educational considerations • Pedagogical framework: • Motivational and cognitive aspects • Content: • Country's context:
2.	Lwoga, E.(2014)	Tanzania	Strategic implementation • E-Policies and institutional strategic documents • Infrastructure • Adaptive learning • Connectivity and bandwidth • Staff training
3.	Kahiigi, K. E. (2009)	Uganda	Pedagogical change: • Lecturer attitude • Lecturer competence • Student satisfaction • Self-directed learning and research • Curriculum
4..	Hasson, F., Keeney, S., & McKenna, H.(2000)	Indonesia Laos Thailand The Philippines	Critical success factors (CSFs) • Instructors' characteristics: Timely response, technology control, interactive design, attitude toward student, interaction fairness • Learners' characteristics: Computer self-efficacy, internet self-efficacy, attitude toward e-learning • Institution and service Quality: Computer training, program flexibility • Infrastructure and system quality: Internet quality,

The table above shows some of the studies that have been conducted which investigate barriers in the adoption of technology in developing countries. While first-order barriers have been documented as posing the most significant obstacles to achieving technology integration (Pelgrum, 2001; O'Mahony, 2003), underlying second-order barriers are thought to pose the greater challenge (Ertmer, 1999; Garrison, Anderson & Archer, 2003). In spite of the challenges, an increasing number of higher institutions in developing

12

countries have adopted ways of using computers for fostering education (Qureshi, 2012). It is therefore important to address pedagogical considerations in a developing country context in order to achieve the needed effective implementation.

1.10 THESIS STRUCTURE

The structure of this thesis was fully informed and decisively guided by the conceptual framework shown in Figure 1.1 in this section, which provided a visual explanation that allowed nuances to gradually emerge during the entire process of this rather complex empirical inquiry. Miles, Hubert and Saldana (2014) point out the role of a conceptual framework as depicting the visual explanation of the main variables and presumed relationships in the study.
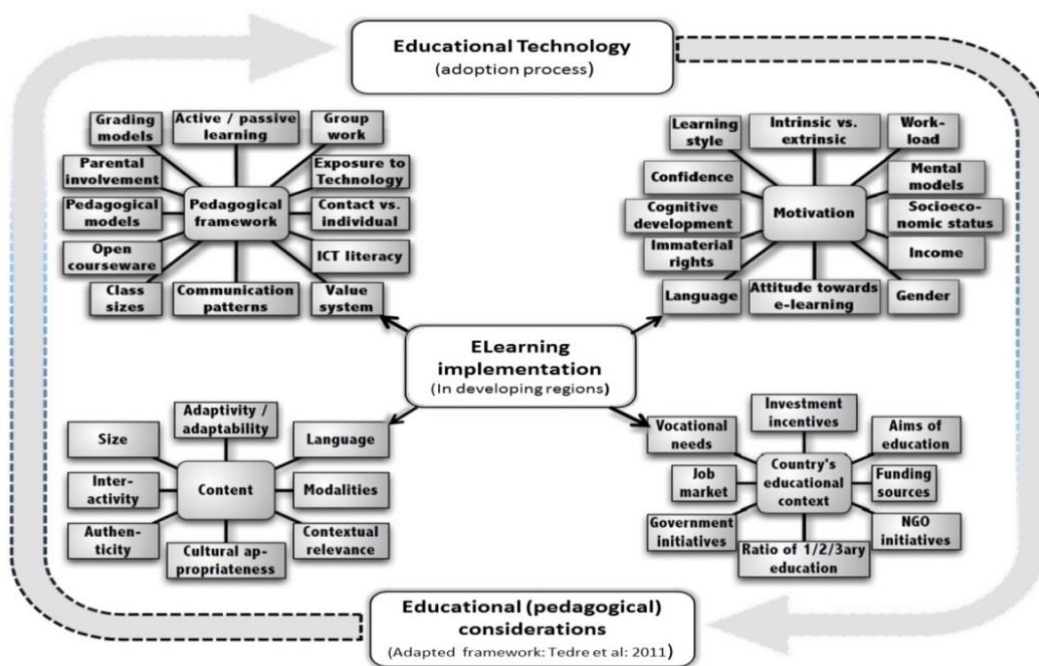
FIGURE 1.1: THE STUDY CONCEPTUAL FRAMEWORK (*ADAPTED FROM TEDRE, APIOLA & CRONJÉ, 2011*)

As shown in Figure 1.1 above, the conceptual framework of 40 variables adapted from the Tedre framework comprises four themes; Pedagogical framework; content; motivation; and the country's educational context, which formed the basis of the entire thesis structure. For the purpose of learning and teaching, I tend to consider the

implementation of e-learning to be a central process towards the adoption of technology. In line with Corbin and Strauss (2014), for the specific purpose in this study, the research approach was theory building, which strictly cycled between Tedre, framework and the situation at the two sampled universities. This approach was useful to analyse the connectedness between emerging issues and the attributes presented in Tedre framework.

SUMMARY

This chapter provides the background to the problem statement, research questions and the objectives of the study. The research in this thesis revealed that the situations in developing countries are similar but unique. Each developing country's context varies greatly from the other. A large portion of research articles have proposed strategies for circumventing the barriers that higher education institutions encounter during e-learning implementation. However, since there is no one-size fits all, there is yet to be a successful solution for the implementation of educational technology in a developing country's context.

The significance of this research also presents

1) Distinct process on how to use such models as the Tedre framework, in this case, to analyse educational technology uptake in a developing environment.

2) The implications that provide a broader understanding of the key and common factors determined as essential pedagogical considerations for educational technology adoption in universities of technology.

3) Literature and empirical data on how to determine pedagogical considerations in the adoption of technology in a developing country context.

4) Identification of varied dimensions that demonstrate attributes' *intra-theme* and *inter-theme* dynamics, which may form part of the essential processes for refining similar models.

With regard to the limitations in this research, voluntary purposeful samples from two universities of technology in South Africa were not fully representative of all the lecturers within the two universities and the other universities across the country. Thus, this may not project a full picture of pedagogical considerations for the adoption of technology in developing countries. However, although generalisability may not fully apply, the transferability nature of this study aims to challenge readers to make connections between elements of the study and their own experience.

CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION

"The key to success is to appreciate how people learn, understand the thought process that goes into instructional design, what works well, and a range of different ways of achieving goals." - Tim Buff (n.d.)

This literature survey is based on the Tedre framework, which proposed 100 attributes for technology projects in developing regions. The attributes were categorised under ten themes. These themes emanated from the construct of the categories that were based on a broader spectrum of educational elements that need to be considered by universities when adopting the technology in developing countries. Due to countries' varied situations, the three researchers of the Tedre framework proposed the elements that addressed three aspects of considerations that were related to each region's unique educational, socio-economic and technical context. For the purpose of this study, the research only focused on the framework's 40 attributes that were related to educational (pedagogical) context and excluded the socio-economic and technical considerations. These 40 attributes were classified and allocated across four themes, a) Pedagogical framework (12 attributes), b) Motivational and cognitive aspects (12 attributes), c) Content (8 attributes), and d) Country's educational context (8 attributes). It was in this research construct that the inquiry explored two universities of technology in South Africa.

The purpose of the comparative study was to explore the pedagogical considerations for educational technology adoption in two South African universities. The conceptual framework depicted in Figure 1.1 and further investigated in section 3.3 of chapter 3 formed the starting point to build the structure of this research literature review. The

important question to answer in this thesis is: to what extent the current findings resonate with pedagogical issues in other developing countries.

Miles, Huberman and Saldana (2014) describe the role of the framework as providing a visual explanation of the main variables and the presumed relationships that need to be studied. The main topics driving the Tedre framework themes and the research questions are discussed logically in this chapter as follow:

1. The concept of educational technology in a developing country's context,
2. Educational factors within the pedagogical framework,
3. Motivational factors in using educational technology,
4. The impact of content knowledge on e-learning,
5. The pedagogical considerations in a country's educational context.

The problem driving this research is the lack of adequate solutions for facilitating successful implementation of educational technology in higher education institutions in developing countries. The target population was informed by typical users of ICTs and emerging technologies to enhance teaching and learning. The comparative study investigated two universities of technology regarding the adoption of educational technology in faculties. This was achieved through soliciting the opinions and perceptions of faculty staff regarding issues that emerge during the implementation of e-learning in a developing environment. The inquiry intended to evaluate a framework by Tedre, Apiola and Cronjé (2011). This research approach sought to determine how useful the framework criteria are in analysing the situation in South African universities of technology. In this comparative study, the research compared the two universities with regard to each of the framework criteria in order to determine how these dimensions resonate with pedagogical issues in other universities in developing regions. The current research sought to answer the main research question: *To what extent are criteria in Tedre, Apiola and Cronjé's framework useful in analysing two South African higher education institutions?*

To review relevant literature, the researcher consulted recent research on information and communication technology (ICT) uptake in higher education, e-learning implementation, and educational technology adoption in developing countries. The review process consisted of four stages. The first stage was to search for information and identify accredited electronic journals and conference proceedings, including the digital library and archives. Secondly, the Google search engine was utilised for automatic indexing through a web crawler, in order to achieve a comprehensive data harvest. Thirdly, the Google scholar search engine was employed to retrieve scholarly articles and accurate citations, as well as to access e-Books and relevant book chapters. For future access, comparison and retrieval the articles were classified and organized into a matrix table of 'literature review cluster'. The key terms for this search used for these resources included "educational technology", "pedagogical considerations", "educational technology uptake and adoption in developing countries" and "e-learning implementation in higher education". The researcher selected these electronic resources because they were trusted search engines for accessing empirical studies related to the adoption and implementation issues (considerations) regarding educational technology in higher education, especially relating to developing countries.

The following issues were taken into account in screening and selecting these journal articles:

- rigour and the relevance based on their keywords, titles, and abstracts
- the timeline which covered studies mostly from 2007 to 2016

Older literature was justifiably included for this review because of their quality, clear argument and evidence supporting its conclusion. In order to address validity and reliability two criteria were applied as means to assess the quality. Firstly, *rigour* was applied to ascertain whether the qualitative research design and method were clearly articulated and appropriately addressed the objectives of the study in line with Mayring, (2014). Secondly, *credibility* was considered in order to verify whether sufficient evidence was provided to support the conclusion in this thesis final chapter. Furthermore, the criteria was considered in order to allow explicit discussion regarding the limitations (Yin,

2013), as demonstrated in section 5.4 of the current research chapter five. As much as possible and in line with Yin (2017), the researcher critically reviewed the broader literature throughout this thesis in order to fully explore the comprehension of technology adoption, particularly in developing countries and in educational context of this research.

2.2 THE CONCEPT OF EDUCATIONAL TECHNOLOGY IN A DEVELOPING COUNTRY'S CONTEXT

It has been suggested by some researchers that the use of educational technology is a process (Blurton, 2002; Thune & Welle-Strand, 2005). Lakhana (2014) describes these processes as part of a mutual relationship between technological growth and intellectual growth. It can be argued that the introduction of new technologies might impact the academic improvement of the learners. In view of the growing number of universities that adopt technology in developing regions, it implies that educational technologies might be a positive response to educational change Kreber & Kanuka, (2013). On the contrary, there is a lack of studies which directly address pedagogical considerations that can improve technology integration in career directed educational programs that are particularly offered in universities of technology. For over three decades, researchers have held various views regarding the use of ICT in higher education and there is still no final definition of e-learning. For example, Blurton (2002) broadly defines information and communication technology (ICT) as a diverse set of technology tools and resources for communicating, disseminating, creating, storing, and managing information. Other relevant definitions include *online teaching* and *learning technologies* (Januszewski & Mulenda, 2013), *learning technologies* and *e-learning* (Badenhorst & De Beer, 2004), *digital learning objects* (Wood & Smith, 2004), *communication technologies* Kreber & Kanuka, (2013), *web-based learning* (Czerniewicz & Brown, 2005), *educational technologies* (Czerniewicz, Ravjee & Mlitwa, 2005), *hybrid* or *blended learning* (Thune & Welle-Strand, 2005), and *virtual learning environments* (Kirkup & Kirkwood, 2005). In the same context, this research intends to investigate the elements of consideration relating

to how the two universities use educational technologies to facilitate teaching and learning.

Bates (2008) suggests that for both social and economic reasons, all students need computer and communications technology skills in order to survive in a knowledge-based society. This means that technology exposure does not only enhance student learning but it also supports the aim of tertiary education by providing a competent environment for 21st century teaching and learning. The next section will therefore explore the impact of ICTs in the context of education.

2.2.1 The impact of ICT in education

The application of ICTs or 'educational technology' which are used interchangeably in this research, is already changing the nature of organisations and the delivery of higher education worldwide (Spector, 2015). Indeed, the introduction of ICTs in teaching and learning has brought far-reaching changes at the institutions of higher education in South Africa. This transformation involves multiple dynamics Spector (2015) that include multiple disciplines, multiple people, multiple tools and multiple opportunities to facilitate meaningful change. Effective educational technology adoption, however, can be costly as it involves complex socio-technical systems. E-learning 'uptake' is the adoption and, or use of ICT, not only by faculty staff members, but also the administrators in faculties and across the institution for varied educational purposes (Manueli, Latu & Koh, 2007). In accordance with Sarkar (2012), effectiveness, equity, cost and sustainability are four broadly intertwined issues that need to be addressed when considering the overall impact of ICT use in education. The universities in other developing countries are also unique (Tedre et al., 2011); this research sought to determine which pedagogical considerations in South African universities echoed their situation.

For many unknowledgeable users in underexposed developing regions, the use of ICT-supported teaching sometimes creates unfamiliar learning environments. This is because

the students are not only unfamiliar with web-based learning, but lecturers are also faced with the challenges of having to change their traditional ways of teaching. The systemic comprehension of the full integration of educational technologies is essential, as it is likely to motivate lecturers to want to use technology in their courses. However, some lecturers are still hesitant to embrace technology fully for one reason or another. The Clark-Kozma debate of the 1980s about whether 'media influences learning' has evolved in recent years and has been overtaken by the latest developments in ICT use and new technology applications. Times have changed since the famous debate in that the machine and method have since entwined (Sarkar, 2012), and that alone, as Spector, (2015) suggests, makes it difficult to establish whether the impact of technology itself can be separated from the effect of technology use. Lakhana (2014) points out that in educational technology one can distinguish between 'material tools' and 'immaterial tools'. This means that while the material tools might involve tangible equipment and peripherals, immaterial tools could refer to cognitive processes and ways of thinking on how to manipulate and or operate the use of computer tools to achieve the task outcomes. The present research sought to understand the ways in which technology could be suitable for facilitating teaching and learning.

The possibility of fully-fledged online course delivery has compelled many higher education institutions, as shown in current document analysis, to adjust their policies and create flexible approaches to learning for most students. Students from the rural and underprivileged areas have in the past lacked opportunities to advance their education due to challenges, such as unaffordable costs, time and distance. The universities' management have, with the 'open mind' looked at considering flexible approaches to learning and teaching. Rather than developing the strategies with existing faculty, many institutions look externally to address the adoption of educational technology (Ozkan & Koseler, 2009). The educational issues might be similar but, as this thesis predicted, the core teaching and learning (pedagogical) considerations are context unique and differ greatly according to varied situations.

Rogers (2010), points out that people are more likely to adopt an innovation if they perceive the advantage of the new strategy, relative to their current approach. The importance of a model or framework, as in any implementation plan (Cao, Griffin & Bai, 2009), is that it outlines the complexities and dimensions for both the technology integration and course redesign. Proposing a theoretical model for technology adoption, Wang and Qualls (2007) and Law, Lee and Yu (2010) suggest considerations that need to be examined, and these entail pedagogical issues, training and support issues, limitations of the devices, safety and security concerns, as well as cost considerations. Considering the importance of an implementation framework, it is worth noting in this thesis whether Tedre framework succeeded to differentiate adequately between its framework categories and the overlaps.

There are many challenges involved in implementing e-learning in developing countries. Continuous faculty support that maintains the implementation process is crucial. New instructional methods that cannot be sustained usually frustrate those who spend considerable time to unlearn old systems and acquire innovations (Sarkar, 2012). A number of technology initiatives in South African schools have failed while some of the government supported initiatives struggle due to one reason or the other. For example, a lack of complete stakeholder involvement and support from principals, heads of units and departments, the national education ministry, teachers, students, parents as well as community leaders often threaten these initiatives. In my general observation, the projects that are most likely to succeed, are those that achieve the buy-in strategy from all the stakeholders concerned. Again, it is not always obvious that naïve schools' authorities are supposed to go all out to involve stakeholders in such a 'never seen before' complex initiative as that of students' tablets that were distributed recently in South African primary schools.

2.2.2 Important pedagogical considerations in the implementation of e-learning

Several researchers have considered the integration of ICT in HE as 'inevitable' (Siritongthaworn, Krairit, Dimmitt & Paul, 2006), and e-learning has been depicted as an innovative approach to education delivery that enhances the learner's skills, knowledge, and performance (James & Hopkinson, 2009). However, the lack of a vision for technology use in learning environments, combined with the failure to consider pedagogical issues in an institution (Mumtaz, 2000) can hinder the implementation process. Sometimes the wealth of resources goes towards building a system that ends up being used more to justify its use than with the intentional pedagogical practice in mind (Kahiigi, 2009). Furthermore, ardent faculty staff members could get easily demotivated if there is a lack of necessary support, such as reasonable technology exposure and adequate training in the appropriate integration of various learner management system (LMS) tools. The previous point is necessary because using technology does not spontaneously transform the learning process into meaningful learning, nor automatically results in effective teaching practices. Kilmurray (2003) explains that merely offering any conceivable course and attempting to replicate the online classroom experience may cause unexpected failure, as it does not necessarily meet the students' needs. In accordance with Ng'ambi and Hardman (2004), an effective pedagogical use of technology is practiced and reviewed consistently in order for an improved enhancement of teaching and learning. Moser (2007) points out that the adoption of new instructional technologies is a multidimensional problem. Notwithstanding the above assertions, the literature is very limited with regard to distinct focus on the pedagogical considerations related to technology adoption in a developing country context.

In their article, Tedre et al., (2011) depict the pedagogical framework as containing a large number of various strongly connected components. To address the challenges, Tedre and Bangu (2010), Thomas and Cronjé (2007) and Kamppuri, Tedre and Takiainen (2005) assert that the most important success factor in any educational technology

initiative is the understanding and mastering of the cultural, gender and other educational dimensions of the course design in context. A number of studies have been conducted to identify critical success factors (CSFs) and to address the effective implementation of e-learning. Bhuasiri, Xaymoungkhoun, Zho, Rho and Ciganek (2012) argue that the prioritisation of CSF's in technology adoption in developing countries has not been widely studied. They point out that the factors affecting e-learning implementation presented by previous researchers range from descriptive to analytical studies with numerous dimensions. Bhuasiri et al.'s (2012) sentiment is echoed by other researchers (Kahiigi, 2009; Tedre & Bangu, 2010; Ferreira, Haddad and Faria, 2014; Bharuthram & Kies, 2013) who add that many institutions still face similar implementation challenges due to a distinct lack of focus on pedagogical considerations. This deficit might be due to a lack of awareness concerning pedagogical dimensions in a specific context. Sun, Tsai, Finger, Chen and Yeh (2008) believe that these critical success factors can help the universities the implementation process by overcoming potential obstacles. This study comparatively examined the pedagogical issues that can potentially affect effective technology adoption in two universities of technology. In an effort to place the dynamics of educational technology adoption into perspective, a brief discussion on technology acceptance models is provided in the next section.

2.2.3 The models of information and communication technology (ICT) adoption

There are many theories employed to determine various aspects related to the use, acceptance and adoption of technology (Chen, 2005; Lee, Cheung & Park, 2009; Angeles, 2013). The Technology Acceptance Model (TAM), amongst others, is the most popular and can add more insight in understanding this research. He and King (2008) state that Davis's Technology Acceptance Model (TAM) is generally used to measure technology adoption. These models might be relevant in the current research analysis in order to determine the factors that drive technology adoption and why? Three widely used theories regarding technology adoption for teaching and learning purposes include:

a) *The technology acceptance model (TAM)*

Proposed by Davis (1989), this model comprises two beliefs; that the perceived utilities and the perceived ease of use, determine the attitudes towards the adoption of new technologies. The TAM implies that when users are presented with a new technology environment, as is the case in this study, a number of factors could determine how and when they use the technology.

b) *The theory of reasoned action (TRA)*

Developed by Ajzen and Fishbein (1980), this model defines connections between beliefs and faculty members' attitudes towards technology adoption as well as norms and the intention to use technology effectively in their teaching. In this research, two universities were explored in order to also determine faculty attitudes towards technology adoption.

c) *The diffusion of innovation (DOI)*

In order to understand any approach to technology adoption inquiry, it is useful, as was in this study, to consider different types of adoption categories in accordance with the theory of innovation diffusion. The theory was popularised by Everett Rogers in 1962. Diffusion of innovation is a theory that describes how, why, and at what rate do the new ideas and technology spread (Rogers, 2010). Unlike in developed countries, an online environment for many students and lecturers alike often presents with an unfamiliar teaching and learning platforms. Consequently, such students are not only incompetent navigating the online learning environment but the lecturers might also be reluctant to abandon old traditional ways of teaching in order to become necessary innovators. The diffusion of innovation (DOI) theory, is instrumental in defining the types of individuals who behave differently when faced with unfamiliar situations. Rogers (2010), classifies the types of innovators into four categories: Early adopters, Early majority, Late majority, and Laggards. This classification could be of interest and relevance to this study in

assessing why the groups of individuals or faculties are different, and how the differences impact the findings in this thesis. In my years of experience as an educational technologist at various universities, and in line with Roger's (2010) theory of diffusion, I have observed the following patterns during the introduction of new technologies:

- Early adopters are like trendsetters. These individuals are always first to try new technologies. They are always on the lookout for strategic connections between smart innovations and their personal needs. They seem to be constantly motivated by the idea of getting an advantage over their peers.
- Early majority are motivated by the success and the guarantee that the technology will work. They prefer less complex approaches and will rather follow proven, simple, better ways of performing their duties.
- Late majority are conservative, but want to fit in by promoting social norms rather than just technology benefits. Unlike the early majority, the late majority adopters dislike risks and are often influenced by the laggards.
- Laggards are the most sceptics and the last few to adopt a new technology, if at all. This is because they share many of their doubts about why the technology is not going to work. Most laggards tend to criticise the technology even when they have not tried the tools.

The study is not only explaining how educational technology was implemented in different faculties but also the understanding of pedagogical elements that are essential in the adoption of educational technology. The interview questions used in this study were based on four primary areas, namely pedagogical framework, motivational and cognitive aspects, content and the country's educational context. The perceived value are the variables that influence the adoption process by which a faculty member becomes aware of, evaluates, and decides to use or not to use new technologies in a developing environment (Wang, Wu & Wang, 2009).

The adoption of educational technology depends significantly on the attitude and social norms towards ICTs, especially at faculty level (Lizzio, Wilson and Simons, 2002). For

example, the theory of reasoned action (TRA) which was discussed earlier was useful in explaining the influence of pre-existing attitudes and behavioural intentions towards faculty's adoption of technology-enhanced teaching. The primary data for this study was analysed based on the premise of four research areas in order to answer efficiently the research questions. The educational considerations are elaborated under topics, which are related to four main themes, namely;

a) Pedagogical framework

b) Motivational and cognitive aspects

c) Content

d) Country's educational context

Each theme in this study comprises a number of attributes which altogether make a total of 40 categories, alternatively referred to as 'attributes' in this thesis. The next section discusses these themes and their respective attributes in context.

2.3 EDUCATIONAL FACTORS WITHIN THE PEDAGOGICAL FRAMEWORK

The concept 'pedagogy' could involve implementation strategies which should be reflected in the curriculum. The pedagogical framework should be explicit in addressing the methods and techniques as well as best e-learning practices (Bates, 2008). Furthermore, educational technology practitioners and developers need a better understanding of how the faculties perceive and react to elements of e-learning (Koohang & Durante, 2003). This is essential because lecturers use technology tools to enhance their teaching, and deliver curriculum content amongst other complex educational purposes. As in any formal teaching and learning situation, the university expects lecturers to prepare and be able to unpack the content concepts unambiguously. The teacher knowledge namely; pedagogy, content and knowledge of technology (PCK) as Koehler and Mishra (2009) point out, is a complex intersection among the three independent bodies situated within the Technological Pedagogical and Content

knowledge (TPACK) framework (Mishra & Koehler, 2006). The Pedagogical Content Knowledge (PCK) concerns subject matter knowledge that validates lecturers' unambiguous teaching capabilities (methods) on the subject matter. On the other hand, the literature describes Content Knowledge (CK) as a deep understanding of the subject matter. This is an important point since there is a need to distinguish the educators from 'subject experts' with regard to subject matter delivery. As it may seem in the literature, the necessary transformation within pedagogical practices is yet to be made (Luft & Roehrig, 2007; Friedrichsen, Abell, Pareja, Brown, Lankford & Volkmann, 2009). Therefore, the content knowledge might still not be sufficient for the development of pedagogical content knowledge. Forty variables as they relate to four main Tedre framework themes, as well as the premise for testing their presumed relationships are discussed here forth.

2.3.1 Pedagogical framework

In a quest for the adoption of new technologies, many higher education institutions (HEI's) are faced with multilevel challenges. As a result, ICT has often become part of the strategic plan in most HEI's. Some institutions have expanded and actively developed ICT-integrated programs and relevant policies; however, most of these strategic plans lack an explicit action plan for total successful implementation (Muianga, Hansson, Nilsson and Mondlane, 2013). Pedagogical issues that often differ significantly between developed and developing countries' educational systems cause additional challenges (Wims & Lawler, 2007; Tedre et al., 2011). When institutions have not clearly defined and strategically adopted the implementation framework, they are unlikely to understand the extent to which educational technology has been adopted institution-wide (Graham, Woodfield & Harrison (2013). Based on practical experience, the choice of pedagogical approach in a formal education setting encompasses a range of practical decisions that need expert planning by the teacher. Numerous attempts have been made by learning scientists in developing the contexts, tools, frameworks and pedagogical models in order to better understand emerging pedagogical theories (Cobb, McClain, de Silva and Dean,

2003; Barab & Squire, 2004). Emphasising the need for a framework structure for the implementation, Kituyi and Tusubira (2013) suggest that a distinguishing framework must be developed and used in HEI's (Mumtaz, 2000; Graham et al., 2013) to guide the management of areas on which to concentrate in order to achieve positive effects of e-learning integration. In challenging educational settings that rural and disadvantaged areas mostly experience in rural and disadvantaged areas, Kahiigi (2012) suggests that educational technology initiatives should take into account important issues in the context-dependent educational characteristics of faculty. For similar reasons, the present study intended to discover to what extent the two South African universities compare in their technology uptake challenges and issues.

There is little knowledge regarding pedagogical considerations for educational technology adoption and the specific solutions to implementation challenges particularly in universities of technology in developing countries. Nonetheless, Tedre et al., (2011) point out that for such innovation initiatives, a clear investigation and evaluation of pedagogical choices might strengthen the project implementation. In the same notion, twelve elements of the pedagogical framework are discussed in the next section.

2.3.1.1 Exposure to technology

Describing the actions of an early adopter, Bronack and Riedl (1998), interestingly suggest that technology adoption is usually forced, especially when the option of "doing nothing" is non-existent. A similar implication is that there might always be a forced choice between teaching techniques and methods when a faculty member is presented with an unfamiliar teaching setting and the option of "doing nothing" is absent. In many instances, students seem to be exposed to technology more than their lecturers are. The pressure (Bronack et al., 1998) to keep up with students' learning styles may leave the lecturer with little or no option other than to integrate the use of technologies. Interestingly, Bates and Poole (2003) point out that, teachers may not be resistant in principle to greater use of technologies. In fact, lecturers also recognise that they need adequate training and

appropriate resources if they are to implement educational technology properly to support their teaching (Bates, 2008).

Technology, as it is ubiquitous, has changed every aspect of our life and education. Students who are unable to navigate through a complex digital landscape will no longer be able to participate fully in the socio-economic and cultural life around them (OECD, 2015). In accordance with Kahiigi (2009), the challenge might not be exposure to technology, but the implementation of suitable approaches and strategies that would result in effective integration of the technology. It is common knowledge that through self-learning, many students with easy access to technology can learn new advanced computer techniques on the internet. However, the exposure to technology in previously disadvantaged schools, especially in rural areas, is often limited due to a lack of adequate infrastructure. Consequently, many education institutions including businesses are ill equipped and lack technology. Some studies have shown that exposure and an appropriate use of ICT can increase educational quality and connect learning to real-life situations (Lowther et al., 2008). Furthermore, there has been no clear dissimilarity between teaching with and teaching about technology because rigour and relevance of such studies have not been attained (Arbaugh, 2002; McKinney, Yoon and Zahedi, 2002; Sun et al., 2008). The use of technology in education seems to be concerned with actual technology advancement, rather than its educational purposes. Some educational institutions are tempted to acquire elaborate and expensive equipment without a clear implementation plan, which if not utilized may result in a wasteful expenditure. It is important that research undertaken to investigate the adoption of educational technologies should add value through its validity and robustness.

Technology barriers include not only the lack of specific technology knowledge and skills, but also the lack of technology-supported pedagogical knowledge (Hew & Brush, 2007). On one hand, Inan and Lowther (2010) suggest that teacher demographics, such as years in teaching experience and the age generation gap, have a negative impact on their computer proficiency. In contrast, a generation gap and experience might not necessarily count when adequate equipment and seamless internet connectivity are available in

teaching venues (Broos & Roe, 2006). This research seeks to discover whether the generation gap, experience and age difference were of concern in the adoption of technology in the two universities.

2.3.1.2 The ICT literacy

Due to a lack of adequate infrastructure, learners' and teachers' exposure to technology is limited, as many might have never used computers before. A community with a technologically competent population often attracts new businesses and arguably sustained investments (Önsel, Ülengin, Ulusoy, Aktaş, Kabak & Topcu, 2008). Bates (2015) points out that for both social and economic reasons; all students need computer and communications technology skills in order to survive in a knowledge-based society. Sometimes, those students who are so-called '*techno-savvy'* are likely to intimidate less competent students. Similarly, many academics who are most familiar with face-to-face interaction in the traditional classroom might be intimidated by the new internet teaching environment. A computer-literate individual often displays more confidence than those that are less competent, and this might impact on student learning (Fraillon, Ainley, Schulz, Friedman, & Gebhardt, 2014).

It remains a concern that many educational technology initiatives supported by the government, sometimes fail to succeed. A number of technology projects have been rolled out in many South African schools over a period and due to a lack of both ICT literacy and technical support for teachers in schools, they struggle to succeed. Some schools lack adequate infrastructure and capacity to implement technology-integrated learning. Adding to the challenges, the skilled professionals in Information Technology (IT) are reluctant to accept school employment offers due to the low salary scales that are not commensurate with the skill's market. Lecturers are then forced to rely on each other or on the institutional human resource (HR) skills development for basic computer training.

2.3.1.3 Value system

Good citizenship in our societies should entail the upholding of decent values. Learning is a continuous process (Schwartz, 2013) and requires that values and drive are inculcated to ensure that the students become self-directed, lifelong learners. While values might be regarded as guiding life principles, some researchers suggest that values may play a very small role in behaviour except when there is value conflict (Rokeach, 1973; Tetlock, 1986; Schwartz, 1992).

In some cultures, it is seen as rude to interrupt elders or superiors while they are speaking. The implication is that students might not ask the lecturer questions while they are teaching, and this may render the student passive in their learning. The value systems and individual behaviour can be treated as an integrated whole in an individual personality (Grunert & Jhul, 1995). In South African HEI's, there is diversity in student populations as these are multicultural universities. It is, therefore, imperative for technology adoption in HEI's to consider the diversity of cultures and value systems. Different value systems emanating from group work, for an example, may affect a wide range of pedagogical and organisational elements, in case certain dynamics carry over into virtual learning (Tedre et al., 2011). However, in the absence of conflict values and diversity can be activated into awareness to benefit learning and be used as guiding principles (Rokeach, 1973; Tetlock, 1986). In accordance with Schwartz (2013), groups and individuals represent universal requirements of human existence as specific values about which they communicate in order to explain, coordinate, and rationalise behaviour. Another aspect that will be looked at in this thesis is determining the role that value systems play in group dynamics.

2.3.1.4 Active and passive learning

Learning is characterised by active rather than passive learning, and the learner should be in central control of their learning process. One of the distinctive features of learning is the ability to acquire knowledge and to be able to impart this knowledge to others (Lizzio et al., 2002). The option between *passive* and *active* defines a learning approach for the learning event (Piccoli, Ahmed and Ives, (2001). Therefore, the choice of the most suitable learning model is very important. Tedre et al., (2011) point out that learners and teachers in developing countries are often exposed to a single learning model that is teacher-centred; and that the radical and sudden switch to a student-centred, open learning environment may not be easy to implement. The learner-centeredness provides guidance to individual learning differences as it is more than just adapting to different learning styles.

Students' active participation, engaging with peers, lecturers or with content can validate some degree of learning that might lead to a certain level of satisfaction. Understanding the factors that influence students' beliefs about e-learning is useful for motivating the students to engage on an online learning environment (Grandon, Alshare & Kwan, 2005). The implication is that students engage actively in using technology as a tool rather than passively receiving information from the technology (Piccoli et al., 2001). In agreement, Lizzio et al., (2002) observed that students' learning environment is a stronger predictor of learning outcomes at university than prior achievement at school. Some researchers regard students' attitude and impressions towards ICTs as an important factor in interactive e-learning (Arbaugh, 2002; Arbaugh & Duray, 2002; Hong et al., 2003). Therefore, it is important to consider whether the learning event will be learner-centred or whether the approach will be a 'traditional', teacher-driven type of learning environment.

2.3.1.5 Grading models

The Department of Basic Education (2001), in South Africa, emphasises the importance of aligning assessment policies, teacher knowledge and infrastructure in schools. This is a call by the government to uplift the quality of education. The use of computers in education can reduce administrative workload, particularly through the automated assessment process, thereby saving more time to be utilised for teaching and learning. Computers are not only convenient for facilitating formative and summative assessments; learner management systems (LMSs), such as Blackboard, but the system software can also facilitate record keeping, track student's online activities, and monitor the students' progress and performance. An increasing number of HEI's are adopting grading models that provide a number of diversified assessment tools and methods (Cassady & Gridley, 2005). Although many online assessment tool options exist, nothing was found adequate to administer the e-portfolio (online) assessments and grading. The information obtained through an internet search by the researcher indicated that popular e-portfolios, such as *Mahara* are compatible regarding *Learning Tools Interoperability* (LTI) more with the Sakai learner management system, rather than with Blackboard. Learning Tools Interoperability (LTI) is able to connect two platforms, such as a learning management system (LMS) with external service tools, into one seamless user experience. It would be interesting to explore the extent to which open source software, such as Sakai, Moodle, Desire2Learn and others, are viable e-assessments platform solutions in developing countries. The lack of efficient e-portfolio assessment tools compels the academics to manual labour which could cause human error.

Grading models that are not flexible can affect the manner of teaching. Utilising different online evaluation methods creates a connection between students and their lecturer (Liaw, Chen & Huang, 2008), which could somehow make students believe that their learning efforts are properly assessed. Liaw, Chen and Huang, (2008) close this argument by indicating that perfecting the grading models, especially in developing countries, remains a challenge and will require sophisticated inventions in a number of

areas. It might be easy to identify those areas of consideration, but it might seem difficult to implement the new strategies, methods and techniques that emerge with new inventions. Although innovation is inevitable, the pattern seems to widen a recurring gap, which is a steep challenge to address especially in socio-economically challenged countries such as those with poor infrastructure. The questions to address therefore is, "How could open courseware salvage the situation in developing countries?"

2.3.1.6 Open courseware

The technological tools we use for production purposes should be generally available as open-source in order that they can be within the reach of many users. These production tools arose from the need to handle learning materials in new formats and modes, as pointed out by Tlhoaele, Hofman, Naidoo and Winnips, (2014). The use of ICTs in education has also led to the emergence of Open Educational Resources (OERs), which permit the learning materials to be remixed, reused and redistributed. The OERs enable open access to any course material and in diverse forms of media (Atkinson, Brown & Hammond, 2007). Dougiamas and Taylor (2003), point out that open access is essential for those educational institutions that have restricted and outdated instructional materials. Free content access can be useful since the sharing of knowledge and ideas may encourage self-development and the need to benchmark with the best course developers in other countries. Open courseware encourages local material development, since imported materials may provide a framework for the design of local materials. In unstable socio-economic situations, such as those in developing countries, developing educational materials from scratch often costs less than adapting imported materials. Therefore, lecturers should be encouraged to develop their own reusable learning objects (RLOs).

2.3.1.7 Parental involvement

Educational technology adoption automatically calls for institutional change (Bates & Sadleir, 2016). Thus, it is imperative for HEI's to involve all stakeholders, including

parents, in the planning of such technology initiatives (Lwoga, Anderson, Mapunda, Andersson and Mossberg, 2015). Due to socio-economic constraints in developing countries, a typical household survives below the living wage margin. Many students rely on parents and relatives for tertiary financial support. Therefore, the endorsement by parents and the community at a large might sustain technology adoption projects, since this may create a sense of ownership. Becker (2001) and Wood and Ashfield (2008) reiterate that when considering the adoption of technologies in education, schools need to ensure that learners, teachers and parents, in particular, are involved from the early project planning. Although parental involvement seems less hands-on at the university level, Hansson et al., (2011) suggests that parental involvement is an important element of educational projects on the K-12 level. Bhukuvhani, Zezekwa and Sunzuma (2011) recommend that it should not only be the role of the teacher to encourage the use of technology, but all stakeholders, including parents, must be involved in support of this noble endeavour.

2.3.1.8 Communication patterns

Students normally learn better by sharing ideas in a group. A variety of collaboration tools should be made available in order to afford collaborative learning online. A number of researchers suggest 3D virtual reality (VR), as an innovation tool for collaboration and synchronous learning that can be effective in facilitating communication between students and lecturers (Bronack, Sanders, Cheney, Riedl, Tashner, & Matzen, 2008). The benefit of the 3D-VR innovation is that users may be able to utilise face-to-face traditional communication interactions such as voice and physical gestures while expanding their creative teaching and learning spaces.

The explicit and implicit differences in cultural diversities, especially in South Africa, also termed as the "Rainbow Nation", make it crucial to understand student-lecturer communication patterns. Understanding societal value systems and cultural diversity increases communication flow and effective collaborative learning. Students come from

different cultural backgrounds and interrupting or posing a question to the lecturer is sometimes seen as culturally improper or disrespectful, even if it is for greater clarity.

One of the most significant rationales for e-learning is that it affords communication both inside and outside the traditional classroom (Januszewski & Mulenda, 2013). Without any restrictions on time and space, students can communicate instantaneously, anytime and anywhere (Harasim, 2016; Kim & Park, 2016). Prompt response and reasonable turnaround time of feedback to students improves learner satisfaction. Sun et al., (2008), supported by Chickering and Gamson's (2015) principles for good teaching practice suggest that lecturers who fail to respond to students' problems timeously, have a negative impact on students' learning.

Educational technology has not only changed the communication approaches in the classroom but has also influenced the way lecturers deliver their content material and the way students learn. In accordance with Tlhoaele et al., (2014), technology communication tools provide both the lecturers and students with dynamic teaching and learning strategies and thus increase interactivity and learning collaboration.

2.3.1.9 Class sizes

The size of the class should facilitate reasonable individual attention and meet the students' expectations (Laurillard, 2013). Garrison, Anderson and Archer (2001) emphasise the individual attention in learning as an important educational factor, in particularly with respect to gaining access to course content and the lecturers. Adequate planning and preparation is equally important for effective lesson implementation. Unprepared faculties and ineffective online course delivery are likely to add frustrations to overall design challenges (Garrison et al., 2001). Some researchers consider the context dynamics brought about the different class sizes as a key factor (Osin, 1998; Tedre & Cronjé, 2011). The implication is that varied class sizes should be valued since these dynamics are likely to encourage responsive instructional design leading to meaningful learning.

In the last decade, for example, South Africa has seen a considerable increase in the number of student enrolments in HEI's. It is very difficult for lecturers with large class sizes to employ interactive teaching strategies and to gain insight into the difficulties experienced by students. This unbalanced lecturer-student ratio and the overcrowded computer laboratories remain a threat to the provision of quality education. Online teaching and learning requires an acceptable level of student-to-staff ratio. It is important to take into consideration the course material design and the type of activities that can suggest efficient student participation.

2.3.1.10 Group work

Technology in education can be seen as an integral component of pedagogy and many assignment projects are facilitated through collaborative group work. Empirical studies have also reported the advantages of using technologies in learning environments. Pointing out the educational benefits provided by technology, Liu and Huang, (2010) suggest the support of collaborative group work projects, problem-solving and engaging learners in learning-related activities in various physical locations. What may seem to be a challenge is the fact that, by default, students tend to be isolated from one another through the use of technology. Vygotsky (2016) suggests that social interactions play a critical role in the process of active construction of learning and cognition. Although social interactions are regarded as a promoting learning, in some cultures competition between students is regarded as self-centredness.

Unlike in most continents, the culture in Africa is widely diverse in relation to religion, ethnicity, tribe, race and language. From practical experience and as an African woman, my observation is that cultural diversity is enormous within regions and across the continent. For instance, a voluntary collaborative group effort in activities is encouraged and recognized as 'humanity', *Ubuntu*. It is believed that *'it takes a village to build a nation'*. In addition, traditional competitions are usually organised for entertainment and the defeat is often not well accepted, hence jealousy against the winner which often

results in rivalry. This kind of 'culture' sometimes suppresses confident performance and full potential to succeed individually and within group work. Tedre et al., (2011) warn that value systems might affect pedagogical and organisational aspects in group work dynamics. The implication is that since students come from different backgrounds, value systems should be taken into consideration when implementing online collaborative learning. In this research, although the two universities are diverse in culture they are also unique in the sense that DUT is dominated by Zulu culture and CPUT is Coloured (Mixed race) culturally influenced. It will be interesting to note the impact of diverse value systems and culture dynamics that play in these two universities.

2.3.1.11 Contact versus individual teaching

Contact and individual teaching is most practical and effective in small class sizes as it provides appropriate levels of instruction to diverse groups of students. Garrison et al., (2001) point out that whether planning for face-to-face or blended learning, the decision between contact and individual teaching remain the pedagogical element to be considered. In addition, the capacity to completely individualise the pace and level of instruction to the needs of each student has been a challenge (Atkinson & Vasu, 2000). Although computers can individualise instruction for students, Tedre et al. (2011), indicate that in developing countries, the need for individual contact teaching and effective support is high even at the tertiary level. More than a decade, it is yet to be established whether teachers who successfully integrate educational technology prefer individual study rather than students receiving instructions as was found in Moseley and Higgins's (1999) study of the attitudes of teachers. With these two conflicting claims, the current inquiry is yet to establish the level of contact versus individual teaching support provided during technology integration.

2.3.1.12 Pedagogical models

Different models of teaching have emerged as the means of adapting to new learning environments. New instructional materials and revised curricula also bring about new teaching approaches and strategies in pedagogical constructs underlying new technologies (Fullan, 2016). The quality of the course design that is interactive and engaging are critical determinants of the teaching and learning experience. A well-designed course enables students to develop high-level thinking models and to establish conceptual knowledge (Kim & Park, 2016; Piccoli et al., 2001).

Furthermore, a lack of vision for technology use in learning environments, combined with the failure to consider pedagogical issues, might hinder the intended implementation process. In his case study on the use of Blackboard as the learning management system, Sakar (2012) found that students' e-learning dissatisfaction was based on the lack of a firm framework to encourage students to learn. It is important that the choice of technology and framework support pedagogical models that are compatible with specific techniques of teaching and learning. With the correct support, faculties are able to accomplish behavioural and cognitive goals in ways that benefit a variety of teaching approaches and meaningful learning.

Many implementation models and suggestions have been put forward. However, there is little consensus about what pedagogical models should encompass. For example, Lee, Cerreto and Lee (2010) suggested that attitude toward the behaviour (AB), subjective norm (SN), and perceived behavioural control (PBC) can influence the adoption of educational technology. They based their assertion on Ajzen and Fishbein's (1980) three significant predictors of teachers' intention, as discussed earlier, rather than Davis's (1989) theory of perceived usefulness and perceived ease of use. Varied interconnecting positions have emerged regarding technology integration. According to Mumtaz (2000), the successful implementation of e-learning must address three interlocking frameworks for change: the faculty, the institution, and policy makers. On the other hand, Fuller, Vician

and Brown (2006) suggest that an effective e-learning system implementation needs to address pedagogy, technology and the individual. In view of the above, this empirical study sought to answer the key question regarding the extent to which the Tedre framework criteria were useful in analysing a similar situation in two South African universities.

The use of ICTs for teaching, learning and research at HEI's has undeniably brought far-reaching changes. The changes have affected teaching and learning, hence the development of various teaching models (Liu & Huang, 2010). Effective instructional models are developed through learning interventions over time and over teaching experiences (Bower, 2008; Dalgarno & Lee, 2010). When you understand better, you implement better. It is through subsequent testing and refining that effective models are developed and deployed in other contexts (Barab & Squire, 2004). Many faculties believe that one learning theory or the other legitimately influences their teaching approaches.

In contrast to the behaviourist approach, and in line with Vygotsky, (2016) the job of the teacher in constructivist models is to facilitate students' learning while they set their own goals and 'teach themselves. In addition, Jaffer, Ng'ambi and Czerniewicz (2007) believe that there are two dominant positions existing concurrently; on the one hand, there are the protagonists of pedagogy underpinned by theories from behavioural and cognitive psychology, and on the other hand, are the proponents of educational technology pedagogy inspired by variations of constructivism. As I tend to lean towards the constructivist paradigm, my belief is that learner-centeredness inspires learning, unleashes creativity and unlocks cognitive thinking. It is important that course development and activities are interactive and engaging in order to stimulate critical thinking that is required for student cognitive learning. Furthermore, the pedagogical models, as methods and techniques of teaching, include behaviourism and constructivism. The learning theory of 'behaviourism' coined by Skinner in the 1960s concentrates on observable 'cause and effect' relationships between the student and the teacher (Skinner & Ferster (2015). The teacher's role was to modify the behaviour of students by setting up reward situations to reinforce students when they exhibit desired

responses. Dissatisfaction with the behavioural approach, some constructivists were more concerned about cognitive learning and how the human brain reacts during the process of learning (Vygotsky, 2016; Liu & Huang, 2010). Importantly, some researchers agree in principle that learning theories are regarded as the basis for educational technology pedagogy; hence, many prefer models that accommodate any learning theory (Ally, 2004; Dyke, Conole, Ravenscroft & de Freitas, 2007; Hung & Yuen, 2010).

Highlighting the critical success factors, Selim (2007) suggests strong pedagogical foundations, such as content, assessment and student learning support, as essential factors for the success of educational technology adoption. Kirkwood and Price (2005) argue that technologies are introduced in universities without explicit consideration being given to the implications for student learning. In accordance with Tedre et al., (2011), the choice of pedagogical approach is influenced by a range of practical decisions that demand expert planning, as well as the full understanding of educational practices in a specific environmental framework.

Describing Moseley and Higgins's (1999) model of teaching and learning, Mumtaz (2000) emphasizes PCK as the combination of content and pedagogy into an understanding of how specific topics are presented for instruction and content is organized and adapted to fit the diverse interests and abilities of students. Shulman (1986) developed the idea of PCK in order to describe the relationship between the amount of knowledge of a particular subject matter (content) and the knowledge required for teaching content (pedagogy). The subtopic, *'The content development'* in section 2.6.1 in this chapter will discuss the TPACK framework as it relates to the curriculum.

2.4 THE MOTIVATIONAL FACTORS IN USING EDUCATIONAL TECHNOLOGY

Learning motivation theories define the set of factors that influence students' motivation to learn, such as using technology tools to interact with the tutor or instructor and other

learners (Huang, Rauch & Liaw, 2010). Therefore, it is important to consider implementation models that consider the enabling cognitive and pedagogical effects in a learning environment. This means providing students with activities that will encourage various learning interactions, stimulate their critical thinking, and represent a substantial form of motivation (Summers & Svinicki, 2007).

2.4.1 Motivational and cognitive aspects

Dewey (1986) describes the purpose of education as growing or habitual learning. While Dewey (2013) logically insists that technology creates knowledge, Dusek (2006) emphasises the existence of complex relations between humans and technology, which necessitates a systems approach to technology. Lakhana (2014) and Bates (2008), point out that the systemic approach addresses the fundamental interdependence between technological growth and intellectual growth. The implication is that while technological growth refers to computer skills, the intellectual growth might relate to ways of thinking in achieving the maximum goal.

One of the relevant theories of motivation is Keller's (1987) Attention, Relevance, Confidence and Satisfaction (ARCS) model. This model presents six consensual motivation factors: attitude, competence, meaning, inclusion, leadership and satisfaction. These factors are regarded as building blocks for instructional strategies that encourage students' motivation to achieve learning outcomes. Engaged students are motivated students, and computer-based materials seem to have the potential to retain their attention by providing information that is concrete, yet perceptually easy to process. In order to improve the success of educational technology adoption and usage, it is important to understand students' motivational and cognitive aspects (Kahiigi, 2009; Tedre, et al., 2011). Students often find it difficult to follow a bad lesson and also tend to lose motivation quickly. Thus, it is of importance that online activities are interactive with clear instructions. This purpose shall serve to stimulate students' motivation that will enable them to complete their tasks (Xakaza-Kumalo, 2010). Bates, (2016), points out

that the extent to which students are motivated to engage in learning activities depends on their expectation of the fundamental satisfaction and the value gained from each activity.

In accordance with Summers and Svinicki (2007), motivation factors, such as progress feedback, challenging yet attainable goals for learning and enhanced perceived value of the tasks, can be seen as some of the building blocks for instructional strategies that intend to provide reinforcement for the encouraged activities. It is through a well-designed course, with proportional amounts of *workload* and interactive activities, that students become motivated to participate in the learning process. Unlike passive learning, active participation affords sharing and increases knowledge and better understanding of the concepts. Tlhoaele et al., (2014) point out that better understanding of the course content by students leads to *self-confidence* and ultimate improvement in their performance. Other authors, however, believe that confidence in learning is attributed to a clear understanding of students' complex conception status, which incorporates social, economic, ethnic, cultural and tribal construct (Lakkala, Ilomäki & Kosonen, 2012; Bates, 2016).

2.4.1.1 Mental models

Computer anxiety emanates from mental pressure which may greatly affect the learning satisfaction in e-learning. It is observed that students change their *mental models* and behaviours just enough to work productively with the change of any results. Some students lack self regulation and work just enough to get a pass mark. This is due to lack of self efficacy which is consistent with temporal motivation (Steel, 2007). Explaining the adoption process of educational technology, Schwartz (2013), argues that when presented with new technological experiences, students work hard to maintain a familiar sense which could be a static, continuous present. This process of minimal change explains the learning environment and cultural practice, which creates metaphors that link the known with the unknown (Huang et al., 2010). For example, a phone metaphor is used for the smartphone to make mobile computing understandable, and the Facebook

is used in terms of telephone directories and address books. Facebook is an online social networking website where people can create profiles, share information and content in various formats.

2.4.1.2 Gender

Based on the complex socio-economic elements, *gender* participation needs to be considered as a learning motivation since, role expectations may be critical to students' social behaviour (Chen & Jang, 2010). As a practical example, in most African cultures it is common that boy children are somehow treated differently in what seems as that of more value than girls. From my Zulu cultural experience, the household chores and responsibilities differ significantly between genders. A boy child is groomed from an early age to be physically and emotionally strong, in that way entrusting him with the expected social responsibilities including the protection of younger siblings. While the boy child enjoys certain privileges and in most cases, more free time, the girl is expected to conduct herself respectfully to everyone and at all times undertaking most of the household chores. This kind of cultural condition results in girls being less assertive than boys, because being forward is perceived to be unrefined conduct. In accordance with Rudman and Glick (2001) men continue to depend on women to fulfill domestic roles. This study will also unpack the impact of gender roles and value systems on the adoption of technology at two multicultural universities and in a country such as South Africa where cultural diversity is evident.

In view of the above, differences may exist between regions with regard to the university student's readiness to initiate a conversation, pose questions, or actively participate in the classroom, however, there are studies undertaken that reveal that there are no significant gender differences in technology use. For example, Zhang (2005) found that gender was not a significant factor in receiving education, and concluded there was no statistically significant difference in the overall perception of computer competence based on gender. In their study, Zhou and Xu (2007) found that due to socio-contextual factors, males tend to display more confidence than their female counterparts in using technology

for learning purposes. In contrast, Davis and Davis (2007) found that in online activities such as electronic communications, word processing and spreadsheet applications, females indicated higher perceptions of competence than male participants did. The implication is that it will remains difficult to achieve educational goals without gender sensitivity. The multicultural, diverse university communities are a reality in South Africa, hence the need to address and close the gender gap on ICT in education, particularly in affected developing countries (UNESCO, 2015).

2.4.1.3 Learning styles

Various theories can be found about how students prefer to learn. Students may go through the same stages of the progressive learning cycle, however, sometimes they prefer different aspects of the learning cycle (Dunn, 2000). Due to the lack of a holistic theory of learning styles, there is considerable disagreement between what the different learning styles are and what they should be named (Willingham, Hughes & Dobolyi, 2015). Some labels attached to 'learning styles' include cognitive styles, cognitive controls or personality. Cormier (2008) points out the importance of understanding when and how students use educational technologies in their Personal Learning Networks. This implies that appropriate curriculum development needs to provide for individual learning abilities. There is no doubt that learners differ in terms of personality and preferences, but whether these are learning styles is highly debatable and yet to be proven. Students have different learning skills and abilities that differ between students, be it in aptitude, trait or some other ability to learn (Segal, 2014). Methods that the lecturer uses arguably encourage students to employ individual learning styles, as a result of each student taking a different learning path. In his classic debate, Clark (1994) affirms that instructional methods that make the difference students' learning, and not the format or the delivery technology. On the other hand, Siemens (2013) asserts that the mode of presentation of the instructional material adapts automatically to each student. It is, therefore, important to assess and consider the appropriate use of different media formats and varied instructional methods to cater for several learning abilities. Furthermore, educational technology integration

enables course content delivery in different media and animated formats, which the lecturer would not be able to deliver using the traditional chalkboard method.

2.4.1.4 Immaterial rights

Immaterial rights refer to ownership and copyright of intellectual property, such as patents, trademarks and all other immaterial innovative ideas (Rowe, Lunt, & Ekstrom, 2011). The development of a critical mind through critical thinking could be the influential factor to creativity and innovativeness. On the information security of an online course Rowe et al., 2011), discovered that open source applications and tools available on the internet can assist both lecturers and students to not only develop, but importantly, also to manage their own content information. Application software such as Turnitin and SafeAssign are useful to detect and avoid plagiarism and copyright violations.

Most HEI's are sensitive to the debated issues of copyright and intellectual property. Many institutions in South Africa struggle with policies and remain uncertain on a number of issues concerning the Protection of Personal Information Act, commonly known as the POPI Act. Locally developed online materials are encouraged; however, any higher learning institution that want to establish repositories need to be aware of the international standards growth in their prospective content development areas (Churchill, 2014).

2.4.1.5 Confidence

Lecturers are expected to suffer a measure of technology anxiety when they have to experiment with new technologies. Some lecturers lack self-confidence in exploring educational technologies and thus tend to avoid their use, or opt to resist altogether. Aversion to change or resistance to the adoption of technology has a lengthy history in education, mainly caused by the uncertainty in the faculty (Dusek, 2006).

Roca and Gagné (2008) suggest that perceived usefulness, perceived ease of use and perceived playfulness are core determinants of the intention to continus with e-learning.. In his literature review report, Buabeng-Andoh (2012) concludes that the use of technology for learning is not limited to gaining computer competence, but also extends to involvement in cognitively challenging tasks. Students with high self-efficacy have added confidence in accomplishing individual e-learning tasks, and in fundamental intellectual abilities such as reflection, communication, interpretation and resolution (Forde, McMahon & Reeves, 2009; Thompson, Merica and Cope, 2002; Joo, Bong and Choi, 2000).

From a different angle, in their study, Zhou and Xu (2007) found that female teachers, as opposed to male teachers, lacked confidence and had less experience in using technology to enhance teaching. Furthermore, Wu, Tennyson and Hsia (2010) suggest that a higher level of individual computer self-efficacy is positively associated with a higher level of learning performance. The implication based on these assertions is that if both lecturers and students are confident in using technology to create and accomplish learning tasks, the use of educational technologies and of e-learning is likely to increase (Roca & Gagné, 2008; Wu et al., 2010) .

2.4.1.6 Income

Access remains one of the prevalent e-learning challenges for most HEI's in developing countries. Many students do not earn an income, but rely on families and limited bursaries/grants to fund their university education. A large portion of the population in South Africa survives on a marginal income. Household families struggle to make ends meet due to the high rate of unemployment and the low income that they receive. Many students, especially those from rural areas and disadvantaged backgrounds, are most likely to be negatively affected by these socioeconomic challenges.

Most HEI's have moved to create flexible approaches to learning for students who in the past lacked opportunities to advance their education due to socio-economic challenges.

For instance, distance education allows working students to acquire qualifications through various e-learning platforms. The approach is convenient and cost-effective in terms of saving travel and time away from work. In addition, skills and knowledge for lifelong learning which are relevant in the workplace, can be acquired through e-learning. In an effort to minimise costs, Bates (2008) encourages free online access or low-cost learning materials instead of buying international programmes, some of which, he says, lack contextual relevance.

2.4.1.7 Attitude towards e-learning

Technologies with a variety of rewards to support students' learning, could be one of the factors for improving student motivation. Motivation is inspired by a sense of control and the possibility of building knowledge during the process of learning (Liaw, Chen & Huang, 2008). Bolliger, Supanakorn & Boggs (2010) state that research indicates that a number of interrelated factors involving demographics might influence attitudes and other personality factors. It must be noted that attitude may also affect faculty staff. It is possible that some faculty members are too comfortable in the way they teach; as a result, they become reluctant to change and thus avoid adopting technology as an innovative way of teaching. Other lecturers are demotivated by the lack of technological support from the institution. Some of the consistent factors that demotivate lecturers from using educational technology include inadequately equipped teaching venues, lack of a technology-integrated curriculum and lack of skills and knowledge in online teaching among other factors (Kahiigi, 2009; Tedre & Bangu, 2010; Bhuasiri et al., 2012; Bharuthram & Kies, 2013;) . Although some faculties might receive institutional support such as training, other lecturers still need to develop their own capacity in order to integrate various technologies efficiently into different learning situations. In accordance with Higgins (2016), lecturers with positive attitudes towards technology are inclined towards using it in the classroom. In return, students are empowered and gain skills through exposure to technology rather than only receiving instruction.

However, a complex conception of educational technology fosters a positive attitude towards using technology (Cheung & Slavin, 2012). Students could have a more positive attitude toward technology when they are not afraid of the complexity of using computers, as usually shown by incompetent computer participants. Piccoli et al., (2001) point out that technology exposure and user confidence result in students who are more satisfied when they participate in an encouraging e-learning environment. Most of the factors identified as hindering the adoption of technology over two decades ago (Rosen & Weil, 1995; Winnans & Brown, 1992; Dupagne & Krendl, 1992; Hadley & Sheingold, 1993), remain the challenging issues of educational technology uptake, particularly in developing countries. It is for this reason that this research intends to contribute towards findings regarding the pedagogical considerations that are essential for effective technology adoption in two universities in South Africa.

2.4.1.8 Language

Many HEI's in developing countries lack adequate skills to develop high-quality instructional materials and programmes (Kahiigi, 2012; Tedre et al., 2011). The implication thus is that many imported e-learning programmes are developed in English, which might be the second or even third language for most students and faculties in developing countries. Consequently, the instructional materials are not always adequate for the local context. Such materials might need considerable adaptation both to local languages and to cultural appropriateness. Bates (2008), suggests that it is cheaper to adapt a foreign language learning object than to build an object from scratch. Contrary to the latter, to modify foreign programmes into local languages could be a costly undertaking for countries such as South Africa, which has the diversity of 11 official languages.

In addition, interaction on a social platform and the use of language are determining factors in the development of a critical mind (Vygotsky, 2016). Importantly, because of language inefficiency, the HE language policy makers should consider adopting

appropriate proven educational technology programmes in order to close the language and ability gaps.

2.4.1.9 Workload

The use of computers has not only reduced administrative workloads in faculties; students also benefit by using computers to automatically create different media formats in half the time than if it was done manually (Bates & Sadleir, 2016). I have observed theis pattern myself over the time and during assignment projects when interacting with university students. Information overload can easily overwhelms students. It is important to consider proportional portions of workload and not excessive and unattainable assignment projects, as most students might fail to handle the work overload. Different types of media content have the potential to stimulate student engagement (Tlhoaele et al., 2014); however, information overload tends to distract students. Importantly, videos and demonstrations should have a maximum duration of at most 2 to 3 minutes per video clip. High volume videos are affected by low bandwidth when compared to small chunks of content delivery. The implication is that access and uninterrupted learning is compromised.

2.4.1.10 Intrinsic and extrinsic motivation

Whether it is external motivation or self-regulated, students need some form of constant motivation for support in their learning. The study conducted by Law, Lee and Yu (2010) reports that the extrinsic motivation constructs have a significant effect on student learning. Further findings indicate that both intrinsic and extrinsic motivation are highly effective in students' self-efficacy. Shen and Khalifa (2008), reiterate that the intrinsic and extrinsic motivations have a significant effect on student behavioural use of educational technology. Students, therefore, should be afforded assignment tasks that stimulate engagement and facilitate critical thinking.

Gagné and Deci (2005), point out that the learners with intrinsic motivation exhibit epistemic curiosity. This implies that curiosity is based on lack of knowledge about a particular problem and wanting to know more about its working solution. Unlike extrinsically motivated, intrinsically motivated students are most likely to adopt a deep learning approach rather than simple rote memorising that is considered surface learning (Richardson, 2005). Furthermore, students' improved academic performance is often linked to high levels of deep learning (Phan, 2010; Floyd, Harrington & Santiago, 2009).

Many faculties have time constraints for using technology in their teaching. Others claim the lack of technical services and inadequate equipment, are barriers for using technology. However, my thought is that some academics are simply reluctant to find time for technology integration. The truth is that the lecturers' self-development should be of importance. Ironically, as Veen (1993) states, lecturers' development also depend on their intrinsic motivation, as well as their time commitment to improve quality learning for their students. Furthermore, time commitment depends both on organisational incentive structures and on individual variables (Veen, 1993). Importantly, the availability of support services such as training is necessary for lecturer motivation and increased faculty capacity in the development of quality course design.

2.4.1.11 Cognitive development

The ability to build knowledge from the known to unknown through experience affects student learning by experience (Bereiter, 2005). Cognitive development refers to the extent to which a learner can construct and confirm meaning through interaction in a critical community of inquiry (Garrison, Anderson & Archer, 2001). These authors further suggest that educational experience happens at the convergence of three distinct types of presences, namely cognitive, teaching and social presence. On rethinking cognition, Jones and Bronack, (2008) point out that cognitive scaffolding can improve student satisfaction and accelerate discourse within the online learning environment. For over two decades, literature reviews have been conducted about theories underlying pedagogic activities and educational tools (Hung, 2001; Ally, 2004; Conole et al., 2004; Mayes & De

Freitas, 2004; Dyke et al., 2007). New learning theories have emerged due to these technological developments. Ravenscroft (2001) and Wilson (1995) suggest that the pedagogy of technology integration has also transformed in two steps; from instructivism to cognitive constructivism, and currently to social constructivism. Bransford, Brown and Cocking (2000), point out that the science of learning is based on Piaget and Vygotsky's cognitive constructivist theories. These theories emphasise that learners should be able to construct knowledge and understanding from their prior knowledge and belief systems (Scardamalia & Bereiter, 2014).

Huang, Rauch and Liaw (2010) describe the constructivist approach as emphasising collaborative learning and students' ability to solve real-life, practical problems. This can be achieved through focusing on projects that require solutions to problems rather than on instructional sequences that require learning of certain content skills. In accordance with Flores, Ari, Inan and Arslan-Ari (2012), effective e-learning implementation can be achieved by combining adaptive hypermedia techniques with strategies that are informed by learning theories and motivational models. This means that it is possible to integrate multiple teaching method approaches in order to reach multiple and diverse learning styles. With regard to cognitive revolution in educational theory the *Cognitive Approach,* Dewey (2013) and Vitzgotsky (2016), among others, proposed that students actively construct knowledge and this construction of knowledge should happen in a social context. Collaborative learning should be emphasised and must be both traditionally and culturally inclined. This will afford these students the opportunity to actively construct the knowledge in a social context that is free from gender role stereotyping.

2.4.1.12 The country's socioeconomic status

Most developing countries are faced with serious socio-economic situations that could impede not only their economic potential but also technology initiatives in education. Due to the acknowledged imbalanced socio-economic environment in South Africa, students come from different schooling backgrounds and many with minimum preparedness when they enter HEI's. The country's economic environment underlies all educational

technology initiatives (Tedre et al., 2011). The adoption of technology in developing regions is affected mainly by various economic factors, such as having to build the infrastructure from scratch, operational costs, computing equipment and so forth (Arbaugh, 2002). Thus, it is important to consider the students' socio-economic environment in order for sustainable technology rollout.

ICT's are increasingly becoming accessible in one form or another, even in remote rural areas. The use of mobile devices has become convenient, commonplace to young, old, educated, as well as less educated people (Sun et al., 2008). In this way, ICTs are definitely becoming powerful tools in modern society, by extending both formal and informal education opportunities and eliminating the socio-economic barriers, especially in developing countries. Aforementioned suggestions have inevitably increased the demand for e-learning from businesses and institutions of HE (Arbaugh, 2002). Some researchers found that the characteristics of e-learning fulfil the requirements for learning in a modern society (Sun et al., 2008). In support, Selim (2007) describes e-learning as the use of modern telecommunication technology to deliver information instruction and learning content. Although e-learning has an increasing growth rate, challenges do exist. There is an abundance of e-learning standards available for each country to assist in deciding on their needs, as well as to ascertain whether the standards will meet those needs (Frydenberg, 2002).

2.5 THE IMPACT OF CONTENT KNOWLEDGE IN E-LEARNING

Information communication and technology allows students to create content through completing the assignments, blogs, social media and other online activities (Flores et al., 2012). Describing the experiential learning theory Kolb and Kolb (2009) emphasise that learning is best conceived as a process of continuous reconstruction of experience, and not only by the achievement of outcomes. Online tools enable students to manipulate information in order to adapt solutions to their own contexts (Dogan, 2015). Lecturers also

use technology to bring information to students in different media formats that are useful to kindle interactive learning. It is for this reason that appropriate internet communication tools in the course design should be made available to ensure interactivity between students, students and lecturers, and the virtual community at large (Xakaza-Kumalo, 2010).

In view of all the above, the content aspect of e-learning needs to be explained through the lens of the purpose of technological, pedagogical and content knowledge (TPACK) as the teacher technology integration framework.

2.5.1 The content development

In order to understand the origins of the technological, pedagogical and content knowledge (TPACK) framework and its impact on the field of educational technology, it is important to examine its roots in pedagogical content knowledge (PCK). Shulman (1986), points out the importance of a more coherent pedagogical content knowledge (PCK)

theoretical framework that addresses good teaching practice and teachers' level of content knowledge, as depicted in Figure 2.1 below.
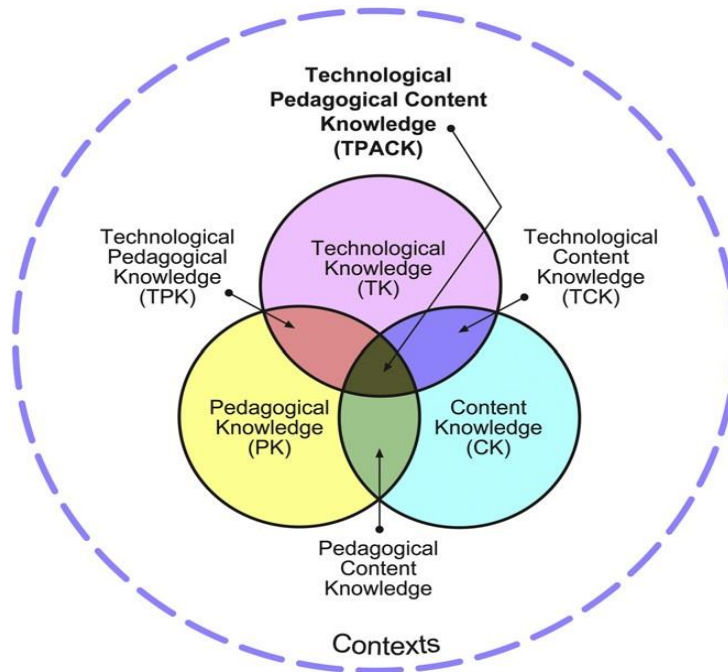
FIGURE 1.1: THE GRAPHIC REPRESENTATION OF TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (ADAPTED FROM KOELHER & MISHRA, 2006)

Due to the fact that faculty makes use of technology tools to deliver the curriculum content, it is important for lecturers to understand the core business of teaching (pedagogy) and to possess confident content knowledge. The TPACK framework explains the relationships and the complexities between the three 'basic' components of knowledge: technology, pedagogy, and content (Koehler & Mishra, 2009; Mishra & Koehler, 2006). Literature evidence suggests that content knowledge (CK) is a necessary precondition for the development of pedagogical content knowledge (PCK) (Halim & Meraah, 2002; Capraro, Capraro, Parker, Kulm & Raulerson, 2005). Subject matter knowledge, also known as pedagogical content knowledge (PCK), concerns students' understanding of the specific course content explanation and the lecturer being aware the level of the students' knowledge. Content knowledge (CK) refers to the deep understanding of the subject matter through knowing and understanding the facts (Luft & Roehrig, 2007; Friedrichsen et al., 2009).

2.5.1.1 Cultural appropriateness

Students are exposed to different cultures in foreign content through the use of the internet. Students are led into internet through learning material which might include simulations, podcasts, vodcasts, animations and YouTube, amongst others. According to Cheung and Slavin, 2012, students' learning changes according to the culture. Cheung and Slavin (2012) explain further that the culture evolves in response to students' changes in the social and material environment. Some faculties might somehow find relevant iInternet information from the open courseware and other educational resources; however, it is important to scrutinise its sensitivity towards the diverse culture particularly of the students you deal with. Although in his book Cuban (2009) indicates that global economy impels stakeholders to consider technology integration in order to improve academic learning, he suggests that education is firmly grounded in cultural beliefs with regard to the student-teacher relationship, rather than student-machine relationship; thus, Cheung and Slavin (2012) affirm that this kind of approach dominates learning, instead of opportunities to adapt to technology. Bhattacharya, Mach and Moallem (2011:26) concur that education is "education" when it is "complete and is based on the environment, culture and experience of the child".

Because culture is not just ethnicity but also being part of 'human society', it does influence learners' cognition, behaviour and the way they complete tasks (Kukulska-Hulme, 2014). In accordance with Gay (2002), culturally responsive pedagogy recognises the strengths and accomplishments of the students and enhances them further in the learning process. Furthermore, group information sharing is useful in developing knowledge (Bereiter, 2005), and therefore it is important to be sensitive to the collaborative learning tradition that is inherent in hugely diverse cultures. This will be to avoid both negative and positive impacts on teaching and learning (Karami, Karami & Attaran, 2013). According to Alshare, Al-Dwaire, and Akour (2003), technology integration is lagging in developing countries due to among other factors, cultural concerns. This is due to lack of skills and knowledge in developing programmes in local content that is

culturally appropriate for implementation in developing countries. For this reason, this study intends to determine how the cultural aspects affect the integration in two multicultural universities.

2.5.1.2 Authenticity

As in any learning situation, authentic learning can be characterised by active engagement that is linked to some elements of progressive inquiry (Muukkonen, Hakkarainen & Lakkal, 1999). One of the objectives of innovative education is to create learning experiences that afford personalised learning in order to allow students to create their own learning path. In order to create reliable and stimulating content that will keep students interested in the learning processes. ICTs can be utilised in various forms such as interactive images, hyperlinks, websites, and videos, including mash-ups that combine sound, animation, transcripts and videos. This type of technology-integrated learning should be experiential in order to be able to stimulate aspects of the natural environment (Liaw, 2008). This implies that learning should be authentic, especially when students engage in authentic activities that involve meaningful projects to solve real-life problems.

The advancements, standards, specifications and subsequent adoptions have led to a significant growth in the interoperability and scalability of educational technologies (Sarkar, 2012). Technology-integrated learning environments allow students to interact amongst themselves as found in the study of Xakaza-Kumalo (2010), thus confirming that learning occurs socially through students' engagement during authentic activities. It is important that faculties consider the context and use the resources available to them. Technology based learning provide authentic learning environment as Herrington, Reeves and Oliver (2014:401) describe:

> *"In everyday life few successful problem-solving strategies ignore the context and limitation afforded by the real situation. However, in formal education settings, pedagogical strategies often ignore the real world relevance of a learning context."*

2.5.1.3 Modalities

A preferred learning style as a way of learning is the way in which the student learns best. Pritchard, (2013) points out that the progression of students' learning is often without fully understanding the theory behind it. The modalities, also known as learning styles, refer to the way students apply their senses in the learning process (Liaw, 2008). Collis and Moonan (2001) describe technology-integrated learning as a multifaceted and dynamic way of knowledge creation, knowledge transfer and learning. Lytras, Pouloudi and Poulymenakou (2002), point out that the multidimensional model illustrates the way technology-supported learning can work as a value-added process, while supporting the different needs of learners.

Some of the common but questionable modalities (Clark & Feldon, 2005) include: visual (seeing) for students who prefer using images, pictures and spatial understanding. Also mentioned is the aural/auditory (hearing) for students who prefer using music and sound. Some may consider kinesthetic (moving, doing) learning style as those students who learn better by physically using their bodies; others may use tactile (touching, experiencing) as they prefer to learn by experiencing and by feel of hands and sense of touch. Learning styles have since expanded into Garderner' (2011) theory of multiple intelligence. Gardener insists that learning styles are not multiple intelligence. In accordance with Fleming, (2009) various types of learning include a verbal (linguistic) approach using both oral and written words; a logical (mathematical) style which is preferred by students who use logic, reasoning and systems. Furthermore, a social (interpersonal) style might be considered for students who learn better collaboratively in groups or with other people. Finally, besides the naturalistic learning style a solitary (intrapersonal) learning style might also be suitable for the student who prefers self-study and working alone. Students' learning styles are influenced by certain beliefs and perceptions (Brown & Addler, 2008); thus, learning styles are dependent upon cultural artefacts and individual processes of socialisation. By recognizing and understanding students' different learning styles, lecturers are able to select and utilise better-suited technology tools to facilitate high order learning activities.

2.5.1.4 Contextual relevance

There have been many accounts of both successful and unsuccessful reports attributing the failure of e-learning to its inability to be relevant to local needs and cultures. Sakar (2012) emphasises that the biggest mistake is the installation technology without first assessing student needs, the availability of the content, and using inappropriate foreign content without appropriate customisation. Students are more likely to be interested in content that is relevant (Keller, 1987) in the sense that it satisfies their personal needs, and goals, as well as their career aims. In order to increase contextual relevance, Weaver and Cottrel (1988) suggest relating the course instruction to students' values, behaviours and goals. Bates, (2015) encourages adding value to global relevance through content knowledge that is customisable. However, this may pose a challenge since many lecturers may still not have the capability to manipulate content during instructional material development. In this case, to show relevance the content ability should be shared internationally in order to benefit understanding of different cultures beyond foreign languages and across regions of the world (Bates, 2015). With the internet, a wealth of instructional materials in almost every subject can be accessed from anywhere, at any time and by everyone. However, the overall impact of technology use in education is dependent on its sustainability, effectiveness, affordability and equity (Sakar, 2012). It is for this reason that the educational factors in the context should be seriously considered in the process of educational technology adoption.

2.5.1.5 Size

Sometimes, access to learning is determine by multimedia volume or size that has been used to supplement learning content. Many students in poor countries are disadvantaged and may not have free access to the internet that other students from affluent areas may enjoy. For example, podcasting, video lectures, and YouTube video content all need varying amounts of bandwidth in order to be viable. Furthermore, technology integration

renders meaningful learning when appropriate content and visuals are well-organised and closely aligned with the expected outcomes in context (Bates, 2016; Tedre et al., 2011).

High volume audio content that is used for class activities might suffer low bandwidth, causing interrupted learning to many students. Law, Lee and Yu (2010) suggest that intrinsic and extrinsic motivation is essential for students' self-efficacy. Therefore, it is important to limit audio-visual learning materials, such as podcasts and videos to a minimum duration, in order to keep students motivated. Furthermore, information overload might not essentially benefit students since huge workloads may easily overwhelm and demotivate many students.

2.5.1.6 Language

Many faculties are still hesitant to consider social networks as valid formal teaching and learning platforms. Students' engagement with the world's diversity in social network platforms exposes them to different cultures and language skills (Liu, Moore, Graham & Lee., 2002). Language is not neutral but is determined by culture as it conforms to appropriate institutionalised behaviours and societal values (Emmitt, Zbaracki & Pollock, 2010). This implies that language can be used to assume a specific role and to differentiate between a learner and a lecturer in a learning event.

In some HEI's, there are guiding policies in place with reference to the use of language and conduct in social network platforms. Social media platforms such as *FACEBOOK* are commonly considered as unsafe environments for formal teaching. However, social network platforms can well be utilised to facilitate group activities and brainstorming which may include information/ideas sharing prior to controlled tasks which are provided on the formal and protected LMS environments. Supported by Lockyer and Patterson (2008), Vie (2008), discovered that an increasing number of faculties explore social networking sites as potential platforms for self-expression, engaging and producing new content. Additionally, Hourigan and Murray (2010) concur that the introduction of innovative and new technologies, such as blogging, increases interaction and provides frequent content

updates. This means that students initiate the communication, thus becoming developers of content in various formats as they apply different technology tools in their reflective process. Strampel and Oliver (2008) describe the reflective content produced by student bloggers as the highest output level of descriptive reflection and cognitive retrieval. Therefore, it is a key responsibility of a lecturer to create quality interactive course activities that will benefit critical thinking and develop or improve students' language learning skills. It is important that the appropriate selection of suitable collaborative tools are selected in order to facilitate positive learning outcomes. For example, for an individual group brainstorming activity, the relevant communication tools such as chat and the discussion forum that are suitable for facilitating synchronous real-time engagement, should be made available. Wikis encourage collaborative learning by allowing group members to edit a single document and to create a truly collaboratively finished product. The study intends to explore the implementation of collaborative tools, such as those found in Blackboard as the chosen learner management system at the two universities.

2.5.1.7 Adaptivity and adaptability

The manner in which an individual chooses, or is inclined to approach a learning situation, has an impact on the performance and the outcome achievements (Cassidy, 2004). Well-noted advantages of e-learning are student benefits, such as better instructional content delivery, personalised instruction and convenient access to information (Dogan, 2015). However, some of the major challenges of web-based instruction include accommodating students with differing profiles, prior experiences, expectations and learning abilities (Curran-Smith, Abidi & Forgeron, 2005;). Furthermore, the impact of ICTs on education represents key developments with regard to current pedagogical practices (Nicolaides, 2012). Literature indicates that using educational technology fosters intellectual development and habitual adaptation; on the other, Curran-Smith et al., (2005), argue that technology replaces lecturers' own teaching, thus sacrificing benefits that students receive through by face-to-face, interesting and compelling lessons.

From the researcher's teaching experience, every student is capable of learning; however, at each individual's own pace and at different levels of achievement. Supporting this idea, Bronack and Reidl (1998:5) point out the assumption that "All students are incapable of learning anything" is a dead option. Students present different characteristics in online learning, and these include field independence (Chen and Jang, 2010), self-efficacy (Artino, 2008; Yukselturk & Bulut, 2007), self-regulation (Azevedo, Moos, Greene, Winters & Cromley, 2008), and particular learning styles (Graf, Yang, Liu & Kinshuk, 2009). In view of these differences, Cheung and Slavin (2012) suggest that it is imperative to consider additional explanations and scaffolding for slower-paced learners, and more challenging material for fast learners. It is therefore important that faculties consider adaptive teaching that will allow students to create their own learning paths. The adaptive learning implication will be to provide a clear-cut sequence of steps in a student's online learning progression. Therefore, the use of technology should dominate learning instead of opportunities to adapt to technology (Cheung & Slavin, 2012). Nevertheless, the need to adapt is perceived as technology-led and requires faculty staff to develop their skills in the use of ICTs.

HEI's such as CPUT and DUT are obliged to adapt to external conditions caused by the widespread adoption of technologies, such as mobile devices, social media and various social network services (Kukulska-Hulme, 2014). It can be argued that faculties lack the motivation to implement technology-integrated teaching. For intrinsic motivation, Midgely, (2015) states that the method of teaching used by a lecturer encourages students to adopt a specific type of learning approach. According to Flores et al., (2012), through combining adaptive hypermedia methods with strategies informed by instructional theories and motivation models, an adaptable online tutorial can be achieved.

Teo, Chan, Wei and Zhang (2003) point out that community adaptivity is characterised by adaptive virtual learning and system design. The adaptivity levels have challenged the practitioners and some have responded by predicting the "tiers of adaptivity". The latter suggests that through intensive use of data analysis and educational technologies, the course programmes will advance through several tiers of adaptivity which could offer

greater personalisation through more advanced automation. However, Solvie and Kloek (2007), argue that most adaptive learning systems fail to provide guidance based on individual differences but tend to provide learning paths and content, based on the perceptions of a few experts and designers.

2.5.1.8 Interactivity

Knowledge involves experiential interactive transformation that continuously takes place. It is not adequate for course design activities to be limited to products where interactivity is trivialised to a simple menu selection, clickable objects, or linear sequencing. Tlhoaele et al., (2014) suggest that the direct effects of technology and interactive engagement methods complement each other in the improvement of students' interactive engagement levels. According to Lakhana (2014), technology is the construct of an interactive and experiential process that inures intellectual adaptation. Subsequently, this type of learning process is known as the "constructivist" approach. The implication to faculty is the quality development of course design that motivates students' engagement and critical thinking. The assumption of learning from the web-based platform is that students construct knowledge for themselves by interacting with information and materials. In order for students to be able to construct their own understanding, the course design activities should be interactive enough to maintain the students' curiosity, and encourage them to engage with the content (Keller & Suzuki, 2004).

2.6 THE PEDAGOGICAL CONSIDERATIONS IN A COUNTRY'S EDUCATIONAL CONTEXT

Education has always played an important role in the economic development of a country. However, each country should have its own clear goals that adequately address the areas of national needs. The literature indicates that both the external environment and internal

sources are crucial determinants of educational technology adoption, hence the changing roles of governmental education policies.

2.6.1 The country's educational context

In accordance with Alshare et al., (2003), technology integration within education in developing countries is mainly affected by political, cultural and economic concerns. On the other hand, for successful educational technology adoption Tedre et al., (2011) suggest that a thorough understanding of the national vocational needs, the job market, funding, and teacher-student ratio in primary, secondary, and tertiary education, is critical. This section discusses the policy issues and challenges in the planning and adoption of educational technology in context.

2.6.1.1 Investment incentives

While countries can learn from the successes and failures of others, Tedre et al., (2011) emphasise that each developing country's context differs greatly from others, and there are no explicit rough-and-ready solutions for such complex socio-technical structures. Not only do e-learning technologies benefit HEI's but also there has been evidence of growth in the investments in programmes designed for corporate education and training in various industries (Ringstaff & Kelley, 2002). Therefore, an early exposure to technology will assist students to adapt easily when they enter the work environment. For an invested country's economy Akst and Jensen (2002), point out that a society with a well-educated and technology-literate population is more likely to attract investments. New and sustainable businesses may boost the country's economy.

Many HEI's that consider the adoption of educational technologies have increased investments in learner management systems (Hennessy, Ruthven & Brindley, 2005; Moonen, 2008), such as Blackboard and Sakai amongst others, and in hardware and various software applications. However, some faculties expect incentives for the time and

effort that come with all the planning and the development of course design. As a result, the integration of technology in the courses is minimal (Angeli, 2005); hence, the impact of information technology on existing curricula is not yet significant (Rodriguez, Nussbaum & Dombrovskaia, 2012). Some of the barriers to technology adoption relate to a lack of compensation for curriculum development (Tlhoaele et al., 2014). Such implications affect the teaching implementation in faculties, as the return on investment is yet to be determined. Supplying rewards may stimulate the implementation process in the form of recognition and promotions for those faculty members who choose to implement the process.

Synergy between government departments with relevant interest is encouraged in order for effective implementation of related initiatives. For example, in support of the Gauteng online government schools initiative in South Africa, the collaboration between two departments, the Department of Education and the Department of Communications, developed an e-Education white paper (2004) and reduced the internet and telephone tariffs by 50% in schools. Therefore, the questions to be asked are whether similar synergies could mitigate real education problems such as the #FeesMustall students' campaign, and whether the deliberated incentives, such as motivation, can improve teaching with technology in developing countries.

2.6.1.2 Aims of education

The aims of education differ between various countries' national education systems. For example, the common e-learning objective in developing countries is to afford access to basic education, whereas in developed countries the aim is to advance an effective knowledge economy and to enhance lifelong learning (Gulati, 2008). Although the primary purpose of technology integration is to enhance the learning experience, Kukulska-Hulme (2014) argues that the adoption of technology for teaching and learning lacks explicit educational foundations.

Since 1994, South Africa has progressed steadily in providing access to education to all after the advent of a democratic government. Responsive to an increased demand for HE, significant changes have taken place; more doors in HEI's were opened, policies were reviewed and tertiary qualifications were restructured with added value to accommodate further education and training (FET). Furthermore, all public tertiary institutions are now subsidised by the government's NSFAS student financial scheme. As the demand for education increases, so does the outlook for quality education as people begin to rethink about what value the type of education actually adds? Students are beginning to ask critical questions regarding the decolonisation of current education curriculum. The national ongoing debates insist that decolonisation of education should illuminate its meaning and relevant context in terms of transformation.

Access to ICTs has become an important national objective in many countries, and in some countries, it is established in the governing laws. Emphasising the enhancement of lifelong learning in the white paper on e-Education in South Africa (2004), Naledi Pandor, the then minister of higher education, alluded to technology integration as providing access to *"a wide choice of diverse, high-quality communication services which will benefit all learners and local communities".* Bates and Poole (2003) assert that knowledge-based economies are those dependent on hi-tech sectors such as computing and ICTs, as well as service industries, such as health and education.

Since the emergence of educational technologies, instructional strategies in higher learning have been evolving; curricula have been reviewed, adjusted and adapted according to new methods and techniques. The curriculum is the means to educational development by introducing new content and new goals. Governments have intensified their investments towards ICT in education. The universities and web-based learning platforms as the forces that operate on the micro- and meso-level of the education system are influential in bringing about changes that are beyond the direct control of ministries of education (Pelgrum, 2001). While individuals see education as self-advancement, the government can view the demand for HE as a mechanism for national development. The sharp increase in student enrolment, the knowledge explosion, the many advances in

emerging technologies, global and economic change, and subsequent multidimensional constraints have all contributed to reforms in HE (Hattangdi & Ghosh, 2008; Shin & Harman, 2009).

2.6.1.3 Job market

Global participation has encouraged countries to strive for relevant and quality education with graduate attributes that meet the standards of international job markets (Önsel et al., 2008). Technology application tools are regarded as being beneficial to learning inHE settings, where students realise that they will be applying these tools at different work settings in the near future (Edmunds, Thorpe and Conole, 2010). Many nations are investing in HE and counting on increased graduate output to promote wealth and to benefit the country's economy (Önsel et al., 2008). It is of importance therefore, that e-learning is integrated with relevant curriculum restructuring in order to equip students with the kind of skills, knowledge and aptitudes they will require in the competitive markets.

Universities have realised the importance of work-based learning, where students can access courses from their workplace. Numerous HEI's have signed commitments with industry to jointly guide students to complete their qualifications. For some qualifications, students study the theory at the university before they are then placed in various industries, where they are formally assessed for the purpose of practical exposure and experience in the real work environment. The use of corporate markets in work-integrated learning in higher education enhances courses and new programmes concerning varied career needs (Hong & Songan, 2011; UNESCO, 2015).

2.6.1.4 Government initiatives

Educational technology initiatives, such as the adoption of e-learning in poor countries, can pose intolerable financial constraints in HEI's. Alshare et al., (2003) point out that the intervention attempts by governments with limited resources, do not achieve significant

differences in the current rapidly transforming education landscape. E-learning initiatives might require considerable investments in technology. Likewise, the universities should invest in technology use and reskilling in order to ensure that faculties understand the technologies they use and how to apply those technologies to meet the students' learning satisfaction (Welsh, Wanberg, Brown & Simmering, 2003).

Progressive governments take the country's education seriously, and flexible governments tend to respond positively to educational needs. The government initiatives should support student learning by providing teacher development in technology skills to enable efficient course design. It is important to involve all stakeholders, particularly parents, for example, in government distribution of student take-home tablets in Gauteng schools in South Africa. Financial aid for students, such as NSFAS, is a key government initiative that supports the country's growth in producing students with competitive graduate attributes. Importantly, strong strategies and projections should prevail in a stable education system in order to avoid being caught up with drastic changes such as abrupt relocation of national funds to save insufficient national education budget. The government should support HEI's that are attempting to solicit external funding from non-governmental organizations (NGOs). This necessary support could potentially benefit stability at tertiary institutions against the #FeesMustFall campaign.

2.6.1.5 Vocational needs

A countries' main objective for educational technology adoption should be to afford people convenient access to education. ICTs can be used effectively for skills development and as a poverty alleviation strategy (Angeli & Valanides, 2009). Thus, it is important that the national education goals address the vocational needs of the country in order to create the balance between vocational needs and the excess of despondent graduates (Nokelainen & Dedehayir, 2015). Furthermore, it will be difficult to meet the vocational training without virtual classes (UNESCO, 2015). Distance learning HEI's such as the University of South Africa (UNISA), with its more than 300 000 student enrolment, and further education and training colleges (FETs) afford flexible learning opportunities to

young and old, rural or suburban, full-time employed as well as unemployed individuals, so that they can acquire their qualifications. In agreement, Sakar (2012) reiterates that ICTs in education afford both formal and informal opportunities to previously underserved constituencies. These communities are characterised by scattered and rural populations, ethnic minority groups, the elderly and persons with disabilities, girls and women traditionally excluded from education due to cultural and or social reasons, as well as those who for cost reasons or time constraints are unable to enrol on campus.

The implementation of policies on quality education should be monitored in both categories of tertiary education in South Africa, namely in both Technical and Vocational Education and Training (TVET) and traditional universities. For example, the national qualification framework (NQF) regards certain qualifications as equal, when in fact the quality of teaching and learning has been compromised in TVET colleges due to a lack of qualified staff and quality management mechanisms. The ongoing debates insist that universities have the responsibility to define the curricula first before decolonising it. The concern calls for a review of what is perceived as colonised curricula. An example would be where the curriculum inhibits creativity and expression in African languages. Bates (2016) views curriculum along the context in digital age as product and a body of knowledge to be transmitted during authentic learning process.

2.6.1.6 Non-governmental organisation initiatives

Much as it is important to understand how students fund their studies, it is equally important to be aware of the government educational initiatives by a number of non-governmental organisations (NGOs). This is important because the World Bank, UNESCO and other large financial aids, might fund some of the projects. However, such projects must be closely monitored as they may suffer negative impact (Hong & Songan, 2011) causing enormous ramifications on the entire country's education sector. Funded projects in developing countries have been driven mainly by articulated objectives and clear goals of education innovation, such as the use of ICTs for development and improved strategies to alleviate poverty. Scalable and sustainable research-based

education innovation is likely to attract funding. Cuban (2009) and Fullan (2016) suggest that studies of the processes underlying the educational changes are crucial determinants of whether the implementation of a strategy for improvement succeeds or fails in reaching its educational objectives. It is for this reason that NGOs must be involved, not only for funding benefits, but also to contribute knowledge, share skills and experience of running complex projects such as that of educational technology adoption in developing countries.

2.6.1.7 The ratio in primary, secondary and tertiary education

The student-computer ratio is conceived as indicators of the availability of computers that are accessible to students in computer laboratories at any given time (Hong & Songan, 2011). Many schools and HEI's in previously underprivileged areas lack adequate infrastructure to install full-fledged computer laboratories. As a result, there are not enough computers available for all the students and therefore they tend to share the equipment. For instance, four or five students might be sharing one computer in the laboratory with a student-computer ratio of 40:10. Because most students do not have access to the internet, in the case of simultaneous online assessment, the lecturers might need to make prior bookings in order to secure the laboratory venue. In some cases where schools have computer laboratories, the academics sometimes lack the technology skills and beliefs to implement e-learning.

Although a wide range of research has focused on ICT use in HEI's, Bates (2015), suggests that the impact of educational technology might affect the entire spectrum of education, from early childhood development to primary and secondary school education. Different countries base their formal education systems on national vocational needs. The common educational structure comprises basic education and the higher education sub-sector composed of tertiary institutions, such as universities and vocational training colleges. The years spent in each school level and phases are different and unique to each country's educational context. For example, the Ugandan 7-6-3 school system differs from the South African formal education system which comprises 4-3-3-3 in four school phases: firstly, the Foundation phase (4 years) Grade R-Grade 3; secondly, the

Intermediate phase (3 years) Grades 4-6; thirdly, the Senior phase (3 years) Grades 7-9; and fourthly, Secondary school education (3 years) Grades 10-12. It is imperative that the education system of a country is integrated, firstly across the curriculum and programme granularities at different levels. Secondly, as a systemic approach in the core business of the entire education spectrum characteristic of lifelong learning and quality graduate attributes for the 21st century.

While it is mandatory policy in some HEI's to have a minimum web-based course presence (e-learning policy, 2011) or at least 50% online courses as implemented in Case-2, Mooij and Smeets (2001) suggest that it has been a tradition that most teachers in secondary schools could decide on their own whether or not to use certain didactic approaches. This means that teachers are free to apply new techniques. The implication is that teachers' skills and beliefs in ICTs are considered important for technology integration that might result in positive adoption. This effort prepares students for readiness when they enter the university level. Mooij and Smeets (2001) point out that student can focus on performance rather than spending more time figuring out new tools' functions and adapting to a new online learning environment. However, the lack of exposure to technology can affect students' confidence, and a lack of confidence is a contributory factor for low participation in online activities (Kahiigi, 2012). This challenge results in negative academic performance in many academically capable students.

2.6.1.8 Funding sources

The funding sources of educational institutions differ between developed and developing countries. In South Africa, the education government subsidy is graded and classified according to various kinds of schools and tertiary education institutions. For example, public education institutions are government subsidised, whereas private schools and universities are unlikely to receive the same support. Many students fund their education from a combination of their own investment, family contributions and sometimes the government student loan such as NSFAS in South Africa. NSFAS is the government funding that supports access to, and success, in HE and training for students from poor

and working class families who cannot afford tertiary education fees. Much as the government collaborates with NGOs and other funding sources to see the fruition of education innovation, teachers in schools and faculties in HEI's should be committed. Faculty teaching members ought to hone their technology skills, their beliefs, values, attitudes, methods and intention to fully integrate technology to benefit all students.

The nationwide student #FeesMustFall campaign has undeniably shaken the manner in which policymakers, particularly HEI's, may reconsider the way forward. As the debates also grow around 'free decolonized quality education', the impact in South African HEI's may give way to severe political scrutiny. For example, concerning retaining its current stature, it is uncertain whether these developments strengthened or weakened the legacy of universities as such as University of Cape Town (UCT). UCT is both the sub-Saharan and Africa's oldest and most prestigious university.

Unlike the situation in developed countries where HEI's (HEIs) compete for resources and funding, developing countries have a less competitive environment (Önsel, et al., 2008) as HEIs receive ample funding from the government and other international donors. The funding proportions can differ between institutions depending on donor allegiance and fundraising capabilities (Archibugi & Coco, 2005). For instance, in accordance with the new funding framework (Ministry of Education, 2006) the government grant can be as low as 35% if an institution is able to raise large amounts of private funds through research contracts, donations and investments. On the other hand, it can be as high as 65% where an institution is unable to generate substantial amounts of private income. This research explored how the funding differs in the two universities as well as the causal implications.

National competitiveness is the greatest concern for policy makers in many countries. Many researchers regard technology as the driving force behind economic growth and development (Archibugi & Coco, 2005). They suggest it should be expected that countries which fail to develop appropriate technological capabilities, will continue to lag behind. It is for this reason that government and foundation funders should invest in innovative educational programmes and in the acquisition of new technologies. In order to sustain

the adoption of technology, it is necessary to ensure adequate funding for infrastructure and to support staff the rollout of e-learning.

SUMMARY

In this chapter, the literature review covered the five main topics that are driven by the research questions. The topics discussed logically were the following:

      1) The concept of educational technology in the context

      2) Educational factors within the pedagogical framework

      3) Motivational factors in using educational technology

      4) The impact of content knowledge in e-learning

      5) The pedagogical considerations in a country's educational context.

The main aim of the research is to validate a framework by Tedre, Apiola and Cronjé (2011), which suggested 40 attributes connected to pedagogical considerations of educational technology adoption in developing countries. The purpose is to explore pedagogical considerations of educational technology adoption in two universities of technology in the African developing region. The purpose is to establish how useful their criteria are in analysing the situation in African universities.

The study aims to compare the two universities to each other along the criteria in other regions, in order to establish the extent to which these dimensions resonate with pedagogical issues in other developing countries. The 40 framework attributes were discussed as viable variables under four main themes: Pedagogical framework, content, motivation, and the country's educational context. These 40 variables were explained with regards to their relevance to the process of educational technology adoption, which is characteristic of the implementation of e-learning.

CHAPTER 3
RESEARCH DESIGN AND METHOD

3.1 INTRODUCTION

"The process of collecting data depends on meticulous timekeeping and constant planning and replanning, always looking ahead in order to be ready for diversions." - Adrian-Holliday (2007: 47-48)

There is no basic solution for the adoption and implementation of educational technology in developing countries (Tedre, Apiola and Cronjé, 2011). This study employed the qualitative approach to investigate two South African universities of technology. The case study sought to examine the issues that lecturers regard as key considerations in the adoption of educational technology in a typical university of technology.

3.2 RESEARCH PERSPECTIVE

Social informatics informed the underlying research perspective of this study. In accordance with Anastasiades and Zaranis (2016), the concept of social informatics refers to a problem-driven research domain that is characteristic of ICT. The complexities related to socio-technical systems that are employed during technology adoption require multifocal analysis and interpretation from a lens of multiple realities. Consequently, the internal and external environmental changes could influence the intention to adopt educational technology in HEI's. The implementation of e-learning becomes a central process in the adoption of technology. However, due to many factors, there is no one-size-fits-all solution to limit these implementation challenges. During this process, numerous educational issues need to be considered, particularly in the developing countries as these vary in many ways from industrialised countries (Tedre, Apiola & Cronjé, 2011).

This study stems from the research conducted by Tedre, Apiola and Cronjé (2011) in which they developed a framework that identified 100 attributes that need to be considered for educational technology development projects in developing regions. The framework entailed three key factors of consideration when educational technologies are integrated for the purpose of teaching and e-learning in developing regions. The three factors were educational, socio-economic and technical considerations. The factors addressed the educational technology adoption together with related issues whereby 100 attributes were determined as categories. These categories were grouped and classified under ten themes. The latter presented the considerations that were related to each region's unique socio-economic, technical, and educational context.

i)   Socioeconomic context

In the socio-economic context, 26 attributes were discussed under the following three themes.

- Economic considerations
- Organisational and political considerations, and
- Staff recruitment and training

ii)   Technical context

In the technical context, 34 attributes were considered and discussed under three themes:

- Tools and equipment
- Connectivity
- System administration

iii)   Educational context

The pedagogical issues that need to be considered when adopting technology in a developing country's context accounted for 40 attributes. These attributes were discussed under four themes:

- Pedagogical considerations

- Motivational aspects

- Educational context

- Content

It is important to note that the current research focused only on the educational considerations and excluded the socio-economic and technical aspects of technology adoption. This study therefore researches the extracted constructs of the pedagogically related considerations in a developing country context. Furthermore, related constructs of the 'usefulness' and 'resonance' were used to guide the inquiry. The usefulness was used with regard to how useful Tedre framework's criteria are in analyzing the situation at the two universities of technology. The usefulness was measured in terms of pedagogical, motivational, educational and content criteria. The resonance was used to investigate how the two universities compare as well as the extent to which the educational, pedagogical, motivational and content issues corroborate with other universities in other developing countries.

The current empirical research process set out to explore the adoption of technology in the two universities in South Africa in order to investigate: i) an overview of the situation at two universities of technology regarding their issues of educational technology adoption; and, ii) to present a comparison of the two universities along each of the pedagogical considerations at universities in other developing regions as found in the Tedre framework criteria that are depicted below.

Table 3.1: The elements of a systemic view on educational technology in developing countries by Tedre, Apiola and Cronjé, (2011)

The educational considerations for technology adoption in developing regions

1. Pedagogical considerations

2. Motivational aspects

3. Educational context

4. Content
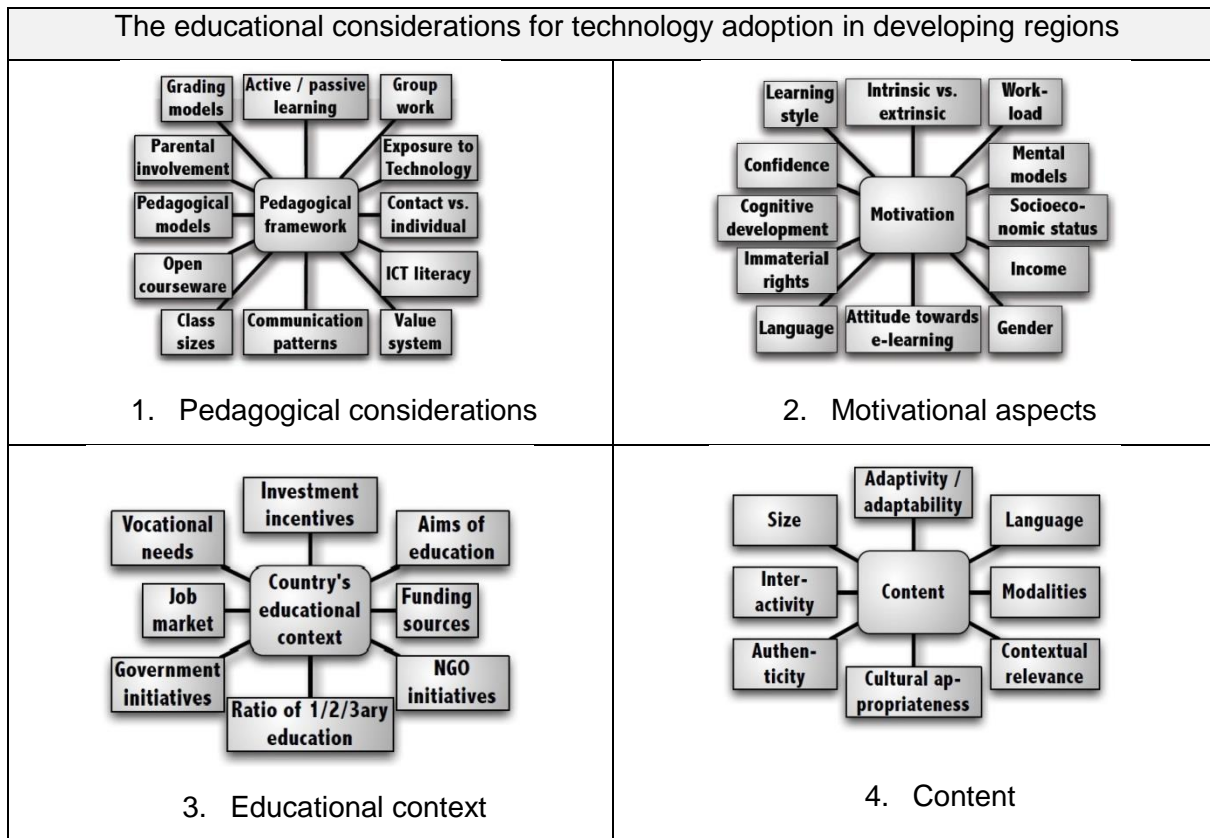
The adoption of technology for the purpose of teaching and learning involves many elements that need consideration, particularly in HEI's in developing countries (Aldunate & Nussbaum, 2013). Tedre, Apiola and Cronjé conducted a research at some universities in African countries with an objective to determine key attributes to be considered in the adoption of technology. Their research outcomes produced a framework (Tedre framework) on which the current research is premised. The framework depicted in Table 3.1, also known as Tedre framework in this research, is based on research literature and aforementioned authors' experience on educational technology and e-learning in several African countries. In their paper "*Towards a Systemic View of Educational Technology in Developing Regions*", Tedre et al. (2011) discuss some pedagogical, socio-economic, and technical considerations that educational technology developers may need to re-think

in projects in developing regions. The current study aims to evaluate the framework by determining how useful their criteria are in analysing the situation in two South African universities of technology, and to establish connections in order to refine the framework. Additionally, the usefulness of the Tedre framework can assist as analysis tool for technology adoption at universities of technology in developing countries.

Participant interviews were conducted for this research and the perceptions of the participants were interpreted according to the descriptions of their views and experiences. This qualitative option resonates with Merriam's (2002) argument that phenomenology is the study of describing the way people describe their experiences through their senses. In accordance with Glaser and Strauss (1967), the naturalistic approach is a research method that advances reality as holistic because it provides necessary insights into information-seeking experiences. The researchers further imply that reality is continually changing so that theory formation becomes an ongoing process designed to understand the phenomena. Theory building in this research specifically cycled between Tedre framework and the two universities of technology. Thus, the current study affords theory building that was accomplished through inductive analysis described by Corbin and Strauss (2014) as 'discovery of new ideas' that provide explanation for the data. In this particular case, the process of theory building involved the specific line-by-line data observation by the researcher in order to identify patterns. The researcher was able to distinguish between plausible categories and providing an understanding of the themes that tied into the connected notions of the interpretive outcome. Broader generalisation was obtained through these observed patterns and thus a tentative theory was formed. It must be noted that this research method was not necessarily designed to assume grounded theory approach. Rather, for the purpose of this research, theory building deliberately cycled between Tedre framework and the two universities of technology.

3.3 THE CONCEPTUAL FRAMEWORK

The conceptual and planning phase includes the prior thoughts, readings and questions that the researcher had about the phenomenon under study. The key research areas are depicted in the conceptual framework as seen in Figure 3.1 below.
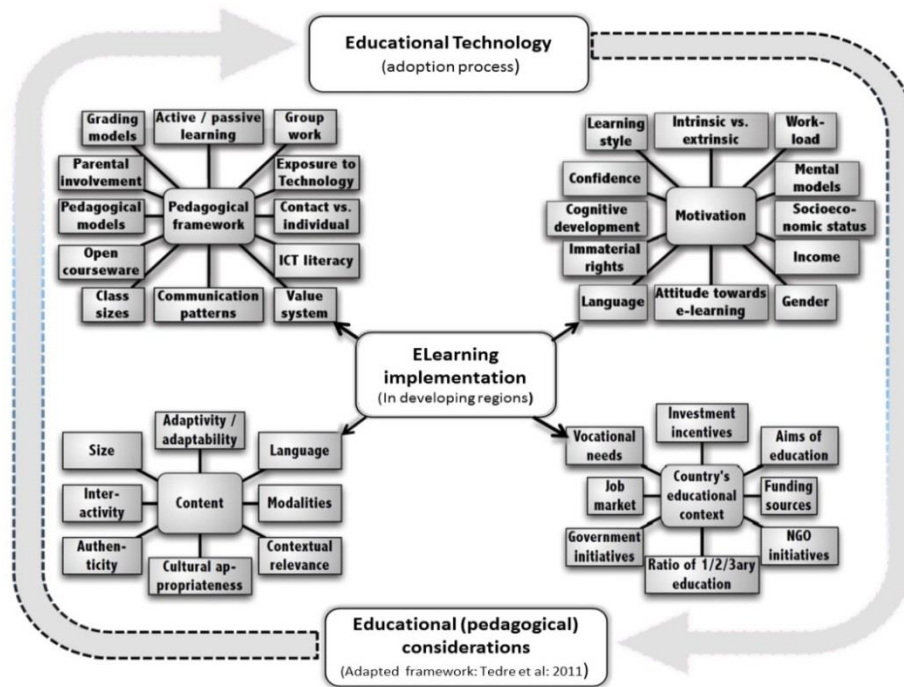
FIGURE 3.1: THE CONCEPTUAL FRAMEWORK (ADAPTED FROM TEDRE ET AL., 2011)

The conceptual framework was used as a starting point to focus the two universities' investigation on the pedagogical considerations for the adoption of educational technology. The conceptual framework sought to provide a picture of connected research nodes guiding the flow of the study (Miles et al., 2014). Thus, the framework was created by first combining the four major issues of educational considerations as identified in the Tedre framework. The four themes of educational considerations depicted in the above conceptual framework are: pedagogical framework, motivation, content and the country's educational context.

The research was guided by these four themes as the premise in the context of this study. Each thematic category as seen above consists of numerous categories which total to 40

variables. Each variable, as discussed in the literature review in Chapter 2, was explained with regards to its relevance to the process of educational technology adoption which can be characteristic of the implementation of e-learning.

3.4 TARGET POPULATION AND SAMPLING

The purposive sample was drawn from accessible population in two universities of technology in South Africa. As Cohen, Manion and Morrison (2013) assert, the purposive sampling is usually used in qualitative research since the researcher selects the participants based on specific characteristics that are suitable for the study. In this case, the participants already used Blackboard and other technologies for the purpose of teaching, learning and research. The participants profiled as typical users of ICTs and emerging technologies to enhance teaching and learning. They were qualified teachers with varied lecturing experience. The participants were selected in order to generate useful data and with the expectation that they would yield rich and in-depth information (Mouton & Babbie, 2001). According to Rubin and Rubin (2011) different ages, gender, language, education, and backgrounds all have an influence on the outcome of the interview. Additionally, Neuwman (2005), views demographic variables as the key to ensuring sample credibility.

In view of the above, the maximum variation sample was therefore considered as a strategy to cover a wide range of intended groups of participants. This was achieved by selecting the key demographic variables: age, gender, qualifications, teaching experience, faculty, campus location, and the designation as was included in the interview protocol. Each of the two universities that were sampled consist of six faculties; therefore, one participant was drawn from each faculty in their respective universities. Two senior managers in the e-learning support division were also part of the sample; one from *Educational Technology Unit*, and the other from *Centre for e-learning.* Thus, the sample comprised a total of 14 participants.

The DUT and CPUT are HEI's in South Africa and are situated in two different and unique coastal provinces, the Kwa-Zulu Natal (KZN) province and Western Cape Province (WC) respectively. Both institutions offer technological career directed educational programmes. The two universities are similar in numerous elements. Table 3.2 below shows the areas of similarity between CPUT (Case-1) and DUT (Case-2).

Table 3.2: The comparative aspects between Case-1 and Case-2

Item description	Case-1	Case-2
Type of institution	University of technology	University of technology
University campus structure	Multiple campuses	Multiple campuses
Number of faculties	Six faculties	Six faculties
Course content delivery mode	Blended	Blended
Learner Management System (LMS)	Blackboard 9.0	Blackboard CE
LMS support	a) 3 Instructional designers (ID's) plus; 1 Educational Technologist (ET) b) ET and ID's randomly intervene within all faculties and across campuses.	a) 3 Instructional designers (ID's) b) Each ID exclusively allocated to 2 faculties
E-learning Strategic documents (for this research purpose)	a) E-learning Policy (March, 2011) b) Teaching and Learning Policy (July, 2006) c) Teaching and Learning Plan (September, 2011).	a) E-learning Strategic Planning and Deployment Report (September, 2014) b) Guidelines for Teaching and Learning (2012).
Data establishment	Data instrument(s) Case-1	Data instrument(s) Case-2
Pedagogical usefulness	Semi structured interviews, observation, policy documents	Semi structured interviews, observation, policy documents

Motivational usefulness	Open ended questionnaire, semi structured interviews, observation, visual data source	Open ended questionnaire, semi structured interviews, observation, visual data source
Content usefulness	Policy documents, semi structured interviews	Policy documents, semi structured interviews
Educational usefulness	Semi structured interviews, national education policy documents, observation	Semi structured interviews, national education policy documents, observation

As shown in the above table, the two HEI's share several common elements that may justify a comparative study. Both institutions offer career guided qualifications and use Blackboard as the mode of course delivery. Each university has six faculties that are administered across different campuses. The next section elaborates on research techniques that were employed in the research design.

3.5 RESEARCH DESIGN

In this study the researcher set out to investigate faculties in two universities of technology in South Africa with regards to their key considerations for the adoption of educational technology in a developing country. Crotty (1998) suggests three basic questions for initiating the research design. The three questions include:

a) What methods were used?

The qualitative data instruments used include less structured interviews, observation, document analysis, field notes, training workshops and visual-photos. The multiple data source techniques were used as a strategy to address validity and credibility. This strategy was used to confirm the findings by overcoming the limitations of other data source techniques applied.

b) What methodology was employed?

The descriptive qualitative approach was used in order to facilitate in-depth inquiry during the investigation in the two universities. A comparative case study approach was employed in this research in order to evaluate whether the criteria in Tedre framework was applicable in the real world (Yin, 2011). It is during a case study whereby research questions of meaning and process can be answered only through understanding the context in which they exist (Merriam, 2002).

c) What theoretical perspective supported the research proposal?

In line with Corbin and Strauss (2014), the current study afforded theory building, which was accomplished through constant comparison and allowing the 'discovery of new ideas' that provided explanations from the data. Until data saturation was achieved, the theory building traversed between the Tedre framework and the situation in the case study of two universities of technology. For the purpose of this research, the latter approach did not assume complete grounded theory. Rather, the approach was meant to facilitate theory building which strictly cycled between Tedre framework and two universities.

The structure of this research design follows Crotty's (1998) guidelines by employing a qualitative empirical case study with the conceptual framework used to maintain the scope of research.

3.5.1 Qualitative research

The qualitative approach was adopted as a research method because it is problem orientated (Creswell, 2003) and practical in dealing with the phenomena that are not easy to quantify such as beliefs, meanings and content analysis (Guba & Lincoln, 2005). The researcher employed the qualitative approach because, as Guba and Lincoln point out, it allowed the study process to examine less tangible aspects such as values, attitudes and

perceptions of the research subject. Furthermore, the qualitative inquiry is suited to smaller samples (Merriam, 2002), hence a small sample of 14 participants was sought at Case-1 and Case-2. This comparative study examined the detailed account of perceptions of fulltime practicing faculty members at the two universities of technology. In accordance with Brink (1991), qualitative research seeks to capture the context in its entirety rather than to control the context of the research. Therefore, the context is significantly important in this comparative qualitative inquiry. Thus, the interviews in this study were conducted in a natural setting, in this case, the universities' teaching environments in different faculties.

The participants were staff members who used ICTs to enhance their teaching and learning in their subject courses. Cresswell (2003), points out that the nature of the qualitative researcher is one who seeks understanding of human behaviour and thinking, and their interpretation of the unfolding events. He further outlines interpretive research as an enquiry process of understanding a social phenomenon. Therefore, the holistic perspective in the consideration of technology adoption was examined as it unfolded regarding each case study. The participants described their perspectives, belief systems and experiences in relation to educational technology integration in a developing environment.

3.5.2 The purpose of qualitative research

The purpose of qualitative research is to describe the essential qualities of complex social phenomena (Merriam, 2002). Therefore, the qualitative approach was systematically employed in this study to ensure that the research process provided rich, robust, systemic information in order to facilitate deeper understanding. Merriam (2002), points out that the pervasive postmodern way of looking at things in a qualitative inquiry affords one's outlook and worldview to change accordingly. For example, the qualitative approach was employed in this research; however, a strong undercurrent emerged characterised by the need to present minimal supplementary quantitative data. The approach provided more

understanding as the counted variables' frequencies and co-occurrences illustrated and supplemented the discussion in order to triangulate the data sources.

3.6 RESEARCH OBJECTIVES AND QUESTIONS

The aim was to explore two South African universities of technology during their technology uptake, in order to solicit faculty perceptions about the key elements required in the adoption of educational technology in developing regions. The main objective was to determine the extent to which the pedagogical aspects resonate between two universities along those in other developing countries as identified in Tedre framework?

The main objective was divided into the following four secondary objectives:
a) To obtain an overview of the situation at two universities in terms of the Tedre framework.
b) To compare the two universities to each other along each of the Tedre framework's pedagogical dimensions.
c) To determine the extent to which the Tedre framework's dimensions are adequate in providing a comparative framework.
d) To determine any shortcomings of the Tedre framework and to recommend improvements.

The main research question and subsequent sub-questions flowing from this objective were posed as follow:
1. *To what extent are the criteria in the Tedre framework useful in analysing two South African higher education institutions?*
   i. How did the two South African universities compare in their technology uptake challenges and issues?
   ii. How did those elements resonate with the pedagogical aspects as proposed in the Tedre framework in other developing regions?
   iii. Did the Tedre framework differentiate adequately between its framework categories; (Or were there any overlaps?)

iv.   Was the Tedre framework a comprehensive framework? (Or were there key elements that may have been overlooked?)

3.7 RESEARCH METHOD

The next section elaborates the methodological approach used to facilitate this inquiry.

3.7.1 Case study

This study set out to validate usefulness of the criteria in the Tedre framework for analysing the situation in South African universities. In accordance with Yin (2011), the case study research design is useful for testing whether scientific theories and models actually work in the real world. Yin (2003), initially provided a simple description that case study research consists of a detailed investigation, often with data collected over a period of time. The case study strategy was chosen because it offers a comprehensive and robust analytical research process which is necessary to understand the problem being investigated. The case study option was also useful to support the theory by showing how it played out in a real life situation. Miles, Huberman and Saldana (2014), describe a case study as a phenomenon that occurs in a bounded context, and Yin (2011), elaborates that a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context. It must be noted that this study incorporated 'theory building' which cycled between Tedre framework and two universities as supplementary effort to describe the connectedness between the framework and the universities.

This qualitative study is an in-depth descriptive, inquiry based case study that was conducted to explore the situation during the process of educational technology adoption in two universities in South Africa. The qualitative case study enabled researcher to generate data that could provide rich data about the participants' subjective (Creswell 2014) experiences of using technologies in authentic learning educational research. The goal of this comparative study was to explore two universities, in order to determine how

their perspectives corroborate with pedagogical issues found in other developing regions. Yin (2017), asserts that a multiple or collective case study affords the researcher the ability to analyse each setting and across settings, hence a case study of two universities was an adequate option for the naturalistic approach this study required.

3.8 INSTRUMENTATION

In this research, multiple data sources were employed in order to collect sufficient information from the respondents, who voluntarily shared their views and their involvement in the technology adoption environment. As a result, the multiple research techniques used in this research facilitated empirical evidence that provided better understanding of the holistic perspective of the inquiry, as portrayed by the participants. The data collection instruments employed in this study include less-structured open interviews, observation, field notes, photographs and document analysis. Yin (2017) believes that the use of multiple sources of evidence can create a case study database that is useful to track and maintain data evidence. In agreement, Gillham (2000), considers the use of multiple sources of evidence as the key characteristic of case study research.

3.8.1 Interviews

The interview technique applied was the less-structured questionnaire with open-ended questions. In accordance with Creswell (2009), the human person is the primary data collection instrument; hence the interviews yielded most of data for this research. An advantage of using the semi-structured face-to-face interview in this study was that it allowed researcher to probe for detailed information and provide clarification of the questions to the participants, where necessary (Creswell 2014). The interviews were conducted to explore, in detail, the participants' perceptions and accounts. This was done in order to establish, firstly, the correlation of the situation within two South African

universities, and secondly, the resonance between the findings and pedagogical considerations in other developing regions.

During the process of interviewing, the researcher kept the conversation focused on the topic, while encouraging participants to expand on their answers. In order to achieve standardisation and to guide the data analysis, the interviews comprised questions listed under four topics. The questionnaire was structured around the theme constructs described within the Tedre framework. The inductive qualitative approach facilitated the list of questions under four themes; namely, pedagogical framework, motivational aspects, content and country's educational context.

The interview (topic) guidelines served purely as a guide, and the areas to be explored during an interview were clearly outlined. The topic guidelines were used because it afforded the researcher the opportunity to probe the participants, in order to collaboratively construct a meaningful reality. In line with Boyce and Neale (2006), the interviews were flexible. This means that the less-structured open-ended questions could be presented in a number of ways that there was no rigid sequence for posing the questions. For example, some responses by the participants prematurely lead the discussion to a different topic connecting with a question yet to be asked in another section of the questionnaire. The researcher allowed the flexible sequence of the questions and probed further in pursuit of possible connections between the two questions.

In line with Krueger and Casey (2014), this particular interview questionnaire was piloted using postgraduate students on numerous occasions, and had been refined before it was finally accepted by the faculty experts. The interview protocol was scheduled for a duration of two weeks in each university. The interviews were conducted during August-September, 2014 which was a third quarter of the academic year in the second semester in both institutions. Another strength of using semi-structured face-to-face interviews in this study was the fact that researcher had already established rapport with the participants. As a result, semi-structured face-to-face interviews were a safe space to 'dig

deep' into the participants' experiences of integrating technology at universities of technology. All interviews were recorded and consent forms were signed by the participants prior to the interview. The interviews were conducted confidentially on site, with each participant in their teaching departments within their faculties. Although Kolb (2008) suggests the "researcher's office" or "interviewee's home" as appropriate space to conduct effective interviews, the participants' offices were identified as suitable venues to solicit current in-depth perspectives.

3.8.2 Observation

The interpretive nature of the current research allowed the researcher to consider direct observation in one of Blackboard (LMS) training sessions conducted for the lecturers. The session which was facilitated by instructional designers, was conducted to train the lecturers on using tools that are available in the LMS. Direct observation entries were made during both the Case-1 and Case-2 Blackboard training sessions in the laboratories. This direct observation was initially unplanned, however it became a necessary technique to provide an additional data source. Furthermore, observational evidence is often useful in providing detailed information about the topic being studied (Yin, 2013).

Whether the investigator is using the observational or interview protocol, the essential process is recording the information or 'login data' as referred to by Lofland and Lofland (2006). In line with this process, the researcher recorded the information through the use of observational field notes. Additional notes were made from observing students' movements and activities in their computer laboratories. Photography was also used to capture the environmental setting that distinctively compares and describes the main campuses in both universities. Direct observation takes place when the researcher is not actively participating in the actions being observed. Hence, the participation and behavior of the participants during the training event; as well as the physical setting, were recorded in detail.

i)   Case-1 Blackboard training session

The first direct observation took place at the Case-1 main campus in Bellville, Cape Town during '*Basic training*' in a computer laboratory. This was a morning session that lasted for 3 hours with a 10 minute break. Two instructional designers facilitated the session with 21 academics in attendance.

ii)   Case-2 Blackboard training session

The second direct observation took place at the Case-2 main campus during a staff Blackboard training session. The training was facilitated by one instructional designer in the laboratory.   The two-hour training session was attended by 10 academic staff members.

3.8.3 Document analysis

The document content analysis was achieved by analysing the institutions' policies and strategic documents. The documents were loaded onto ATLAS.ti, and as with the interview transcripts, three stages of data coding were applied. In addition to data collected through the one-on-one interviews, robust document content analysis was employed. The analysis began with open coding that entailed labeling the segments of the text, and axial coding that involved interconnecting and exploring the relationships between the categories. Thereafter, salient categories were selected through closed coding to produce a discursive set of theoretical propositions. While Case-2 provided two strategic documents, Case-1 provided three strategic documents for the purpose this research: The documents made available by Case-2 were, a) *E-learning Strategic Planning and Deployment Report* (September, 2014), and, b) *Guidelines for Teaching and Learning at DUT.* The document analysis from Case-1 included*: a) E-learning Policy*

(March, 2011), b) *Teaching and Learning Policy* (July, 2006), and c) *Teaching and Learning Plan* (September, 2011).

The documents from the two institutions were necessary for researcher to attain sound background information prior to meeting and conducting interviews with the participants. According to Creswell (2009), sources of information, data, and ideas generally fall into two types: people and documents. Describing the type of data used for document analysis, Yanow (2006:411) asserts that;

> "*Document reading can also be part of an observational study or an interview-based project. Documents can provide background information prior to designing the research project, for example prior to conducting interviews. They may corroborate observational and interview data, or they may refute them, in which case the researcher is 'armed' with evidence that can be used to clarify, or perhaps, to challenge what is being told, a role that the observational data may also play*" (Yanow, 2007, p. 411).

In this research, data from interviews were the perspective account based on participants' views, while the document content analysis was extracted from the previously mentioned institutional strategic documents in both universities. Creswell (2009) classifies data-collecting procedures into four categories. These categories include interviews, observations, documents, and audiovisual materials. The next section describes the data collection techniques utilised in this research.

3.9 RESEARCH INSTRUMENTS MATRIX

Table 3.3: Data collection methods relating to areas under investigation

Questions	Document analysis	Interview	Observation	Photos	Workshop	Implications	Tedre, Apiola & Cronjé's Framework
How do the two universities compare? (Case-1 versus Case-2)	✔	✔	✔	✔		✔	✔
Why do they differ?		✔			✔	✔	
Pedagogical aspects of (4) themes							
1. Content	✔	✔				✔	
2. Motivational and cognitive aspects		✔	✔		✔		
3. Educational context	✔			✔			
4. Pedagogical framework	✔	✔					✔

The data collection instruments selected were intended to efficiently address the research questions, in line with the study conceptual framework. An elaborated discussion about each data source has been provided in the previous section. Table 3.3 affirms selected data instruments as the document analysis, interviews, observations, photos/Visual images and workshops. The table also shows the triangulation strategy on how multiple data source will verify and complement similar data by other source.

3.10 DATA MANAGEMENT AND ANALYSIS PROCEDURE

The next section (3.10.1 and 3.10.2) describe the procedures that were employed to manage and analyse this research data.

3.10.1 Data management

In qualitative research, the interview transcripts, field notes and observations do not provide explanations, but afford a descriptive account of the study. Similarly, two computer assisted tools were sought for specific data management purposes. The ATLAS.ti 7 (License certificate, Appendix F) as a qualitative data analysis software tool, was used to code data, create categories and determine eminent relationships through network tools (See Appendix H). MS Excel was used for visual analysis of the current data analysis. These tools did not provide the interpretation of analysed data but were used as supplementary tools useful in the data management. Therefore, the researcher was the main analyst throughout the process and directed the tools during management of the dataset.

The collection of credible data takes time and requires researcher to establish complete rapport with the participants (Locke, Silverman, & Spirduso, 2009). The interviews were recorded on a PHILIPS voice recorder (DVT1700) to ensure clear sound and playback. All the interview sessions were recorded with respondents' consent and were later transcribed by researcher. The interview transcripts were electronically archived and are preserved safely in storage devices for backup and future retrieval. Different, yet meaningful codes, were used as identifiers that anonymised the participants but still revealed information to researcher.

The Boolean operator in the analysis query tools assisted the researcher to filter and analyse the descriptors in a printed format. Conducting Boolean searches enabled the

researcher to locate multiple codes, combinations and categories, and their connected relationships. The query lists acquired through ATLAS. ti were printed for analysis purposes and all the information documents were guarded in a safe place to ensure that no-one gains access to the material.

3.10.2 Data analysis

In qualitative data analysis, there is no standardised procedure to follow, as each research study involves unique topics and different contexts (Thorne, 2016). The approach follows three basic procedures: identifying concepts, collecting examples of these concepts and analysing the concepts in order to discover differences, commonalities, patterns and structures. For example, the current study comprised three integrated phases of data analysis. The researcher decided on the unified perspectives approach in order to adequately respond to current study's multiple objectives. The researcher planned and personally designed the process as depicted in Figure 3.2 below.
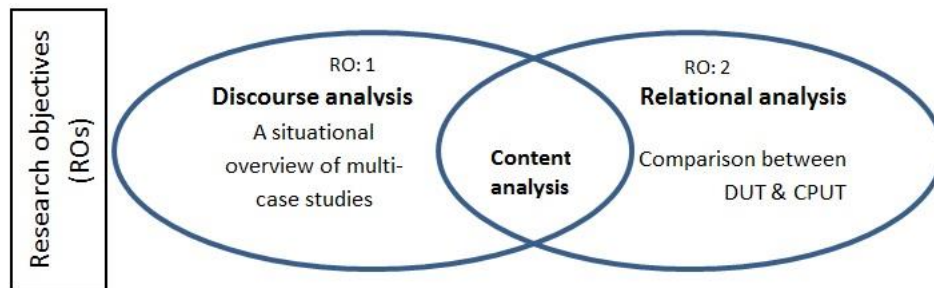
Figure 3.2: The unified perspectives of data analysis

Data was acquired to address the research objectives through unified analysis approach as depicted in Figure 3.2. The analysis approach was driven by research objectives based on intersecting discourse analysis and relational analysis. The content analysis examined the situation in two universities and thereafter compared how they differ and why? The analysis determined the situation and compared the perceptions of lecturer participants and senior managers at two HEI's in South Africa.

The perceptions were based on a less structured open ended questionnaire about pedagogical considerations for educational technology adoption, at Case-1 and Case-2 as universities of technology in a developing country.

Firstly, *discourse analysis* was followed in order to identify not only the main themes, but also the manner in which they were expressed, and for making direct quotations used during the interviews. Creswell (2014) emphasises the value of collecting in-depth data to understand why things happen in the manner they do. Hence, in their own words, the participants were allowed to describe their attitudes and beliefs, how they interpret their situation, and were able to suggest motivations for the way they operate. Secondly, *relational analysis* was employed through identifying concepts and exploring the relationships between those concepts. Thus, direct quotations were used to support the findings, to analyse the situation at Case-1 as it compares to Case-2, on the pedagogical considerations of technology adoption as found in other HEI's in developing regions.

The first stage of analysis was to sort the data and to identify the unit of analysis. This was achieved by separating the interview transcripts into useful chunks of data, by using sentences and paragraphs. All the data segments from the first university were compiled in one document named *Case-1.* The same procedure was applied in the second document, named *Case-2.* Data segments by respondents from Case-1 were represented by codes. For example, the code C1A represented the first respondent (A) in *Case-1.* This systemic coding*: C1B, C1C* or *C2B, C2C* and so forth, was continued throughout all 14 transcripts, thus concealing the respondents' identity.

Data analysis in this research started immediately after the first interview which assisted with informed adjustments of the subsequent interviews. For example, the interview protocol was slightly modified, particularly the information regarding the national education policies, where more clarification was required. The researcher made an attempted effort to personally design the flow chart in order to illustrate the whole process of data analysis. Below is the illustration in Figure 3.3, for all the process steps regarding how she carried out the analysis.
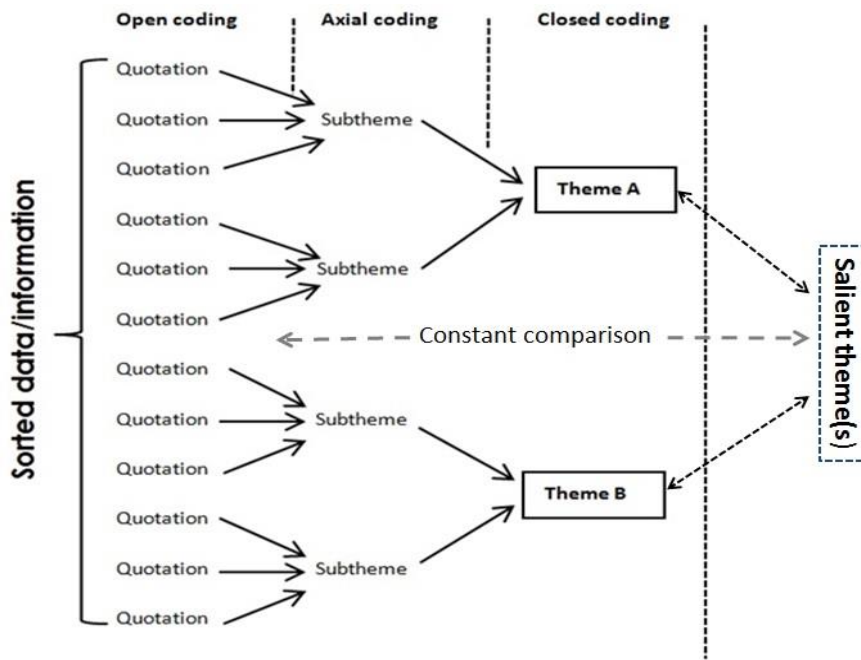
Figure 3.3: An inductive illustration of the analysis process conducted in the current research

In line with Corbin and Strauss (2014), the coding approach followed three coding stages. The stages are illustrated in Figure 3.3 above to understand the study data analysis process. After the data was sorted, *open coding* was applied to allow new codes to emerge. The first set of coding involved labeling data segments in codes that described the meaning of the segment of the text. The researcher did this because in their grounded theory approach, Strauss and Corbin (1994) assert that open coding allows a summary statement or word for each concept that is discussed in the transcript. It must be noted that the theory building in this research is particularly driven by 40 predetermined variables which cycle between Tedre framework and the two universities. Based on this limitation the approach cannot warranty a full grounded theory approach. The second set of coding, *axial coding* was conducted for connecting these open codes or categories. Thereafter, the relationship of the categories or themes was explored and described, and connections were made between the categories. It was also important that the list of open codes was reviewed and similar or redundant codes were discarded to reduce the list to a manageable number of themes. Hence, constant comparison was repeatedly conducted for new code matching of the same kind until the data was saturated.

Thirdly, *selective coding* enabled the researcher to select core themes that were central to the explanatory framework of developing the theory. This was achieved through closed coding which narrows the subcategories and identifies the overarching themes. The iterative process was conducted in all 14 interview transcripts to allow data credibility and conformity. Importantly, the final themes were comprehensive and reflected the purpose and objectives of this study. The description of category relationships was useful in understanding the meaningful interpretation of the findings.

The descriptive qualitative analysis took an inductive approach, whereby thematic content from the accumulated data was used to build theory as the structure of analysis that continued until theoretical saturation was achieved. While the themes intersected the data, the researcher also looked for common, repeated occurrences within each case so that each respondent's 'story' about pedagogical considerations of technology adoption. To maintain the narrative context, a detailed scrutiny of the categories was performed to see how the themes interrelate, firstly within each university, and secondly between the two universities. Thereafter, the comparative case study dynamics were analysed along the pedagogical criteria found in the Tedre framework of educational considerations in the adoption of educational technology in developing regions.

3.11 DATA INTERPRETATION

Although the conceptual variables of the current study were adapted from an existing study, the descriptive qualitative propositions were based on the data analysis achieved in this study. In line with Boyce and Neale (2006), the researcher's epistemological stance was constructed through both her own interaction, and the participants' beliefs and experiences at two universities.

In the process of developing the interpretation list, the researcher ensured that all texts selected for analysis were complete and accurate, so that the narrative textual analysis

produced results that offered a richer understanding of the research findings. The descriptive qualitative approach enabled the researcher to interpret the data by reconciling the perspectives and developing a theoretical model (Bellinger, 2004).

The narrative analysis connected the salient themes and subcategories that produced a discursive set of theoretical propositions. The four main themes were pedagogical framework, motivational and cognitive aspect, content and the country's educational context. After the completion of the data analysis, the researcher complied an interpretive report on the findings. Validation was maintained as an ongoing principle throughout the entire process of this research project. In the final report, the researcher committed to maintain consistent discussion proportional to the topics, and to the emphasis of participants' transcribed views as transpired within the groups and between the two case studies.

3.12 VERIFICATION

Validation strategies are used to maintain the accuracy of the measurement methods with respect to ensuring that it actually measures what it is intended. Based on their evaluative criteria, Guba and Lincoln (2005) suggest that trustworthiness of a research study is of importance when evaluating its worth. They further assert that trustworthiness is established through *credibility,* which indicates that findings are true; the *transferability,* which shows that the conclusions have applicability in other contexts; *dependability,* which shows that the findings are consistent and could be repeated; and *confirmability,* showing unbiased research and findings are that are shaped by the respondents' perceptions. Considering the paradigm and methodology used to address the research question in this study, Guba and Lincoln (2005)'s concept of crystallization was adopted which involved using multiple cohorts and data resources, as illustrated in this research.

The aspect of crystallisation involved being true to the data or confirmability of data by giving the participants a chance to verify or refute the categories and emerging themes

that we discovered (Guba and Lincoln 2005). Thus, participants were given an opportunity to look at the transcripts and emerging themes before the final themes were developed.

In this case, credibility was demonstrated by member checking and triangulation techniques. Member checking demonstrates credibility when participants confirm that the reported research findings are their own experiences (Schwandt, Lincoln and Guba, 2007). For member checking, the researcher emailed the transcripts to each participant for them to reflect the issues and verify the correctness of the interview. The interviews were acknowledged and affirmed by the respondents. All the transcripts were accepted as a true record of the interview, and one transcript was returned with additional information. The information was duly considered and amendments were subsequently made by researcher. To enhance the dependability of this study, the researcher maintained an audit trail of emails, ethical clearances, preparatory letters and raw data gathered in the observations, as well as other materials that documented the journey of this study.

Furthermore, in qualitative research, it is commonly expected for the findings to meet quality, rigor and trustworthiness. A good quality study is able to help "understand a situation that would otherwise be enigmatic or confusing" (Eisner, 1991, p. 58). To achieve this quality, all responses analysed in current data reflected personal opinions, experiences and the perceptions of the participants. To ensure reliability in qualitative research trustworthiness is crucial, as Seale, (1999, p.266) states that, "trustworthiness of a research report lies at the heart of issues conventionally discussed as validity and reliability." In line with Kvale (2008) and Kvale and Brinkmann (2009), transferability was ensured through researcher's honest and sufficient account of fieldwork context in order to challenge the readers whether prevailing environment could be similar to their experiences.

In case study research, the phenomena are perceived and explored from multiple perspectives (Yin, 2013). The use of different sources of information increases the validity of a study (Patton & Cochran, 2002). The multisource evidence was used in this research

as a strategy to confirm findings by overcoming the limitations of other data source techniques. Denzin (2001) and Patton (1999) identify three types of the triangulation of sources: *time*, *space* as well as *person,* whereby the consistency of different data sources is examined from within the same method. Therefore, in line with the holistic, descriptive qualitative method, data triangulation was achieved through the systematic approach of implementing data sources (Denzin, 2001).

3.13 DELINEATION OF RESEARCH

The study was conducted in South Africa which is regarded as one of the developing countries on the African continent. Notwithstanding the country's current economic meltdown and downgrade to junk status, it remains a developing economy alongside many striving national economies. Unlike the industrialised countries, developing countries in this research also refer to developing regions. The population of participants in this study was limited to only two universities of technology, in two geographically separated provinces. The current study was selective and not exhaustive of the Tedre framework, in that the focus and interest was only on the pedagogical considerations and excluded the technical and socio-economic aspects of the framework.

This research did not offer design approaches for educational technology in developing countries, but sought to provide guidelines about educational considerations with regard to educational technology uptake and adoption in two universities of technology in South Africa. Generalisability for this research may not apply; however, the transferable nature of this study aims to challenge readers to realise the resonance between the elements of this study and their own experiences.

3.14 ETHICAL CONSIDERATION

The two key ethical issues that need to be considered in any research project are *consent* and *confidentiality*. In research, ethical considerations refer to confidentiality and

protecting the participants' identity (Stake, 2013). In line with Thorne (2016), for the entire undertaking of this research project the ethical protocol was fully adhered to. The permission was granted by the research committees in Cape Peninsula University of technology and Durban University of technology as per evidence in Appendices E and F respectively. It must be appreciated that the study only investigated the uptake and adoption of educational technology by the two universities of technology as opposed to individual participants at personal capacity. The respondents were guaranteed anonymity and consent forms were signed prior to the interviews. The consent forms were sent by email to participants ahead of the interview and completed signed forms were collected at each interview. The researcher also brought along extra copies for convenience. These were signed voluntarily by interviewees and handed back to researcher. Before each session the study scope and interview procedures were explained. The confidentiality and anonymity was reassured to participants and continues to be maintained until the final submission of this thesis.

SUMMARY

In this chapter the research method and design employed to facilitate this study were discussed. Two case studies examined the issues that lecturers regard as key considerations in the adoption of educational technology in a developing environment. The study stems from the research conducted by Tedre, Apiola and Cronjé (2011) in which they developed a framework that identified 100 attributes on educational, socioeconomic and technical considerations of educational technology development projects in developing regions.

The purposive sample of 14 participants was drawn from accessible population in two universities of technology in South Africa. The descriptive qualitative inquiry employed two case studies in order to examine the situation during the adoption of educational technology in a developing environment. Qualitative multiple data sources were used for validity and credibility. The qualitative data analysis software, ATLAS.ti 7 was used to

manage data mined from less-structured interviews, observation, field notes, training workshops, visual photos, and document analysis. The researcher analyzed data while the tools enabled the manipulation of data analysis process.

In qualitative research it is commonly expected for findings to meet quality, rigour and trustworthiness. Validity, reliability and transferability are thus discussed in qualitative research terms. Limitations and ethical compliance are also addressed in detail. In the next chapter, the findings are discussed in detail.

CHAPTER 4
SUMMMARY OF FINDINGS

4.1 INTRODUCTION

"We need to bring learning to people instead of people to learning." - Elliott
Massie (2004)

To understand one's own situation, one needs to recognise the positions in countries close to them. Using the Tedre framework's constructs, this thesis reports on the pedagogical considerations for educational technology adoption in two universities of technology in South Africa. A qualitative case study approach was employed using semi-structured interviews, participant observation, workshops and document analysis. This was done to explore the two universities to paint a clear picture of how useful the Tedre) framework criteria is when analysing the situation at these two universities. The results of the analysis established certain overlaps that might be useful to refine Tedre framework. The research aimed to answer the main research question; *To what extent are criteria in Tedre, Apiola and Cronjé's framework useful in analysing two South African higher education institutions?* The implications of the results are discussed relative to three key areas in this chapter; a) to the similarities and differences in two South African universities, b) the extent to which current findings resonate with similar situations at other universities in further African countries, and c) to determine the shortcomings and overlaps in the Tedre framework.

The current research stems from the study by Tedre, Apiola and Cronjé (2011). Tedre et al (2011) developed a framework that determines a number of factors to be considered when proposing educational technology development projects in developing regions. The framework proposed 100 attributes that were classified under ten themes. These themes emanated from the construct of categories that were related to several pedagogical

elements of consideration upon the adoption of educational technologies in developing regions. Due to countries' varied situations, the three researchers proposed the elements that addressed three aspects of considerations that were related to each region's unique educational, socio-economic and technical context.

This research project focuses on the considerations of educational technology adoption in the developing country context. For the purpose of this research, the socio-economic and technical aspects were excluded in the current study. Therefore, the 'educational considerations' as core inquiry of this study were guided by four predetermined research themes that formed the construct of this study title; "*Pedagogical issues arising from the introduction of educational technology at two South African universities of technology.*" The aim was to examine the Tedre framework in order to determine how useful its criteria are in analysing the situation in a different African university environment. The goal was achieved by comparing two universities of technology with each other to determine how and why they differ, along each of the pedagogical criteria identified in the framework. The qualitative study sought to examine the detailed account of perceptions from representative faculty members who used ICTs to enhance teaching and learning at these two universities. That aim was to solicit the participants' perceptions of the key factors in the adoption of technology in a developing environment.

4.2 DEMOGRAPHIC PROFILE OF THE PARTICIPANTS

The interview protocol included the demographic variables that covered a wide range of groups of participants. The participants' race description was 3 Blacks, 3 Coloureds (Mixed race), 6 Whites and 2 Indians. Also taken into consideration were other demographic variables: age, gender, qualifications, teaching experience, faculty, campus location and the designation as stated in Rubin and Rubin (2011) and Neuwman, (2005). In accordance with Neuwman, (2005), demographic variables validate the credibility of the sample. Table 4.1 depicts a composite demographic profile of the individuals who participated in this research.

TABLE 4.1: THE DEMOGRAPHIC PROFILE OF THE PARTICIPANTS

Institution information			Age			Gender		Years' Experience			Qualifications		
Institution	N	Number of campuses	30-49 years	50-60 years	>60 years	Males	Females	<4	5-15 years	>15	Diploma	Degree	Post grad
Case-1	7	5	6	1	n/a	3	4	2	3	2	1	5	1
Case-2	7	5	2	3	2	3	4	2	1	4	1	3	3
Total	14		8	4	2	6	8	4	4	6	2	8	4

The purposive sample comprised of 14 participants, eight females and six male university employed staff members. Their ages ranged from 30 to 61 years of age with university teaching experience brackets ranging from 2 years to >15 years. The two universities have the same number of campuses. While Case-1 has more younger academics between ages of 30-49 years old. Most of the academics in both universities have formal degree qualifications.

4.2.1 The case study 1 at a glance

The Western Cape Province (WC) lies at the Southern tip of the African continent. The population estimate in this coastal province is 6 200 100 (STATSSA, 2015), and its predominant race is Coloured (ditto). The CPUT is located in this province within South Africa. There are over 32 000 students as well as 2 000 academics and professional staff members at CPUT. The university has five full campuses and two satellite campuses within the province.

4.2.2 The case study 2 at a glance

The DUT is situated in KwaZulu Natal (KZN). Similar to the WC, KZN is a coastal province in South Africa and situated on the Indian Ocean. The province has the second largest population in South Africa, after Gauteng Province, with an estimate of 10 919 100 people

(STASSA, 2015). KZN is dominated by the Zulu ethnic group and its culture. The DUT has over 25 000 students from various parts of the country, and approximately 550 full time academic staff and 800 professional, support and administrative staff, who are located across its eight campuses. There are six campuses in the city of Durban and two in Pietermariztburg.

In an effort to expand an in-depth understanding of the research domain, the findings addressed four research objectives:

a) To obtain an overview of the situation at two universities.
b) To compare the two universities to each other along each of the Tedre framework's pedagogical dimensions.
c) To determine the extent to which Tedre framework dimensions are adequate in providing a comparative framework.
d) To determine any shortcomings of the framework and to recommend improvements.

Data extracted related to predetermined themes which covered the scope of this research. The four themes; i) pedagogical framework, ii) motivational and cognitive aspects, iii) content, and, iv) country's educational context, served as interview themes in the topic list (Appendix A). These were adapted from the Tedre framework to facilitate a balanced inquiry into this study.

In line with Mishra and Koehler's (2006) framework regarding proper integration, the participants' perceptions and description about how they used technology to facilitate their teaching affirmed the TPCK. The current findings indicated that suitable technology as shown in Table 4.2 below, was regarded as important pedagogical consideration for realising effective integration. This notion was justified as adequate use when 'suitability of tools' was translated in terms of its appropriateness in specific learning tasks rather than mere senseless technology integration.

TABLE 4. 2 THE EXAMPLES OF CO-OCCURRENCES ON EDUCATIONAL CONSIDERATIONS FOR TECHNOLOGY ADOPTION

Emerging categories	Suitability	Motivation	Country's Context	Content	Ped Framework:
Prim/Sec/Tertiary education sytem	n/a	1 - 0.05	1 - 0.05	n/a	n/a
Active participation		n/a	n/a	n/a	2 - 0.15
Assessment and grading	1 - 0.05	1 - 0.06	1 - 0.06	1 - 0.08	n/a
Aims of education	1 - 0.05	1 - 0.06	n/a	n/a	n/a
Content curation	n/a	n/a	1 - 0.07	n/a	n/a
Content development	n/a	n/a	1 - 0.08	n/a	n/a
Content relevance	n/a	1 - 0.08	n/a	n/a	n/a
Creative learning	1 - 0.06	n/a	n/a	1 - 0.11	n/a
Economic development	n/a	n/a	1 - 0.08	n/a	n/a
Global exposure and participation	1 - 0.06	n/a	n/a	n/a	n/a
Government subsidy	n/a	n/a	n/a	1 - 0.13	n/a
Class sizes	1 - 0.06	1 - 0.10	n/a	n/a	n/a
Incentives	1 - 0.06	n/a	n/a	n/a	n/a
Inter-university collaboration	n/a	n/a	n/a	1 - 0.17	n/a
Job market	n/a	1 - 0.13	n/a	n/a	n/a
Motivation & attitude	n/a	1 - 0.13	n/a	n/a	n/a

The table shows that data analysis revealed a number of elements regarded as factors that impact technology integration at the two universities. The relevant categories were classified accordingly and shown as value labels in the table. An additional theme, 'suitability' is one of the three emergent salient themes. A big number of variables were regarded as considerable factors in technology integration and adoption. The table depicts the examples of co-occurrences that were yielded in the network of emerging categories. This was supported by the interview analysis discussed in detail later in this chapter.

Most of the data for this research were provided through the interviews. The interview questionnaire (Appendix A) intended to address four current research objectives in order to respond to the research questions that related to an overview situation of technology adoption in two South African universities. In addition, the intention was to compare the two universities along the pedagogical dimensions of the Tedre framework. In no preferential order, the list in Appendix B provides the examples of participants' in-depth perspectives regarding each area of research and related questions. The responses reflected in Appendix B are the participants' direct narratives that emanated from the

predetermined themes; *content, pedagogical framework, motivation and cognitive aspects,* and *the country's educational context.*

In order to follow the narrative in this thesis, it is important to note that the universities are coded as Case-1 and Case-2. It is on that ethical compliance and to conceal identification that the participants are referred to as 'Respondent C1A, B or C' and Respondent C2A, B or C to describe, for example, Case-1 or Case-2 faculty A, B or C. Therefore, as shown in Appendix B, the narratives from Case-1 and Case-2 are reflected as participants' responses which are related to each category question from which the participants were asked. The emerging subcategories and descriptions are explicitly defined in the context of this research. For example, 'authenticity' under the theme 'content' refers to 'the original, primary content material and personally developed content'. While the 'aims of education' was summarised as education goals that address the country's needs; the categories such as 'class sizes' and 'tertiary readiness' were addressed as issues related to a broader pedagogical framework theme.

In order to provide a coherent approach to addressing the current research objectives and subsequent main research question, the findings are discussed according to the analysis and variable implications in each of the four research premises. Therefore, the related results are discussed under the four main headings related to the pedagogical framework, country's educational context, motivational and cognitive aspects, and content.

4.3 THE FINDINGS RELATED TO THE PEDAGOGICAL FRAMEWORK

Challenging the educational settings in rural and disadvantaged areas found in developing countries, Bates (2015) and Kahiigi (2012) argue that educational technology initiatives should take into account important issues in the context-dependent educational characteristics of faculty. One of the policy documents analysed in this study stated its purpose amongst others as:

To provide parameters and guidance for quality practices in teaching and learning,
leading to improved student access, retention, and success (Teaching and Learning
Policy, 2006).

The policy implication, therefore, is to adhere to guidelines and to what Mumtaz (2000)
suggests as a distinguishing context-influenced framework. This framework development
is implied to guide the areas on which to concentrate in order to achieve positive effects,
particularly the educational technology adoption in the context. Importantly, policy
development alone is not enough to ensure implementation but monitoring, evaluation
and reviewing the effectiveness of the policies hold the promise of successful technology
adoption.

4.3.1 Exposure to technology

Ease of access and exposure to computers and other technologies can afford students
self-learning so they can acquire new advanced computer techniques on their own. In the
present day, technologies are ubiquitous and that makes for easy access to information
from mobile learning devices. As a result, the exposure to technology in previously
disadvantaged HEI's and specifically in the rural areas should not be compromised due
to a lack of infrastructure. The findings are consistent with the notion of inadequate
infrastructure related to disparities as Respondent C2A describes the implication and her
frustration as a result thereof:

> "*Let's just have a standard in which all the lecture venues, all the students are*
> *exposed to a particular standard of technology by exposure. Let's just have that*
> *standard. So, like our community where we are coming from where there is the*
> *gap between the very rich and the very poor. You get that also in our very learning*
> *and teaching environments. In the same university, the same campus but other*
> *departments' teaching venues are more equipped than others*"

It is important that every student should be exposed to a variety of technologies at
universities. The negative implication is that students who are unable to navigate through

a complex digital landscape will no longer be able to participate fully in the socio-economic and cultural life around them (OECD, 2015). The findings as shown in Table 4.3 indicate that a number of technology tools were used to facilitate students' learning in both universities. In line with Davis's (1989) technology acceptance model the participants' attitude towards perceived utilities and the perceived ease of use saw a variety of tools being used to facilitate teaching.

TABLE 4.3: THE TYPES OF TOOLS AND TECHNIQUES USED TO FACILITATE TEACHING AND LEARNING

Case-1	Case-2
2:2 Twitter, YouTube videos, Respondus.. (6:6)	3:19 Blackboard, ejournals (42:42)
2:8 Blackboard, YouTube, emails. (11:11)	3:26 Using Moodle, having started w.. (52:52)
2:24 Social media, Blackboard, Skype.. (24:24)	3:32 We use Wiki a collaborative tool.. (59:59)
2:27 The Early warning system (25:25)	3:44 eJournals and video (65:65)
2:37 Cellphones, Google apps, Powerpoint.. (35:35)	3:52 Blackboard, discussion forums (70:70)
2:51 Video (94:94)	3:58 Blackboard, videos, blogging, powerpoint.. (77:77)
2:60 Facebook (102:102)	3:64 emails, dropbox (83:83)
2:83 Respondus assessment software (132:132)	3:66 Videos and podcast (85:85)
2:85 ePortfolio (133:133)	3:77 - Moodle because it is open source (116:116)
2:119 Skype and Facebook (185:185)	
2:120 Forums (185:185)	
2:150 Blogging and watching Youtube .. (302:302)	
2:155 The discussion board (305:305)	
2:159 Story Board, QR codes, Prezi, (314:314)	

When asked to indicate the type of tools and methods that they used to facilitate or enhance their course teaching, the participants mentioned a wide range of tools and techniques as indicated in Table 4.3 above. Importantly, the results revealed some commonalities between Case-1 and Case- 2 regarding the choices and the exposure to new technology preferences. The analysis also indicated that the Blackboard LMS and its collaborative tools, such as emailing and discussion forum were regularly utilised. Furthermore, the analysis shows that students mainly used Youtube to creatively develop their own content through project tasks. In that way, students can get exposed to various creative design tools.

Exposure and access to technology is one of the effective ways for faculty staff pedagogical use of ICT in teaching (Yildirim, 2007). Access alone, however, is not enough to develop interactive instructional materials (Tlhoaele et al., 2014); faculty staff members need regular training on the use of technology to enhance their teaching. In response, the findings revealed a proactive programme in both universities in the form of Blackboard training workshops that are conducted regularly to support technology integration. It must be noted that the secondary data depicted in Figures 4.1 and 4.2 below emanate from the primary data collected in this research and shown for later discussion purpose in Table 4.4. To evaluate the impact of two workshop sessions during the current research, the analysis found that the training workshops were rated useful since not all academics were 'technologically inclined' as depicted in Figure 4.1 below.
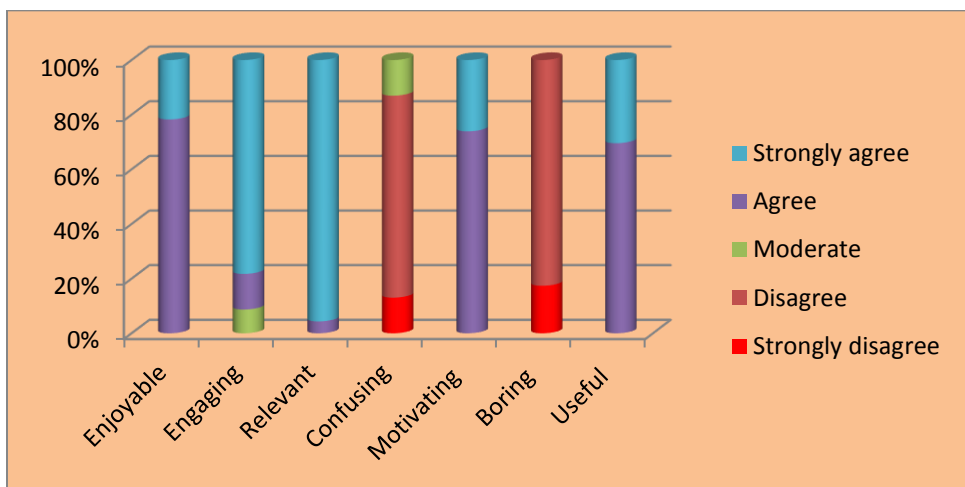
FIGURE 4.1: Graphical representation of motivational factors in Case-1

Results show that about 70% of participating academics enjoyed the training because the tasks were relevant and the procedures were not confusing. While 65% of the participants found the tools to be useful, 70% found the training experience motivating for the adoption of technologies in their teaching.

The two universities revealed contrasting results regarding the staff involvement in their respective training sessions. The motivational factors that emanated in Case-2 are depicted in the graph represented in Figure 4.2 below:

112
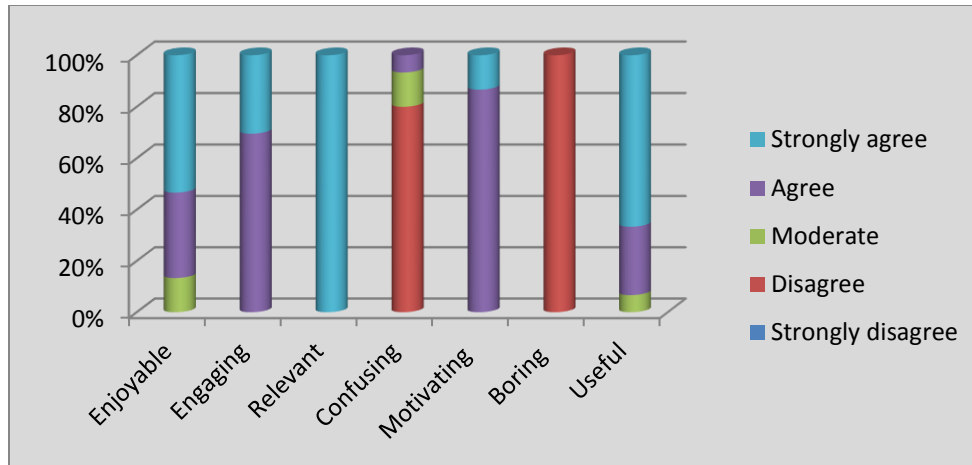
FIGURE 4.2: Graphical representation of motivational factors in Case-2

The graph depicted in Figure 4.2 show that results in Case-2 indicate that more than 90% of participants found the training and the tasks relevant and 80% said that they were motivating. This was due to 65% of the participants found that the engaging activities were useful for an online teaching environment. None of the participants disagreed with the structure of the training workshop and the processes that were followed in that session. Interestingly, the findings indicated that Case-1 used a wider variety of technology tools and techniques as compared to Case-2. The implication might benefit technology exposure as students engage regularly with different tools.

The document analysis of the e-learning Policy (2012) revealed that students' exposure to technology was mandatory for learning and teaching. The policy document states that;

> The use of additional technology and tools should be incorporated or enhanced in all the processes of teaching and learning, unless it poses a security threat to assessment procedures or institutional systems. (e-learning Policy, 2012).

In agreement with the above, one of the lecturers in Case -1 stated that;

> "We make sure we don't exclude anyone from learning. They use the technology they have and available to complete tasks. You don't want students to be disadvantaged by not having access to software. We make sure that what

software they need is provided. Either provided in the labs or can be downloaded for free. In terms of their ability, we find that students just naturally learn from each other… My experience is that through Skype and Facebook and now recently, well, other forums, it [technology] *seems to equalize people."*
[Respondent C1E]

The observation results also exposed a positive attitude from the lecturer who proactively ascertains that students are not excluded based on their inability to operate computers. Instead, he explains that they use available technology to complete the tasks. What was also a significant finding was the determination to expose students to new skills and technology. It is not only the students who need exposure to new technology, the visual analysis seen in Figures 4.3 and 4.4 below confirms the resolve of faculty staff members to also sign up for regular technology training.

FIGURE 4.3: LECTURERS BLACKBOARD (9.0) TRAINING SESSION IN CASE-1	FIGURE 4.4: LECTURERS BLACKBOARD (CE) TRAINING SESSION IN CASE-2
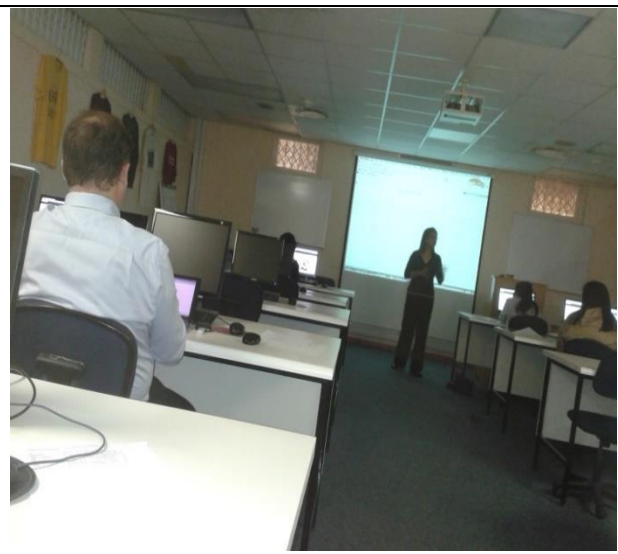
Academic staff are compelled by policies in both universities to integrate technology in the course offerings. For example in Case-1, for each subject/module a lecturer must identify the required and appropriate types of learning activities (lecture, tutorial, practical,

peer group, experiential, independent reading, independent research, etc.) and utilise all available synchronous and asynchronous teaching modalities (Teaching and Learning Policy, 2006). In Case-2, while lecturers strive to engage students in lectures, tutorials, seminars and group discussions, the institution shall provide the necessary training, coaching and ongoing support to academic staff with regard to providing e-learning modules (Guidelines for Teaching and Learning at DUT, n.d.). For the support, both universities conduct regular trainings in order to assist lecturers on how to use Blackboard tools. Currently, teachers also recognise that they need adequate training and appropriate resources if they are to implement technology effectively to support their teaching (Bates, 2015).

In the quest to implement successful e-learning, both universities have established a number of students' laboratories across their various campuses. This endeavor is consistent with Lowther et al (2008), in that exposure to technology can increase the quality of education and connect learning to real-life situations. The participants in this study admitted that it is in fact the lecturers who benefit more regarding technical skills and knowledge during integration. This is because the lecturers' computer skills are modest compared to some students' advancement in technology and use of new applications (apps).

4.3.2 The ICT literacy

The majority of teachers in South Africa are aware of technology and 'what it can do', yet they are not keen to change to new ways of teaching. Many academics who are used to face-to-face interaction of the traditional classroom seem to be intimidated by the new teaching internet environment. This was reflected in the interviews when one of the respondants, typical of the laggard (Rogers, 2010), justified his reluctance to integrate technology and blamed the problem to the time-consuming for course development. The implication is that unless the lecturers increase their use of technology in teaching, learners have a slim chance of developing their computer skills. This approach is

consistent with the use of technologies to complete various tasks as the lecturer describes in Case-2 below.

> *"So they almost don't realise that they're doing all these other things, in Story, Prezi, Essay Writing, towards the production of a digital story. And then we've also used an App called Cognition as a questioning tool to help students prepare for the learning conversation….. "they would scan a QR Code and they would get more information to respond to certain questions, linked on the walkabouts."*
> [Respondent C2A]

The above claim was in line with the policy document analysis in Case-1 that emphasised infrastructure support, assuring that,

> "The Institution's administrative policies and procedures allow for an effective and efficient ICT structures and infrastructure with sufficient resource allocation to support and maintain the quality of e-learning in all offerings and services" (e-learning Policy, 2012, p.2).

In her struggle for survival and to "bridge the digital divide" in rural Cameroon, Palamakumbura (2008: 166) found that there might be some relationship between 'chronic poverty and computer illiteracy'. In this research, the findings imply that unlike Case-1, Case-2 has more students from rural and destitute surroundings. Students who are affected by these conditions rely on government subsidies, such as NSFAS, for financial aid. This means that they have fewer options regarding access and exposure to technology, unless free internet and adequate quota is provided to students. Bates (2008), highlights that, for both social and economic reasons, all students need computer and communications technology skills in order to survive in a knowledge-based society. The implication is that, a computer-literate student often displays more confidence than those that are ICT-illiterate, and this might affect student learning and performance.

4.3.3 Value system

It is expected that good citizenship in our societies would entail the upholding of good values. Learning is a continuous process (Schwartz, 2013) and thus needs to inculcate values and drive to ensure that the students become self-directed, lifelong learners. The spirit of collaboration and teamwork learning should be considered during the adoption of e-learning (Tedre et al, 2011). In this study, the participants believed that an African learner has a very strong cultural foundation in terms of how certain things work (Respondent C2A). Thus, the diversity in culture should be taken into consideration as value systems might play a role in group dynamics. This is because gender and role expectations might be decisive factors in collaborative learning and in group formations (Hawkins, 2002).

The findings in Case-1 showed evidence of how value systems are considered during collaborative leaning.

> *"Sometimes you find students will want to associate with whoever shares the same values as them, whoever it is that they can easily relate to. That's what I have found. But sometimes, what I also do is I encourage them to choose whoever they want to work with*, (considering) *culture, race etc.*" [Respondent C1B]

This notion was also found in Case-2 as emphasis on group tasks was made;

> *"I think it's important to do the group work tasks… the biggest one is how much do you value work? Some don't commit. We're very lucky in that regard because they all just kind of see each other as people.*" [Respondent C2D]

Furthermore, it was observed that in addition to computer laboratories, students worked in groups on personal laptops in open locations around the campus, sharing ideas and information. Although in both institutions there is wide range of diversity in terms of race, ethnicity, culture and social dynamics, the visual analysis revealed that students tended to group themselves by race. This pattern and racial tendency contradicts theories of

cooperative learning. Theories of cooperative learning emphasize the need for heterogeneous groups (Johnson & Johnson, 2008). The findings implication is that although students differ in many ways, they value the idea of working collaboratively in order to achieve the common goal (Roberts, 2004), which is to assists each other to complete the assignment task.

4.3.4 Active and passive learning

With regard to active and passive learning, findings indicate that students in both universities use technology to complete the assignment projects. Findings revealed there might be interdependence between active participation and authentic learning. Herrington et al (2014) point out that a pedagogical approach that situates learning tasks in the context of future use is characteristic of authentic learning. Respondent C1B's views suggest that using audiovisual content excites the discussion and class participation. In this way, he further attests that these videos allow him to teach the students about theories that are very difficult to teach, particularly for students with poor literacy.

The analysis of the interviews revealed that students participate more when they are afforded the opportunity for creative learning. This affordance is in line with understanding the factors that influence students' beliefs about e-learning, which is useful for motivating students to adapt to the online learning environment (Grandon et al., 2005). As shown in Case-1, students use emerging technologies to create their own learning environment (Herrington et al., 2014).

> *"My students are very active and creative with technology; they have created for themselves a Facebook of page."* [Respondent C1A]

Again, this was consistent with another lecturer's account in a similar situation,

> *"I find that my students participate more online than face to face; – it's with greater ease that they can ask challenging questions."* [Respondent C2B]

118

On the other hand in Case-2, students involuntarily learned the video production skills while learning the course content. The lecturer attested that she also learns technical skills from the students.

> *"They make their own instructional videos, like a tutorial and publish on Youtube… they're so technologically inclined I learn a few tricks from them."* [Respondent C1E]

Clearly, the purpose of active learning indicated a high consideration in both of these universities. Hence, it is important to consider whether the learning event will be learner-centred or the approach will be a 'traditional', teacher-driven type of learning environment (Tedre et al, 2011).

4.3.5 Grading models

Although large class sizes have been flagged in section 4.3.9 as a barrier that hinders e-learning implementation, the interviews analysis seems to contradict that notion when it comes to using technology for assessment;

> *" I had 220 students last semester, the lecturers with bigger classes would be more easily persuaded to move to Blackboard because it is very efficient when it comes to marking and assessment grading, It keeps records and it doesn't make a mistake unless you made a mistake when you set up the test."* [Respondent C1A]

In South Africa, all teaching and learning in tertiary education is guided by seven Critical Crossfield Outcomes which are regarded as key competencies to be effective in 21st century working places (South African Qualifications Authority (SAQA), 2007). Therefore, all HEI's need to provide opportunities for developing these key competencies. However, there are limited applications that cover other forms of assessment other than the quiz format or multiple-choice questions. The current findings discovered that the volumes of work regarding the compilation of evidence in portfolios, lacks the adequate grading tool. The concern was confirmed in the Information and Design faculty;

"*A lot of our work is portfolio based. So tools purely for grading… we have not found so useful.*" [Respondent C1F]

Policy implementation strategies (e-learning Policy, 2012: 3) revealed by the document analysis stated that the mark schedule or online grade book displaying all moderated assessment marks, must be part of the 'minimum online presence' requirement. Lecturers from both institutions stated that they facilitate high volumes of formative assessments using *Respondus* on the Blackboard LMS. This choice could be that the system has the capability of facilitating record keeping, tracking student's online activities and monitoring students' progress and performance. Furthermore, some lecturers used Blackboard for pre-practical tests and those count for marks. The respondents regarded the system's grade rule as a crucial feature for monitoring students at risk. Thus, lecturers believe that because of that rule, students work hard and their assignment compliance is greater.

Sometimes the assessment approach by two teachers in the same subject might differ. This was confirmed by one of the respondents;

"*We're two lecturers sharing the subject. The next lecturer doesn't work the same way that I do but for my part where I do practicals - I use Respondus assessment software which grades automatically into Blackboard gradebook.*" [Respondent C1A]

The findings revealed an element of multiple approaches for grading and assessments, as one lecturer explained her department approach;

"*In my context when we have the project as the assessable outcome and students then are supported through technology to better achieve the goal of completing the project, then they are highly motivated to engage because they can see that it will help them to do the project. So I think as a means to an end we find technology quite valuable. Our grading is more of a portfolio process where students present their work and then it's still assessed by humans. So, we've used technology for feedback for formative feedback, for example, Podcasts etcetera. So I think for formative assessment, yes, and then more to communicate that assessment,*

rather than a kind of a self-generated or automated assessment, we're not using technology for that at this stage." [Respondent C1F]

Notwithstanding the different grading and assessment approaches, in line with SAQA (1997), it is imperative that assessments must be aligned to the outcomes that have been set, in order to achieve quality education. In South Africa, the importance of aligning assessment policies, teacher knowledge and infrastructure in schools is emphasized (Department of Basic Education, 2001). Furthermore, research suggests that regular online evaluation creates a connection between students and the lecturer, which makes students believe that their learning efforts are properly assessed (Liaw et al., 2008).

4.3.6 Open courseware

OpenCourseWare (OCW) refers to course lessons created at universities and published for free via the internet. For educational technology adoption to fully benefit from these course designs, most barriers are yet to be eliminated in developing countries. Internet access has exposed practitioners to various options and benefits of OCW, as one of the lecturers in the current study indicates:

> "*Using Khans Academy and other open courseware, I get hints and good tips from those people and more information about credible reliable sources for my courses."*
> [Respondent C1A]

Another lecturer adds her experience,

> *"I try to make sure that what I find is openly licensed"* [Respondent C2A*]*

The findings revealed a sense of awareness and relief to at least most developing countries' strained socio-economic status. The OCW encourages local material development, especially since developing educational materials from scratch often costs less than adapting imported materials (Dougiamas & Taylor, 2003).

In the context of a developing country, another lecturer added:

> *"I think we should be going the route of what's affordable, and wide accessibility."…"Most free, open education resources are of high quality content."*
> [Respondent C2B]

Many universities are increasingly considering the use of Open Educational Resources (OERs), especially in terms of curriculum development (Atkinson, Brown & Hammond, 2007). OERs are useful for content development as they permit the learning materials to be remixed, reused and redistributed. Faculties should be encouraged to develop their own content in the form of reusable learning objects (Herrington et al., 2014).

4.3.7 Parental involvement

HE learning has become increasingly expensive, leaving those who cannot afford, stranded and frustrated. Many students rely on parents and relatives for tertiary financial support in order to remain at school, sometimes resulting in universities excluding all students who have outstanding fees. The high numbers are confirmed in the document analysis with the enrolment of over 25 000 students in DUT and approximately 35 000 students at CPUT. Although parents might play a key role in technology adoption, findings indicate that parental involvement is not fundamentally hands-on at the university level at these two universities. Current documents analysis makes mention of "stakeholders" and "key stakeholders" however; none of those specifically refers to 'parents'. For example, in the Guidelines for Teaching and Learning (2012) some aspects were addressed as follow;

1. The process involved interviews with key stakeholders from the faculties and central services
2. Careful planning - is essential with so many moving parts and stakeholders
3. The primary obstacle to progress is that all of the key stakeholders who have a responsibility for e-learning
4. Staff to engage more effectively with partners, students and other stakeholders.
5. "…and the quality of service it provides to all stakeholders"
6. E-learning requires the active engagement of many different institutional stakeholders.

7. The real challenge is bringing the stakeholders together

8. Communications breakdown between the many stakeholders

E-learning has the potential for growth in developing countries, which can only be realised when all the needs and concerns of the stakeholders are addressed (Hansson et al., 2011). In view of the above, the parent's role is blurred and it is difficult to determine the extent to which parents are involved in either planning or the implementation of a project. Becta (2004) and Wood and Ashfield (2003), argue that any technology initiative must involve all stakeholders and the parents in particular. Similarly, Bhukuvhani, Zezekwa and Sunzuma, (2011) point out that it should not only be the role of universities to encourage the use of technology but parents must be involved in the support of this important endeavour.

4.3.8 Communication patterns

The findings revealed that the most emails were the communication tool that was used the most between lecturers and students. Respondent C1B explains why she preferred a particular communication tool to liaise with students,

> "*I started using emails because I found that reliable*" she stated.

Without any restrictions on time and space, students and lecturers should be able to communicate synchronously or asynchronously, for facilitating collaborative and cooperative learning. The document analysis stated that Case-1 must have at least one active communication tool selected from the learner management system (LMS) suite of communication tools. This was based on what they call 'Institutional Adjustment for Non-Residential Students'. This policy clause (ELearning Policy, 2011) was developed to accommodate students who cannot easily access traditional campus-based (residential) study due to constraints of time, distance, disability, and personal/professional issues through the appropriate use of technology for Learning and Teaching. E-learning should indeed afford communication both inside and outside the traditional classroom (Januszewski & Mulenda, 2013).

Making the maximum use of technology is important in the STEM subjects; i.e. Science, Technology, Engineering and Mathematics. One lecturer from the Engineering faculty appreciated the communication capability of the LMS as she indicated that,

> "*Blackboard is functional even for a subject like Stats, and Maths symbols that I use for my explanations to answer their questions [sic].*" [Respondent C1B]

Although ICT may assume real life synchronous interaction, it might not completely replace the essence of one-on-one contact. Another young lecturer who was in her first year of teaching, indicated her frustration; referring to her class she indicated;

> *"They don't listen to me therefore I use videos".* She further detailed how she has tried to improve the situation:

> *"But if I stand up in front of my students and tell them stuff, it goes in one ear and through the other and they don't remember and they don't learn it. So, I find you have to change your teaching to make it more active for them. So, the videos help because the first time they listen to it they try to get an understanding. Then when they're doing it for homework again, they go through the video again and it's not me having to repeat myself a hundred times, it's on the video. If you need it please go look. I found that that has helped although they are quite passive in my class, they take notes, and they watch the videos because they know that they can access it later."* [Respondent C2E]

The above indicates the importance of paying attention and becoming aware of different learning paths/learning styles the students have. Various theories can be found about how students prefer to learn. Although students may need to go through the same stages as they progress through the learning cycle, they may prefer different aspects of the cycle to others (Segal, 2014). On the other hand, another lecturer, Respondent C2B, cautions against the teacher-centered approach that, '*giving them notes and talking a lot in class,*' does not motivate students. Understanding socio-cultural diversity makes communication flow more effective. Learners seem to be dynamic when engaging in groups as the results revealed that; "*Online they communicate in English. In class they talk in Xhosa to each other, and helping each other."* [Respondent C1D]

Analysing Niesyto, Buckingham and Fisherkeller's (2003) video culture programme, Cronjé's (2010) view is that most students have both the global language and communication means which is unique to their age group. This implies that communication patterns are set up in ways that take 'shared understandings' into consideration regarding what might constitute communication (Cronjé, 2010). It is equally important that communication must be driven by awareness and shared understanding of diverse culture that exist across university students. Similarly, Tlhoaele et al., (2014), add that technology communication tools provide both the lecturers and students with dynamic teaching and learning strategies. The implication in both statements is the validation that the cultural diversity that is enshrined in the "Rainbow Nation" of South Africa makes it crucial to understand student-lecturer communication patterns in the South African context.

4.3.9 Class sizes

The size of the class should facilitate reasonable individual attention and meet the students' expectations. It is difficult for lecturers with large class sizes to employ interactive teaching strategies and to understand the challenges experienced by individual students. Some respondents this as one indicated: *"'We don't do formal group work because of too large class sizes"* [Respondent C2E]

Another lecturer elaborated on the challenges of lack of access and inadequate teacher student ratio;

> *"I need to make sure that they have a computer at home with internet connection to do the assessment. Otherwise, why should I set an online assessment in which the student is disadvantaged? If it has to be an online assessment, the easiest way for me is to get all of them in a lab. However, if it is a big class size you don't get the lab. So that can pose a challenge. The other challenge could be supporting them while they are engaged in that assessment. The weak ones will need support and if it is a big class you have more challenges that you need to support and you*

might not be able to be there for everybody at the same time or to give everybody the same quality of attention." [Respondent C2B]

The implication is that both teaching and learning often suffer due to large numbers and lack of adequate students' laboratories. Notwithstanding, some researchers point out that the key factor is in designing the learning environments whereby lecturers should appreciate and consider the context dynamics brought about by different class sizes (Osin, 1998; Tedre et al., 2011).

4.3.10 Group work

In this study, the participants believe that an African learner has a very strong cultural foundation in terms of how certain things work. Thus, diversity in culture should be taken into consideration, as value systems might play a role in the group dynamics. This is because gender and role expectations might be decisive factors, not only in collaborative learning but also in group formations (Hawkins, 2002). As previously indicated in section 4.3.3, large class sizes are not conducive for group and collaborative learning. Therefore, it must be noted that collaborative learning is more effective in smaller manageable groups rather than large uncontrollable groups (Lin & Reigeluth, 2016).

When asked how they decide on group formation, one lecturer answered;

"*They choose their own groups. The A students stick together and then the average students stick together. All the hard workers tend to stick together. I actually have the urge to shake it up a bit and put some of the weaker students with the some of the strong students.*" [Respondent C1D]

This statement confirmed the approach taken by Respondent C2C as she pointed out that she did not impose on students' group formation, however she indicated *"I only get involved if the group is not being productive"* The statement is further affirmed in Johnson and Johnson's five elements of cooperative learning. Cooperative learning is characterized by five elements as listed by Johnson and Johnson (2008):

a) Positive interdependence.

b) Individual and group accountability.

c) Interpersonal and small group skills.

d) Face-to-face promotive interaction.

e) Group processing

In my Zulu culture, interrupting elders or superiors while they are still speaking, is seen as rude behaviour. In this context, it could mean that students might not ask questions during the lesson as the lecturer might interpret this as being disrespectful. This may thus render the student passive in learning process because meaningful learning is supposed to be engaging, interactive and creative.

It is interesting that during the analysis, a connection between three of the attributes was developed. A strong interdependent relation emerged between *value system*, *group* learning and *gender* roles. This pattern is justified through the example in the Health and Wellness faculty;

> *"In their recent task they chose their groups based on their value systems, religions, and culture preferences. Group 1 is actually a mixed group. There are two black males, with three coloured females, and females are from rural areas. The next group is a typical coloured Cape Flats group. It's a combination of Muslim and white English females. The fourth group consists of pure Afrikaans white females. The next group is again black with only one boy. That boy is not even from the Western Cape. It's four black females and one black male. The next group is coloured females only. So, they group themselves according to how they feel comfortable e.g.in their religion or sociocultural dynamics. In group 8, there are three boys and five girls, and they're all Muslim."* (Respondent C1C).

The participants believed that recognising the value system plays an important role if students need to respect each other's roles in group participation. Consideration should therefore be paid to different personalities, as these tend to prevail during group work. In line with Grunert and Jhul, (1995), value systems and individual behaviour can be treated as an integrated whole in individual personality.

4.3.11 Contact versus individual teaching

The capacity to completely individualise the pace and level of instruction to the needs of each student has been a challenge (Atkinson, 1993; Atkinson & Vasu, 2000). Although computers can individualise instruction for students (Tedre et al., 2011), the process may seem unlikely in developing countries considering unfavourable situations such as large class sizes, the lack of quality student intake and poor infrastructure. However, there is a need to balance individual close contact teaching with effective support. Some of the participants supported the view that learners need to be sustained in dealing with 'this new paradigm' of information overload, The findings from the document analysis suggested that establishing an effective institution-wide model for support and training is 'a prerequisite' for success in the growth and adoption of e-learning. For that purpose, both universities have established strategic support units named, *Center for e-learning* and *Educational Technology Unit* respectively.

4.3.12 Pedagogical models

As an educationist, I profile myself in the constructivism paradigm, and I strongly believe that learning, as a process, occurs over time as so does the success of e-learning implementation through the 'kaizen' approach. This approach states that he job of the teacher in constructivist models is to facilitate students' learning, while they set their own goals and 'teach themselves' (Vygotsky, 1997). Some researchers agree and state that effective instructional models are developed through learning interventions over time and over teaching experiences (Bower, 2008; Dalgarno & Lee, 2010). It is through subsequent testing and refining that effective models are developed and deployed in other contexts (Barab & Squire, 2004). Most faculties in this research believe that their teaching approaches are legitimately influenced by one of the learning theories. The findings revealed that the participants were able to distinguish between the challenges they experience and what they consider to be key factors for the successful adoption of

educational technologies. Most participants appreciated the importance of the key pedagogical elements during technology integration.

> *"If you work from- or coming in from the point of what is it that you want the students to learn or how do you want them to engage with the material, then the technology presents us with the whole range of other ways of achieving – the kind of the same thing but perhaps more interesting and more relevant to where the students are at, at the moment."*

Analysing the e-learning barriers, Hew and Brush (2007) point out that technology barriers include not only the lack of specific technology knowledge and skills, but also the lack of technology-supported pedagogical knowledge in instructional design. This concern was validated through participants' choices of technology use as shown in Table 4.3, and in several instances in their narratives in this chapter. In accordance with Tedre, Apiola and Cronjé et al., (2011), the choice of pedagogical approach is influenced by a range of practical decisions which demand expert planning, a the full s well as an understanding of educational practices in a specific environmental framework. The viable decision might include Mumtaz emphasis (2000) on the Pedagogical Content Knowledge combination of the content and pedagogy. The emphasis provides an understanding of how specific topics are organized and presented for instruction in the relevant context.

4.4 THE FINDINGS RELATED TO THE MOTIVATIONAL AND COGNITIVE ASPECTS

Dewey (1986) describes the purpose of education as growing, or habitual learning. While Dewey (2013) insists that technology creates knowledge, Dusek (2006) emphasizes the existence of complex relations between humans and technology, which necessitate a systems approach to technology. According to Bates (2008), the systemic approach addresses the fundamental interdependence between technological growth and intellectual growth. Kahiigi (2012) argues that educational technology initiatives should take into account important issues in the context-dependent motivational and cognitive

characteristics of faculty. Students need motivation but lecturers also require sound skills to be able to create critical thinking tasks that will motivate student learning.

The data source for the above topic was provided in Figures 4.1 and 4.2, as well as the subsequent detailed account of motivational factors of the participants during the adoption of technologies. The analysis particularly addressed the motivational factors related to technology adoption by both faculty staff and learners.

4.4.1 Mental models

Computer anxiety emanates from mental pressure that could affect student satisfaction in e-learning (Cattell & Scheier, 1961). The document analysis in Case-2 found one of the student support objectives as:

> OBJECTIVE 3: With assistance from academic and student support units, and through collaboration among staff, assist first-year/first-entry students to adjust to the demands and culture of tertiary education (Guidelines for Teaching & Learning, 2012).

Schwartz (2013), points out that students change their *mental models* and behaviours to work productively just enough to achieve minimum required outcomes. Students who are not self-regulated lack motivation to learn. Some interviews supported Schwartz's claim as Respondent C2D explains;

> "Female students are better students than males, and their assignment compliance is greater. They study harder. They're generally better students. I think the males are two types of students– they are two groups, some guys are lazy but sort of strategically lazy. In other words, they're not poor students but they say, well I'm just going to do just enough to get through this thing because I've got a lot of other things on. So they're kind of strategically lazy - they do – I think the males can better assess what I need to do to pass."

Respondent C1B also supported this notion that female students are hard workers and they '*like good marks'* and *'the boys think that the girls waste time in the group by discussing every detail rather than getting the tasks completed.'* In some subjects, such as *Health Sciences* and in *Food Technology* studies, the majority of students are females. This indicates greater chances for female dominated groups in the class.

This notion of planned or selective approach by students toward the completion of assignments is further found in male students;

> *"Sometimes boys prefer group work together because they feel that girls talk too much and don't get the work done. 'They just want to get things done."*
> [Respondent C2A]

This pattern or any similar behaviour of exclusion in girls was not found in any of Terdre framework attribute analysis. Further research should be carried out to determine if this was a coincidence or perhaps an existing state of affairs related to *group work* as discussed in section 4.3.10, or to the *gender* pedagogical attribute below.

4.4.2 Gender

The results revealed that regardless of gender, technology exposure and enhanced computer skills are not significant when boosting students' confidence in computer based participation, In Africa, and in my practical experience, it is generally noted that gender has an impact in determining people's roles in the society. Understanding gender roles in the community is essential. In my practical experience as an African black woman, males have a more privileged role than their female counterparts do. This can be seen from the formal sector employee rate of 57% males to 43% females. (STATSSA, 2016). It is yet to be seen if Employment Equity and transformation translate into positive policies that encourage gender balance, particularly in addressing equity in places of employment. Notwithstanding the societal dynamics and stereotypes, the place of a woman is at least

no longer confined to 'in the kitchen', and students can venture into different HE qualifications and follow their desired career paths.

The results showed that certain qualifications are still associated with a specific gender. For example, both the nursing qualification as well as the Health and Wellness faculty is dominated by female students:

> *"Because* of the stereotype in nursing profession; I'd say girls are roughly in 60% majority, and boys are in the minority by 40%." [Respondent C1E]

Describing the gender impact on group formation Respondent C2B explains as follow;

> *"There is a good integration in terms of genders when I look at my groups. There will be one or two groups where it will be…maybe three boys and one girl. But mainly they just mix with whoever it is that they are friends with and whoever it is that they sit next to in class because they are able to relate. They also look at things like if the person stays in a residence because then they know they can meet until late and then they take the bus together and go back to that same area."*

Again, the above pattern also seemed to connect strongly with group work discussed in section 2.3.10. While it is a common expectation in the African tradition for the male figure to assume the leadership position, and even more so when the male figure is the older than the others, this was not the case when participant C1F described an example as;

> *"One student age +-40 scores A+ high marks but refuses to tutor fellow students in class. He's also very passive in group work but scores high in individual projects."*

There is the arguable notion that in African countries, male students are more confident than females when engaging with with technology (Zhou & Xu, 2007). The observation by one lecturer indicated the following statement:

> "*I have noticed that it is more, how exposed the student is to that particular technology that the student is going to be confident and be able to use it. I think, because we make it compulsory that is why we haven't picked up the trend yet, If*

you are not exposed to technology it doesn't matter whether you a boy or a girl."
[Respondent C1B]

Contrary to Zhou and Xu's (2007) notion that male students are more active participants than females, the current findings disputed the notion by indicating that *'gender is not a descriptor'* in particular when it comes to performance or group work and leadership. Rather, *'if one is not exposed to technology it doesn't matter whether one is a boy or a girl; as they will still struggle with technology'; explained Respondent C1E.* This means that all students should be exposed to technology regardless of gender, culture or social status.

4.4.3 Learning styles

The analysis revealed that there was greater interest in both searching for new tools and researching innovative ways of applied technologies. Although infrastructure support is imperative, institutional technology leadership is a stronger predictor of an academic's use of computer technology in teaching (Anderson & Dexter, 2005). This was demonstrated by proactive policies which provide clear guidance regarding the use of modalities to cater for different student learning paths. The findings also show that two senior management participants from the e-learning support units, firmly supported the institutional vision. This was done by their participation in policy making in their capacity as directors, and by ensuring the smooth implementation process. Although the two universities adopted similar implementation plans, disparities were noticed in spite that both universities of technology offer technological career directed educational programs in six faculties with eLearning strategic support units responsible for technology integration roll out.

The policy document analysis emphasised the necessity of technology for fostering confidence through independent and active learning. The statement was backed by policy document, (E-learning Review, 2012) stating that,

1. Enhancing the student experience to help develop highly employable distinctive graduates.
2. Supporting high-quality engaging provision that enhances the students' learning.
3. Encouraging change in learning and teaching practice through enhanced programme design and delivery.

Importantly, designing for different learning skills and abilities has the potential to stimulate curiosity and learning. This is the reason that that appropriate integration should consider flexibility and make allowance for different learning styles in order for students to follow varied paths in the process of learning. The participants' view was that students in general are very open to new technology. One respondent emphasized the motivational value of e-assessment and indicated that,

> "*Learners will be motivated as long as they can see that there is something in it for them, such as assessment grade"* Respondent C2B.

Another lecturer added that,

> "*The support they [students] get in order to complete the project keep them highly motivated to engage because they can see that it will help them to do the project. So I think as a means to an end we find technology quite valuable.*"[Respondent CIB]

The analysis also revealed mixed feelings regarding the benefits of technology for varied learning pathways for students who lacked critical thinking. Some extracted examples of narratives by participants include,

> *C2E: "The disadvantage is that the Internet can spoon feed students with the answers"*
> *CIB: "Chemistry a programme that allows my students do the experiment digitally."*
> *C2C: "Other sections need f2f for practical sessions".*
> *C2E: "Some of them are visually impaired and can't see on the board, I give them the presentation before class."*

Siemens (2013) asserts that the mode in which the instructional material is presented should be adaptable to each student. The incorporation of multimedia implies that some visual learners learn best by watching a demonstration, other students by reading text, others by engaging in a dialogue and others by playing a game (Tlhoaele et al., 2014).

4.4.4 Immaterial rights

Many instructional material developers take an advantage of using authentic and suitable open source content, rather than reinventing the wheel. These additional resources and tools are useful to enhance online teaching and learning. Open source tools assist both lecturers and students to develop and manage their own content. The latter might be important for the facilitator who should guide students through the process of discovery. Some participants also suggested that, in the end, 'the power won't be sitting in the content' nor in the universities, as the ownership of content gradually seems less important. This could be realised as more academics use additional resources which are provided by the OERs.

Although not open source, some application software, such as Turnitin and SafeAssign, are useful to detect similarities in order to avoid plagiarism and copyright violations. Additionally, many HE's in South Africa skirt around policies to address issues concerning the Protection of Personal Information Act, commonly known as the POPI Act insert the year of the act.

In the current research, the findings indicated there is institutional support to circumvent challenges related to copyright issues. Evidence from the visual data analysis (Figure 4.3 and Figure 4.4) shows that Turnitin in Case-1 and SafeAssign in Case-2 form part of regular Blackboard LMS training workshops. This move was supported by the document analysis that indicates that post-graduate students are supported through an administrative portal that is made available to all research supervisors. The reason for

this is to allow appropriate post-graduate supervision and for all research outputs to be tested for originality. This is evident when the lecturer describes the purpose as follow,

> *"They like research and presenting kind of tasks. I've also made them use digital story telling in their project tasks, to avoid the whole issues of plagiarism and to get students to use media that they are familiar with..."* Respondent C1E.

Importantly, the same similarity detection system is available to academics in both universities for their academic and research purposes.

4.4.5 Confidence

It is natural for lecturers to suffer a measure of technology anxiety when they experiment with new technologies. According to Forde, McMahon & Reeves (2009) some university new students might be unfamiliar with web-based learning while other students who demonstrate high levels of self-efficacy, have more confidence in accomplishing individual e-learning tasks. Lecturers also face the challenges associated with changing their traditional ways of teaching. These lecturers are cautious, since they are also trying to find their feet, as one of them explains;

> *"I'm testing as I go along. If it doesn't work for me or I find that students struggle with it then I won't use it again"* [Respondent C1A]

Researchers believe that the moment both the learner and lecturer are confident to create and accomplish learning tasks, the use of educational technologies and e-learning is likely to increase (Wu et al., 2010). Some lecturers might naïvely assume that in this present day, university students are clueless regarding the use of technology. This is supported by some of the interviews; for example, the lecturer who had planned to orientate his new students provides the turn of events:

> *"In fact, I used to think that I would have to go through a whole lesson, I had it all planned; one full week of showing students how to log on, where's the URL, user*

name, password and all that technical support– but I found that I was wasting their time and my time." [Respondent C1C]

In his literature review report, Buabeng-Andoh (2012) concludes that the use of technology for learning is not limited to gaining computer competence, but also extends to involvement in cognitively challenging tasks.

4.4.6 Income

Analysing the attributes, the current findings suggest that there is more than one angle to look into the 'income' factor in the context of this research. For instance, sustainable educational technology initiatives require financial viability and stability. A large number of the population in South Africa survives on a marginal income; hence, many students do not earn an income but they rely on their parents and relatives for financial support (Tedre et al., 2011). The findings showed that due to lack of income, not all students owned personal laptops. This was affirmed by some students converging in open learning spaces and sharing personal laptops as shown in Figure 4.7. The findings also revealed inadequately equipped computer labs. This observation is supported by visual data presented in Figure 4.6 and Figure 4.7 respectively. The situation shows a dire need for improved infrastructure in order to enable both universities to efficiently support students' learning. Students from disadvantaged backgrounds, particularly those from the rural areas, who have limited or no connectivity at all, are likely to be negatively affected by the socio-economic challenges.

4.4.7 Attitude towards e-learning

Many faculty members are comfortable in the way they teach and some have become reluctant to change their traditional ways of teaching. With regard to technology integration, the interview analysis revealed that some faculties are au fait with technology

and want to adopt it, while others are reluctant. There are also those who show an awareness but do not want to adopt it. However, my research did not reveal that there were faculty members who were unaware of technology integration and e-learning. The findings did however show that faculty members often struggle with change, as Respondent C1D explains when asked whether the academics were ready for the change to new ways of teaching;

> *"It's more a case of not willing to change, but change is always difficult. People are used to traditional ways of doing things, and people are resistant to change. I think they're ready but it's in human nature, they're not willing."*[Respondent C1D]

A lack of technological support from the institution could lead to some lecturers becoming demotivated. However, it is not only the faculty staff members' attitudes that may influence technology adoption, but also the learners' satisfaction. Much as the 'lack of access' is a common notion found in previously disadvantaged communities, in the findings, one lecturer indicated differently;

> *"Fortunately, for me most of my students have internet access and computers at home"* [Respondent C2C]

Thus, the question remains whether 'access' may still be regarded as one of the barriers for the adoption of e-learning in developing countries. Interestingly, the opposite was also indicated in another faculty;

> *"They don't own computers, when taken to labs still they don't know how to use a computer. A lot of the problems stem from computer literacy; the more we enforce integration, the better computer skills they get, and the more the chance for job opportunities for them later in life"* [Respondent C2E]

It was evident that the recent lecturer seemed to experience more challenge in addressing the considerations of 21-century knowledge and skills necessary for the competitive job market.

In this research, the documents analysis found that the implementation and uptake of e-learning in both universities is backed by the full institutional plans. These include the comprehensive e-learning policies, and other relevant institutional policies such as the Teaching and Learning Policy, the Intellectual Property Policy and policies on plagiarism, assessment, language and the Curriculum Development Policy. In addition, faculty support is shown in the visual data analysis in Figure: 4.3 and: 4.4 which depicts training workshops conducted in both universities.

While one participant's view about younger colleagues was that *'the younger generation definitely approach their teaching differently*, and that *'those people that won't adopt technology ever, will move out of the system and the others will just take it on*", she also had a different view regarding her learners:

> *"I would definitely say, because I kept on using blackboard tools they came on board. I force them to engage with the material. Some of them would adapt fast but most of them as they see other people do it then they also get on that wagon. So it's a gradual process."* [Respondent C1A]

Although not all participants have put all their subjects actively online, one lecturer who had, indicated that using educational technology for teaching has student-lecturer benefits.

> *"I came to realize that the only person that is actually learning the most on all of this is the lecturer"* [Respondent C1A]

With regard to using technology, another enthusiastic lecturer provided her positive views as;

> *"I feel I want to empower myself. I want to empower my children. I want to empower my students…I like to share, I've invested many hours building my course on Blackboard – my course is a model, the material that I have collected. I'm happy to show and assist my colleagues. We share what we've learnt. Internet allows us to do more openly, freely, faster…"* [Respondent CID]

The Respondent C1E explained that she was motivated because she could see how technology helped to engage her students;

> *"I can see the fact that it enriches the learning experience. And for me as an educator, it's interesting. So I'm quite fascinated and curious, of course. I think also because it might be linked to the fact that I'm doing research on technology."*

Although some faculties receive institutional support such as training, other lecturers still need to develop their own capacity in efficiently integrating various technologies into different learning situations (Bolliger et al., 2010).

4.4.8 Language

Most of the imported e-learning programmes have been developed in English, which might be the second or even third language to most students and faculties in South Africa. For example, the findings revealed the multilingual capability amongst students. *Language*, like other connected attribute, also indicates the relationship with *communication patterns* that has already been highlighted under section 4.3.8 above. According to the Council for Higher Education (CHE) (2004), English is the language of instruction in almost all universities. The findings show that while engaging in the formal discussion forum environment on Blackboard LMS, the learners do switch from English to their mother tongue when they share ideas during collaborative learning. The lecturer claimed that students interacted in English online and *'In class they talk in Xhosa to each other."* It would be useful to understand if the situation would have been any different if the online content was developed in any of the local languages.

The instructional materials are not always adequate for the local context. Such materials might need considerable adaptation to local languages (Bates, 2008). Findings indicated that sometimes a video may show useful content and technique, but students could struggle to understand a foreign accent. It is usually cheaper to adapt foreign language content than developing the content locally from scratch. However, to modify foreign

language programmes into local languages might be a costly undertaking for a diverse country like South Africa that has eleven official languages.

4.4.9 Workload

To increase and maintain students' motivation, the lecturers should consider reduced work burden for the students, particularly in non-value tasks. Information overload tends to distract the students. It is important to consider proportional chunks of workload and not excessive and unattainable assignment projects, as most students might fail to handle the work overload. The findings revealed some important factors regarding the way we teach. One participant's view in the Science and Food faculty was that educators must remain critical, reflective practitioners and always think about *"what it is that we want to achieve pedagogically?"*
The lecturer describes how she avoids overloading students with work,

> *"I try not to overload them with more than what they need.*
> *-this generation doesn't want to read a lot. They only just want to read what is necessary for them to read; I try to reduce information overload as much as I can."*
> [Respondent C2D]

Different types of media content have the potential to stimulate student engagement (Tlhoaele et al., 2014). Videos and demonstrations should be at the maximum duration of 2 to 3 minutes per video clip. Students easily get overwhelmed when they realise they are unable to handle work overload. High volume videos are affected by low bandwidth, thus access and uninterrupted learning is compromised.

4.4.10 Intrinsic and extrinsic motivation

Learners with intrinsic motivation exhibit epistemic curiosity (Gagné, 1985). Law et al., (2010) point out that intrinsic motivation is related to deep learning rather than surface learning, which is linked to extrinsic motivation. Furthermore, in their investigation Law et

al., (2010) found that extrinsic motivation constructs have a significant effect on student learning. This claim is consistent with the current findings whereby it is acknowledged that learners are generally open to new technologies. The findings show that sometimes students are reluctant to participate in certain online activities unless there is an incentive 'attached' to it. In line with the findings in the section 4.5.2 about authenticity, Respondent C1A attests that students are not readily intrinsically motivated.

> "*I'm pretty sure that the motivation comes down to what's in for me, and I'm going to get marks.*"

Responded C1E is of the opinion that

> "*learners will be motivated as long as they can see that there is something in it for them, for example, the assessment grade.*"

This claim is consistent with Respondent C2E when describing students' behaviour; "*Some are active. The majority however, if it's not for marks, they're not interested*".

The interview analysis in the current section corroborates with the findings that were discussed in section 4.3.12, which relate to best practices leading to self-development and sound pedagogical use of technology. This participant indicates some key educational considerations that are essential for meaningful integration in the design faculty:

> "*With my B.Tech group, there's a lot of intrinsic motivation because they're working students, they know this is the only opportunity for them currently, nationally, to advance their qualifications. But with the more junior students for example, I'm thinking of ECP, it's the fun factor. I think it's the fact that for example, asking them to do a digital story rather than an essay, they're curious, they're used to media. They see it all around them; they want to be part of it. They actually take great care in getting it just right because they know it's going to be published. But I think the fact that it's more widely shared makes them more motivated to produce something that they can be proud of.*" [Respondent C1E]

The above implication might provide insight into understanding studetns' external motivation and self-regulated learning. The findings in this case also indicate that students are in need of some form of motivation to support their learning. The suggestion is in line with Shen and Khalifa (2008) whereby they reiterate that intrinsic and extrinsic motivations have a significant effect on students' use of educational technology.

4.4.11 Cognitive development

A wide range of issues regarding motivational and cognitive aspects should to be fully understood in order for a successful educational technology initiative. The findings indicated that in general, lecturers want to offer quality teaching. This is according to Respondent C2B who says that using technology allows for 'different learning windows' on different aspects of the work. This has the implication that students need to be afforded different learning approaches that they can apply in problem-solving learning situations. This lecturer further indicated that

> *"Students do not just do social media; …they want to do everything online."*
> [Respondent C2B]

The respondents' view is that, although students are active as expected, the technology "pushes them out of their comfort zone". It is therefore important to consider students' 'popular base', such as those in social media platforms, as students become more active in such learning spaces. However, what is more important is to transform those spaces into proper learning environments that nurture and allow exploring, critical thinking and problem-solving abilities.

Scardamalia and Bereiter's, (2014) point out that student learning is affected by experience as well as the ability to build knowledge from the known to the unknown. Effective e-learning implementation can be achieved by combining adaptive hypermedia techniques (Liu & Huang, 2010) with strategies that are informed by learning theories and motivational models (Vygotsky, 1997).

4.4.12 The country's socioeconomic status

The socio-economic status of a country is a complex social, economic, tribal, and cultural construct (Tedre et al., 2011). With that in mind, any technology initiative will be affected by these factors. Hence, the current research looked into some of these factors. Unlike the Tedre framework, the present research findings revealed that in addition to socio-economic, the socio-cultural factor is inevitable. It must be appreciated that in both universities a majority of students are despondent about socio-economic situation in which they find themselves. Nevertheless, students seem to embrace the opportunity to access education when it is presented. The notion is supported in the document analysis which states that in order to allow access to learning, both institutions have established remote campuses, each with computer laboratories.

This claim is additionally confirmed by the interview analysis as one respondent indicates;

> "*We do have more students from a disadvantaged background in the Midlands, Maritzburg. I think probably 80% of our intake is NSFAS Students here. I think that percent might be lower in Durban.*" [Respondent C2D]

The implication is that even though all campuses have installed 'labs' as it is also known, the findings indicate that some computer laboratories are more overcrowded than others. The inner city campuses were better equipped than other remote 'forgotten' campuses. They are forgotten in the sense that sometimes the technical challenges have to wait for days until the instructional designer visits the campus. Furthermore, the inadequately equipped laboratory venues defeat the objectives of flexible, any time and any place, student access to learning.

Participants felt in general that if students were in a better economic situation, every child would be able to attend computer lessons starting in primary school. It should not matter whether the learner attends a rural school or an ex Model C School, because ultimately, the impact could affect their use of technology later in life. Although the participants were teachers at higher learning institutions, they showed empathy towards all learners

including those in primary and high schools. This implies that they felt that way either because school learners are their future students, or they were aware of the educational disparities and poor infrastructure in most disadvantaged schools. Nevertheless, the e-learning standards are available for each country to make decisions that will meet their country's needs (Frydenberg, 2002).

4.5 THE FINDINGS RELATED TO THE CONTENT

The ICTs allow students to create content through completing assignments, blogs, social media and other online activities (Lee, 2008). The present analysis found that the participants are keen to create their own content. Some of them are champions, advocating for reusable content objects and the curation of the information. What has become more important instead, is how one supports and scaffolds the learners' learning. It is imperative to consider the students access in a broader scope of educational technologies.

Faculty staff members, as the drivers of curriculum and content, are compelled to understand the core business of teaching (pedagogy) as well as CK (Koehler & Mishra, 2009). The TPACK framework explains the relationships and the complexities between the three 'basic' components of knowledge: technology, pedagogy, and content (Koehler & Mishra, 2009; Mishra & Koehler, 2006). The subject matter knowledge (PCK), is concerned with students understanding of the content the awareness of the lecturer regarding students' knowledge. The CK refers to the deep understanding of the subject matter through knowing and critically analysing the facts. (Luft & Roehrig, 2007). Very few teachers can still commit to high quality teaching when you consider the challenges related to technology adoption in developing countries.

4.5.1 Cultural appropriateness

The findings indicated that video content and Youtube in particular, was the most utilised across faculties in both universities. In Table 4.3, Youtube is depicted as the most popular tool used for different educational reasons. Different faculty departments used simulations and videos to deliver relevant content in different courses. For example, in Case-2, one lecturer explained that she used foreign content because her subject, *Radiography and Nuclear Medicine*, is international and the content remains up to date particularly with regards to 'diseases outbreaks'. The same was found in Case-1 when the lecturer explained that she uses relevant sites on the internet in order to get real life examples and scenarios. Another response from a different cultural angle was that Youtube videos give students a very different perspective from the usual lesson presentation that is provided by the lecturer in class.

> *"Students get it from another person. From another culture, from another setting and even the medium which is the digital or electronic medium is sometimes more appealing to the students?* [Respondent C1E]

Many HEI's in developing countries still struggle to reach successful e-learning implementation. The document analysis put forward that if e-learning is to be embedded in the learning programmes, then a major culture shift might be required. For many academics, e-learning is still seen as too technical, too remote from teaching and requiring too much time for little benefit. These tendencies, if not adequately addressed, may hamper positive and early adoption. Gay (2002), points out that culturally responsive pedagogy recognizes the strengths and accomplishments of the students and enhances them further in the learning process

4.5.2 Authenticity

The authentic context refers to real-world situations, whereby knowledge can be applied (Herrington et al., 2014). Authentic learning, as in any learning situation, should be

characterised by active engagement with the learning content (Muukkonen et al., 1999) towards the advancement of knowledge building (Scardamalia & Bereiter, 2014).

In response to how he ensures authenticity of the content Respondent C2C views were;

> *"I use Khan Academy quite a lot. Regardless of the accent, the way he explains the concept is better than what they learnt at school. However, slow bandwidth is always a challenge."*

Findings also show that some participants opted for a different approach to explain difficult theories, especially to English second language speakers as in this case. Respondent CIB, felt that he was not supposed to be telling the story. Instead, he was supposed to be helping students interpret the story and relating it to the theory that he wanted to teach them, in this case, Maslow's hierarchy of needs and Darwin's theory on the survival of the fittest. His view was that audiovisuals encourage discussion and class participation, and he justified his take on the authenticity in the context as follow;

> *"There was this pack of lions that are trying to kill this baby buffalo and the buffalo is a cub, a young one, because those predators always attack the easiest target. So, that buffalo runs further into the river. Then a crocodile was trying to pull the baby buffalo into the water to eat and the lions were also pulling the baby buffalo out of the river from crocodile. So it was a tug of war between the lions and the crocodile and the lions overpowered the crocodile. The crocodile gave up and the buffalo was taken out of the river. But when the lion was supposed to kill the buffalo and eat it the herd of buffalo came to defend their cub and they actually chased the lions away and so it's a very interesting video, very short." [*Respondent CIB]

This was an example of authentic context where students could relate and facilitate authentic discussion (Herrington et al., 2014). Importantly, the lesson learnt was that hunger is at the top of the apex in the hierarchy of needs. It also taught that everything has to eat, but staying alive and protecting your own for survival, are equally the most important.

The next lecturer decided to use digital storytelling to engage and encourage student learning. Story telling is characteristic of authenticity as it reflects on individual experiences. The research task and individual presentations influenced this choice. These findings are in line with the document analysis as they confirm the expectations of two universities' policies.

5.4.3 Modalities

Liaw (2008), refers to modalities as the learning styles related to the way students apply their senses in the learning process. Other authors describe learning modalities as being related to the TPCK framework (Mishra and Koehler, 2006). According to this framework, lecturers show the ability to employ different media to interpret and explicitly present information. The same example, 'the apex in the hierarchy of needs' can be relevant to describe the principles regarding authentic learning. The audiovisual content (Respondent C1B) was suitable to represented the 'hierarchy of need' as metaphoric survival of the fittest. This authentic approach to teaching and learning allowed students a clear interpretation and analysis of the events. The research findings show that the lecturers understand and recognise students' different learning styles. This was further supported by the finding that the lecturers show an ability to select and utilise technology tools to facilitate high order learning activities, as seen in this sections 4.4.11 and 4.5.2. The lecturers' abilities and confidence to use technology for teaching and learning was made possible by the support they received through the training workshops that was offered to academics. The findings revealed that the two Blackboard training workshops provided in Case-1 and Case-2 yielded positive results as reflected in Table 4.4 below.

TABLE: 4. 4: THE MOTIVATIONAL ASPECTS OF LMS TRAINING WORKSHOP PARTICIPATION

CASE-1	Variables	Strongly disagree	Disagree	Moderate	Agree	Strongly agree	N=23
1	I enjoyed the session				18	5	23
2	It was engaging			2	3	18	23
3	Tasks were relevant to my job				1	22	23
4	It was confusing	3	17	3			23
5	It was motivating				17	6	23
6	It was boring	4	19				23
7	The training was useful				16	7	23
CASE-2	Variables	Strongly disagree	Disagree	Moderate	Agree	Strongly agree	N=15
1	I enjoyed the session			2	5	8	15
2	It was engaging				16	7	15
3	Tasks were relevant to my job					15	15
4	It was confusing		12	2	1		15
5	It was motivating				13	2	15
6	It was boring		15				15
7	The training was useful			1	4	10	15

This table indicates a total of 38 participants who were trained on the use of technology tools that are available in the LMS. Twenty-three academics participated in the Case-1 and fifteen participated in Case-2 for the Blackboard training workshops.

This training was important for academics as it demonstrated that any form of collaboration, communication, information and other relevant tools found on the internet and outside the LMS, could be similarly applied for the purpose of teaching, learning, and formative assessment. Table 4.4 indicates that in both cases, the majority of participants appreciated the sessions, due to the fact that they were interactive and motivating. A graphical display of the factors that affect the motivational aspect of technology use is further depicted per case study in Figure 4.1 and Figure 4.2.

4.5.4 Contextual relevance

Students are motivated when they realise that the knowledge will be useful and are applicable in the real world and to solve the real-life problems. The document analysis indicated that faculty staff members are encouraged to use multiple media and create their own content for teaching. This is backed through institutional support units that have

been established to support academics through regular training sessions on the use of technologies, as shown in Figure 4.3 in this chapter. Respondent CIE, is already creating her own content, and she explained that it was,

> "..*the responsibility of the educator to curate and contextualise the content for students and to assist students to adapt, so that we don't have to focus on Euro-centric material.*"

One participants' view was that due to the 'international standard' of his course, the contextual relevance did not apply in his case. He further explains that;

> "*For Paper Making Science and Technology, we test according to standard methods as conducted in Europe. So, I don't think the context is that relevant to this type of material*" [Respondent C2B]

However, in contrast the interview analysis revealed in a different context that another lecturer (Respondent C2A) in a similar situation has somehow derived a solution. Some differences were discovered in language connotations that necessitated conversions, as indicated in the examples below;

> "*We localise and contextualise the content… I teach them the skills how to convert from calories to kilojoules*" [Respondent C2A]

Importantly, in the true sense of pedagogy the lecturers are keen to teach how to concert to kilojoules as opposed to what? whatA similar situation emerged during the interview analysis of Respondent C2E;

> "*I have to put the content in our context by converting the metric system; I show my students how to convert from inches to centimeters and millimeters...*
> *We cater to a South African 34 not Size 6. That's our standard base patterns.*"

It is imperative that the learning activities relate the knowledge requires for the types of problems in the real world. Weaver and Cottrel (1988) point out that by relating the course instruction to students' values, behaviours and goals, student participation is likely to be enhanced. However, participation does not automatically translate into critical thinking

and problem-solving strategies for learning. Contextualising the instructional material should not compromise quality education, and in particular the affordance of critical thinking and cognitive learning.

4.5.5 Size

Many universities have started to digitize and archive their libraries, as faculties encourage students to produce, store and share audio and video data files with each other and for class assignments. The students at times have access to computers, however, it is what they cannot access that causes a challenge. This research findings showed that there was high internet usage for audio-visual content and in particular, the Youtube, for the purpose of developing and the disseminating information. The acknowledgement of inadequate infrastructure by faculty staff as well as senior management was indicative of the positive support towards effective technology adoption. This is consistent with the document analysis (E-learning review, 2012), which set out to address the key strategic challenges, such as the e-learning support infrastructure, for academic staff and students.

A further challenge indicated by Respondent C1D was caused by bandwidth interruptions that often disturb the flow of learning activities, especially presentations. Another lecturer added that low bandwidth can compromise the instructional material and inhibit the availability of using rich content.

> *"The IT challenges range from firewalls to lack of bandwidth. You cannot put too rich a content in your course, other than notes. A student in his phone may only have– 100 megabytes of data. One or two downloads and his data is finished."* [Respondent C1E]

The previous statement is also affirmed in document analysis findings which revealed technical support for student learning support and academic staff through orientation and regular trainings. Many students in poor countries feel despondent about disparities, as

they may not have free access to internet that other students from more affluent areas may enjoy. Therefore, the streaming of video lectures, podcasts and YouTube video content needs to be employed with caution, as these could require varying amounts of bandwidth in order to be viable.

4.5.6 Language

Students' engagement in social network platforms exposes them to different cultures and language skills (Liu et al., 2002). Hourigan and Murray (2010) point out that the introduction of innovative and new technologies, such as blogging, increases interaction and provides frequent content updates. This claim was consistent with the interview analysis in *Food Technology* studies, which showed that internet information allows faculty staff to stay relevant and updated. However, sometimes the difference in language inferences does exist, as the interview analysis revealed according to Respondent C1C;

> *"The content sometimes is definitely not for the South African context. I explain to my students that when they talk about the rad as a radiation. If they refer to the technician they're actually talking about the radiographer."*

The conceptual framework for this thesis, as outlined in Chapter 3 and in section 4.7.2, is the Tedre framework that consists of two types of associations that are homonymous attributions to 'Language' as seen in the pedagogical framework, and in the content. The data analysis and constant comparisons eventually made it possible to separate the meanings of these connotations.

Hourigan and Murray (2010) point out that the introduction of innovative and new technologies, such as blogging, increases global interaction. As a result, an increasing number of faculties tend to explore social networking sites as potential platforms for self-expression, engagement and the production of new content (Emmitt et al., 2010). The present thesis reports on key considerations related to the maximum use and adoption of educational technology in a developing country context.

As depicted in Figure 4.5, The *Atlas ti* network patterns, the findings revealed various dynamics of concentration that emerged due to implications of pedagogical considerations related to educational technology adoption in two South African universities of technology.
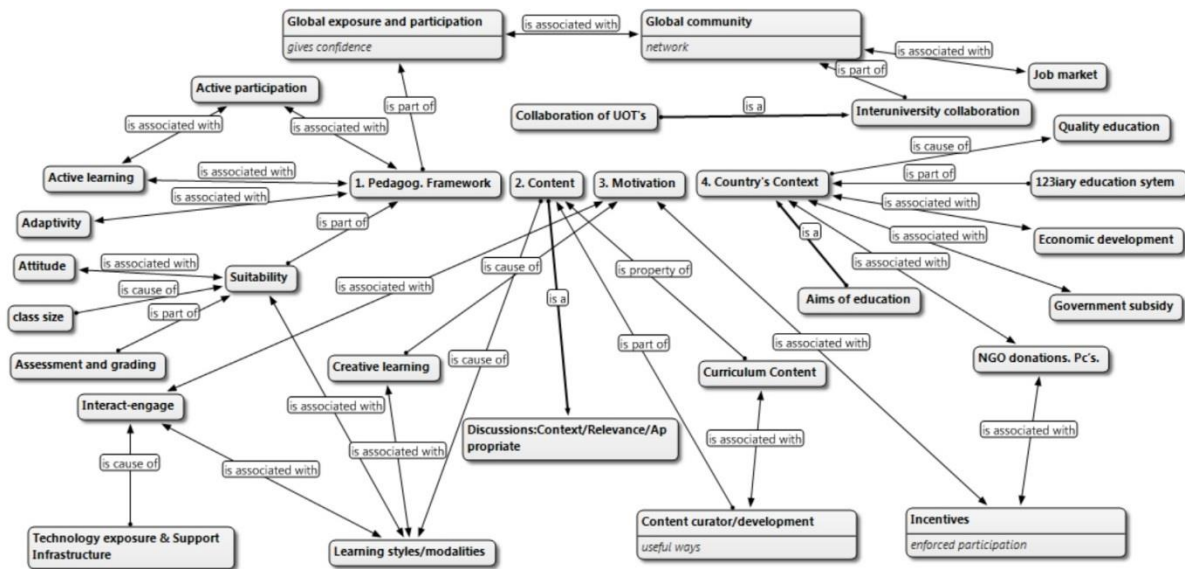
FIGURE 4. 5: THE NEWORK VIEW OF THE IMPLICATONS RELATED TO PEDAGOGICAL CONSIDERATIONS ACCORDING TO THE ATLAS TI ANALYSIS

The Atlas ti network view in Figure 4.5 above indicates that global exposure and participation is associated with recognition and relevance in a global community. However, the viable point of departure might be the collaboration with associated universities. In the centre of the network are four pillars of current research that investigated educational issues related to; pedagogical framework, the country's educational context, motivational and cognitive aspects and content. The issues as seen in the network, are both directly and indirectly connected, making the scope even broader and more in-depth. The document analysis also found that relevant policies, such as language policies and e-learning implementation guiding policies were also considered together.

4.5.7 Adaptivity and adaptability

The findings showed an understating of varied learning approaches that are possible for different students. Respondent C2A's view on different learners is that there are those visual students '*that will respond more to questions, and those who work at their pace alone'.* Adaptive learning is regarded as, amongst others, a method of teaching that is used by a lecturer to encourage students to adopt a specific type of learning approach (Midgely, 2015). The research finding of the study concur in this regard, as participants appreciated the fact that technology allows students to develop their own learning environments. Respondent C1E backed this sentiment when he stated that:

> "*The technology that we've introduced was actually pretty easy for students to adopt and it was easily integrated.*"

Other participants also shared this view, indicating that those who choose not to adopt technology face the danger of staying fixed in one approach whereby

> "*you keep it in the classroom, chalk and talk situation.'* [Respondent C2C]

Some participants believe that technology 'expands the scope' when they use interactive technology such as the Wiki collaborative tool for research assignments. Importantly, in order to achieve effective integration, it is of vital importance that adequate and less complex educational tools be selected. A number of higher learning institutions are increasingly insisting on 'innovation, cutting edge technology'. In view of the former, the real world challenges need to be considered in order to determine the feasibility of the implementation of such technology in a developing country context. Notwithstanding, it is possible for effective lecturers to become creative and take the advantage of low cost technology to benefit their teaching. Others consider different tools in different tasks as Respondent C1F explains;

> "*I teach Chemistry. I use technology and videos as a research tool to show them not the theory or the principles of science, but seeing how science works. To allow them*

to learn adaptively, and to draw from their experiences in order to relate to what they see on a video or what they see on the overhead projector…To reflect how the lesson relates to their personal lives"

The reflection exercise after any learning situation is important. Cassidy (2004) points out that the manner in which an individual chooses, or is inclined to approach a learning situation, has an impact on the performance and the outcomes achievements.

4.5.8 Interactivity

Technology is described as a construct of an interactive and experiential process that inures intellectual adaptation (Lakhana, 2014). It is important that interactivity is not trivialised to simple menu selection, clickable objects, or linear sequencing (Xakaza-Kumalo, 2010), but to engagement methods that complement each other to improve students' interactive engagement levels (Tlhoaele et al., 2014). The participants indicated the importance of interactive learning as the better way of connecting with students because '*if one does not do that, one loses them'* [Respondent C2D]. The findings further show that technology can be the interactive tool and suitable for use in all subjects. Although the suitability of technology was one of the driving factors to integration, the findings also revealed some degree of reluctance for technology adoption.

4.6 THE FINDINGS RELATED TO THE COUNTRY'S EDUCATIONAL CONTEXT

The external environment and internal sources are crucial determinants for changing the roles of education policies, (Gulati, 2008). For successful educational technology adoption in the developing country context, Tedre et al., (2011) suggest that critical factors include; a thorough understanding of the national vocational needs, the job market, funding, and the teacher-student ratio in primary, secondary and tertiary education. To validate the information in this regard two senior managers were

participants in the current study. It was anticipated that lecturers may not be fully conversant with policies related to both their institutions and or national education systems.

4.6.1 Investment incentives

Many HEI's have increased investments for innovation and in particular the learner management systems (Hennessy et al., 2005; Moonen, 2008). Similarly, working towards achieving the latter, the documents analysis indicated that both universities were keen to put such systems in place. The determination in Case-1 was that; unless otherwise stipulated, all university policies, standards, and guidelines for on-and-off campus learning and teaching must apply to all offerings used in e-learning.

The document analysis in Case-2 indicated policy commitment (Teaching and Learning Plan, 2011) to help facilitate pedagogic change by:

- providing staff incentives,
- encouraging the creation of peer networks,
- sharing best practice,
- exploiting opportunities for learning and teaching research.

Further interview analysis confirmed the need to consider incentives, as lecturers felt that the effort that goes into integrating technology is time consuming. This finding is further backed by the policy document analysis which confirms the importance of 'lecturer recognition' (E-learning Policy, 2012). This means that lecturers should receive appropriate recognition of teaching and scholarly activities related to the effective use of e-learning methods in their programmes that is commensurate with their efforts in their traditional activities and programmes. As part of government incentives for technology adoption in schools, the DOE and the Department of Communications reduced internet and telephone tariffs by 50% in schools. In accordance with Akst and Jensen (2002), the society with a well-educated, technology-literate population is more likely to attract investments and sustain new businesses. This relates to the importance of access to

156

education for all, in order to produce citizens who might contribute positively to country's economy.

4.6.2 Aims of education

The core aim of education in any country should be to provide quality teaching for its national economic sustainability and development. The national government has made progress in transforming education in South Africa, although there is still much to be achieved. The findings revealed that the current standard of school education was compromised by policy adjustments that lowered the pass mark to 30% in matric subjects. As a result, the participants felt that 30% pass was not sufficient for students to cope at university level. The findings indicated that most participants felt that many new students were insufficiently prepared for 0entering university. As a result, Respondents C1A, C2C and C2D elaborated;

> Respondent C1A: They're passing with 30%, meaning that they don't know 70% of the work. So they're coming in here [*at university*] and then they are expected to pass with a pass of 50%.
>
> Respondent C2C: In Radiography, we get 5,000 applications for 70 places; They go through a rigorous NBT test as a screening procedure. So when you analyse those results you discover that some of them can't even spell or some of them can't even read, and some of them can't even write.
>
> Respondent C2D: I think our pass marks are too low. It's almost a culture of mediocrity…
> Other SADC regions have same disadvantages but much more motivated and competent.

The interview analysis further indicated that government-related policies need to be subjected to regular reviews in order to sustain quality standards in education. Quality education is important for any country's reputation and certainly for economic stability.

4.6.3 Job market

With regard to global competitive job markets and in line with Önsel et al., (2008), the findings indicated the need for universities to stay abreast of developments so that there could be a 'seamless transition' of graduates into the work place. Findings depicted in Figure 4.5 show that the job market and the global community are mutually linked. The long-term benefit is that students will be able to cope with the fast changing technological landscape (Önsel et al, 2008). One of the reasons why many people seem to struggle to catch up with new technologies, could be that they are unable to cope with the fast pace of technology advancement. However, the advantage is that if students are well exposed to technology, through integration they have much bigger chance to cope with innovative cutting edge technologies as would be anticipated in the work place. The notion of exposing students to varied technologies is in consistent with the view of Respondent C2A;

> *"It would benefit the workforce because the organisation is getting people that are able to use the latest technology in any way that would benefit the company."*

Technology application tools are regarded as beneficial to learning in HE settings, when students understand that they will be applying these tools in different work settings in the near future (Edmunds et al., 2010). The interview findings backed by the policy document analysis shows that both universities have strong work integrated learning (WIL) ties with external work organisations. The use of corporate markets in work-integrated learning in HE enhances courses and new programmes that relate to varied career needs (Hong & Songan, 2011; UNESCO, 2015) The document analysis further indicated institutional commitment to strengthening links with partners and supporting transition and progression, particularly as part of WIL activities. However, there was no clear indication whether students are absorbed after the WIL training in those companies. This is particularly important, as the youth unemployment rate seems to be increasing every year in South Africa.

4.6.4 Government initiatives

E-learning initiatives require significant investments in technology, as well as the maintenance of all installed equipment, hardware costs and software licenses (Childs et al., 2005; Welsh et al., 2003). The same considerations may not differ from the processes of educational technology adoption in HE formal settings. Several government funded educational technology projects have been initiated. These projects include the *Khanya* project (2011), *Teacher laptop* initiative (LTI), the *Gauteng online schools project (GOSP)* and the recent *'Paperless' learner tablet* initiative. However, issues such as poor connectivity and even lack of a complete stakeholder involvement threaten these initiatives.

Nevertheless, progressive and flexible governments tend to respond positively to its country's educational needs. For example, NSFAS is another important government initiative that supports the country's growth in producing students with competitive graduate attributes. The findings back the positive role NSFAS plays in the education of despondent students as Respondent C2B elaborates;

> *"We do have more students from generally, a disadvantaged background in the Midlands, Maritzburg. I think probably 80% of our intake is NSFAS Students here. I think that percent might be lower in Durban."*

The implication of high percentage NSFAS intake can be argued in that the financial aid scheme serves more rural areas than students in the urban city, Durban. Although the current findings specifically refer to Kwa-Zulu Natal province, it is not clear whether the same pattern would apply in other cities like Johannesburg and in other provinces.

4.6.5 Vocational needs

Both universities offer technological career directed educational programs. The government has widened the learning opportunities for students who did not achieve a

university exemption in their matric results. Amid challenges, the South African government has made strides to support structures of transformation in the education sector. Respondent C1B stated that the findings that might bring relief to the challenges of access to tertiary education, is that government policies should not only address open software but also the open resources in education policies.

To address the national education goals, the government has established two categories of tertiary education, namely, Technical and Vocational Education and Training (TVET) and traditional universities. The policy also regards certain qualifications in TVET, such as the National Diploma (ND), as equivalent to a university qualification. Although current findings emphasised the power of 'interuniversity' collaboration, there was no indication of collaboration with any TVET college. Instead, findings indicated the strong link between the two universities investigated in this study. Some universities of technology are collaborating for the purpose of community of practice through universities of technology (UOT's) organisation.

4.6.6 Non-governmental organization initiatives

In addition to understanding the way students fund their studies it is equally important to recognise how governmental organizations (NGOs) projects are funded by the World Bank, UNESCO and other large financial aids. Cuban (1990) and Fullan (2016) emphasise the importance of research driven projects for funding whereby NGOs may contribute knowledge, share skills and experience running complex projects such as an educational technology adoption project. The findings indicate that while the institutions under consideration were considered as 'very slow to change', the NGOs were regarded as progressive structures, already effecting the change 'where it really matters'. The implication could be that this determination is enough motivation for government to embrace NGOs' initiatives. In the findings, the participants' views in Case-1 were that the government must promote open education at the policy making level. One participant, Respondent C2B, supported the notion of OCWs and low cost technology. She also

believed that government should lead by example in being cost effective across all government departments about IT systems choices, for instance by, "using LINUX instead of Windows."

4.6.7 The ratio in primary, secondary and tertiary education

South African HE has been experiencing violent protests by students over 'free decolonised quality education.' Many of the challenges relate to socio-economic issues. These challenges require a revisit into government educational aims and policy implementation. Many students cannot afford personal computers or laptops. The findings revealed that students do share the equipment in the laboratories and student service centres. This is due to the lack of adequate supply of resources and inadequate infrastructure. The latter is backed by the document analysis that indicates the plan and timelines for improving the infrastructure (e-Learning Review, 2012).

FIGURE 4.6:CASE-1 STUDENTS' ACCESS TO COMPUTER LABS

The student-computer ratio is an indicator of the availability of computers that are accessible to students in a computer laboratory at any given time. The findings in the visual analysis, as shown in Figure 4.6, indicate that the student laboratory is very overcrowded. The equipment in the *media centres* is utilised for scanning, faxing and printing. These student support facilities should be well monitored and regularly serviced.

In contrast, the media centre, as seen in Figure 4.6 above, had two printers; however the second printer was labelled "out of order" on the day the current data was collected.

FIGURE 4.7: CASE 2 STUDENTS' ACCESS TO COMPUTER LABORATORIES

The current research findings indicated a general 'lack of adequate infrastructure' in both universities. This situation was backed by the visual analysis that showed that the laboratories were not adequately equipped, as seen in Figure 4.7. Furthermore, the researcher observed that some students sitting at the hallway tables, were sharing and working on personal laptops. These new patterns of technological use may influence the students' open and dynamic learning in HE. Although the situation did not exactly present Personal Learning Networks by definition, it was however a considerable shared learning space (Kolb and Kolb, 2009). Cormier (2008) describes the Personal Learning Networks (PLEs) as rhizomatic open learning spaces that expose students to various learning resources and opportunities.

4.6.8 Funding sources

Funding sources remain a challenge in many developing countries as it continues to impact unfavourably on the HE sector in South Africa. The *#FeesMustFall* campaign, at the time of writing this thesis, was a revolutionary call to government by students for

162

'decolonised free quality education' across all the universities in South Africa (Omar, 2015; Onishi, 2015). Socioeconomic challenges and lack of HE funding were part of the drivers of this students' movement.

To address funding, the findings revealed policy commitment in both Case-1 and Case-2 as an institutional strategy. In addition, the Executive Management shall provide the necessary funding for licensing and infrastructure in order to support e-learning and blended learning across all sites of delivery and all faculties. Furthermore, in Case-2 the funding strategy included creating opportunities for external funding, as well as income generation through innovation in learning and teaching initiatives.

Technology can be regarded as the driving force behind economic growth and development. This is perhaps the reason why Archibugi and Coco (2005) point out that the countries that fail in developing appropriate technological capabilities should be expected to continue to lag behind.

4.7 ANALYSING THE TWIST IN A TAIL

> *"…it is not just the words that are significant here. It is the underlying concepts and meanings, expressed through those words that channel our thoughts, actions and understandings."* Plowright (2011:3)

In the course of the current research, I identified two types of emergent undercurrents that emanated from co-occurrences and overlapping of attributes across four research themes, as illustrated in the next table. Creswell and Miller (2000) point out that dynamics in a qualitative research are brought about the reality that changes when people's perceptions begin to change in the subject topic. Two types of dynamics emerged because of developing relationships or connection(s) between the attributes across the four themes. For the purpose of this research, the two concepts are intra-*theme* and *inter-theme,* created to facilitate logical relationships that emerged within and across the four

themes. The relationships/connectedness are colour coded and depicted in Table 4.5 below.

TABLE 4.5: THE ILLUSTRATION OF DYNAMICS RELATING TO ATTRIBUTES CONNECTION ACROSS THE THEMES

Pedagogical Framework(12)	Motivation (12)	Content (8)	Country's educational context (8)
Exposure to technology	Mental models	Cultural appropriateness	Investment incentives
Value system	Gender	Authenticity	Aims of education
Grading models	Learning styles	Modalities	Job market
Open courseware	Immaterial rights	Contextual relevance	Government initiatives
Parental involvement	Confidence	Size	Vocational needs
ICT literacy	Income	Language	NGO Initiatives
Communication patterns	Attitude towards e-learning	Adaptivity and adaptability	Ratio of 1/2/3ary education
Class sizes	Language	Interactivity	Funding sources
Group work	Workload		
Active / passive learning	Intrinsic and extrinsic motivation		
Contact vs. individual	Cognitive development		
Pedagogical models	Socioeconomic status		
Suitability of technology			
Curriculum			
Work ethics			

Types of attributes relationships indicated by colour

- Intra-theme connection
- Inter-theme connection
- Inter-theme connection
- Intra-theme connection
- Inter-theme connection
- Emerging attributes
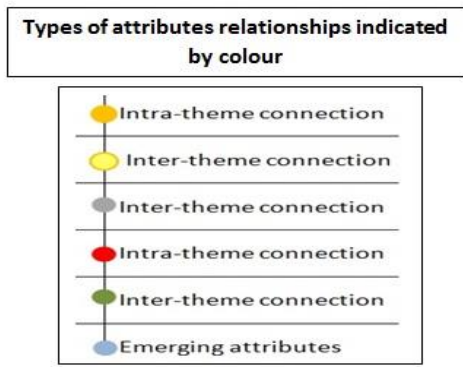
Some attributes in the table above, have 'connectedness' with the other(s) by specific meaning or connotation and are coded in the same colour. For example, the attributes that are coded in the same colour are together affected for one reason or another, and thus connected. Based on its nuanced journey the current research inquiry presented some significant and unexpected twists. Overlaps and some shortcomings were revealed in framework. Concerning the pedagogical considerations, the researcher agreed in the main with the Tedre framework attributes, as necessary elements proposed in their framework. As per the research findings, the researcher added in context, *suitability of technology*, *curriculum* and *work ethics,* as pedagogical considerations necessary during

e-learning uptake in a developing environment, based on her findings at the two universities of technology in South Africa.

4.7.1 Dynamic 1: Intra-theme attribute relationships

The 'intra-theme' occurred as result of a relationship that connected two or more variables by specific meaning or connotation within the same theme. For example, in the pedagogical framework theme, the two variables, colour coded in orange, are connected due to the same implication defining the two concepts, 'exposure to technology' and 'ICT literacy'. The two attributes were perceived as one association, as participants insisted on using the terms interchangeably during the interviews.

> *"They don't own computers, they are not exposed to technology, when taken to labs they are still ICT illiterate and incompetent."* [Respondent C1F]
>
> *"A lot of the problems stem from computer literacy-the more we force, to integrate technology the better they get exposure to technology."* [Respondent C2E]

As a result, as seen in Table 4.5, and based on the findings, the two terms showed significant correlation. It became clear that the terms seen differently but were operated interchangeably and maintained the same impression. In view of the situation, it would be useful to review each of the framework's criteria and contextualise the attributes before the analysis process is undertaken. Tedre et al., (2011:4), confirm this concern, as they put it, that "naïve technology transfer just does not work," at least not in developing countries and certainly not in the two universities of technology.

All predetermined attributes were considered as variables in the inquiry process. However during the interview, some attributes were used interchangeably by participants, others were merged due to the same associations (connotation) in participants' perceptions. For example, the participants regarded both, the 'Government initiatives' and 'funding sources (See table 4.5: red colour coded) as referring to the government financial support, hence the emergent of 'government subsidy' instead. This new attribute, government subsidy,

is a result of two amalgamated variables. This implication affirms that countries are indeed unique, and sometimes people refer to different meanings within the same context.

4.7.2 Dynamic 2: Inter-theme attribute relationships

The 'inter-theme' relationship was observed in the current research when certain variables, for specific reasons, were connected with each other across different themes. Unlike an intra-theme relationship, the 'inter-theme' connections resulted in associated attributes beyond their own theme and across other themes. The pedagogical framework and, motivation and cognitive aspects displayed a set of inter-theme relationships. The two attributes, *value system* and *group work* belong to the pedagogical framework theme, while '*gender'* was classified under motivation and cognitive aspect theme. The analysis results in sections 4.3.3; 4.4.2; and 4.3.10, revealed a significant connection between *gender*, *value systems* and students' participation in *group* work. This was because each one of these attributes was constantly addressed with the other two (attributes) implying the connected interdependency of the three variables. The implication, therefore, is that although females may relate respectfully to men, reality as shown in this research is that female students are often group leaders in many of the class projects. As one would expect in the context of a culturally diverse South Africa, the findings revealed groups formation as a balanced mix of culture, race, gender, ethnicity, religion as well as socio-economic background.

Contrary to situations found in other developing countries, where value systems are fully recognised by students, gender issues in this thesis did not necessarily affect the group selection. Students chose their preferred groups. It was also noted that the choices were mainly based on fellow student's capabilities, rather than culture and stereotype gender roles. This means that the transformation is gradually benefitting through recognition of student diversity in South African HEI's. It is yet to be seen if this transformation translates into positive policies that encourage investments incentives, NGOs initiatives and other related funding sources.

166

Another 'inter-theme' relationship was created due to a crosslinking attribute. This particular connection was formed as a result of a homonym. The 'language' was attributed to two separate themes and implying different meanings for the Content, and Motivational and cognitive aspects, for which its differentiation is explained in sections 4.4.8 and 4.5.6. This particular variable seemed more suitable to Content, rather, as it was understood and presented by participants in that context.

SUMMARY

Using the Tedre framework's construct, this chapter reported on the pedagogical considerations for educational technology adoption in two universities of technology in South Africa. The qualitative case study employed semi-structured interviews, participant observation, workshops and document analysis to explore the two universities. Data analysis related to the four themes as the premise of this research:

Pedagogical framework: Concerning the findings relating to pedagogical framework, the participants were able to distinguish between the challenges they experience and their perception of the key factors necessary for the successful adoption of educational technologies. The findings show that both universities are Blackboard licensed users and the faculties additionally use a variety of technology tools to facilitate teaching and learning.

The motivational and cognitive aspects: It was found that students' mental models differ when it comes to working in group projects. The findings indicated that female students are more intrinsically motivated and seem to have a better assignment compliance than male students. The findings revealed that gender has no significant bearing on computer competence.

Content: The present analysis found that the participants are keen to create their own content. Some participants were champions, advocating for reusable content objects and

the curation of information. Learner support and scaffolding were seen to be important educational factor in student learning process. However, the students' access to broader scope of educational technologies needs to be taken into consideration.

Country's educational context: Universities have been marred by students' protests in support of 'feesMustfall' campaign that almost clouded the HE system in South Africa. Notwithstanding, students' campaign and other national education challenges, the findings indicate an increased level of government financial support and funding sources, such as the NSFAS, a student financial aid for students who cannot afford tuition fees. Furthermore, the DOE and the Department of Communications have reduced the internet and telephone tariffs by 50% in schools as part of government incentives for technology adoption in schools. The findings further indicate that several government policies need to be reviewed in order to improve quality education.

CHAPTER 5

CONCLUSION

5.1 INTRODUCTION

"The illiterates of the 21st century will not be those who cannot read and write but those who cannot learn, unlearn, and relearn."- Alvin Toffler (n.d.)

In this qualitative case study, the Tedre framework was used as a lens through which to explore the Cape Peninsula University of Technology and Durban University of Technology with regards to their adoption of educational technology. In this empirical study, I recognise the implementation of e-learning as a central process towards the adoption of technology for the purpose of learning and teaching. Hence, during this process, numerous pedagogical issues needed to be considered in order for effective technology integration. Appropriate integration is important in order to enhance the adequate use of technologies in teaching and learning (pedagogical) processes. From the literature review in Chapter 2 the question I asked was how the presumed attributed subcategories would develop in this research. From the findings in Chapter 4, I answered this question from a bigger picture point of view. This chapter summarises a report on the discussion, conclusions, limitations and recommendations related to pedagogical considerations for educational technology adoption in a developing environment.

5.2 SUMMARY

This research focused on four themes and educational factors that are related to the pedagogical framework, motivation, content and country's educational context surrounding the adoption of technology particularly at two universities of technology in a developing country context. Out of the total 100 attributes in the Tedre framework, 40 attributes were classified under the four mentioned educational factors. It is these 40

dimensions in Tedre framework that were used to guide an investigation into the processes of educational technology adoption and integration in two South African universities. The purpose was to determine the extent to which the Tedre framework criteria apply, or fit into, educational technology dimensions as they emerge in these two universities of technology.

The purposeful case study which was carried out in the Durban University of Technology and the Cape Peninsula University of Technology, comprised a total of fourteen participants. The sample composition for each inquiry site included one senior manager and six lecturers from each faculty. The demographic distribution as shown in Table 4.1 of Chapter 4 was balanced in terms of race and gender and comprised 8 females and 6 male participants, and 3 Blacks, 3 Coloureds, 6 Whites and 2 Indians participants.

The theory building was considered for a specific purpose in this research. The theory building approach cycled between the Tedre framework and the situation at two sampled universities. It must be noted that this research did not assume a complete grounded theory approach, however, it meant to facilitate theory building which strictly cycled between Tedre framework and two universities. The current study emphasises theory building that was accomplished through inductive analysis described by Corbin and Strauss (2014) as 'discovery of new ideas' which provided explanation for the data.

Following Miles, Huberman and Saldana's (2014) approach, the conceptual framework provided a picture of connected research nodes that guided the flow of this thesis. The qualitative multiple data sources employed were; less-structured open-ended interviews, observation, field notes, photographs, and document analysis (Yin, 2013). Social Informatics guided the underlying research perspective of this study. In accordance with Anastasiades et al., (2016), the concept of social informatics refers to a problem-driven research domain that is a characteristic of ICT. This thesis seeks to provide understanding regarding the extent to which the internal and external environmental changes influence the adoption of educational technology in HEI's. This was achieved by exploring two universities in order to investigate: i) an overview situation regarding

educational technology adoption at those universities; and, ii) how the two universities compare to each other along each of pedagogical considerations in other developing regions as found in the Tedre framework criteria. The systemic comparison was carried out in order to effectively determine the extent to which these dimensions resonate with pedagogical issues in other developing countries. This thesis responded to the main research question that was stated as follows:

To what extent are criteria in Tedre, Apiola and Cronjé's framework useful in analysing two South African higher education institutions?

In general, the pedagogical considerations for e-learning uptake in both universities corroborated with each other. The findings further show that about 90% of educational factors that affect technology integration and subsequent educational technology adoption resonate with pedagogical issues found in other developing countries. This statement is backed by the summary in Appendix B, and in the findings that account for all 40 variables related to current thesis's four research premises as stated in Chapter 4 sections 4.4; 4.5; 4.6 and 4.7.

In the present thesis, I hypothesised that the universities of technology across South Africa are similar in their approach to operations, policies and implementation of educational technology. On the contrary, the findings revealed that the two universities differ in many aspects. Although their educational strategies and policies are very similar, differences were found in the manner and approach of the implementation. The document analysis shown in Table 4.6 provides the comparative summary of the adoption strategies between two universities.

TABLE 4.6: A COMPARATIVE SUMMARY OF THE E-LEARNING ADOPTION STRATEGIES BETWEEN THE TWO UNIVERSITIES

Criteria	Description	Case-1	Case-2
Objectives	The goal and purpose of the policy documents	• To align the use of technology in Learning and Teaching • To add value to T&L methods	• To contribute to university strategic goals, Mission and Vision, and objectives • To add value to T&L methods
Campuses	Physical institutional campus buildings or sites.	Five (7) campus sites	Eight (8) campus sites
Faculties	Institutional faculties and sites	1) Informatics and Design 2) Applied Sciences 3) Education and Social Sciences 4) Engineering 5) Health and Wellness Sciences 6) Business	1) Accounting and Informatics 2) Applied Sciences 3) Arts and Design 4) Engineering and Built Environment 5) Health Sciences 6) Management Sciences
Mode of teaching and learning	Method and techniques for institutional programme course delivery	Blended teaching approach	Blended teaching approach
Policy group(s)	A group of related institutional policy(s) in which the e-learning policy belongs.	1) Teaching and Learning Policy 2) Intellectual Property Policy 3) Teaching and Learning Plan. 4) Policy On Plagiarism 5) Policy On Assessment 6) Procedures And Rules For Assessment 7) Language Policy 8) Curriculum Development Policy 9) Electronic Communication Policy 10) Information Security Policy	1) Guidelines for T&L 2) Curriculum Development Policy 3) WIL Policy 4) E-learning Strategic Planning and Deployment 5) Institutional Planning, and Technology Innovation and Partnerships
E-learning inception period	Adoption of the LMS and official introduction of educational technologies	Since 2005 Blackboard Learn 9.0	Since 2002 Blackboard Learn CE
Support	• Strategic divisions that manage and coordinate T& L systems. • E-learning support service units that provide academic support	LMS user (pedagogical) support: • Centre for e-learning Research and Multimedia support: • Fundani Research and Development center IT support: • Communication and Technology Service (CTS)	LMS user support: • Educational Technology unit Pedagogical support: • Center for Excellence in Learning and Teaching (CELT) IT support: • Information Technology and Support Service (ITSS)

The comparison between the two universities, as seen in Table 4.6, has more commonalities than differences. In both universities, the main objective of technology integration is to add value to teaching and learning methods through blended learning. At senior management level, the two directors who were interviewed showed consistency regarding the adoption of the Blackboard LMS at their respective institutions, as both institutions supported online learning environments. Another interesting finding, as shown in the bottom row of Table 4.6, is, that the three pillars of implementation support structure are very similar in approach. The implication is that the same goal orientated HEI's are distinctively networked and share common strategies and approach in the adoption of technology and implementation of e-learning. Summarised below are the implications of the findings regarding pedagogical framework, motivational and cognitive aspects, content and the country's educational context. The classification of attributes under each theme is shown in the Table 4.5.

5.2.1 Pedagogical framework

In the Tedre framework, a total of 12 variables were attributed to the pedagogical framework. Four of those considerations were affirmed in this research. The other variables were consistent with both universities and the Tedre framework could not assist in differentiating between the two universities.

i) *Technology exposure and ICT literacy*

In this thesis, I agree with the literature and also confirm the importance of the first two attributes in this section that relate to *Technology exposure* and *ICT literacy.* Ease of access to technology is one of the effective ways to expose faculty staff to pedagogical use of ICT for teaching (Yildrim, 2007). This means that, in return, students also benefit through meaningful instructional learning and exposure to technology. However, it was concerning to note that one university appeared better equipped than its counterpart, whereby faculty members seemed more comfortable talking about technology use from

different perspectives. Because of that confidence the lecturers displayed a sound understanding of TPCK from Mishra and Koehler (2006) in the manner that they t used technology to represent information. This was supported by a broader variety of technology tools and the approach and techniques that were used to facilitate teaching and learning. Affirming this part of Tedre framework, the researcher concurs with the literature which predicts that students who are unable to navigate through a complex digital landscape will no longer be able to participate fully in the socio-economic and cultural life around them (OECD, 2015).

ii)   Parental involvement

In this thesis, I concur with Bhukuvhani et al., (2011) when they emphasise the influence of parents as active stakeholders who encourage the use of technology for teaching and learning. Evidence of hands-on parental involvement was missing in both universities as discussed in Chapter 4, section 4.3.7. Hence, the researcher agrees with the literature and thus confirms *parental involvement* as a viable consideration in the Tedre framework.

iii)   Contact versus Individual teaching

With regard to the fourth and last attribute, *contact versus Individual teaching,* big class sizes, the lack of access to computer laboratories and poor infrastructure, make it impossible to balance individual close contact teaching and effective technical support. Although the findings from the document analysis attempted to address this issue through support units in both universities, there was no evidence of implementation in either of these universities. In accordance with Atkinson and Vasu (2000), the challenge has been put placed on the lack of the capacity to individualise the pace and level of instruction to the needs of each student. On that score I agree with the literature and confirm this part of the Tedre framework to be an important aspect when considering the adoption of technology in a developing country's context.

iv)   Other Tedre Framework attributes

The literature review showed that educational technology initiatives should consider important issues in the context-dependent of faculties (Kahiigi, 2012), and follow a distinguishing context-influenced framework (Mumtaz, 2000). On eight of the attributes in this theme: i) *Value system, ii) Grading models, iii) Open courseware, iv) Communication patterns, v) Class sizes, vi) Group work, vii) Active / passive learning, and viii) pedagogical models*, both universities were the same and Tedre framework could not assist to distinctively differentiate between the two universities. Although these considerations were directly relevant to the current research, I believe that these might still be of importance in other contexts.

5.2.2 Motivational and Cognitive aspects

Out of 12 variables in this theme, the literature confirmed that four of them as factors for consideration. This was highlighted by several researchers and discussed in section 2.4 of Chapter 2. The four attributes confirmed in the Tedre framework included *learning styles, income, language* and *workload*.

i)   Learning styles

Both universities has policies in place in place to enforce the appropriate integration of technology for addressing students' different learning paths. However, justifiable options for using technology to facilitate varied *learning styles,* fell short in actual implementation, as one university displayed more options than the other university. It is important that adequate infrastructure is in place to afford effective implementation. However, Anderson and Dexter (2005) point out that although infrastructure support is imperative, the institution's technology leadership is a stronger predictor of the academics' use of computer technology in teaching. Considering the above, I agree with Ertmer and Newby

(2013) that learning styles are an important consideration, as they provide progression for students learning. This implies that individual student can advance in building knowledge during the learning process.

ii) *Income*

With regard to *income,* this thesis revealed in section 4.4.6 that there are many angles that pose a challenge to 'income' factor in the context. As a matter of importance, Bates (2008) encourages free online access or low-cost learning materials rather than buying unaffordable international licenced programmes. In view of Bate's (2008) assertion, the researcher is of the opinion that this particular attribute might not be well placed under this heading. However, it is her belief that *income* might still be relevant in some situations.

iii) *Language*

Imported e-learning programmes have been developed mainly in the English language, which in many cases is the second or even third language for students and faculties in South Africa. As a result, these instructional materials are not always adequate for the local context. Such materials might need considerable adaptation to local languages (Bates, 2008). In accepting *language* as a necessary attribute for consideration, this thesis concurs with the notion that the language of instruction should meet diverse cultural and socio-economic needs which are mostly found in South African universities.

iv) *Workload*

In both universities, information overload was considered a distraction for the students, and small chunks of content delivery, including 2 to 3 minute video clips were suggested. Importantly, Tlhoaele et al., (2014) point out that student engagement can be stimulated by using of a variety of different media. As a result, *workload* has been considered and accepted as one of the important factors to be considered during technology adoption in developing countries.

The current research found that there was a high rate use of audio-visual content in both universities. YouTubes, mostly self-made, were used for different purposes and crosslinking with other attributes in the Tedre framework, such as those discussed in *communication patterns* in section 4.3.8; *Contextual relevance* in section 4.5.4, and *Size* in section 4.5.5. In accordance with Tlhoaele et al., (2014), different types of media content have the potential to stimulate student engagement. It was noted in this research that while one university observed the importance of avoiding 'information overload' as discussed in 4.3.11, the second university did not mention any related concern. In view of that oversight, student *workload* should be considered when deciding to adopt educational technology in developing countries.

In Chapter 2, section 2.4.1, the literature pointed out various problematic arears relating to some of pedagogical factors affecting motivation and cognition during technology integration. Both universities agreed on eight of the attributes in this section, and the Tedre framework did not assist to analyse the differences in that regard. Although the framework was rejected, the attributed variables may still be useful in another situation. The excluded variables include mental models, gender, immaterial rights, confidence, intrinsic and extrinsic motivation, attitudes towards e-learning, cognitive development and the country's socio-economic status.

5.2.3 Content

Three of Tedre framework attributes under this heading were accepted for consideration in the context. The other five variables were rejected, as the criteria fell short in differentiating the situation during the investigation.

i)   Authenticity

In this thesis, *authenticity* is accepted as a necessary attribute to be considered during technology adoption in a developing country context. With regard to authenticity in learning, Herrington et al., (2014) point out that a pedagogical approach is necessary because it appropriately situates the learning tasks in the context of future use. For instance, the authentic learning context should be used when students are able to relate to topics in order to facilitate an authentic discussion. Furthermore, authentic learning should be characterised by active engagement with the learning content and the indication of some elements of progressive inquiry (Muukkonen et al., 1999) as well as the advancement of knowledge (Scardamalia & Bereiter, 2014).

ii)   *Size*

Law et al., (2010) state that motivation is essential for students' self-efficacy. It is therefore important to keep students motivated by reducing audio-visual learning materials to a reasonable *size* and a video clip playback length to 2-3 minutes at the most. In both universities, bandwidth was a challenge, but what was interesting is that unlike in Case-1, some lecturers in Case-2 were proactive. They had had implemented a solution to the problem by guarding against what they termed as 'information overload', to avoid overwhelming the students. The implication is that information overload might not necessarily benefit students, since huge workloads may easily overwhelm and demotivate many of them. On that point, the researcher concurs with the literature and thus confirms the importance of *size* as a consideration in the decision to adopt technology in HE's in developing regions.

Iii) Interactivity

It is important that the course design activities are interactive enough to maintain students' curiosity and to encourage student' engagement with the content and additional resources (Keller & Suzuki, 2004). Thus, interactivity in the Tedre framework can be

confirmed as a viable consideration, especially because the two universities were not coordinated regarding this particular attribute. While there were examples of online tasks in Case-1 that were created to be interactive, such as discussions on Facebook and on Blackboard discussion forums, Case-2 made more use of the LMS content repository access and relevant internet simulations, to facilitate learning.

Both universities concurred on the remaining five items; c*ultural appropriateness, modalities, contextual relevance, language,* and *adaptivity and adaptability.* As a result, these attributes were rejected and did not qualify because both universities were aware and already have considered the factors in their adoption of e-learning. Since the findings did not support some of the attributes it implies that Tedre framework fell short in differentiating between two university situations. For example, with regard to *modalities,* both universities were fully aware of this element as a pedagogical consideration, to the extent that they conducted regular training session, as seen in Table 4.3. Figure 4.3 and Figure 4.4.

5.2.4 Country's educational context

From the eight attributes under this heading, two of them; *government initiatives* and *funding resources* were found viable and accepted as considerations in this thesis.

i)   Funding resources

Although the government grants proportion could not be confirmed in two very similar career orientated programme universities of technology, unexpectedly, with regard to the *funding resource* variable, the results revealed blatant differences between the two universities' infrastructure; hence this particular attribute is accepted in the list of considerations under current heading. Tedre et al., (2011) point out that the funding sources of educational institutions differ between countries and between various kinds of institutions. The new funding framework, as approved in the Government Gazette (2003),

explains how the Ministry of Education distributes government grants to public universities and technikons. Government grants differ proportionately between universities in South Africa. For example, government grants as a proportion of total income can be as low as 35% if an institution is able to raise large amounts of private funds through donations, research contracts and investments. On the other hand, the grant proportion can be up to 65% where institutions are unable to generate substantial amounts of private income. It has become clear therefore that the students' #FeesMustFall campaign has done much to highlight the plight of the underprivileged majority in South Africa. The protests supported students who lack tertiary funding, as well as those who are eager to ensure a future through tertiary education. Although the government has overstretched its budget, the question remains how this funding challenge can be addressed.

ii)   Government initiatives

In this thesis, it was found that government technology initiatives have been focused more in schools than at tertiary education institutions. These government-funded projects include the *Khanya* project (2011), the *Teacher laptop* initiative (LTI), the *Gauteng online schools project (GOSP)* and the *'Paperless' learner tablet* initiative. Although NSFAS may be a useful government support mechanism to enable tertiary education students to purchase personal computers or laptops, equipment maintenance, internet connectivity and software costs might still be a challenge. Literature importantly points out that e-learning initiatives require considerable investments in technology as well as the maintenance of all installed equipment, hardware costs and software licenses (Childs et al., 2005; Welsh et al., 2003). In view of the contrast between the findings and the literature, *government initiatives* suggested in the Tedre framework need to be relooked, to ensure balanced and effective elearning uptake at primary, secondary and tertiary levels in developing countries.

With the rest of the variables under this heading, the Tedre framework could not assist in differentiating between the two universities. For instance, the *aims of education* in both institutions are guided by national goals. The notion was the same in both universities

that e-learning policies need to be mandated from national government and enforced in all education levels - *primary, secondary and tertiary*. Considering the slow adoption of technology in many universities, the findings in both institutions embraced the NGOs initiatives and their deployment in line with national ICT integration guidelines. With regard to the national *vocational needs,* both universities offer almost identical technological career-directed educational programmes, and the criteria did not assist in differentiating between the two universities. A similar situation was found regarding the *investment incentives*; the determination in Case-1 was that all university policies, standards, and guidelines be followed. In Case-2, faculty staff members were compelled by policy to facilitate pedagogic change by providing staff incentives, amongst others. Furthermore, with regard to *job markets* both universities were found to have maintained strong WIL ties with external work organisations. Due to similarities, as mentioned above, these variables were not accepted as part of the considerations in this thesis.

5.3 DISCUSSION

The results of this thesis illustrate that educational technology adoption in a developing environment presents many challenging issues, firstly, to both of the universities in this research and, secondly, to other HEI's in developing countries. The pedagogical considerations for educational technology adoption at previously disadvantaged HEI's cannot be ignored in South Africa. In this section I highlight the study limitations and reflect on important aspects of this research journey; I then conclude with recommendations and further research.

5.3.1 The methodological reflection

The research in this thesis intended to determine firstly, the correlation of the situation within two South African universities; secondly, the resonance between the findings and pedagogical considerations during educational technology adoption in other developing regions. The theory building approach from the case study cycled between the Tedre

framework and the two universities, allowing for nuances that are essential in this complex empirical inquiry. There were two validation methods created to determine how useful Tedre framework criteria are, in analysing the situation at the two universities.

Firstly, a criterion in the Tedre framework was accepted on the three following logical bases:

a) Where the analysis findings contradicted the literature
b) Where a variable was silent or missing and there was no evidence in either or both universities
c) Noncompliance, where a university policy was in place but not implemented.

Secondly, a criterion in the Tedre framework was rejected on the three following logical bases:

a) When the situation in both universities was the same and the Tedre framework did not help to differentiate between the two institutions
b) Where the specific practices in both universities were found to concur with the literature
c) When either of the universities were in line with practices found in the literature.

For example, in the case where the two universities had almost the exact situations, whereby the Tedre framework variables could not assist to differentiate between the two universities, that particular criteria were deemed not useful in analysing the situation, hence such rejected attributes were excluded. The opposite is also true, as the accepted variables were those that needed attention, and were either characterised by policy non-compliance, missing or silent attributes as well as when the findings contradicted the literature review. The major implication is that by virtue of its exclusion, each framework variable creates a clear validation of the extent to which the current situation resonates with universities in other developing countries. The implications of the accepted and rejected attributes in the Tedre framework can be explained through a limited basic quantitative illustration that is provided as a supplement in the Table 5.1.

The percentage of accepted variables and those that were excluded is depicted in Table 5.1.

Table 5.1: Summary of accepted and excluded attributes as per the Tedre framework criteria

	Research Predetermined Themes	Rejected Variables	Implication Percentage	Accepted Variables	Implication Percentage	Tedre-framework Total Attributes
1.	Pedagogical framework	8	66%	4	33%	12
2.	Motivation & Cognition	8	66%	4	33%	12
3.	Content	5	62.5%	3	37.5%	8
4.	Country's context	6	75%	2	25%	8
	Total	27	67.5%	13	32.5%	40

This table is meant to supplement qualitative data by illustrating in comparison the number of accepted and rejected attributes. Thus, this secondary qualitative data is attained from Table 4.5 in current research and by no means represent quantitative data. For example, the above table shows the 40 variables related to educational factors affecting pedagogical integration of educational technology. These factors were used to compliment the findings regarding the extent to which the Tedre framework criteria are useful in analysing e-learning implementation situation at the two universities of technology in South Africa. A total of 40 variables, as seen in Table 5.1, were investigated under the four research themes; a) pedagogical framework (12 attributes), b) motivational and cognitive aspects (12 attributes), c) content (8 attributes), and d) the country's educational context (8 attributes). The implications for rejecting and accepting the variables for each theme were logically interpreted in percentages according to Table 5.1. For example, 8 out of the 12 Tedre framework pedagogical attributes were rejected by the study, which translates into 66% rejection. A similar formula was used for all the other attributes and the results of the rejected and accepted total number of attributes against the Tedre framework are presented in Table 5.1.

The findings revealed that both universities were fully understand the practices and strategic processes necessary for educational technology adoption. As a result, in this

thesis, it was determined that 68% of the situation was in line with the literature review; hence, the affected attributes were rejected and deemed unnecessary for further consideration. Although 68% of the total framework criteria were rejected, the variables may still be useful in a different context. The implication of the results, as reflected in Table 5.1, is that the situation in the two universities is largely similar to the situation in other developing countries.

The findings confirm that 33% of the Tedre framework pedagogical attributes were indeed factors that need to be taken into consideration during the adoption of e-learning in developing countries.

5.3.2 The substantive reflection

Although countries and regions are unique and vary in many ways (Tedre et al., 2011), the results in this thesis suggest there were no conclusive significant differences found within the two South African universities, as well as between these two universities and the universities in other developing countries. Some key educational considerations in the Tedre framework were recognised, as seen in APPENDIX C and in the subsequent discussion in the sub-sections of section 5.2 of this chapter.

5.3.2.1 Pedagogical framework

In accordance with Koohang and Durante (2003), technology practitioners and developers need more understanding of the way faculties perceive and react to elements of e-learning. Nawaz and Kundi (2010) concur with Tedre et al., (2011) in that e-learning implementation must take into consideration the needs of a given context. Importantly, understanding the situation in a given context, as demonstrated in the various sections under this particular sub-heading in this thesis, and comprehensively depicted in Figure 4.5, may save many technology initiatives from failure.

5.3.2.2 Motivational and cognitive aspects

Contrary to gender-stereotyping that is perceived in other developing countries according to Kahiigi (2009), gender was not a defining issue. Gender did not necessarily affect the learning elements pertaining to group selection, roles and other learning factors, such as computer competence and online activities. Societal stereotypes have, however, had an impact on HE learning in a number of contradictory ways. Firstly, Zhang (2005) found that gender was not a significant factor in receiving education and concluded there was no statistically significant difference in the overall perception of computer competence based on gender. Secondly, in their study, Zhou and Xu (2007) found that due to socio-contextual factors, male students displayed more confidence than their female counterparts when using technology. Thirdly, Davis and Davis (2007) found that in online activities such as the electronic communications, word processing and spreadsheet applications, females indicated higher perceptions of competence than the male participants did. In this thesis, the results in section 4.4.2 showed no significant difference based on gender capabilities, participation, roles, as well as in computer skills and knowledge. The findings also indicated a significant connection between *gender*, *value systems* and participation in *group* work. This was because each of these attributes was constantly addressed with the other two, implying the interdependence within these three variables. This could mean that transformation and the culture of 'ubuntu' in HEI's are slowly and surely benefitting from South Africa's diversity.

5.3.2.3 Content

Subject matter knowledge, also known as pedagogical content knowledge (PCK) (Nawaz & Kundi, 2010), concerns the students' understanding of the explanation, as well as the lecturer being aware of the students' levels of knowledge. The interview findings reflected a sound understanding of PCK as described by Nawaz and Kundi, (2010), as well as the ability for teachers to integrate technology for the purpose of teaching and learning.

TPACK is a framework that describes the relationships and the complexities between technology, pedagogy, and content as basic components of knowledge (Koehler & Mishra, 2009). Although both universities largely embraced the use of content found on the internet, similar issues found in the Tedre framework were mainly attributed to language, contextualisation and appropriateness. In line with Koehler and Mishra's TPACK framework, the findings revealed that lecturers used multiple types of technology in different media formats. These design formats have the potential to stimulate interactive learning and to creatively present information to students. In return the students are obliged to create content through completing assignments, blogs, social media and other online activities. When the right affordances are provided, these opportunities make students the creators of content. As Laurillard (2002) also points out, the successful creation and transmission of knowledge through educational technologies is a universal understanding of the nature of knowledge.

5.3.2.4 Country's educational context

The common e-learning objective in most developing countries is to provide access to basic education, whereas in developed countries, the aim is to advance an effective knowledge economy and lifelong learning (Gulati, 2008). For successful educational technology adoption, Tedre et al., (2011) suggest that a thorough understanding of the national vocational needs, the job market, funding, and teacher-student ratio in primary, secondary, and tertiary education, are critical considerations. To ensure the effective implementation process, the current findings showed a few enforcement measures. Firstly, the two senior managers were entrusted with the responsibility of innovation and successful implementation of e-learning in the entire institution. Secondly, the institutional policies provided compliance measures and enforcement strategies, reflected by the fact that it was compulsory to maintain a minimum web presence in all courses offered at the universities. Thirdly, in both universities, superior logic in governance prevailed with regard to the changing landscape in HE (e-Education White paper, 2004). The LMS has been officially implemented in both universities as the institutional choice for formal online learning in all the courses across programmes. Some researchers tend to justify high

LMS investment, as they assert that many HEI's have increased the investments and incentives for the sake of innovation (Hennessy et al., 2005; Moonen, 2008). As in any invested organisation, the hope for an effective technology adoption at the universities is to see a return on their investment. In line with Önsel et al., (2008), the findings also indicated the need for universities to stay abreast of developments, so that there could be a 'seamless transition' for efficient student graduates into the work place. Furthermore, the findings shown in Figure 4.5, suggest that the *job market* and *global community* were mutually linked and associated with the same goal.

5.3.3 The Scientific reflection

Addressing the gap in the knowledge as presented in Chapter 2, the qualitative research approach as explained in Chapter 3 and Chapter 4, allowed this thesis to determine the extent to which the Tedre, framework attributes align within the pedagogical dimensions of two South African universities of technology. The aim of this study intended to define the extent to which the Tedre framework criteria apply during the e-learning uptake in the two universities in a typical developing country. Table 5.2 shows the summary of the research areas and the chapters that addressed the research questions.

TABLE 5.2: SUMMARY OF THE RESEARCH AREAS AND RESPONDING CHAPTERS

Main research areas	Addressed in:		
Research sub-questions	Chapter	Table	Figure
1. How do the two South African universities compare in their technology uptake challenges and issues?	Chapter 2 Chapter 3 Chapter 4 Chapter 5	4.1 4.3 4.4 5.1	4.1 4.2 4.3 4.4 4.6
2. How do these elements resonate with the pedagogical aspects as proposed in the Tedre framework in other developing regions?	Chapter 2 Chapter 4 Chapter 5	4.2 4.3	4.5 5.1

3. Does the Tedre framework differentiate adequately between its framework categories? (Or are there any overlaps?)	Chapter 2 Chapter 3 Chapter 4 Chapter 5	 4.2 4.4 4.6	4.5 4.6 4.7
4. Is the Tedre model a comprehensive framework? (Or are there key elements that may have been overlooked?)	Chapter 2 Chapter 4 Chapter 5	4.5 5.1	

Table 5.2 shows a balanced view of the way in which the sub-questions were addressed in this research. The findings were not only described in the chapters, but were also presented in visual illustrations for better understanding. The following sections present the discussion of the responses to each research question.

5.3.3.1 Response to Research sub-question One

The first sub-question was framed as *"How do these two South African universities compare in their technology uptake challenges and issues?"*

The findings in this study suggest that no significant differences were found within the two South African universities. In fact, there were more commonalities than differences as shown in Table 5.1. The findings revealed similarities between the two universities in relation to institutional structure, their policies and in the implementation approach of Blackboard LMS rollout. The main imbalance, however, observed between the two universities was a situation of the 'have and have nots' due to modest supply of laboratory equipment and resources in one of the universities. Thus, I agree with Tedre et al., (2011) when they say, "No technology rollout is immune to economic factors", and that ICT-based solutions should strongly depend on economic matters.

5.3.3.2 Response to Research sub-question Two

The second research sub-question asked, "*How do these elements resonate with the pedagogical aspects as proposed in the Tedre framework in other developing regions?*"

In this thesis the situation in the two investigated universities resonated with the pedagogical factors in the Tedre framework. Although I endorse all the elements proposed by the Tedre framework, three additional considerations; the technology suitability, curriculum, and work ethics also emerged in this thesis. Once again, the current research findings showed that no conclusive significant difference was found in the technology adoption challenges faced by the two universities of technology in South Africa as well as in those that were found by Tedre et al., (2011) in the universities in other developing countries. In the suspicion of the common cause, the question may be asked whether there is causal relation between the correlations that need to be uniquely addressed. I agree with literature review in the notion that e-learning implementation should adhere to policy guidelines that distinguish context-influenced framework. A framework can be useful to guide the management of focus areas in the process (Mumtaz, 2000).

5.3.3.3 Response to Research sub-question Three

The third sub-question refers; "*Does the Tedre framework differentiate adequately between its framework categories; (Or are there any overlaps?)*"

In their view, Tedre et al., (2011) believe that countries and regions are unique and differ in many ways. In this thesis as shown in Table 5.1, the findings show that more than 67% of the Tedre framework attributes did not differ from the situation found at the two universities. In fact, at this point, the framework did not help to differentiate between the

two universities and thus, those criteria were rejected in this thesis. However, I still believe that the excluded attributes may be relevant in another context.

Based on the criteria reflected in section 5.3.1 (a), (b) or (c), a smaller, yet important percentage difference of 33%, constituted the variables which needed to be considered during the adoption of technology. For example, contrary to situations in other developing countries, the current analysis in section 4.3.4 found no significant evidence in relation to hands-on *parental involvement* in either of the two universities, unlike parents' high involvement seen at the school levels. I tend to agree with Bhukuvhani et al., (2011) when they emphasise the influence of parents as active stakeholders to encourage the use of technology in universities. Technology initiatives in HE should not be left to government and NGOs alone. Parents' visible presence and support is essential at university level to help improve many areas lacking in those developing countries.

With regard to the Tedre framework criteria overlaps and in the course of the current research I identified two types of dynamics that emanated from co-occurrences and overlapping of attributes across four research themes, as illustrated in Table 4.5 and fully described in section 4.7 of chapter 4. Firstly, an 'intra-theme' relationship occurred as result of a linked connection between two or more variables, due to a specific connotation within the same theme. Secondly, unlike in intra-theme relationships, the 'inter-theme' connections resulted from the associated attributes beyond their own themes and across other themes, creating more overlaps on other attributes.

Thus, in view of the above dynamics that occurred during the analysis of the situation in the two universities, and as seen in Table 5.1, I can say that the Tedre framework could not adequately differentiate between 27 of its 40 framework categories.

5.3.3.4 Response to Research sub-question Four

The fourth and final sub-question was framed as; *"Is the Tedre model a comprehensive framework? (Or are there key elements that may have been overlooked?)"*

Based on this empirical research, I can confirm that the Tedre framework criteria were useful in analysing the situation at the two universities in a developing country. I agree with almost 68% of the Tedre framework proposals, that although developing countries may be unique, the situation and challenges regarding educational technology adoption remain similar. Some criteria might have been overlooked in Tedre framework thus revealing its shortfalls. As per the results presented in Tables 4.2 and 4.5, three criteria emerged as new attributes and were added to the framework as, the suitability of technology, curriculum and work ethics. On the other hand, I could not find evidence 33% missing or unspoken variables in either of the universities. Hence, those were the attributes confirmed as key considerations to be taken into account and for which to raise more awareness. Furthermore, it must be appreciated that in this research, a criteria was established that distinguished the accepted and rejected variables for educational considerations in the context of this research.

5.4 LIMITATIONS

The findings presented in this thesis provide an insight into the pedagogical considerations of educational technology adoption in developing countries. However, limitations were also identified as follows:

Firstly, the participation in this research was voluntary purposeful sample of 14 participants in the study that was carried out in two universities of technology. For that reason, the study might not be fully representative of all lecturers within the two universities and other universities in South Africa. Creswell and Miller (2000) points out that dynamics in a qualitative research are brought about the reality that changes when

people's perceptions change in the subject topic. The research might have yielded better results if the two weeks per site data sourcing period was prolonged. In this case, the findings obtained could be enriched through a longitudinal research approach, in order to provide a deeper understanding of the considerations related to educational technology adoption in developing regions. Purposive sampling, on the other hand, limit the number of potential participants because the researcher chooses the sample according to predetermined criteria.

Secondly, another limitation challenge faced by the researcher was the 'separation of powers' and self-bias. On one hand, as an instructional technologist employed in one of the two universities to support academic staff in e-learning at that time, some of the responses could have been interpreted according to my expectations. For the second university I established, through emails, a rapport (Locke et al., 2009) although some participants were still anxious and behaved as if I was there to 'inspect' how they implemented e-learning. It would have enriched my data if the participants were comfortable enough to provide in-depth and more genuine perceptions.

Thirdly, for the purpose of this study and for practical reasons, this research focused only on the educational considerations of technology adoption in the Tedre framework, and the socio-economic and technical aspects were excluded. It would be useful to broaden the scope of this research, as some of the current findings already moved into the socio-economic and technical aspects.

Lastly, although generalisability may not fully apply, the transferable nature of this study aims to challenge readers to make connections between elements of the study and their own experience.

5.5 RECOMMENDATIONS

This thesis seeks to offer a broader understanding of the common factors regarding pedagogical considerations for educational technology adoption in developing regions. An increasing number of HE institution in developing countries have adopted e-learning. Lecturers are compelled to adapt by using technology tools that enhance their teaching, and deliver curriculum content, amongst other educational purposes. Although the investment incentives and government initiatives in e-learning alone cannot have any sustainable competitive advantage, their value, as pointed out by Peppard and Ward, (2004), emerges from the manner in which e-policies relate to real issues in the context. It is important that the country's context be considered during educational policy development, in order to address the country's vocational needs, amongst others. For successful educational technology adoption in a developing country context, Tedre et al., (2011) suggest that a thorough understanding of the national vocational needs, the job market, funding, and teacher-student ratio in primary, secondary, and tertiary education are critical factors. Furthermore, the findings confirm the importance of improving quality education through evaluation and regular policy reviews.

Steadily improving infrastructure shown in this research demystifies the notion that technology integration provides access to learning if the students cannot access learning anywhere and anytime (Suhail & Mugisa, 2007). This challenge persists because students have limited access to few computers available to them. Furthermore, regular workshops should be provided for academic development in faculties in order to keep up to date with developing e-learning trends. For example, three-dimensional (3D) virtual worlds in the form of Virtual reality (VR) should be considered to enhance learning and teaching where real scenarios are not feasible in developing countries. In addition, augmented reality (AR) tools facilitated by apps are successful tools to be used as they highly engage the students (Almoosa, 2016).

Although the Tedre framework was comprehensive in analysing the situation in the two universities of technology, the realisation also came to fore that Tedre framework was neither linear nor flat, but was in fact more sophisticated with nuances than presented at face value. Thus, for future research, a different approach is suggested to fully and entirely validate the framework criteria. There is potential for more refinement as this research has discovered and added some new attributes to the framework.

The comparative case study in this research has provided sound empirical foreground for further inquiry into issues of disparity and the impact of an inadequate supply of equipment. In addition, it provides reasons why students forgo computer laboratories and rather engage in what seems like a rhizomatic learning environment, where students share resources such as personal laptops in open learning spaces on the campus. Importantly, future related studies should perhaps investigate exactly what the students share in their connected learning spaces.

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APPENDIX A

Pedagogical considerations for integrating educational technology in two South African universities of technology: A comparative study

Faculty: _____

Lecturer experience:	<4 years	5-15 years	>15 years
Age:	30-49 years	50-60 years	>60 years
Gender:	Male	Female	

A. Pedagogical framework

1) What kind of technologies do you use to enhance your teaching?
2) How useful are the technologies in meeting your learners' different learning styles? Please elaborate.
3) In what ways is technology suitable for your subject? Please give examples.
4) What is your opinion about diverse cultures and value systems in an educational group work setting?
5) In your opinion how useful is technology for assessment and grading?
6) In your view what are the factors that hinder technology integration in your course(s)?

B. Motivational and cognitive aspects

7) What keeps you motivated in using educational technologies in your teaching?
8) In your view what key factors enable you to effectively implement your online course?
9) What kind of activities that keep your students engaged and motivated online?
10) In your opinion what sorts of activities engage your students ' active participation?
11) In your opinion how ready and willing are academics/lecturers to integrate technology in their course teaching? Please elaborate.
12) Please describe the long term student technology benefits beyond school, if any; Why?
13) In your view, what are the challenges of educational technology adoption in developing countries?
14) What is your take about incentives in technology integration for both lecturers and student?

C. Content

15) In what ways is the information from the Internet useful for your course material?
16) In your opinion what are the advantages and disadvantages of using the Internet content and materials for your teaching.

D. Country's educational context

17) What is your view regarding technology integration in primary, secondary and tertiary education?
18) What are the challenges of educational technology implementation in a developing country?
19) What would you recommend as strategies for an effective rollout and effective adoption of educational technologies in a university of technology?
20) Is there anything that you may want to add?

APPENDIX B

Examples of participants' perspectives

Presumed themes	Emerging categories	Descriptive definition	Examples of the Statements	
			Case-1: N=7	Case-2: N=7
Theme 1: Content	*1.1 Authenticity*	Original, primary content material; and or personally developed content.	*I tend to direct the students to reliable sources.* *I verify the source of the information. Is it from a place that is trustworthy; scientifically proven; reliable or current?*	*-Both lecturers and students are responsible for utilising authentic content.* *There's a lot out there. So you need to be able to sift and sort quality content.* *-I encourage them to use journals because I know*
	Size	The size of content, data and bandwidth	*It is a challenge for a student somewhere in a rural town or a village with limited Internet access if we rely on video content for teaching.*	*You cannot put too rich a content in your course, other than notes..*
	Cultural appropriateness	Cultural appropriateness in the educational content	*From another culture and from a different setting, digital or electronic medium is sometimes more appealing to students.*	*The terminology that they use is not used in our country.*
	1.5 Modalities	Modalities of learning with provision to personalized learning.	*I think we shouldn't just follow the Euro-centric model of high media dense material but also allow for the more text based and simple designs.* *I also send different content format, text, links and YouTube videos*	*- I also try and not bombard them with too much information because I find then they just shut down because now they don't know what to focus on.* *Discussion tools: unlike the humanities, there's not really too much to debate and discuss. Our subject content is universally standardized.*
Theme 2: Pedagogical	*2.1 Class sizes*	A capacity of enrolled students in a particular course/module for a specific time.	*I can reach all those 86 students irrespective of their learning styles*	*Online assessment is very useful for me; I can't assess written work for a massive class like that.*

	2.3 Group work	Students' collaborative and cooperative effort(s) during task(s) or assignment projects	*We don't do formal group work because of too large class sizes.* *I encourage my students to choose whoever they want to work with; whether culture, race etc.* *I try to get students to work with me as a team*	*Groups are balanced in many aspects e.g. socio cultural background, race, gender, and religion.* *I only get involved if the group is not being productive.*
	Active / passive learning	Passive or active approach to online learning	*My student are very active and creative with technology, they have created for themselves a Facebook page.*	*Some are quite active. The majority however, if it's not for marks, they're not interested.*
Theme 3: Motivation and Cognitive aspects	*Gender*	Students' sexual orientation	*If you are not exposed to technology it doesn't matter whether you a boy or a girl, You will still struggle with technology.* *- I also observed that gender is not a descriptor; We have girls in majority; most gays, and few male characters.*	*Because of the stereotype in the nursing profession; I'd say girls are roughly in 60% majority, and boys are in the minority by 40%.* *Female students are better students than the males, their assignment compliance is greater.*
	Confidence	Self-reliance in navigation and working with online content	*I offer face to face lectures with elements of technologies.*	*I'd say there are some limitations because you do get students that will need you there physically* *-Some still prefer face to face contact learning*
	Intrinsic and extrinsic	Types of motivation that stimulate students' curiosity to learn	*In fact all my subjects that I teach are all online. Sometimes lecturers also need recognition and support. You must attach incentives because educational technology is not always fun.*	*I put latest articles relating to the topic and then you get a mark for participating in the discussions* *-Students get motivated as they learn from the real world experience from simulations*
	Learning styles	Students' learning skills and abilities	*Some of them are visually impaired and can't see on the board, I give them the presentation before class.*	*The hands-on experiments are outdated but you can actually now log in to Crocodile Chemistry a programme that*

				allows my students do the experiment digitally.
	4.1 Aims of education	Education goals that address the country's needs	*An advantage is that developing countries yearn for education, the students yearn to learn*	*To promote open education at the policy position*
	4.2 Job market	A global competitive market place	*-Relevant Curriculum: Universities should stay abreast of developments, so that there could be a seamless transition for learners to work place.*	*Technology would develop students in different aspects in terms of preparing them for employment*
	4.3 Government initiative	Government intervention to support online learning	*-OERs should be encouraged and money should be provided for research into that.* *- I think probably 80% of our intake is NSFAS Students.*	*Policy review: Financial support and infrastructure from government must be monitored. Government should support compliant NGOs in technology initiatives in communities.*

Theme 4: Country's educational context

APPENDIX C

Pedagogical considerations for integrating educational technology in two South African universities of technology: A comparative study

I agree to participate in the interview for the above Cape Peninsula University of Technology doctoral research project. I have read the explanatory statement and which I shall keep for future records.

I understand that any information I provided in the interview response will be confidential, and that no information that could lead to the identification of any individual or my institution will be disclosed in any reports in the research project or to any other party.   I also understand that participation in the interview is voluntary; I can choose not to answer every question without being penalized or disadvantaged in any way.

Please check the appropriate box below:

☐ The information I provide can be used in further research projects that have ethics approval on condition that my non-identification remains.

☐ The information I provide cannot be used by other researchers unless my written permission is granted through the current researcher of this project.

☐ The information I provide cannot be used except for this research project and as specified above and as in the Explanatory Statement.

Name of Organization/ institution:...

Name of Respondent:…………………………………………………………………………

Email:……………………………………………………………………..

Telephone:…………………………………………………….

Signature:…………………………………………………….

Date:…………………………………………

APPENDIX D

Explanatory statement letter

Dear colleague

As a valuable member of your institution and community your views and opinion are being sought regarding educational technology uptake in South Africa. I wish to invite you to participate in an interview about the aspects to be considered during the educational technology implementation at higher education institutions in developing regions. The problem driving this research is that no readymade "one-size-fits-all" solution exists for facilitating the successful implementation of educational technology in developing countries. The objective of this research is to contribute to the development of such models. In their proposed framework Tedre, Apiola and Cronje (2011), identify Pedagogical, Socioeconomic and Technical considerations for educational technology in developing regions. In my research study the Tedre framework criteria will be evaluated for a situation analysis at two South African universities whereby the refinements to the model may be recommended.

You are guaranteed total anonymity and your interview responses will be treated in the strictest confidence. Access to transcripts will be strictest to researcher and her colleagues at ▮▮▮ ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ who are also involved in this research project. Individual responses will not be accessible to any government, industry, or higher education institution or other organization. Under ▮▮▮▮ Research and Ethics committee regulations, all returns and information must be stored for five years in secure premises at ▮▮▮▮.

Should you have any queries please contact **Sheila Kumalo** by email sheilaxk@gmail.com or phone 021 959 6414 (B); 076 704 3916 (M).

APPENDIX E

29th April 2014

Ms Sheila Khumalo Xakaza
c/o Department of Information Technology, Faculty of Informatics and Design
Cape Peninsula University of Technology

Dear Ms Khumalo Xakaza

PERMISSION TO CONDUCT RESEARCH AT THE DUT

Your email correspondence in respect of the above refers. I am pleased to inform you that the Institutional Research Committee (IRC) has granted permission for you to conduct your research at the Durban University of Technology.

We would be grateful if a summary of your key research findings can be submitted to the IRC on completion of your studies.

Kindest regards.
Yours sincerely

PROF. S. MOYO
DIRECTOR: RESEARCH AND POSTGRADUATE SUPPORT

APPENDIX F

Cape Peninsula
University of Technology

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80 Roeland Street, Vredehoek, Cape Town 8001

Office of the Research Ethics Committee	Faculty of Informatics and Design

At a meeting of the Faculty Research Ethics Committee on 27 July 2013, ethics approval

was granted to MS SHIELA XAKAZA-KUMALO student number 211083615 for research

activities related to the DTech: Information Technology degree at the Faculty of

Informatics and Design, Cape Peninsula University of Technology.

Title of dissertation/thesis:	The pedagogical socio-economic and technical considerations for educational technology in developing regions: a case study in South Africa

Comments

Research activities are restricted to those detailed in the research proposal. Consent should be obtained from the three universities to be researched.

Signed: Faculty Research Ethics Committee	19/2/2014 Date

APPENDIX G

ATLAS. ti Qualitative data analysis software permission

-----Original Message-----
From: ict-help@unisa.ac.za [mailto:ict-help@unisa.ac.za]
Sent: 11 March 2015 11:03 AM
To: Kumalo, Shiela
Subject: Service Request 1201268 (Please install ATLAS ti installation) Resolved

Your Service Request regarding " Please install ATLAS ti installation " has been Resolved.

The Service Request number is 1201268

Please contact the Service Desk if you are not satisfied with the resolution. Failure to respond within 48 hours will cause the SR 1201268 to be closed.

In replying to this e-mail notification, please remember to use the following subject:
##1201268##
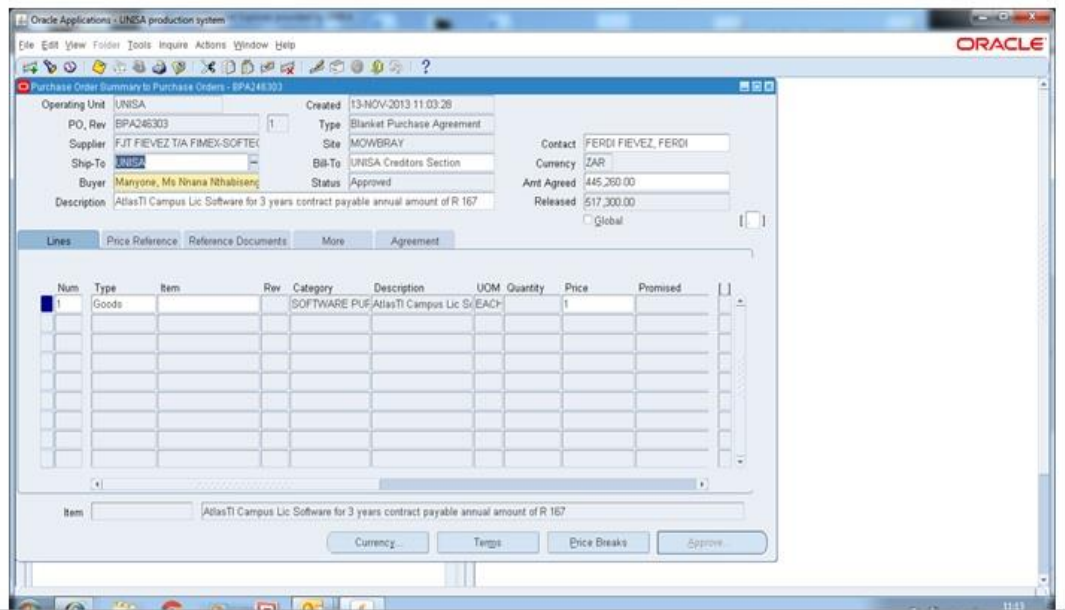
APPENDIX H

Examples for some of the Codes-quotations
Code-Filter: All

_____

HU: DTech Chapter4 Atlas ti Analysis
File: [C:\Users\kumals\Desktop\PhD backup\PhD\PhD\chapter 4...\DTech Chapter4 Atlas ti Analysis.hpr7]
Edited by: Super
Date/Time: 2016-11-12 11:11:58

_____

Code: -a portfolio approach {1-2}~
P 3: Case study 2 - 3:91 [-a portfolio approach] (142:142) (Super)
Codes: [-a portfolio approach - Families (2): PEDAGOGICAL FRAMEWORK, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
-a portfolio approach

_____

Code: 'We just want to get things do.. {1-5}
P 3: Case study 2 - 3:122 ['We just want to get things do..] (194:194) (Super)
Codes: ['We just want to get things do.. - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
'We just want to get things done.

_____

Code: 1. Pedagog. Framework {2-6}
P 2: Case study 1 - 2:23 [C1D:Social media, Blackboard, ..] (24:25) (Super)
Codes: [1. Pedagog. Framework]
No memos
C1D:Social media, Blackboard, Skype, mobile phones and Gmail instead of communicating solely in the class setup it has real advantages and benefits to use electronic.we use discussion forums. We also exchange file documents.I can arrange to have a meeting with them sooner than our regular class time. So it would be like a virtual meeting. Blackboard does all of those things on one platform,it's like a virtual classroom. It tracks activities and keeps records. Blackboard is functional even for a subject like Stats, and Maths symbols that I use for my explanations to answer their questions
-in that the learners are different. the Early warning system, alerts me of their performance when they need a bit more attention.
P 2: Case study 1 - 2:54 [C1D: absolutely. In fact, when..] (99:99) (Super)
Codes: [1. Pedagog. Framework]
No memos
C1D: absolutely. In fact, when I try and think of any course that I, myself, have been on, in my studies, I don't think that there's any one of them that would not have been affected. Blackboard allows me to vary tasks. So then I can ask them to do formulas in Applied Stats and I can also ask them to present theory.

_____

Code: 2. Content {4-6} 2

P 2: Case study 1 - 2:10 [to get notices out. To get inf..] (12:12) (Super)
Codes: [2. Content - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
to get notices out. To get information out. Put the study guide on
CIA: We make sure we don't exclude anyone from learning. They use the technology they have and available to complete tasks. You don't want students to be disadvantaged by not having access to software. We make sure that what software they need is provided. Either provided in the labs or can be downloaded free. In terms of their ability, we find that students just naturally learn from each other… My experience is that through Skype and Facebook and now recently, well, other forums, it [technology] seems to equalize people
P 2: Case study 1 - 2:16 [I use Blackboard as a way of c..] (17:17) (Super)
Codes: [2. Content - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
I use Blackboard as a way of communicating with my students
P 2: Case study 1 - 2:146 [C1F:My student are very active..] (267:269) (Super)
Codes: [2. Content - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [content relevance - Families (2): CONTENT, CONTENT CASE 1] [Creative learning - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Curriculum Content - Family: CONTENT CASE 1] [Global exposure and participation] [Interuniversity collaboration]
No memos
C1F:My student are very active and creative with technology, they have created for themselves a Facebook of page where they are in constant communication with one another. next week for we have a Ebola talk, the Ebola virus talkl - We've invited a virologist from the University of the Western Cape'
-Size: No, not really. I don't have a lot of students
P 3: Case study 2 - 3:83 [for communication and for inst..] (120:120) (Super)
Codes: [2. Content - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
for communication and for instructional materia; repository..
C2A: "Let's just have a standard in which all the lecture venues, all the students are exposed to a particular standard of technology by exposure. Let's just have that standard. So, like our community where we are coming from where there is the gap between the very rich and the very poor. You get that also in our very learning and teaching environments. In the same university, the same campus but other departments' teaching venues are more equipped than others"
_____
Code: 3. Motivation {7-6}
P 2: Case study 1 - 2:86 [Through ePortfolio the student..] (133:133) (Super)
Codes: [3. Motivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1] [MULTIMEDIIA] [Technology exposure & Support Infrastructure]
No memos
Through ePortfolio the student taps into various resources. ePortfolio has multimedia: it has text, videos, photos, -and it has pictures whatever the student is dealing with that the student wants to bring it in.
P 2: Case study 1 - 2:154 [I would definitely say, becaus..] (304:304) (Super)
Codes: [3. Motivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1]
No memos 3

I would definitely say, because I kept on using it they came on board.
P 2: Case study 1 - 2:189 [Marks: I do 15 mark or 10 mark..] (429:429) (Super)
Codes: [3. Motivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1] [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Incentives]
No memos
Marks: I do 15 mark or 10 mark or 14 mark pre-prac tests. So that's their ticket into the lab. If they did not do that they're not allowed to do practical. To me it means you didn't read your practical manual and you will not be able to follow the topic in class. I also verify whether it was due to not having access to the internet.
P 3: Case study 2 - 3:140 [learning the most on all of th..] (44:44) (Super)
Codes: [3. Motivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1]
No memos
learning the most on all of this is the lecturer
P 3: Case study 2 - 3:164 [I like the fact that technolog..] (292:292) (Super)
Codes: [3. Motivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1]
No memos
I like the fact that technology allows students to develop what they think is important for their learning, and for their work or life
P 3: Case study 2 - 3:165 [they're so technologically inc..] (318:318) (Super)
Codes: [3. Motivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1]
No memos
they're so technologically inclined some of them or actually most of them, they respond very positively to that
P 3: Case study 2 - 3:168 [Everyday there's a free newspa..] (325:325) (Super)
Codes: [3. Motivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1] [Global exposure and participation]
No memos
Everyday there's a free newspaper, free news feeds, RSS feeds into my Economics classroom about stuff we are talking about at the moment
_____

Code: 4. Country's Context {7-7}
P 2: Case study 1 - 2:188 [Government policies must be mo..] (398:398) (Super)
Codes: [4. Country's Context - Family: Hindrances]
No memos
Government policies must be monitored for implementation Its effectiveness must be measured constantly and they are not doing that.
P 2: Case study 1 - 2:227 [there is a place in our school..] (581:582) (Super)
Codes: [4. Country's Context - Family: Hindrances] [123iary education sytem - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Aims of education - Family: Considerations] [Economic development]
No memos
there is a place in our schooling system but we shouldn't lose focus why we're putting it in the schooling system. NGO'S must be of benefit to the end user which is the students at the end of the day -that whole process should, at the end of the day, benefit the learner to come back to the economy which benefits the government. 4

P 2: Case study 1 - 2:243 [it should be introduced in our..] (630:630) (Super)
Codes: [4. Country's Context - Family: Hindrances]
No memos
it should be introduced in our schooling systems but the focus should be correct.
P 3: Case study 2 - 3:240 [Gov policies should not only a..] (597:597) (Super)
Codes: [4. Country's Context - Family: Hindrances]
No memos
Gov policies should not only address open software but also open resources in the green paper for education
P 3: Case study 2 - 3:248 [Gov policy review: I think our..] (606:606) (Super)
Codes: [4. Country's Context - Family: Hindrances] [Quality education - Family: PEDAGOGICAL FRAMEWORK]
No memos
Gov policy review: I think our pass marks are too low
P 3: Case study 2 - 3:254 [NGOs they are the right sort o..] (614:617) (Super)
Codes: [4. Country's Context - Family: Hindrances] [Government subsidy - Family: COUNTRY'S ED CONTEXT CASE 1] [NGO donations. Pc's. - Family: COUNTRY'S EDUCATIONAL CONTEXT]
No memos
NGOs they are the right sort of people because usually they've got the right drive or you know they're there for the right reasons
-Change policies; it's not about having a teacher standing in front of a class
-Gov certainly need to embrace the idea
-the government can use NGOs so that they don't have to put so much. You know they could give the NGO an X amount of money or whatever, or facilities
P 3: Case study 2 - 3:272 [-if every child is able to att..] (653:653) (Super)
Codes: [4. Country's Context - Family: Hindrances] [Global exposure and participation] [Job market] [Technology exposure & Support Infrastructure]
No memos
-if every child is able to attend computer lessons in primary school, for example. Whether they're in your rural school or a Model C School that will affect, ultimately affect how the person is able to use technology later on
_____

Code: 123iary education sytem {1-2}
P 2: Case study 1 - 2:227 [there is a place in our school..] (581:582) (Super)
Codes: [4. Country's Context - Family: Hindrances] [123iary education sytem - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Aims of education - Family: Considerations] [Economic development]
No memos
there is a place in our schooling system but we shouldn't lose focus why we're putting it in the schooling system. NGO'S must be of benefit to the end user which is the students at the end of the day -that whole process should, at the end of the day, benefit the learner to come back to the economy which benefits the government.
CIB Sometimes you find students will want to associate with whoever shares the same values as them, whoever it is that they can easily relate to. That's what I have found. But sometimes, what I also do is I encourage them to choose whoever they want to work with, (considering) culture, race etc
_____

Code: 123iary not ready {2-3} 5

P 3: Case study 2 - 3:236 [-students are actually not pre..] (593:593) (Super)
Codes: [123iary not ready - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [country context - Families (2): COUNTRY'S ED CONTEXT CASE 1, COUNTRY'S EDUCATIONAL CONTEXT]
No memos
-students are actually not prepared for tertiary education
P 3: Case study 2 - 3:264 [affects us because when you ge..] (651:651) (Super)
Codes: [123iary not ready - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Government subsidy - Family: COUNTRY'S ED CONTEXT CASE 1] [Quality education - Family: PEDAGOGICAL FRAMEWORK]
No memos
affects us because when you get poor matriculants that are coming through to your first year class it affects your results as well

_____

Code: access to learning {7-0}
P 2: Case study 1 - 2:122 [We make sure we don't exclude ..] (186:186) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [efficiency - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
We make sure we don't exclude anyone from learning. They use the technology they have and available to complete tasks You don't want students to be disadvantaged by not having access to software.we make sure that what software they need is provided. Either provided in the labs or can be downloaded for free
P 2: Case study 1 - 2:185 [infrastructure bandwith and co..] (394:394) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1] [despondent communties]
No memos
infrastructure bandwith and connectivity I think are the challenges, if we rely on students watching videos and lots of it, a student somewhere in a rural town or a village won't be able to access it as easily as somebody living in the city.
P 3: Case study 2 - 3:229 [Illuminate ,every Monday from ..] (560:560) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
C2B: My students are very active and creative with technology; they have created for themselves a Facebook of page Illuminate ,every Monday from 8 to 10, we're going to have a lecture.
I find that my students participate more online than face to face; – it's with greater ease that they can ask challenging questions
P 3: Case study 2 - 3:239 [To promote open education to p..] (596:596) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [cons policies - Families (2): Considerations, COUNTRY'S EDUCATIONAL CONTEXT] [gov initiiatives - Family: COUNTRY'S ED CONTEXT CASE 1]
No memos
To promote open education to promote it at the policy position
P 3: Case study 2 - 3:262 [rather compromise my lecture t..] (649:649) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Lack of resourses - Family: Hindrances]
No memos
C2D: I think it's important to do the group work tasks… the biggest one is how much do you value work? Some don't commit. 6

We're very lucky in that regard because they all just kind of see each other as people
rather compromise my lecture time, maybe two periods a week.
P 3: Case study 2 - 3:283 [-I think pedagogically, well, ..] (683:683) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL
FRAMEWORK CASE 1] [content access - Families (2): CONTENT, CONTENT CASE 1] [Content
curator/development - Families (2): CONTENT, CONTENT CASE 1] [open courseware - Family: CONTENT] [Quality
education - Family: PEDAGOGICAL FRAMEWORK] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
No memos
-I think pedagogically, well, socio-economically developing country, I think we should be going the route of what's
affordable, wide accessibility. So the whole idea of open appeals to me and to a lot of people for that reason. Free,
open education resources. A lot of which is high quality stuff.
P 3: Case study 2 - 3:292 [I can book the lab for you the..] (720:720) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL
FRAMEWORK CASE 1] [mot student support - Family: MOTIVATOIN CASE 1]
No memos
I can book the lab for you then you can come as a group and then you can do your work and what we've actually
done as well is to take up the tutor sections because they've got tutorials as well
_____
Code: Active learning {2-5}
P 3: Case study 2 - 3:45 [Poster design] (66:66) (Super)
Codes: [Active learning - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
Poster design
P 3: Case study 2 - 3:59 [They make their own instructio..] (78:78) (Super)
Codes: [Active learning - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
They make their own instructional videos, like a tutorial and publish on Youtube
_____
Code: Active participation {5-3}
P 2: Case study 1 - 2:114 [Girls like getting good marks...] (179:179) (Super)
Codes: [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [gender
dynamics - Family: Gender]
No memos
Girls like getting good marks. if you have a look at the interaction with the students. I'd say girls are even more active
than what the boys are.
P 2: Case study 1 - 2:115 [Sometimes it varies e.g. in St..] (179:179) (Super)
Codes: [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Gender - Family:
Gender]
No memos
CIE: They make their own instructional videos, like a tutorial and publish on Youtube… they're so technologically
inclined I learn a few tricks from them
Sometimes it varies e.g. in Stats 3 Class, it was generally only the girls that posted and in Stats 4, there were more
boys that posted. 7

P 2: Case study 1 - 2:121 [I find that my students online..] (185:185) (Super)
Codes: [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
CIA: I had 220 students last semester, the lecturers with bigger classes would be more easily persuaded to move to Blackboard because it is very efficient when it comes to marking and assessment grading, It keeps records and it doesn't make a mistake unless you made a mistake when you set up the test
I find that my students online have more – it's with greater ease that they can ask challenging questions.
We're two lecturers sharing the subject. The next lecturer doesn't work the same way that I do but for my part where I do practicals - I use Respondus assessment software which grades automatically into Blackboard gradebook."
P 2: Case study 1 - 2:146 [C1F:My student are very active..] (267:269) (Super)
Codes: [2. Content - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [content relevance - Families (2): CONTENT, CONTENT CASE 1] [Creative learning - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Curriculum Content - Family: CONTENT CASE 1] [Global exposure and participation] [Interuniversity collaboration]
No memos
CIF A lot of our work is portfolio based. So tools purely for grading… we have not found so useful
C1F:My student are very active and creative with technology, they have created for themselves a Facebook of page where they are in constant communication with one another. next week for we have a Ebola talk, the Ebola virus talk
In my context when we have the project as the assessable outcome and students then are supported through technology to better achieve the goal of completing the project, then they are highly motivated to engage because they can see that it will help them to do the project. So I think as a means to an end we find technology quite valuable. Our grading is more of a portfolio process where students present their work and then it's still assessed by humans. So, we've used technology for feedback for formative feedback, for example, Podcasts etcetera. So I think for formative assessment, yes, and then more to communicate that assessment, rather than a kind of a self-generated or automated assessment, we're not using technology for that at this stage.
- We've invited a virologist from the University of the Western Cape'
-Size: No, not really. I don't have a lot of students
P 3: Case study 2 - 3:146 [creatively come up with maybe ..] (318:318) (Super)
Codes: [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
creatively come up with maybe a poste
_____
Code: Active/passive learning {1-1}
P 9: tedre et al framework.docx - 9:2 [Exposure to technology] (7:7) (Super)
Codes: [Active/passive learning] [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Communication patterns] [Exposure to technology] [Group work] [ICT literacy] [open courseware - Family: CONTENT] [Parental involvement] [Pedagogical models] [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
Exposure to technology
_____
Code: adaptability {5-2}
P 2: Case study 1 - 2:13 [some of them are visually impa..] (14:14) (Super)
Codes: [adaptability - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos 8

some of them are visually impaired and can't see on the board
P 2: Case study 1 - 2:17 [It's a safe space where they c..] (18:18) (Super)
Codes: [adaptability - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
It's a safe space where they can comment,
P 2: Case study 1 - 2:59 [was actually pretty easy for s..] (101:101) (Super)
Codes: [adaptability - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
was actually pretty easy for students to adopt
P 2: Case study 1 - 2:66 [To allow them to learn and als..] (103:103) (Super)
Codes: [adaptability - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [pedagogical knowledge]
No memos
To allow them to learn and also to draw from their experiences to relate what they see on a video
P 3: Case study 2 - 3:176 [it's probably easier for a fir..] (336:336) (Super)
Codes: [adaptability - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
it's probably easier for a first year to adapt than a second or third year.
_____
Code: Adaptivity {5-2}
P 2: Case study 1 - 2:12 [86 students irrespective of th..] (13:13) (Super)
Codes: [Adaptivity - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] -
Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
86 students irrespective of their learning styles
P 2: Case study 1 - 2:38 [they learn better when they se..] (35:35) (Super)
Codes: [Adaptivity - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] -
Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Learning styles/modalities]
No memos
they learn better when they see things.
P 2: Case study 1 - 2:72 [people learn in different ways..] (60:60) (Super)
Codes: [Adaptivity - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] -
Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
people learn in different ways.
P 2: Case study 1 - 2:121 [I find that my students online..] (185:185) (Super)
Codes: [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity -
Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] - Families (2):
MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
I find that my students online have more – it's with greater ease that they can ask challenging questions. 9

P 3: Case study 2 - 3:149 [Time to adapt my materials and..] (234:234) (Super)
Codes: [Adaptivity - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] -
Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
Time to adapt my materials and to tweak them so they, you know, so that the technology can be used more fully

_____

Code: Adaptivity [Clone: 1] {5-2}
P 2: Case study 1 - 2:12 [86 students irrespective of th..] (13:13) (Super)
Codes: [Adaptivity - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] -
Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
86 students irrespective of their learning styles
P 2: Case study 1 - 2:38 [they learn better when they se..] (35:35) (Super)
Codes: [Adaptivity - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] -
Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Learning styles/modalities]
No memos
they learn better when they see things.
P 2: Case study 1 - 2:72 [people learn in different ways..] (60:60) (Super)
Codes: [Adaptivity - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] -
Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
people learn in different ways.
P 2: Case study 1 - 2:121 [I find that my students online..] (185:185) (Super)
Codes: [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity -
Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] - Families (2):
MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
I find that my students online have more – it's with greater ease that they can ask challenging questions.
P 3: Case study 2 - 3:149 [Time to adapt my materials and..] (234:234) (Super)
Codes: [Adaptivity - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] -
Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
Time to adapt my materials and to tweak them so they, you know, so that the technology can be used more fully

_____

Code: Adaptivity and Adaptability {1-0}
P 9: tedre et al framework.docx - 9:4 [Cultural appropriateness] (20:20) (Super)
Codes: [Adaptivity and Adaptability] [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Contextual
relevance] [Cultural appropriatenss] [Interactivity] [language - Family: Hindrances] [Modalities] [Size]
No memos
Cultural appropriateness 10

_____

Code: advantage {1-0}~

P 2: Case study 1 - 2:246 [an advantage is that developin..] (633:633) (Super)

Codes: [advantage - Family: PEDAGOGICAL FRAMEWORK CASE 1]

No memos

an advantage is that developing countries yearn for education, the students yearn to learn

_____

Code: age {2-0}

P 2: Case study 1 - 2:169 [It's more a case of not willin..] (355:355) (Super)

Codes: [age - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Mot-attitude - Family: MOTIVATION]

No memos

It's more a case of not willing but change is always difficult. People in age traditionally, people are resistant to change. I think they're ready but it's in human nature they're not willing,

P 2: Case study 1 - 2:172 [It's attitude, resist to chang..] (357:358) (Super)

Codes: [age - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Attitude - Family: MOTIVATOIN CASE 1] [Resistance to change - Family: PEDAGOGICAL FRAMEWORK]

No memos

It's attitude, resist to change they don't want to go beyond what they've always done

- the younger generation definitely approach their teaching differently

_____

Code: aims of education {3-1}

P 2: Case study 1 - 2:186 [In my faculty we train future ..] (396:396) (Super)

Codes: [aims of education - Families (2): COUNTRY'S EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1] [Technology exposure & Support Infrastructure]

No memos

In my faculty we train future teachers: So we must prepare our students to be ready for that period, where they go into the classroom and use technology effectively. Not to be scared to work with these learners and I think that is why it's so important for us to expose them to technology now for future.

P 3: Case study 2 - 3:266 [That affects us because when y..] (651:652) (Super)

Codes: [aims of education - Families (2): COUNTRY'S EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1]

No memos

That affects us because when you get poor matriculants that are coming through to your first year class it affects your results as well.

- this whole 35, 36% or 40% pass is absolutely ridiculous.

P 9: tedre et al framework.docx - 9:8 [Investment incentives] (30:30) (Super)

Codes: [aims of education - Families (2): COUNTRY'S EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1] [Funding sources] [Government initiatives] [Investment incentives] [Job market] [NGO initiatives] [Ratio of 1/2/3iary education] [Vocational needs]

No memos

Investment incentives 11

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Code: Aims of education {1-1}
P 2: Case study 1 - 2:227 [there is a place in our school..] (581:582) (Super)
Codes: [4. Country's Context - Family: Hindrances] [123iary education sytem - Family: PEDAGOGICAL
FRAMEWORK CASE 1] [Aims of education - Family: Considerations] [Economic development]
No memos
there is a place in our schooling system but we shouldn't lose focus why we're putting it in the schooling system.
NGO'S must be of benefit to the end user which is the students at the end of the day -that whole process should, at
the end of the day, benefit the learner to come back to the economy which benefits the government.

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Code: all our students have cell pho.. {1-0}
P 3: Case study 2 - 3:279 [all our students have cell pho..] (677:678) (Super)
Codes: [all our students have cell pho.. - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
all our students have cell phones
-we need trainin

_____

Code: Allows collaborative learning .. {1-0}
P 7: DUT E-LEARNING REVIEW 2012.docx - 7:35 [Allows collaborative learning ..] (307:307) (Super)
Codes: [Allows collaborative learning ..]
No memos
Allows collaborative learning with other universities to enrich the student experience.

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Code: and those who work at their pa.. {1-1}
P 3: Case study 2 - 3:42 [and those who work at their pa..] (63:63) (Super)
Codes: [and those who work at their pa.. - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
and those who work at their pace

_____

Code: assess -norm {1-0}
P 2: Case study 1 - 2:88 [need to assess them on somethi..] (135:135) (Super)
Codes: [assess -norm - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Assessment and grading - Family:
PEDAGOGICAL FRAMEWORK CASE 1]
No memos
need to assess them on something that I know they all have access to and it's the baseline or the accepted norm
_____ 12

Code: assess challenges {2-0}
P 2: Case study 1 - 2:89 [tools purely for grading, we h..] (137:137) (Super)
Codes: [assess challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
tools purely for grading, we have not found so useful. Our grading is more of a portfolio process where students present their work and then it's still assessed by humans
P 2: Case study 1 - 2:90 [C1F: I don't use it as an asse..] (138:139) (Super)
Codes: [assess challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
C1F: I don't use it as an assessment tool. I use it as a teaching tool. As a pedagogical tool.
_____
Code: Assessment and grading {10-7}
P 2: Case study 1 - 2:20 [I insert links within my modul..] (20:20) (Super)
Codes: [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
I insert links within my module as class pre-activity. Students upload assignments and to send them back to me
P 2: Case study 1 - 2:44 [I assess them in applied way, ..] (90:90) (Super)
Codes: [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
I assess them in applied way, not regurgitating
P 2: Case study 1 - 2:80 [I use Blackboard for pre-prac ..] (131:131) (Super)
Codes: [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
I use Blackboard for pre-prac tests and that counts
P 2: Case study 1 - 2:84 [grades automatically into Blac..] (132:132) (Super)
Codes: [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
grades automatically into Blackboard gradebook.
P 2: Case study 1 - 2:87 [various options I have I can g..] (134:134) (Super)
Codes: [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
various options I have I can give students more assessments, smaller assessments. I can use the smaller type of assessments building up to the final big one that they write at the end of term.
P 2: Case study 1 - 2:88 [need to assess them on somethi..] (135:135) (Super)
Codes: [assess -norm - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos 13

need to assess them on something that I know they all have access to and it's the baseline or the accepted norm
P 2: Case study 1 - 2:144 [-Class zie matters, I had 220 ..] (262:262) (Super)
Codes: [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1] [mot class size - Family: MOTIVATOIN CASE 1]
No memos
-Class zie matters, I had 220 students last semester, the lecturers with bigger classes, they would be more easily persuaded to move to Blackboard because it is very efficient when it comes to marking and assessment grading, It keeps records and it doesn't make a mistake unless you made a mistake when you set up the test
P 2: Case study 1 - 2:189 [Marks: I do 15 mark or 10 mark..] (429:429) (Super)
Codes: [3. Motivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1] [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Incentives]
No memos
Marks: I do 15 mark or 10 mark or 14 mark pre-prac tests. So that's their ticket into the lab. If they did not do that they're not allowed to do practical. To me it means you didn't read your practical manual and you will not be able to follow the topic in class. I also verify whether it was due to not having access to the internet.
P 3: Case study 2 - 3:28 [Most of my formative assessmen..] (55:55) (Super)
Codes: [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
Most of my formative assessment happens online.
P 3: Case study 2 - 3:94 [C2A:] (149:149) (Super)
Codes: [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1]
Memos: [workload]
C2A: Let's just have a standard in which all the lecture venues, all the students are exposed to a particular standard of technology by exposure. Let's just have that standard. So, like our community where we are coming from where there is the gap between the very rich and the very poor. You get that also in our very learning and teaching environments. In the same university, the same campus but other departments' teaching venues are more equipped than others
_____
Code: Attitude {5-1}
P 2: Case study 1 - 2:172 [It's attitude, resist to chang..] (357:358) (Super)
Codes: [age - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Attitude - Family: MOTIVATOIN CASE 1]
[Resistance to change - Family: PEDAGOGICAL FRAMEWORK]
No memos
It's attitude, resist to change they don't want to go beyond what they've always done
- the younger generation definitely approach their teaching differently
P 2: Case study 1 - 2:173 [Those people that won't adopt ..] (359:359) (Super)
Codes: [Attitude - Family: MOTIVATOIN CASE 1]
No memos
Those people that won't adopt it ever will move out of the system and the others will just take it on
P 2: Case study 1 - 2:179 [Radiography is a technology dr..] (386:386) (Super)
Codes: [Attitude - Family: MOTIVATOIN CASE 1] [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
Radiography is a technology driven profession our whole base, everything revolves around technology. 14

P 2: Case study 1 - 2:180 [when they go into the place of..] (389:389) (Super)
Codes: [Attitude - Family: MOTIVATOIN CASE 1] [confidence] [Mot-attitude - Family: MOTIVATION]
No memos
when they go into the place of work I want that confidence to spill over and eventually go over to competence.
Competence to using the hardware in the clinics
P 2: Case study 1 - 2:192 [staff training and development..] (432:432) (Super)
Codes: [Attitude - Family: MOTIVATOIN CASE 1] [confidence] [Professional development - Family: PEDAGOGICAL
FRAMEWORK]
No memos
staff training and development by HR. to go for training and use the new methods

_____
Code: Attitude towards e-learning {1-0}
P 9: tedre et al framework.docx - 9:9 [Mental models] (40:40) (Super)
Codes: [Attitude towards e-learning] [Cognitive development] [confidence] [Gender - Family: Gender] [Immaterial
rights] [Income] [Intrinsic and extrinsic motivation] [language - Family: Hindrances] [Learning styles] [Mental models]
[Socioeconomic status] [workload]
No memos
Mental models

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Code: Authenticity {9-2}~
P 2: Case study 1 - 2:30 [I follow people whom I value t..] (27:27) (Super)
Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
I follow people whom I value their curated materials.
P 2: Case study 1 - 2:207 [I use a lot of open courseware..] (492:493) (Super)
Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Simulation - Family: PEDAGOGICAL
FRAMEWORK]
No memos
I use a lot of open courseware.. I get information how they do things and useful programmes to teach so students can
practically see things physically, at microscopic level you know in order in order to give them more detail and all that
- For authentic content I make sure that we use reputable websites, like your open courseware.
P 2: Case study 1 - 2:211 [The students have to reference..] (513:513) (Super)
Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
CIA: Using Khans Academy and other open courseware, I get hints and good tips from those people and more
information about credible reliable sources for my courses.
The students have to reference everything, properly
P 2: Case study 1 - 2:216 [I use Khan Academy quite a lot..] (515:516) (Super)
Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [bandwith - Families (2): COUNTRY'S
EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1]
No memos 15

I use Khan Academy quite a lot. Regardless of the accent the way he explains the concept is better than what they learnt at school. Slow bandwidth however I it will buff for sometime but eventually I'll be able to see the full content. I tend to direct the students to trustworthy sources.

we compile our Learner Guides to provide them with examples of trustworthy websites that you will find authentic information

P 2: Case study 1 - 2:217 [I use Khan Academy. C1E: . I t..] (518:519) (Super)

Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1]

No memos

I use Khan Academy.

C1E: . I think there's a lot of useful material available on the internet that presents knowledge much better than we could ever do in a lecture

P 3: Case study 2 - 3:218 [I only look for stuff that is ..] (543:543) (Super)

Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1]

No memos

I only look for stuff that is linked to what we're doing, if I find it relevant and authentic, you know, believable, credible, valid

P 3: Case study 2 - 3:226 [For Paper Making Science and T..] (557:557) (Super)

Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [content contextualize - Families (2): CONTENT, CONTENT CASE 1]

No memos

For Paper Making Science and Technology, we test according to standard methods as conducted in Europe. So I don't think the context is that relevant to this type of material.

P 3: Case study 2 - 3:234 [it's very factual, you know. S..] (568:568) (Super)

Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [content access - Families (2): CONTENT, CONTENT CASE 1]

No memos

it's very factual, you know. So they go into these sites that we're almost recommending to them and they don't explore much and so it would be World Health Organisation you know, the American Occupational Health sites and so there are credible sites that they seem to go to.

P 9: tedre et al framework.docx - 9:4 [Cultural appropriateness] (20:20) (Super)

Codes: [Adaptivity and Adaptability] [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Contextual relevance] [Cultural appropriatenss] [Interactivity] [language - Family: Hindrances] [Modalities] [Size]

No memos

Cultural appropriateness

_____

Code: bandwith {4-0}

P 2: Case study 1 - 2:216 [I use Khan Academy quite a lot..] (515:516) (Super)

Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [bandwith - Families (2): COUNTRY'S EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1]

No memos

I use Khan Academy quite a lot. Regardless of the accent the way he explains the concept is better than what they learnt at school. Slow bandwidth however I it will buff for sometime but eventually I'll be able to see the full content. I tend to direct the students to trustworthy sources.

we compile our Learner Guides to provide them with examples of trustworthy websites that you will find authentic information

CIA: They choose their own groups. The A students stick together and then the average students stick together. All the hard 16

workers tend to stick together. I actually have the urge to shake it up a bit and put some of the weaker students with the some of the strong students
P 3: Case study 2 - 3:219 [There are fantastic videos as ..] (544:544) (Super)
Codes: [bandwith - Families (2): COUNTRY'S EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1]
[content challenges - Families (2): CONTENT, CONTENT CASE 1]
No memos
There are fantastic videos as you know, free open resources, Khan Academy but our bandwidth just does not allow us to use it properly.
P 4: e-Learning policy 2011.pdf - 4:15 [Blended Learning. An education..] (4:2152-4:2392) (Super)
Codes: [Blended learning - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
Blended Learning. An educational formation that integrates e-learning
techniques including online delivery of materials through web pages,
discussion boards and/or email, or the use of any other technologies with
traditional teaching m

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Code: BTech should already have adap.. {1-0}~
P 3: Case study 2 - 3:150 [BTech should already have adap..] (236:236) (Super)
Codes: [BTech should already have adap.. - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
BTech should already have adapted to student life

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Code: But our females are very vocal.. {1-2}
P 2: Case study 1 - 2:99 [But our females are very vocal..] (160:160) (Super)
Codes: [But our females are very vocal.. - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
But our females are very vocal, very vocal)

_____
Code: But shame, some of these peopl.. {1-0}
P 3: Case study 2 - 3:142 [But shame, some of these peopl..] (406:406) (Super)
Codes: [But shame, some of these peopl.. - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
But shame, some of these people don't have electricity

_____
Code: C2B I would say they're quite .. {1-2}
P 3: Case study 2 - 3:181 [C2B I would say they're quite ..] (364:364) (Super)
Codes: [C2B I would say they're quite .. - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
C2B I would say they're quite resistant 17

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Code: can have discussion forums on .. {1-2}
P 3: Case study 2 - 3:75 [can have discussion forums on ..] (115:115) (Super)
Codes: [can have discussion forums on .. - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
can have discussion forums on current events.

_____

Code: CELT, ITSS, the Registry, and .. {1-0}
P 7: DUT E-LEARNING REVIEW 2012.docx - 7:52 [CELT, ITSS, the Registry, and ..] (103:103) (Super)
Codes: [CELT, ITSS, the Registry, and ..]
No memos
CELT, ITSS, the Registry, and CQPA.

_____

Code: Challenges {7-0}
P 2: Case study 1 - 2:184 [in my opinion, the challenges,..] (391:392) (Super)
Codes: [Challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1] [persimistic]
No memos
in my opinion, the challenges, whichever route you take, there is going to be challenges. These challenges aren't greater in my opinion. The benefits outweigh the challenges.
=It already tells the student, there's a certain calibre, there's a certain quality of education that you can expect and it's going to be expected in future.
P 2: Case study 1 - 2:185 [infrastructure bandwith and co..] (394:394) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1] [despondent communties]
No memos
CIE They like research and presenting kind of tasks. I've also made them use digital story telling in their project tasks, to avoid the whole issues of plagiarism and to get students to use media that they are familiar with. Some do afford and many don't
infrastructure bandwith and connectivity I think the challenges, if we rely on students watching videos and lots of it, a student somewhere in a rural town or a village won't be able to access it as easily as somebody living in the city.
P 3: Case study 2 - 3:85 [they don't listen to me theref..] (123:123) (Super)
Codes: [Challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
they don't listen to me therefore I use videos.
P 3: Case study 2 - 3:193 [We have many challenges with e..] (413:413) (Super)
Codes: [Challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
We have many challenges with education in this country.
P 3: Case study 2 - 3:189 [Infrastructure? access to a co..] (417:418) (Super)
Codes: [Challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1] 18

No memos
Infrastructure? access to a computer that's on the internet
- problems with the company firewalls.
P 3: Case study 2 - 3:285 [people always think that techn..] (686:686) (Super)
Codes: [Challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
people always think that technology is going to solve all our problems but its not. It can certainly make some things easier.
P 3: Case study 2 - 3:289 [about the first six months, ha..] (689:689) (Super)
Codes: [Challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1] [interrupted learning] [technology upgrades]
No memos
about the first six months, half the students couldn't get on and it was just a bit of a nightmare du to service pack LMS upgrade
_____

Code: Class size {6-3}
P 2: Case study 1 - 2:11 [I can reach all those 86 stude..] (13:13) (Super)
Codes: [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
I can reach all those 86 students irrespective of their learning styles
P 2: Case study 1 - 2:84 [grades automatically into Blac..] (132:132) (Super)
Codes: [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos
grades automatically into Blackboard gradebook.
P 2: Case study 1 - 2:100 [we don't do formal group work...] (162:162) (Super)
Codes: [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Group criteria - Family: Groups]
No memos
we don't do formal group work. They might have their own groups. It's just too big numbers to
In their recent task they chose their groups based on their value systems, religions, and culture preferences. Group 1 is actually a mixed group. There are two black males, with three coloured females, and females are from rural areas. The next group is a typical coloured Cape Flats group. It's a combination of Muslim and white English females. The fourth group consists of pure Afrikaans white females. The next group is again black with only one boy. That boy is not even from the Western Cape. It's four black females and one black male. The next group is coloured females only. So, they group themselves according to how they feel comfortable e.g.in their religion or sociocultural dynamics. In group 8, there are three boys and five girls, and they're all Muslim
P 2: Case study 1 - 2:129 [Lack of resources, time planni..] (214:214) (Super)
Codes: [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Lack of resourses - Family: Hindrances]
No memos
Lack of resources, time planning. if I have to do a learning activity online, all my students have to be online at the same time. Not everyone has access to internet and computers. So I must take out my class teaching time and take them to the computer lab and book there so that all of them are exposed to adequate resources.
P 3: Case study 2 - 3:156 [We are fortunate in that we ha..] (274:274) (Super)
Codes: [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
No memos 19

We are fortunate in that we have some smaller classes.
C2D: Female students are better students than males, and their assignment compliance is greater. They study harder. They're generally better students. I think the males are two types of students– they are two groups, some guys are lazy but sort of strategically lazy. In other words, they're not poor students but they say, well I'm just going to do just enough to get through this thing because I've got a lot of other things on. So they're kind of strategically lazy - they do – I think the males can better assess what I need to do to pass.
P 9: tedre et al framework.docx - 9:2 [Exposure to technology] (7:7) (Super)
Codes: [Active/passive learning] [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Communication patterns] [Exposure to technology] [Group work] [ICT literacy] [open courseware - Family: CONTENT] [Parental involvement] [Pedagogical models] [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
Exposure to technology

_____
Code: class size {1-1}~
P 2: Case study 1 - 2:147 [I don't have a lot of students..] (269:269) (Super)
Codes: [class size]
No memos
I don't have a lot of students

_____
Code: Cognitive development {1-0}
P 9: tedre et al framework.docx - 9:9 [Mental models] (40:40) (Super)
Codes: [Attitude towards e-learning] [Cognitive development] [confidence] [Gender - Family: Gender] [Immaterial rights] [Income] [Intrinsic and extrinsic motivation] [language - Family: Hindrances] [Learning styles] [Mental models] [Socioeconomic status] [workload]
No memos
Mental models

_____
Code: Collaboration of UOT's {1-1}
P 3: Case study 2 - 3:291 [CPUT's probably got everything..] (709:709) (Super)
Codes: [Collaboration of UOT's - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Global exposure and participation]
No memos
CPUT's probably got everything. They're always ahead of us, ja. You know when we see those graphs of how all the UOTs are functioning, CPUT is right at the top so they pull them down but we've got some wireless hotspots now all around.

_____
Code: collaborative learning {2-0}
P 2: Case study 1 - 2:92 [Online they communicate in Eng..] (158:158) (Super)
Codes: [collaborative learning - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos 20

Online they communicate in English. In class they talk Xhosa or whatever to each other, and helping each other.
CIA I'm testing as I go along. If it doesn't work for me or I find that students struggle with it then I won't use it again
P 2: Case study 1 - 2:106 [spirit of collaboration and te..] (167:167) (Super)
Codes: [collaborative learning - Family: PEDAGOGICAL FRAMEWORK CASE 1] [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
spirit of collaboration and teamwork

_____

Code: Communication patterns {1-1}
P 9: tedre et al framework.docx - 9:2 [Exposure to technology] (7:7) (Super)
Codes: [Active/passive learning] [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Communication patterns] [Exposure to technology] [Group work] [ICT literacy] [open courseware - Family: CONTENT] [Parental involvement] [Pedagogical models] [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
CID It's more a case of not willing to change, but change is always difficult. People are used to traditional ways of doing things, and people are resistant to change. I think they're ready but it's in human nature, they're not willing
Exposure to technology
CIC: In fact, I used to think that I would have to go through a whole lesson, I had it all planned; one full week of showing students how to log on, where's the URL, user name, password and all that technical support– but I found that I was wasting their time and my time.

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Code: Competence to using the hardwa.. {1-0}
P 2: Case study 1 - 2:181 [Competence to using the hardwa..] (389:389) (Super)
Codes: [Competence to using the hardwa.. - Family: PEDAGOGICAL FRAMEWORK CASE 1]
No memos
Competence to using the hardware in the clinics.

_____

Code: comtent relavance {2-0}
P 3: Case study 2 - 3:200 [giving them access to such inf..] (477:477) (Super)
Codes: [comtent relavance - Family: CONTENT CASE 1]
No memos
giving them access to such information it actually broadens their mind
P 3: Case study 2 - 3:215 [The only way I can give them u..] (539:539) (Super)
Codes: [comtent relavance - Family: CONTENT CASE 1]
No memos
The only way I can give them update information is through the internet, and through that technology

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Code: con intergration {1-0} 21

P 2: Case study 1 - 2:215 [I teach Communication, I'm bou..] (514:514) (Super)
Codes: [con intergration - Family: CONTENT CASE 1] [content contextualize - Families (2): CONTENT, CONTENT CASE 1]
No memos
I teach Communication, I'm bound to contextualise the content easily because they have to do assignments for other subjects,

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Code: con mental rights {2-0}
P 2: Case study 1 - 2:206 [I think still, the key for me ..] (490:490) (Super)
Codes: [con mental rights - Family: CONTENT CASE 1] [content access - Families (2): CONTENT, CONTENT CASE 1] [Content curator/development - Families (2): CONTENT, CONTENT CASE 1]
No memos
I think still, the key for me is about the curation of the information. So that somebody who brings the learning, the facilitator should guide the learners through the process of discovery. So I think in the end power won't be sitting in the content or in the universities The ownership of content is going to be less important. It's more important how you support and scaffold the learners learning, providing or considering that they've got access to a broad scope of resources.
P 2: Case study 1 - 2:257 [how we teach children and lear..] (673:673) (Super)
Codes: [con mental rights - Family: CONTENT CASE 1] [recom online guidelines]
No memos
How we teach children and learners to behave online. You know the digital literacy – we should pay attention to privacy issues, intellectual property issues and then I think with high media content you know to make sure that when we design learning that we always give a low tech alternative.

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Code: confidence {6-0}
P 2: Case study 1 - 2:108 [I have noticed that it is more..] (167:167) (Super)
Codes: [confidence] [Gender - Family: Gender] [Technology exposure & Support Infrastructure]
No memos
I have noticed that it is more, how exposed the student is to that particular technology that the student is going to be confident and be able to use it. I think, because we make it compulsory that is why we haven't picked up the trend yet, If you are not exposed to technology it doesn't matter whether you a boy or a girl,
P 2: Case study 1 - 2:180 [when they go into the place of..] (389:389) (Super)
Codes: [Attitude - Family: MOTIVATOIN CASE 1] [confidence] [Mot-attitude - Family: MOTIVATION]
No memos
when they go into the place of work I want that confidence to spill over and eventually go over to competence. Competence to using the hardware in the clinics
P 2: Case study 1 - 2:187 [Not to be scared to work with ..] (396:396) (Super)
Codes: [confidence]
No memos
Not to be scared to work with these learners and I think that is why it's so important for us to expose them to technology now for future.
P 2: Case study 1 - 2:192 [staff training and development..] (432:432) (Super)
Codes: [Attitude - Family: MOTIVATOIN CASE 1] [confidence] [Professional development - Family: PEDAGOGICAL FRAMEWORK] 22

No memos
staff training and development by HR. to go for training and use the new methods
P 2: Case study 1 - 2:198 [I can definitely see an improv..] (461:461) (Super)
Codes: [confidence]
No memos
I can definitely see an improvement in their confidence.
P 9: tedre et al framework.docx - 9:9 [Mental models] (40:40) (Super)
Codes: [Attitude towards e-learning] [Cognitive development] [confidence] [Gender - Family: Gender] [Immaterial rights] [Income] [Intrinsic and extrinsic motivation] [language - Family: Hindrances] [Learning styles] [Mental models] [Socioeconomic status] [workload]
No memos
Mental models

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Code: connectivity {3-0}
P 2: Case study 1 - 2:130 [I need to make sure that they ..] (215:215) (Super)
Codes: [connectivity] [internet acccess] [learner support - Family: Hindrances]
No memos
I need to make sure that they have a computer at home with internet connection to do the assessment. Otherwise why should I set an online assessment in which the student is disadvantaged? if it has to be an online assessment, the easiest way for me is to get all of them in a lab. BUT if it is a big class size you don't get the lab. So that can pose a challenge. The other challenge could be supporting them while they are engaged in that assessment. The weak ones will need support and if it is a big class you have more challenges that you need to support and you might not be able to be there for everybody at the same time or to give everybody the same quality of attention.
P 3: Case study 2 - 3:245 [do think that as the governmen..] (602:602) (Super)
Codes: [connectivity] [embrace the initiatives] [Gov-infrastructure - Family: COUNTRY'S ED CONTEXT CASE 1] [Government subsidy - Family: COUNTRY'S ED CONTEXT CASE 1]
No memos
do think that as the government and NGOs and whoever it is that can assist should definitely put a hand and actually help to facilitate the use of technology to enhance learning. Initatives like free WIFI in citiese.g. PTA
P 3: Case study 2 - 3:276 [But it's maybe cheaper to put ..] (659:659) (Super)
Codes: [connectivity] [Gov-infrastructure - Family: COUNTRY'S ED CONTEXT CASE 1] [gove invest - Family: COUNTRY'S ED CONTEXT CASE 1]
No memos
But it's maybe cheaper to put up a cellphone tower than to build a school and give technology to people.

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Code: connectivity challenge {1-0}
P 2: Case study 1 - 2:136 [What I do find a challenge is ..] (228:228) (Super)
Codes: [connectivity challenge]
No memos
What I do find a challenge is the – currently is the connectivity on campus, Wi-Fi, proxy, you know getting – connectivity on campus I would say is currently the main obstacle . 23

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Code: consid open courseware {2-0}
P 2: Case study 1 - 2:229 [it is the responsibility of th..] (586:586) (Super)
Codes: [consid Contextualization - Family: Considerations] [consid curate - Family: Considerations] [consid open courseware - Family: Considerations]
No memos
it is the responsibility of the Educator to curate that and say you know – and contextualize it for students and to help students to contextualize it. And then ultimately, we need to start developing our own online content that we can refer to, so that we don't have to focus on Euro-centric material.
P 2: Case study 1 - 2:230 [I think in policy there should..] (587:587) (Super)
Codes: [consid bandwidth - Family: Considerations] [consid flexibikty - Family: Considerations] [consid open courseware - Family: Considerations] [consid research - Family: Considerations] [consid sudsidized equipment - Family: Considerations]
No memos
I think in policy there should be more flexibility in the ownership of material. I think open resources OER[?] should be encouraged and money should be provided for research into that. And then I think also supporting learners to acquire their own devices and providing bandwidth,

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Code: consid pedagogical aspect {1-0}
P 2: Case study 1 - 2:236 [Teacher recruitment policy be ..] (590:590) (Super)
Codes: [consid pedagogical aspect - Family: Considerations] [consid teacher recruiment policy - Family: Considerations] [consid work ethics - Family: Considerations]
No memos
Teacher recruitment policy be revised, The problem is the teachers and if teachers don't work or if teachers don't know their work or the teachers can't teach, how is learning going to take place?

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Code: consid professional develpement {1-0}
P 2: Case study 1 - 2:234 [I think Educators should stay ..] (589:589) (Super)
Codes: [consid professional develpement - Family: Considerations]
No memos
I think Educators should stay abreast of developments, so that there could be a seamless transition for learners moving from higher education to the job markets.

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Code: consid research {1-0}
P 2: Case study 1 - 2:230 [I think in policy there should..] (587:587) (Super)
Codes: [consid bandwidth - Family: Considerations] [consid flexibikty - Family: Considerations] [consid open courseware - Family: Considerations] [consid research - Family: Considerations] [consid sudsidized equipment - Family: Considerations]
No memos
I think in policy there should be more flexibility in the ownership of material. I think open resources OER[?] should be encouraged and money should be provided for research into that. And then I think also supporting learners to acquire their own devices and providing bandwidth, 24

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Code: consid sudsidized equipment {1-0}
P 2: Case study 1 - 2:230 [I think in policy there should..] (587:587) (Super)
Codes: [consid bandwidth - Family: Considerations] [consid flexibikty - Family: Considerations] [consid open courseware - Family: Considerations] [consid research - Family: Considerations] [consid sudsidized equipment - Family: Considerations]
No memos
I think in policy there should be more flexibility in the ownership of material. I think open resources OER[?] should be encouraged and money should be provided for research into that. And then I think also supporting learners to acquire their own devices and providing bandwidth,

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Code: consid teacher recruiment policy {1-0}
P 2: Case study 1 - 2:236 [Teacher recruitment policy be ..] (590:590) (Super)
Codes: [consid pedagogical aspect - Family: Considerations] [consid teacher recruiment policy - Family: Considerations] [consid work ethics - Family: Considerations]
No memos
Teacher recruitment policy be revised, The problem is the teachers and if teachers don't work or if teachers don't know their work or the teachers can't teach, how is learning going to take place?

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Code: consid technology exposure {1-0}
P 2: Case study 1 - 2:224 [It will expose the students to..] (577:577) (Super)
Codes: [consid technology exposure - Family: Considerations]
No memos
It will expose the students to those concepts at an early stage before they come to the university under resourced school who are extremely disadvantaged and so that gap is going to grow wider

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Code: consid work ethics {1-0}
P 2: Case study 1 - 2:236 [Teacher recruitment policy be ..] (590:590) (Super)
Codes: [consid pedagogical aspect - Family: Considerations] [consid teacher recruiment policy - Family: Considerations] [consid work ethics - Family: Considerations]
No memos
Teacher recruitment policy be revised, The problem is the teachers and if teachers don't work or if teachers don't know their work or the teachers can't teach, how is learning going to take place?

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P 2: Case study 1 - 2:210 [Things develop so fast so I us..] (512:512) (Super)
Codes: [cont real time updates - Family: CONTENT CASE 1]
No memos
Things develop so fast so I use the internet now for me as a searching tool to keep up with regulations and legislation
_____ 25

Code: contennt rural areas {1-0}
P 3: Case study 2 - 3:211 [it's not often you find a youn..] (507:507) (Super)
Codes: [contennt rural areas - Families (2): CONTENT, CONTENT CASE 1]
No memos
it's not often you find a youngster who doesn't have a smart phone, even into a deep rural area,
C2A:So they almost don't realise that they're doing all these other things, in Story, Prezi, Essay Writing, towards the production of a digital story. And then we've also used an App called Cognition as a questioning tool to help students prepare for the learning conversation….. "they would scan a QR Code and they would get more information to respond to certain questions, linked on the walkabouts

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Code: content access {7-1}
P 2: Case study 1 - 2:206 [I think still, the key for me ..] (490:490) (Super)
Codes: [con mental rights - Family: CONTENT CASE 1] [content access - Families (2): CONTENT, CONTENT CASE 1] [Content curator/development - Families (2): CONTENT, CONTENT CASE 1]
No memos
I think still, the key for me is about the curation of the information. So that somebody who brings the learning, the facilitator should guide the learners through the process of discovery. So I think in the end power won't be sitting in the content or in the universities The ownership of content is going to be less important. It's more important how you support and scaffold the learners learning, providing or considering that they've got access to a broad scope of resources.
P 3: Case study 2 - 3:210 [if they're working somewhere a..] (507:507) (Super)
Codes: [content access - Families (2): CONTENT, CONTENT CASE 1] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
No memos
if they're working somewhere and can afford some technology
P 3: Case study 2 - 3:228 [And also the paper mills would..] (558:558) (Super)
Codes: [content access - Families (2): CONTENT, CONTENT CASE 1]
No memos
And also the paper mills would never be able to administer this. So certainly, you're using the internet in that way, with the library resource. I mean that's really good. It's been a – that's been a big help
P 3: Case study 2 - 3:234 [it's very factual, you know. S..] (568:568) (Super)
Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [content access - Families (2): CONTENT, CONTENT CASE 1]
No memos
it's very factual, you know. So they go into these sites that we're almost recommending to them and they don't explore much and so it would be World Health Organisation you know, the American Occupational Health sites and so there are credible sites that they seem to go to.
P 3: Case study 2 - 3:283 [-I think pedagogically, well, ..] (683:683) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [content access - Families (2): CONTENT, CONTENT CASE 1] [Content curator/development - Families (2): CONTENT, CONTENT CASE 1] [open courseware - Family: CONTENT] [Quality education - Family: PEDAGOGICAL FRAMEWORK] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
No memos
-I think pedagogically, well, socio-economically developing country, I think we should be going the route of what's affordable, wide accessibility. So the whole idea of open appeals to me and to a lot of people for that reason. Free, open education 26

resources. A lot of which is high quality stuff.

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Code: content challenges {6-0}
P 2: Case study 1 - 2:203 [the problem is not all of them..] (486:486) (Super)
Codes: [content challenges - Families (2): CONTENT, CONTENT CASE 1]
No memos
the problem is not all of them have references
P 2: Case study 1 - 2:214 [Not just because it might take..] (514:514) (Super)
Codes: [content challenges - Families (2): CONTENT, CONTENT CASE 1]
No memos
Not just because it might take them a long time to download or whatever but it's more because it might take them a long time to focus on it.
P 3: Case study 2 - 3:209 [C2D:not really free C2E: irrel..] (504:505) (Super)
Codes: [content challenges - Families (2): CONTENT, CONTENT CASE 1] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
No memos
C2D:not really free
C2E: irrelevant. Nothing available for us. they're nice enough but I think we teach more in-depth
P 3: Case study 2 - 3:216 [Language should be localized b..] (540:541) (Super)
Codes: [content challenges - Families (2): CONTENT, CONTENT CASE 1] [language - Family: Hindrances]
No memos
Language should be localized but Copyright issues are a challenge
-you can't assume that everybody is, you know, has got the vocabulary that is assumed by the people who develop these materials
P 3: Case study 2 - 3:219 [There are fantastic videos as ..] (544:544) (Super)
Codes: [bandwith - Families (2): COUNTRY'S EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1] [content challenges - Families (2): CONTENT, CONTENT CASE 1]
No memos
There are fantastic videos as you know, free open resources, Khan Academy but our bandwidth just does not allow us to use it properly.
P 3: Case study 2 - 3:225 [bandwidth interruption disturb..] (553:553) (Super)
Codes: [content challenges - Families (2): CONTENT, CONTENT CASE 1]
No memos
bandwidth interruption disturbs the flow oof presentation

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Code: content contectualize {2-0}~
P 3: Case study 2 - 3:198 [the quality is very variable. ..] (473:473) (Super)
Codes: [content contectualize - Families (2): CONTENT, CONTENT CASE 1]
No memos
the quality is very variable. If it's not suitable you need to be able to adapt it. 27

P 3: Case study 2 - 3:224 [-We localize and contectualize..] (551:552) (Super)
Codes: [content contectualize - Families (2): CONTENT, CONTENT CASE 1] [language - Family: Hindrances]
No memos
-We localize and contectualize the content I teach them the skills how to convert from calories to kilojoules
-auth

_____

Code: content contextualize {8-0}
P 2: Case study 1 - 2:204 [you get a video showing a tech..] (488:488) (Super)
Codes: [content contextualize - Families (2): CONTENT, CONTENT CASE 1]
No memos
you get a video showing a technique so beautifully but then the accent, our students don't understand i
P 2: Case study 1 - 2:213 [But at the same time we cannot..] (514:514) (Super)
Codes: [content contextualize - Families (2): CONTENT, CONTENT CASE 1]
No memos
But at the same time we cannot go international and forget about the local realities. So there is always the need to balance the two
P 3: Case study 2 - 3:213 [they put a procedure there as ..] (535:535) (Super)
Codes: [content contextualize - Families (2): CONTENT, CONTENT CASE 1] [content devepment - Families (2): CONTENT, CONTENT CASE 1] [content expandable - Families (2): CONTENT, CONTENT CASE 1]
No memos
they put a procedure there as it's the same as you read but our students do create their own videos as well. So you can, you know put in local content.
P 3: Case study 2 - 3:221 [a lot of words are unique to E..] (545:545) (Super)
Codes: [content contextualize - Families (2): CONTENT, CONTENT CASE 1] [language - Family: Hindrances]
No memos
a lot of words are unique to Economics and students hear it for the first time
P 3: Case study 2 - 3:226 [For Paper Making Science and T..] (557:557) (Super)
Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [content contextualize - Families (2): CONTENT, CONTENT CASE 1]
No memos
For Paper Making Science and Technology, we test according to standard methods as conducted in Europe. So I don't think the context is that relevant to this type of material.
P 3: Case study 2 - 3:230 [We cater to a South African 34..] (563:563) (Super)
Codes: [content contextualize - Families (2): CONTENT, CONTENT CASE 1] [language - Family: Hindrances]
No memos
We cater to a South African 34not Size 6.

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Code: Content curator/development {4-2}~
P 2: Case study 1 - 2:206 [I think still, the key for me ..] (490:490) (Super)
Codes: [con mental rights - Family: CONTENT CASE 1] [content access - Families (2): CONTENT, CONTENT CASE 1] [Content 28

curator/development - Families (2): CONTENT, CONTENT CASE 1]
No memos
I think still, the key for me is about the curation of the information. So that somebody who brings the learning, the facilitator should guide the learners through the process of discovery. So I think in the end power won't be sitting in the content or in the universities The ownership of content is going to be less important. It's more important how you support and scaffold the learners learning, providing or considering that they've got access to a broad scope of resources.
P 3: Case study 2 - 3:202 [through Blackboard I give them..] (480:480) (Super)
Codes: [Content curator/development - Families (2): CONTENT, CONTENT CASE 1]
No memos
through Blackboard I give them curator content.
P 3: Case study 2 - 3:212 [I use foreign content right no..] (534:534) (Super)
Codes: [Content curator/development - Families (2): CONTENT, CONTENT CASE 1] [content relevance - Families (2): CONTENT, CONTENT CASE 1] [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
I use foreign content right now quite a bit because if you look at Radiography and Nuclear Medicine it is international.
P 3: Case study 2 - 3:283 [-I think pedagogically, well, ..] (683:683) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [content access - Families (2): CONTENT, CONTENT CASE 1] [Content curator/development - Families (2): CONTENT, CONTENT CASE 1] [open courseware - Family: CONTENT] [Quality education - Family: PEDAGOGICAL FRAMEWORK] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
No memos
-I think pedagogically, well, socio-economically developing country, I think we should be going the route of what's affordable, wide accessibility. So the whole idea of open appeals to me and to a lot of people for that reason. Free, open education resources. A lot of which is high quality stuff.
_____
Code: content devepment {1-0}
P 3: Case study 2 - 3:213 [they put a procedure there as ..] (535:535) (Super)
Codes: [content contextualize - Families (2): CONTENT, CONTENT CASE 1] [content devepment - Families (2): CONTENT, CONTENT CASE 1] [content expandable - Families (2): CONTENT, CONTENT CASE 1]
No memos
they put a procedure there as it's the same as you read but our students do create their own videos as well. So you can, you know put in local content.
_____
Code: content dis and advantages {3-0}
P 2: Case study 1 - 2:209 [I keep abreast of different me..] (512:512) (Super)
Codes: [content dis and advantages - Families (3): CONTENT, CONTENT CASE 1, COUNTRY'S EDUCATIONAL CONTEXT]
No memos
I keep abreast of different methods they're using to identify let's say pathogens, for instance, organisms that make you sick and I use that in my teaching
P 2: Case study 1 - 2:212 [Because we always want to attr..] (514:514) (Super)
Codes: [content dis and advantages - Families (3): CONTENT, CONTENT CASE 1, COUNTRY'S EDUCATIONAL CONTEXT] [Global exposure and participation] 29

No memos
Because we always want to attract international people into our university. But at the same time we want our students to be able to fit into the global market. So we cannot ignore the international for just the domestic or the local.
P 3: Case study 2 - 3:231 [The advantage is that your stu..] (564:564) (Super)
Codes: [content dis and advantages - Families (3): CONTENT, CONTENT CASE 1, COUNTRY'S EDUCATIONAL CONTEXT]
No memos
The advantage is that your students can find out anything. And you don't have to spoon feed them the answers. The disadvantage is that the internet can spoon feed them the answers. And sometimes they're not correct

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Code: content expandable {3-0}
P 2: Case study 1 - 2:205 [We should actually contribute ..] (488:488) (Super)
Codes: [content expandable - Families (2): CONTENT, CONTENT CASE 1]
No memos
We should actually contribute to those open source wares or courseware because it helps also to streamline and to see what the quality that's out there is. Especially, from similar context because as I said before you get a video showing a technique so beautifully but then the accent, our students don't understand it
P 3: Case study 2 - 3:206 [As long as you are also using ..] (502:502) (Super)
Codes: [content expandable - Families (2): CONTENT, CONTENT CASE 1]
No memos
As long as you are also using that as something that is additional to your own learning tools that you have developed
P 3: Case study 2 - 3:213 [they put a procedure there as ..] (535:535) (Super)
Codes: [content contextualize - Families (2): CONTENT, CONTENT CASE 1] [content devepment - Families (2): CONTENT, CONTENT CASE 1] [content expandable - Families (2): CONTENT, CONTENT CASE 1]
No memos
they put a procedure there as it's the same as you read but our students do create their own videos as well. So you can, you know put in local content.

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Code: Content information {4-1}~
P 2: Case study 1 - 2:200 [Using Khans Academy and other ..] (464:464) (Super)
Codes: [Content information - Families (2): CONTENT, CONTENT CASE 1] [content relevance - Families (2): CONTENT, CONTENT CASE 1]
No memos
Using Khans Academy and other open courseware, I get hints and good tips from those people and more information about credible reliable sources for my courses
P 2: Case study 1 - 2:201 [it's very useful. I mean our s..] (465:465) (Super)
Codes: [Content information - Families (2): CONTENT, CONTENT CASE 1]
No memos
it's very useful. I mean our students work with a lot of information – they have to look at other buildings, precedent etcetera. So there's a lot of information available but again, we try and help students to discern you know between what is important, relevant and what is not correct. So they have to be critical about what they find online and also learn how to get to reliable sources and how to validate the information. 30

P 3: Case study 2 - 3:197 [Basically I don't use textbook..] (471:472) (Super)
Codes: [Content information - Families (2): CONTENT, CONTENT CASE 1]
No memos
Basically I don't use textbooks anymore, The students don't like textbooks
-Youtube videos: I just put all the information related to that online and then the students have to get that information, then review it
P 3: Case study 2 - 3:201 [we give them various links to ..] (478:479) (Super)
Codes: [Content information - Families (2): CONTENT, CONTENT CASE 1] [open courseware - Family: CONTENT]
No memos
we give them various links to book series Called Paper Making Science and Technology
they can see entrie online course

_____
Code: content overload {1-0}
P 3: Case study 2 - 3:222 [I try to reduce information ov..] (549:549) (Super)
Codes: [content overload - Families (2): CONTENT, CONTENT CASE 1]
No memos
I try to reduce information overload as much as I can

_____
Code: content relevance {6-1}~
P 2: Case study 1 - 2:146 [C1F:My student are very active..] (267:269) (Super)
Codes: [2. Content - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [content relevance - Families (2): CONTENT, CONTENT CASE 1] [Creative learning - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Curriculum Content - Family: CONTENT CASE 1] [Global exposure and participation] [Interuniversity collaboration]
No memos
C1F:My student are very active and creative with technology, they have created for themselves a Facebook of page where they are in constant communication with one another. next week for we have a Ebola talk, the Ebola virus talkl
- We've invited a virologist from the University of the Western Cape'
-Size: No, not really. I don't have a lot of students
P 2: Case study 1 - 2:197 [Audiovisual content is useful ..] (460:460) (Super)
Codes: [content relevance - Families (2): CONTENT, CONTENT CASE 1]
No memos
Audiovisual content is useful as it did when I was teaching students about the concept of 'hierarchy of need'. It excites discussion, it excites class participation and then now I can teach them about theories that are very difficult to teach specially for students who have poor literacy
P 2: Case study 1 - 2:200 [Using Khans Academy and other ..] (464:464) (Super)
Codes: [Content information - Families (2): CONTENT, CONTENT CASE 1] [content relevance - Families (2): CONTENT, CONTENT CASE 1]
No memos
Using Khans Academy and other open courseware, I get hints and good tips from those people and more information about credible reliable sources for my courses 31

P 3: Case study 2 - 3:199 [keep updated like the 'meat sc..] (475:475) (Super)
Codes: [content relevance - Families (2): CONTENT, CONTENT CASE 1]
No memos
keep updated like the 'meat scandal' and components such as diseases of lifestyle and Hypertension
P 3: Case study 2 - 3:212 [I use foreign content right no..] (534:534) (Super)
Codes: [Content curator/development - Families (2): CONTENT, CONTENT CASE 1] [content relevance - Families
(2): CONTENT, CONTENT CASE 1] [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
I use foreign content right now quite a bit because if you look at Radiography and Nuclear Medicine it is international.
P 3: Case study 2 - 3:223 [-this generation doesn't want ..] (549:549) (Super)
Codes: [content relevance - Families (2): CONTENT, CONTENT CASE 1]
No memos
-this generation doesn't want to read a lot. They only just want to read what is necessary for them to read

_____
Code: content supplement {1-0}
P 2: Case study 1 - 2:202 [I use those videos to fill the..] (466:466) (Super)
Codes: [content supplement - Family: CONTENT CASE 1]
No memos
I use those videos to fill the gaps in our teaching courses in order for students to develop adequate content
knowledge.

_____
Code: Contextual relevance {1-0}
P 9: tedre et al framework.docx - 9:4 [Cultural appropriateness] (20:20) (Super)
Codes: [Adaptivity and Adaptability] [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Contextual
relevance] [Cultural appropriatenss] [Interactivity] [language - Family: Hindrances] [Modalities] [Size]
No memos
Cultural appropriateness

_____
Code: country context {1-1}
P 3: Case study 2 - 3:236 [-students are actually not pre..] (593:593) (Super)
Codes: [123iary not ready - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL
FRAMEWORK CASE 1] [country context - Families (2): COUNTRY'S ED CONTEXT CASE 1, COUNTRY'S
EDUCATIONAL CONTEXT]
No memos
-students are actually not prepared for tertiary education

_____
Code: country curriculum {2-1}
P 3: Case study 2 - 3:237 [they're passing with thirty pe..] (594:594) (Super)
Codes: [cons policies - Families (2): Considerations, COUNTRY'S EDUCATIONAL CONTEXT] [country curriculum -
Families (2): COUNTRY'S ED CONTEXT CASE 1, COUNTRY'S EDUCATIONAL CONTEXT] 32

No memos

they're passing with thirty percent meaning that they don't know seventy percent of the work so they're coming in here and then they expect to pass with a pass of fifty percent

P 3: Case study 2 - 3:253 [government, maybe giving acces..] (613:613) (Super)

Codes: [country curriculum - Families (2): COUNTRY'S ED CONTEXT CASE 1, COUNTRY'S EDUCATIONAL CONTEXT] [gov initiiatives - Family: COUNTRY'S ED CONTEXT CASE 1] [Technology exposure & Support Infrastructure]

No memos

government, maybe giving access to computers in schools earlier, before they get to high school.

_____

Code: cput supporting policies {1-0}

P 6: TEACHING AND LEARNING POLICY - 2006.pdf - 6:7 [Curriculum policy, Assessment ..] (6:1068-6:1177) (Super)

Codes: [cput supporting policies]

No memos

Curriculum policy, Assessment policy, Experiential Learning
policy, Language policy, Quality Assurance Polic

_____

Code: Creative learning {1-2}

P 2: Case study 1 - 2:146 [C1F:My student are very active..] (267:269) (Super)

Codes: [2. Content - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [content relevance - Families (2): CONTENT, CONTENT CASE 1] [Creative learning - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Curriculum Content - Family: CONTENT CASE 1] [Global exposure and participation] [Interuniversity collaboration]

No memos

C1F:My student are very active and creative with technology, they have created for themselves a Facebook of page where they are in constant communication with one another. next week for we have a Ebola talk, the Ebola virus talkl
- We've invited a virologist from the University of the Western Cape'
-Size: No, not really. I don't have a lot of students

_____

Code: critical thinking {1-0}

P 2: Case study 1 - 2:218 [rather than just giving conten..] (521:521) (Super)

Codes: [critical thinking - Family: PEDAGOGICAL FRAMEWORK CASE 1] [pedagogical approach]

No memos

rather than just giving content and testing them on that content, you want students to develop a process of thinking and critically reflecting on the material.

_____

Code: Cultural appropriatenss {1-0}

P 9: tedre et al framework.docx - 9:4 [Cultural appropriateness] (20:20) (Super)

Codes: [Adaptivity and Adaptability] [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Contextual relevance] 33

[Cultural appropriatenss] [Interactivity] [language - Family: Hindrances] [Modalities] [Size]
No memos
Cultural appropriateness

_____

Code: cultural aspect and appeal {1-0}
P 2: Case study 1 - 2:49 [From another culture, from ano..] (91:91) (Super)
Codes: [cultural aspect and appeal]
No memos
From another culture, from another setting and even the medium which is the digital or electronic medium is sometimes more appealing to the student

_____

Code: cultural dynamics {6-2}
P 2: Case study 1 - 2:110 [based on their value systems, ..] (169:172) (Super)
Codes: [cultural dynamics] [Group dynamics - Family: Groups] [Group dynamics [Clone: 1] - Family: Groups] [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
CIE: Students get it from another person. From another culture, from another setting and even the medium which is the digital or electronic medium is sometimes more appealing to the students?
Based on their value systems, religions, and culture preferences: Group 1 is actually a mixed, as I say but it's a typical; There's two males, black with three coloured, coloured but from rural areas females.
= the next group is a typical coloured Cape Flats group is a combination again of Muslim with white, but white English females. The fourth group pure Afrikaans white females.
the next group is again black with only one boy. That boy is not even from the Western Cape. Black femaless, one black male. the next group is coloured females only. So, they group themselves according to how they feel comfortable e.g.in their religion or sociocultural..
Group8 There's three boys and five girls. they're all Muslim.
P 2: Case study 1 - 2:117 [in some African cultures, stud..] (183:183) (Super)
Codes: [cultural dynamics]
No memos
in some African cultures, students would not necessarily – and also Afrikaaner cultures, students wouldn't challenge somebody who is older than them or that's more senior than them.
P 2: Case study 1 - 2:118 [Students are more prone to ove..] (184:184) (Super)
Codes: [cultural dynamics]
No memos
Students are more prone to overcome those cultural barriers
P 3: Case study 2 - 3:101 [I split the races so that they..] (160:160) (Super)
Codes: [cultural dynamics]
No memos
I split the races so that they allow for that interaction
P 3: Case study 2 - 3:137 [they all just kind of see each..] (202:202) (Super)
Codes: [cultural dynamics]
No memos 34

they all just kind of see each other as people
P 3: Case study 2 - 3:139 [, it's not really related to t..] (203:204) (Super)
Codes: [cultural dynamics]
No memos
, it's not really related to the communities they're coming from.
- I think because we're all Nurses and then the class is predominantly Zulu-speaking, so yeah we don't seem to have issues

_____
Code: culture {1-0}
P 2: Case study 1 - 2:220 [-Science has universal terms i..] (529:529) (Super)
Codes: [culture] [language - Family: Hindrances]
No memos
-Science has universal terms it's a necessity for them to get to understand and to speak that language. when you speak a scientific language, they actually decipher that language into cultural language

_____
Code: Curriculum {2-0}~
P 4: e-Learning policy 2011.pdf - 4:35 [Curriculum design and assessme..] (9:1181-9:1320) (Super)
Codes: [Curriculum]
No memos
Curriculum design and assessment procedures: This must be done in
line with current policies and requirements of CPUT, SAQA and the
HEQC
P 7: DUT E-LEARNING REVIEW 2012.docx - 7:4 [This process will be driven la..] (89:89) (Super)
Codes: [Curriculum]
No memos
This process will be driven largely by the Curriculum Review process

_____
Code: Curriculum Content {1-2}
P 2: Case study 1 - 2:146 [C1F:My student are very active..] (267:269) (Super)
Codes: [2. Content - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Active participation - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [content relevance - Families (2): CONTENT, CONTENT CASE 1] [Creative learning - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Curriculum Content - Family: CONTENT CASE 1] [Global exposure and participation] [Interuniversity collaboration]
No memos
C1F:My student are very active and creative with technology, they have created for themselves a Facebook of page where they are in constant communication with one another. next week for we have a Ebola talk, the Ebola virus talkl
- We've invited a virologist from the University of the Western Cape'
CIC I use Khan Academy quite a lot. Regardless of the accent, the way he explains the concept is better than what they learnt at school. However, slow bandwidth is always a challenge
-Size: No, not really. I don't have a lot of students

_____ 35

Code: definition elearning {1-0}
P 7: DUT E-LEARNING REVIEW 2012.docx - 7:38 [Elearning should simply be vie..] (397:397) (Super)
Codes: [definition elearning]
No memos
Elearning should simply be viewed as learning, which draws on a specific set of tools to enhance the learning process and experience for the student. It will only become main stream and broadly used if it is not an end in itself but a tool, along with others, for enhancing learning and teaching and providing practical solutions to real issues.

_____

Code: despondent communties {3-0}
P 2: Case study 1 - 2:95 [For students from the rural ar..] (159:159) (Super)
Codes: [despondent communties] [group selection - Family: Groups] [Lack of resourses - Family: Hindrances]
No memos
For students from the rural areas who don't have the resources and the best way to do it is to team them up.
P 2: Case study 1 - 2:185 [infrastructure bandwith and co..] (394:394) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1] [despondent communties]
No memos
CIB There was this pack of lions that are trying to kill this baby buffalo and the buffalo is a cub, a young one, because those predators always attack the easiest target. So, that buffalo runs further into the river. Then a crocodile was trying to pull the baby buffalo into the water to eat and the lions were also pulling the baby buffalo out of the river from crocodile. So it was a tug of war between the lions and the crocodile and the lions overpowered the crocodile. The crocodile gave up and the buffalo was taken out of the river. But when the lion was supposed to kill the buffalo and eat it the herd of buffalo came to defend their cub and they actually chased the lions away and so it's a very interesting video, very short
infrastructure bandwith and connectivity I think the challenges, if we rely on students watching videos and lots of it, a student somewhere in a rural town or a village won't be able to access it as easily as somebody living in the city.
P 3: Case study 2 - 3:258 [we do have more students from ..] (643:643) (Super)
Codes: [despondent communties] [gov initiiatives - Family: COUNTRY'S ED CONTEXT CASE 1] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
Memos: [campus disparities]
we do have more students from generally, from a disadvantaged background in the Midlands, Maritzburg. I think probably 80% of our intake are NSFAS Students here. I think that percent might be lower in Durban

_____

Code: Job market {9-1}
P 2: Case study 1 - 2:178 [One of the reasons why a lot o..] (384:384) (Super)
Codes: [Job market] [Mot-attitude - Family: MOTIVATION]
No memos
One of the reasons why a lot of people still struggle to catch up with technology now is because they see technology to be evolving at a faster pace than they can cope with. the advantage is that if a student spends four years in a university that student should be at a stage where whatever new technology comes the student will cope with it within a short space of time to understand how it operates and to use it in the work place.
P 2: Case study 1 - 2:193 [Professionalism and discipline..] (436:436) (Super)
Codes: [Job market] [longlife learning -21st Century skills]
No memos 36

Professionalism and discipline will be carried over in the workplace because if you get taught in a certain way.
P 2: Case study 1 - 2:194 [They are building a digital fo..] (437:437) (Super)
Codes: [Job market]
No memos
They are building a digital footprint- I can see that their communication, definitely in their professional life is a continuation of what they do at university and of course the inverse is also true.
P 3: Case study 2 - 3:186 [there's a whole lot of actual ..] (402:402) (Super)
Codes: [Job market] [longlife learning -21st Century skills]
No memos
there's a whole lot of actual skills that they learn but I don't think it's enough because if you look at the industry and they're always okay your student
P 3: Case study 2 - 3:244 [Technology would build them in..] (601:601) (Super)
Codes: [Job market]
No memos
Technology would build them in different aspects in terms of preparing them for employment
P 3: Case study 2 - 3:247 [it would benefit the workforce..] (604:604) (Super)
Codes: [Global exposure and participation] [Job market]
No memos
it would benefit the workforce because you are getting people that are able to use the latest technology in any way that would benefit the company.
P 3: Case study 2 - 3:272 [-if every child is able to att..] (653:653) (Super)
Codes: [4. Country's Context - Family: Hindrances] [Global exposure and participation] [Job market] [Technology exposure & Support Infrastructure]
No memos
-if every child is able to attend computer lessons in primary school, for example. Whether they're in your rural school or a Model C School that will affect, ultimately affect how the person is able to use technology later on
P 2: Case study 1 - 2:158 [Motivation varies e,g, B.Tech ..] (310:311) (Super)
Codes: [Lack of motivation - Family: Hindrances] [Mot-attitude - Family: MOTIVATION]
No memos
Motivation varies e,g, B.Tech group, there's a lot of intrinsic motivation because they're working students, they know this is the only opportunity for them currently, nationally, to advance their qualifications.
But junior students actually take great care in getting it just right because they know it's going to be published. But I think the fact that it's more widely shared makes them more motivated to produce something that they can be proud of.
P 3: Case study 2 - 3:8 [they can learn at any time] (50:50) (Super)
Codes: [Lack of motivation - Family: Hindrances] [limitations - Family: Hindrances]
No memos
they can learn at any time
P 3: Case study 2 - 3:50 [if they've missed a section an..] (68:68) (Super)
Codes: [Lack of motivation - Family: Hindrances]
No memos 37

if they've missed a section and they couldn't come to class they can go to Blackboard they can print it.
P 3: Case study 2 - 3:144 [Fortunately, for me most of my..] (232:232) (Super)
Codes: [Lack of motivation - Family: Hindrances]
No memos
Fortunately, for me most of my students have internet access and computers at home
P 3: Case study 2 - 3:148 [At first, the students were he..] (235:235) (Super)
Codes: [Lack of motivation - Family: Hindrances]
No memos
At first, the students were hesitant because it was mainly about access. Because for most of them you find, maybe they don't have laptops so access was the main thing and actually some of them complained about time as well. That if they have to do it in their own time, outside their structured lecture times then it might be very tricky for them because they've got a full timetable.
P 3: Case study 2 - 3:160 [Computer labs stay open up 10:..] (280:281) (Super)
Codes: [Lack of motivation - Family: Hindrances]
No memos
Computer labs stay open up 10:00 at night as do the labs.
-In Durban campus they've got big problems with facilities there and access.
P 3: Case study 2 - 3:162 [Passive. they tend to sit back..] (286:287) (Super)
Codes: [Lack of motivation - Family: Hindrances]
No memos
Passive. they tend to sit back and just absorb.
-2weeks later Lesson not accessed
_____
Code: Lack of resources {6-0}~
P 2: Case study 1 - 2:95 [For students from the rural ar..] (159:159) (Super)
Codes: [despondent communties] [group selection - Family: Groups] [Lack of resourses - Family: Hindrances]
No memos
For students from the rural areas who don't have the resources and the best way to do it is to team them up.
P 2: Case study 1 - 2:129 [Lack of resources, time planni..] (214:214) (Super)
Codes: [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Lack of resourses - Family: Hindrances]
No memos
Lack of resources, time planning. if I have to do a learning activity online, all my students have to be online at the same time. Not everyone has access to internet and computers. So I must take out my class teaching time and take them to the computer lab and book there so that all of them are exposed to adequate resources.
P 3: Case study 2 - 3:145 [First of all you need money. M..] (233:233) (Super)
Codes: [Lack of resourses - Family: Hindrances]
No memos
First of all you need money. Money solves a lot of problems. And maybe the government needs to come in because the whole world is going that way. The whole world and even – the thing is even if you don't have computers or iPads, all our students have cell phones
P 3: Case study 2 - 3:184 [Some are ready and willing and..] (369:369) (Super) 38

Codes: [Faculty readiness - Families (2): MOTIVATOIN CASE 1, PEDAGOGICAL FRAMEWORK CASE 1] [Lack of resourses - Family: Hindrances]
No memos
Some are ready and willing and wanting and they don't have the time or the resources.
P 3: Case study 2 - 3:191 [they don't own computers, when..] (422:422) (Super)
Codes: [ICT skills] [Lack of resourses - Family: Hindrances]
No memos
they don't own computers, when taken to labs still they don't know how to use a computer] a lot of the problems stem from computer literacy-the more we force, integrate,the better they get, the more the chance of job opportunities,
P 3: Case study 2 - 3:262 [rather compromise my lecture t..] (649:649) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Lack of resourses - Family: Hindrances]
No memos
rather compromise my lecture time, maybe two periods a week.

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Code: lack of security in schools {1-0}
P 3: Case study 2 - 3:256 [Crime. The one day you'll have..] (641:641) (Super)
Codes: [lack of security in schools - Family: Hindrances]
No memos
Crime. The one day you'll have a classroom full of computers and the next day it's gone.

_____

Code: Lack of time:I mean long term .. {0-0}

_____

Code: language {7-0}
P 2: Case study 1 - 2:220 [-Science has universal terms i..] (529:529) (Super)
Codes: [culture] [language - Family: Hindrances]
No memos
-Science has universal terms it's a necessity for them to get to understand and to speak that language. when you speak a scientific language, they actually decipher that language into cultural language
P 3: Case study 2 - 3:216 [Language should be localized b..] (540:541) (Super)
Codes: [content challenges - Families (2): CONTENT, CONTENT CASE 1] [language - Family: Hindrances]
No memos
Language should be localized but Copyright issues are a challenge
-you can't assume that everybody is, you know, has got the vocabulary that is assumed by the people who develop these materials
P 3: Case study 2 - 3:221 [a lot of words are unique to E..] (545:545) (Super)
Codes: [content contextualize - Families (2): CONTENT, CONTENT CASE 1] [language - Family: Hindrances]
No memos
a lot of words are unique to Economics and students hear it for the first time 39

P 3: Case study 2 - 3:224 [-We localize and contectualize..] (551:552) (Super)
Codes: [content contectualize - Families (2): CONTENT, CONTENT CASE 1] [language - Family: Hindrances]
No memos
-We localize and contectualize the content I teach them the skills how to convert from calories to kilojoules
-auth
P 3: Case study 2 - 3:230 [We cater to a South African 34..] (563:563) (Super)
Codes: [content contextualize - Families (2): CONTENT, CONTENT CASE 1] [language - Family: Hindrances]
No memos
We cater to a South African 34not Size 6.
P 9: tedre et al framework.docx - 9:4 [Cultural appropriateness] (20:20) (Super)
Codes: [Adaptivity and Adaptability] [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Contextual relevance] [Cultural appropriatenss] [Interactivity] [language - Family: Hindrances] [Modalities] [Size]
No memos
Cultural appropriateness
P 9: tedre et al framework.docx - 9:9 [Mental models] (40:40) (Super)
Codes: [Attitude towards e-learning] [Cognitive development] [confidence] [Gender - Family: Gender] [Immaterial rights] [Income] [Intrinsic and extrinsic motivation] [language - Family: Hindrances] [Learning styles] [Mental models] [Socioeconomic status] [workload]
No memos
Mental models
_____

Code: Leadership and management {1-0}~
P 3: Case study 2 - 3:271 [-HOD's need to take an imitati..] (679:679) (Super)
Codes: [Leadership and management - Family: Hindrances]
No memos
-HOD's need to take an imitative and it must be supported
_____

Code: learn from students {1-0}
P 2: Case study 1 - 2:151 [In fact some of them even teac..] (302:302) (Super)
Codes: [lack of ICT skills - Family: Hindrances] [learn from students - Family: Hindrances]
No memos
In fact some of them even teach me how to use some of the resources available online there.
_____

Code: learner support {1-0}
P 2: Case study 1 - 2:130 [I need to make sure that they ..] (215:215) (Super)
Codes: [connectivity] [internet acccess] [learner support - Family: Hindrances]
No memos
I need to make sure that they have a computer at home with internet connection to do the assessment. Otherwise why should I set an online assessment in which the student is disadvantaged? if it has to be an online assessment, the easiest way for me is to 40

get all of them in a lab. BUT if it is a big class size you don't get the lab. So that can pose a challenge. The other challenge could be supporting them while they are engaged in that assessment. The weak ones will need support and if it is a big class you have more challenges that you need to support and you might not be able to be there for everybody at the same time or to give everybody the same quality of attention.

_____
Code: Learning chalenges {0-0}

_____
Code: Learning styles {7-2}
P 3: Case study 2 - 3:37 [people learn in different ways..] (60:60) (Super)
Codes: [Learning styles]
No memos
people learn in different ways.
P 3: Case study 2 - 3:41 [visual students] (63:63) (Super)
Codes: [Learning styles]
No memos
visual students
P 3: Case study 2 - 3:61 [learn by doing: watch the vide..] (79:79) (Super)
Codes: [Learning styles]
No memos
learn by doing: watch the video, they pause, they do the steps.
P 3: Case study 2 - 3:62 [can cater for the more advance..] (81:81) (Super)
Codes: [Learning styles]
No memos
can cater for the more advanced students at the same as helping the weaker students without disabling anyone
P 3: Case study 2 - 3:163 [I find better ways of connecti..] (288:288) (Super)
Codes: [Learning styles]
No memos
I find better ways of connecting/teaching, it's important because if you don't do that, you lose them
P 3: Case study 2 - 3:152 [they're looking at slides or t..] (289:289) (Super)
Codes: [Learning styles]
No memos
they're looking at slides or they've downloaded them or they're watching the video that I've made again.
P 9: tedre et al framework.docx - 9:9 [Mental models] (40:40) (Super)
Codes: [Attitude towards e-learning] [Cognitive development] [confidence] [Gender - Family: Gender] [Immaterial rights] [Income] [Intrinsic and extrinsic motivation] [language - Family: Hindrances] [Learning styles] [Mental models] [Socioeconomic status] [workload]
No memos
Mental models
_____ 41

Code: Learning styles/modalities {1-5}
P 2: Case study 1 - 2:38 [they learn better when they se..] (35:35) (Super)
Codes: [Adaptivity - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Adaptivity [Clone: 1] - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [Learning styles/modalities]
No memos
they learn better when they see things.

_____

Code: lecture responsibility {1-0}
P 4: e-Learning policy 2011.pdf - 4:29 [The content and all other acad..] (5:2478-5:2669) (Super)
Codes: [lecture responsibility]
No memos
The content and all other academic processes within the offering is the sole
responsibility of the lecturer who needs to ensure proper administration,
including backing up and securing data

_____

Code: limitations {6-3}~
P 3: Case study 2 - 3:8 [they can learn at any time] (50:50) (Super)
Codes: [Lack of motivation - Family: Hindrances] [limitations - Family: Hindrances]
No memos
they can learn at any time

_____

Code: minimum presence {1-0}
P 4: e-Learning policy 2011.pdf - 4:43 [A minimum web presence for all..] (12:2195-12:2666) (Super)
Codes: [minimum presence]
No memos
A minimum web presence for all academic offerings, consisting of, or
showing evidence of active use on:
The relevant subject guide posted online;
Effective use of a populated calendar with all key dates for the
duration of the offering;
One of the communication tools activated to ensure effective
asynchronous communication between the lecturer and student;
A Grade book or other means of giving feedback to the student
regarding moderated assessments

_____

Code: Modalities {1-0}
P 9: tedre et al framework.docx - 9:4 [Cultural appropriateness] (20:20) (Super)
Codes: [Adaptivity and Adaptability] [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Contextual relevance] [Cultural appropriatenss] [Interactivity] [language - Family: Hindrances] [Modalities] [Size]
No memos 42

Cultural appropriateness

_____

Code: Most of them respond very posi.. {1-0}
P 3: Case study 2 - 3:171 [Most of them respond very posi..] (329:329) (Super)
Codes: [Most of them respond very posi..]
No memos
Most of them respond very positively to creative tasts like posters

_____

Code: Mot-attitude {10-1}~
P 2: Case study 1 - 2:82 [we're two lecturers sharing th..] (132:132) (Super)
Codes: [Mot-attitude - Family: MOTIVATION]
No memos
we're two lecturers sharing the subject. The next lecturer doesn't work the same way that I do
P 2: Case study 1 - 2:131 [-online planning at the beginn..] (216:216) (Super)
Codes: [Faculty readiness - Families (2): MOTIVATOIN CASE 1, PEDAGOGICAL FRAMEWORK CASE 1] [Mot-attitude - Family: MOTIVATION] [Planning] [workload]
No memos
-online planning at the beginning increases the workload. Towards the end of the year it reduces the workload. Many lecturers don't have time for all the planning. Most of us already have notes or lecture material in paper form prepared and ready to use for online course development.
P 2: Case study 1 - 2:138 [C1A: I'm not scared to try new..] (252:252) (Super)
Codes: [Mot-attitude - Family: MOTIVATION]
No memos
C1A: I'm not scared to try new things. I like technology. I use it in a positive way it helps me and it makes my teaching interesting. I wouldn't say that the online activity is more active than the non-online activity for my students.
P 2: Case study 1 - 2:158 [Motivation varies e,g, B.Tech ..] (310:311) (Super)
Codes: [Lack of motivation - Family: Hindrances] [Mot-attitude - Family: MOTIVATION]
No memos
Motivation varies e,g, B.Tech group, there's a lot of intrinsic motivation because they're working students, they know this is the only opportunity for them currently, nationally, to advance their qualifications.
But junior students actually take great care in getting it just right because they know it's going to be published. But I think the fact that it's more widely shared makes them more motivated to produce something that they can be proud of.
P 2: Case study 1 - 2:169 [It's more a case of not willin..] (355:355) (Super)
Codes: [age - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Mot-attitude - Family: MOTIVATION]
No memos
It's more a case of not willing but change is always difficult. People in age traditionally, people are resistant to change. I think they're ready but it's in human nature they're not willing,
P 2: Case study 1 - 2:178 [One of the reasons why a lot o..] (384:384) (Super)
Codes: [Job market] [Mot-attitude - Family: MOTIVATION] 43

No memos
One of the reasons why a lot of people still struggle to catch up with technology now is because they see technology to be evolving at a faster pace than they can cope with. the advantage is that if a student spends four years in a university that student should be at a stage where whatever new technology comes the student will cope with it within a short space of time to understand how it operates and to use it in the work place.
P 2: Case study 1 - 2:180 [when they go into the place of..] (389:389) (Super)
Codes: [Attitude - Family: MOTIVATOIN CASE 1] [confidence] [Mot-attitude - Family: MOTIVATION]
No memos
when they go into the place of work I want that confidence to spill over and eventually go over to competence. Competence to using the hardware in the clinics
P 3: Case study 2 - 3:255 [I think we just have to be car..] (618:619) (Super)
Codes: [Mot-attitude - Family: MOTIVATION] [Quality education - Family: PEDAGOGICAL FRAMEWORK] [unreadiness - Family: MOTIVATION]
No memos
I think we just have to be careful with the quality right from school there needs to be a different way of teaching or getting people to engage. New students expect to be spoonfed
Attitude : but we're paying to come here and be taught
P 3: Case study 2 - 3:260 [Maybe that's why 20 or 30% jus..] (645:645) (Super)
Codes: [Mot-attitude - Family: MOTIVATION]
No memos
Maybe that's why 20 or 30% just do not appear online.
P 3: Case study 2 - 3:277 [-Very often they've got a lot ..] (660:660) (Super)
Codes: [Mot-attitude - Family: MOTIVATION]
No memos
-Very often they've got a lot of community responsibilities by virtue of the fact that they're qualified people in certain communities, and so they find, you know, studying is just another one of those and any time they cannot engage with the learning materials
_____
Code: Mot-attitude for students {1-0}
P 2: Case study 1 - 2:191 [The students will always embra..] (430:430) (Super)
Codes: [Mot-attitude for students - Family: MOTIVATOIN CASE 1]
No memos
The students will always embrace fun way of learning such as social media, rather than going to Blackboard and doing a Podcast which sometimes can be a challenge to the student. - in a very formal setting like assessment in Respondus they get scared.
_____
Code: mot attitude for lecturers {1-0}
P 2: Case study 1 - 2:190 [Sometimes lecturers need recog..] (430:430) (Super)
Codes: [mot attitude for lecturers - Family: MOTIVATOIN CASE 1]
No memos
Sometimes lecturers need recognition and support 44

_____

Code: mot class size {2-0}
P 2: Case study 1 - 2:139 [it's a little bit easier with ..] (253:253) (Super)
Codes: [mot class size - Family: MOTIVATOIN CASE 1]
No memos
it's a little bit easier with a small class but it's not impossible with a big class.
P 2: Case study 1 - 2:144 [-Class zie matters, I had 220 ..] (262:262) (Super)
Codes: [Assessment and grading - Family: PEDAGOGICAL FRAMEWORK CASE 1] [mot class size - Family: MOTIVATOIN CASE 1]
No memos
-Class zie matters, I had 220 students last semester, the lecturers with bigger classes, they would be more easily persuaded to move to Blackboard because it is very efficient when it comes to marking and assessment grading, It keeps records and it doesn't make a mistake unless you made a mistake when you set up the test

_____

Code: mot creative learning {2-0}
P 2: Case study 1 - 2:148 [I try and leave it very open f..] (299:299) (Super)
Codes: [mot creative learning - Family: MOTIVATOIN CASE 1]
No memos
I try and leave it very open for them. So that it's a little bit more creative for them
P 2: Case study 1 - 2:160 [They like research and present..] (314:314) (Super)
Codes: [mot creative learning - Family: MOTIVATOIN CASE 1] [Research driven approach - Family: PEDAGOGICAL FRAMEWORK]
No memos
They like research and presenting kind of tasks. I've also used digital story telling to – in project work, to avoid the whole issues of plagiarism and to get students to use media that they are familiar with and they get excited about.

_____

Code: mot diverse attitudes {2-0}
P 2: Case study 1 - 2:165 [You have those who are just re..] (347:347) (Super)
Codes: [mot diverse attitudes - Family: MOTIVATOIN CASE 1] [mot faculty readiness - Family: MOTIVATOIN CASE 1]
No memos
You have those who are just resisting it because of age, and because of other work pressures, and you have those who are welcoming it. You have those who are very knowledgeable about it that are even helping to teach me some of the things. There are those who don't know, who don't have a clue about it and they just don't want it.
P 2: Case study 1 - 2:166 [Students force us to use techn..] (349:349) (Super)
Codes: [mot diverse attitudes - Family: MOTIVATOIN CASE 1] [students want technology]
No memos
Students force us to use technology at the satellite campus one of the students asked me, why don't we use something like Vula or something like Moodle?

_____

Code: mot Engaged learning {2-0} 45

P 2: Case study 1 - 2:157 [the support they get in order ..] (309:309) (Super)
Codes: [mot Engaged learning - Family: MOTIVATOIN CASE 1] [mot student support - Family: MOTIVATOIN CASE 1]
No memos
the support they get in order to complete the project keep them highly motivated to engage because they can see that it will help them to do the project. So I think as a means to an end we find technology quite valuable.
P 3: Case study 2 - 3:151 [it's been interesting because ..] (289:289) (Super)
Codes: [mot Engaged learning - Family: MOTIVATOIN CASE 1]
No memos
it's been interesting because when I look around my classroom on a revision session they're on their laptops or they're on their phones and they've got Blackboard open and they're looking at slides or they've downloaded them or they're watching the video that I've made again.
_____
Code: mot faculty readiness {2-0}
P 2: Case study 1 - 2:142 [I like to share, I've invested..] (261:261) (Super)
Codes: [mot faculty readiness - Family: MOTIVATOIN CASE 1] [mot sharing - Family: MOTIVATOIN CASE 1]
No memos
I like to share, I've invested many hours building my course on Blackboard – my course is a model, the material that I have collected. I'm happy to show and assist my colleagues. We share what we've learnt. internet allows us to do more openly, freely, faster
P 2: Case study 1 - 2:165 [You have those who are just re..] (347:347) (Super)
Codes: [mot diverse attitudes - Family: MOTIVATOIN CASE 1] [mot faculty readiness - Family: MOTIVATOIN CASE 1]
No memos
You have those who are just resisting it because of age, and because of other work pressures, and you have those who are welcoming it. You have those who are very knowledgeable about it that are even helping to teach me some of the things. There are those who don't know, who don't have a clue about it and they just don't want it.
_____
Code: mot flexible {2-0}
P 2: Case study 1 - 2:176 [C1A: Students need to learn ho..] (382:382) (Super)
Codes: [mot flexible - Family: MOTIVATOIN CASE 1] [mot techology competent - Family: MOTIVATOIN CASE 1]
No memos
C1A: Students need to learn how to use technology because in the workplace that's, you know, there are programmes that factories use, online systems, internal online systems Technology broadens students' knowledge. The systems change and there's new things happening and, they need to keep up with all these changes.
P 2: Case study 1 - 2:177 [they will be able to cope with..] (384:384) (Super)
Codes: [mot flexible - Family: MOTIVATOIN CASE 1]
No memos
they will be able to cope with the very fast changing technological landscape.
_____
Code: mot learning experince {1-0} 46

P 2: Case study 1 - 2:145 [what motivates me is that I ca..] (263:264) (Super)
Codes: [mot learning experince - Family: MOTIVATOIN CASE 1] [mot Research driven approach - Family: MOTIVATOIN CASE 1]
No memos
what motivates me is that I can see how it helps to engage students. I can
see the fact that it enriches the learning experience. And for me as an Educator, it's interesting. So I'm quite
fascinated and curious and of course. I think also because it might be linked to the fact that I'm doing research on
technology

_____

Code: mot mindset {1-0}
P 2: Case study 1 - 2:168 [it's a mind-set change. I'm th..] (351:352) (Super)
Codes: [mot mindset - Family: MOTIVATOIN CASE 1]
No memos
it's a mind-set change. I'm the only one at this campus Groote Schuur and Tygerberg using Blackboard actively.
. You must set time aside time to engage with new technologies and get familiar

_____

Code: mot obligation {1-0}~
P 2: Case study 1 - 2:195 [some might even just do it bec..] (439:439) (Super)
Codes: [mot obligation - Family: MOTIVATOIN CASE 1]
No memos
some might even just do it because they're forced to. Others may do it because of bursary obligations

_____

Code: mot Research driven approach {1-0}
P 2: Case study 1 - 2:145 [what motivates me is that I ca..] (263:264) (Super)
Codes: [mot learning experince - Family: MOTIVATOIN CASE 1] [mot Research driven approach - Family: MOTIVATOIN CASE 1]
No memos
what motivates me is that I can see how it helps to engage students. I can
see the fact that it enriches the learning experience. And for me as an Educator, it's interesting. So I'm quite
fascinated and curious and of course. I think also because it might be linked to the fact that I'm doing research on
technology

_____

Code: mot setting up {1-0}
P 2: Case study 1 - 2:171 [Getting everything set up on B..] (356:356) (Super)
Codes: [mot setting up - Family: MOTIVATOIN CASE 1]
No memos
Getting everything set up on Blackboard is the mission.

_____

Code: mot sharing {1-0}
P 2: Case study 1 - 2:142 [I like to share, I've invested..] (261:261) (Super)
Codes: [mot faculty readiness - Family: MOTIVATOIN CASE 1] [mot sharing - Family: MOTIVATOIN CASE 1] 47

No memos

I like to share, I've invested many hours building my course on Blackboard – my course is a model, the material that I have collected. I'm happy to show and assist my colleagues. We share what we've learnt. internet allows us to do more openly, freely, faster

_____

Code: mot student support {3-1}
P 2: Case study 1 - 2:143 [I feel I want to empower mysel..] (260:260) (Super)
Codes: [mot student support - Family: MOTIVATOIN CASE 1] [Professional development - Family: PEDAGOGICAL FRAMEWORK]
No memos

I feel I want to empower myself. I want to empower my children. I want to empower my students
P 2: Case study 1 - 2:157 [the support they get in order ..] (309:309) (Super)
Codes: [mot Engaged learning - Family: MOTIVATOIN CASE 1] [mot student support - Family: MOTIVATOIN CASE 1]
No memos

the support they get in order to complete the project keep them highly motivated to engage because they can see that it will help them to do the project. So I think as a means to an end we find technology quite valuable.
P 3: Case study 2 - 3:292 [I can book the lab for you the..] (720:720) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [mot student support - Family: MOTIVATOIN CASE 1]
No memos

I can book the lab for you then you can come as a group and then you can do your work and what we've actually done as well is to take up the tutor sections because they've got tutorials as well

_____

Code: mot techology competent {1-0}
P 2: Case study 1 - 2:176 [C1A: Students need to learn ho..] (382:382) (Super)
Codes: [mot flexible - Family: MOTIVATOIN CASE 1] [mot techology competent - Family: MOTIVATOIN CASE 1]
No memos

C1A: Students need to learn how to use technology because in the workplace that's, you know, there are programmes that factories use, online systems, internal online systems Technology broadens students' knowledge. The systems change and there's new things happening and, they need to keep up with all these changes.

_____

Code: mot ubiquitous {1-0}
P 2: Case study 1 - 2:140 [everywhere you go you are conf..] (255:255) (Super)
Codes: [mot ubiquitous - Family: MOTIVATOIN CASE 1]
No memos

everywhere you go you are confronted with technology in one way or the other.

_____ 48

Code: mot worload {1-0}
P 2: Case study 1 - 2:167 [-they complain about workload;..] (350:350) (Super)
Codes: [mot worload - Family: MOTIVATOIN CASE 1] [Planning]
No memos
-they complain about workload; It takes lots of preparation time and it takes lots of thinking.

_____
Code: Motrivation {1-0}
P 3: Case study 2 - 3:153 [basically to make the student ..] (271:271) (Super)
Codes: [Motrivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1]
No memos
basically to make the student responsible for their own work.

_____
Code: MULTIMEDIIA {2-1}
P 2: Case study 1 - 2:86 [Through ePortfolio the student..] (133:133) (Super)
Codes: [3. Motivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1] [MULTIMEDIIA] [Technology exposure &
Support Infrastructure]
No memos
Through ePortfolio the student taps into various resources. ePortfolio has multimedia: it has text, videos, photos, -and
it has pictures whatever the student is dealing with that the student wants to bring it in.
P 3: Case study 2 - 3:67 [web links] (84:84) (Super)
Codes: [MULTIMEDIIA]
No memos
web links

_____
Code: new equipment {1-0}
P 4: e-Learning policy 2011.pdf - 4:30 [department takes responsibilit..] (6:1414-6:1562) (Super)
Codes: [new equipment]
No memos
department takes
responsibility for the acquisition, installation, maintenance and operation to
ensure the required technologies can be sustained

_____
Code: NGO donations. Pc's. {2-3}
P 3: Case study 2 - 3:246 [NGO donations. Pc's.] (603:603) (Super)
Codes: [NGO donations. Pc's. - Family: COUNTRY'S EDUCATIONAL CONTEXT]
No memos
NGO donations. Pc's. 49

P 3: Case study 2 - 3:254 [NGOs they are the right sort o..] (614:617) (Super)
Codes: [4. Country's Context - Family: Hindrances] [Government subsidy - Family: COUNTRY'S ED CONTEXT CASE 1] [NGO donations. Pc's. - Family: COUNTRY'S EDUCATIONAL CONTEXT]
No memos
NGOs they are the right sort of people because usually they've got the right drive or you know they're there for the right reasons
-Change policies; it's not about having a teacher standing in front of a class
-Gov certainly need to embrace the idea
-the government can use NGOs so that they don't have to put so much. You know they could give the NGO an X amount of money or whatever, or facilities

_____
Code: NGO initiatives {1-0}
P 9: tedre et al framework.docx - 9:8 [Investment incentives] (30:30) (Super)
Codes: [aims of education - Families (2): COUNTRY'S EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1] [Funding sources] [Government initiatives] [Investment incentives] [Job market] [NGO initiatives] [Ratio of 1/2/3iary education] [Vocational needs]
No memos
Investment incentives

_____
Code: No rich content due to low ban.. {1-0}
P 3: Case study 2 - 3:273 [No rich content due to low ban..] (655:655) (Super)
Codes: [bandwith - Families (2): COUNTRY'S EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1] [interrupted learning] [IT challenges] [No rich content due to low ban.. - Family: CONTENT]
No memos
No rich content due to low bandwidth

_____
Code: not really free {1-0}
P 3: Case study 2 - 3:208 [not really free] (504:504) (Super)
Codes: [not really free]
No memos
not really free

_____
Code: Not suitable {1-0}
P 2: Case study 1 - 2:53 [it's not always where I'll fin..] (97:97) (Super)
Codes: [Not suitable]
No memos
it's not always where I'll find a video clip

_____
Code: one needs to accommodate for a.. {1-0}~ 50

P 2: Case study 1 - 2:33 [one needs to accommodate for a..] (30:30) (Super)
Codes: [one needs to accommodate for a..]
No memos
one needs to accommodate for a range of learning styles

_____

Code: open courseware {4-2}~
P 3: Case study 2 - 3:201 [we give them various links to ..] (478:479) (Super)
Codes: [Content information - Families (2): CONTENT, CONTENT CASE 1] [open courseware - Family: CONTENT]
No memos
we give them various links to book series Called Paper Making Science and Technology
they can see entrie online course
P 3: Case study 2 - 3:243 [OER's initiatives to be suppor..] (600:600) (Super)
Codes: [open courseware - Family: CONTENT] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
[underresourced schools]
No memos
OER's initiatives to be supported at schools where there's a big shortage of textbooks and we always hear of non-delivery or short delivery of textbooks and kids don't have this and that and it costs a fortune.
P 3: Case study 2 - 3:283 [-I think pedagogically, well, ..] (683:683) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL
FRAMEWORK CASE 1] [content access - Families (2): CONTENT, CONTENT CASE 1] [Content
curator/development - Families (2): CONTENT, CONTENT CASE 1] [open courseware - Family: CONTENT] [Quality
education - Family: PEDAGOGICAL FRAMEWORK] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
No memos
-I think pedagogically, well, socio-economically developing country, I think we should be going the route of what's
affordable, wide accessibility. So the whole idea of open appeals to me and to a lot of people for that reason. Free,
open education resources. A lot of which is high quality stuff.
P 9: tedre et al framework.docx - 9:2 [Exposure to technology] (7:7) (Super)
Codes: [Active/passive learning] [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
[Communication patterns] [Exposure to technology] [Group work] [ICT literacy] [open courseware - Family:
CONTENT] [Parental involvement] [Pedagogical models] [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
Exposure to technology

_____

Code: open source {4-0}
P 2: Case study 1 - 2:68 [-hands-on experiments are outd..] (105:105) (Super)
Codes: [open source - Family: CONTENT] [Simulation - Family: PEDAGOGICAL FRAMEWORK]
No memos
-hands-on experiments are outdated but you can actually now log in to Crocodile Chemistry a programme that allows
my students do the experiment digitally.
P 3: Case study 2 - 3:204 [my area of interest has been a..] (497:497) (Super)
Codes: [open source - Family: CONTENT]
No memos 51

my area of interest has been at the moment, open licensing, open education resources
P 3: Case study 2 - 3:217 [I try to make sure that what I..] (542:542) (Super)
Codes: [I try to make sure that what I..] [open source - Family: CONTENT]
No memos
I try to make sure that what I find is openly licensed
P 3: Case study 2 - 3:242 [Open resources is the way to g..] (599:599) (Super)
Codes: [open source - Family: CONTENT] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
No memos
Open resources is the way to go, just developmentally and economically, pedagogically

_____
Code: Other sections need f2f for pr.. {1-4}
P 3: Case study 2 - 3:81 [Other sections need f2f for pr..] (118:118) (Super)
Codes: [Other sections need f2f for pr..]
No memos
Other sections need f2f for practical sessions.

_____
Code: Outcomes {1-0}
P 3: Case study 2 - 3:147 [how they actually portray thei..] (149:149) (Super)
Codes: [Outcomes]
No memos
how they actually portray their understanding of the sectio

_____
Code: overcrowded classes {1-0}
P 3: Case study 2 - 3:70 [in Radiography we get 5,000 ap..] (111:111) (Super)
Codes: [overcrowded classes]
No memos
in Radiography we get 5,000 applications for 70 places

_____
Code: Parental involvement {1-1}
P 9: tedre et al framework.docx - 9:2 [Exposure to technology] (7:7) (Super)
Codes: [Active/passive learning] [Class size - Families (2): MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1]
[Communication patterns] [Exposure to technology] [Group work] [ICT literacy] [open courseware - Family:
CONTENT] [Parental involvement] [Pedagogical models] [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
Exposure to technology
_____ 52

285

Code: part time and distance {1-0}
P 4: e-Learning policy 2011.pdf - 4:20 [Providing all students, includ..] (3:950-3:1093) (Super)
Codes: [doc student support] [part time and distance]
No memos
Providing all students, including part-time and distance education students,
convenient access to the educational resources of the university.

_____

Code: participation {1-0}~
P 3: Case study 2 - 3:43 [work on it together and just t..] (64:64) (Super)
Codes: [participation]
No memos
work on it together and just to encourage participation

_____

Code: Ped Challenges {1-0}
P 2: Case study 1 - 2:127 [I cannot always make online ta..] (212:212) (Super)
Codes: [Ped Challenges]
No memos
I cannot always make online tasks compulsory unless I can provide them with all of these different tablets or phones
or whatever

_____

Code: Ped Framework {0-0}

_____

Code: Ped Framework: C1A {2-0}
P 2: Case study 1 - 2:1 [C1A: I use Twitter, YouTube vi..] (6:7) (Super)
Codes: [Ped Framework: C1A]
No memos
C1A: I use Twitter, YouTube videos, Respondus and Blackboard.
Personally I'm a visual person. I try to incorporate pictures, different media because people learn in different ways.
P 2: Case study 1 - 2:42 [C1A: It is suitable especially..] (90:90) (Super)
Codes: [Ped Framework: C1A]
No memos
C1A: It is suitable especially in this particular class because in Food Micro III class it's very applied all we do a lot of
theory then we constantly pull it through to apply because that's the way I assess them in applied way, not
regurgitating. They have to apply

_____

Code: Ped Framework: C1B {2-0}
P 2: Case study 1 - 2:4 [C1B: technology is so advanced..] (9:9) (Super)
Codes: [Ped Framework: C1B]
No memos 53

C1B: technology is so advanced now that we can get audio, we can get Podcast, we can get video. I think what you do in terms of learning styles is to get to understand the students' learning styles. And not to teach them a particular learning style.

P 2: Case study 1 - 2:45 [C1B: it is suitable for Commun..] (91:91) (Super)

Codes: [Ped Framework: C1B]

No memos

C1B: it is suitable for Communication; it is suitable for Academic Literacy, both. Communication, everybody must communicate by means of technology these days. I mostly just refer students to go watch specific videos on YouTube because I think that maybe that video has a very educational content. it gives the students a very different perspective from the normal lesson that you have in class. So they kind of get it from another person. From another culture, from another setting and even the medium which is the digital or electronic medium is sometimes more appealing to the students?

_____

Code: Ped Framework: C1C {2-0}

P 2: Case study 1 - 2:7 [C1C: Blackboard, YouTube, emai..] (11:22) (Super)

Codes: [Ped Framework: C1C]

No memos

C1C: Blackboard, YouTube, emails. I'm now taking my laptop to class and I'm showing them these beautiful PowerPoints with audio clips video clips, and animations;

- to get notices out. To get information out. Put the study guide on there.

- I can reach all those 86 students irrespective of their learning styles and I can't do that with a Whiteboard.

-some of them are visually impaired and can't see on the board, I give them the presentation before class.

-students can go back and retrieve information and download at will.

=-face to face lecture with elements of technologies.

-I use Blackboard as a way of communicating with my students but also consolidating my, the module or the lesson that I need to bring across in ways that I couldn't have done. .

- It's a safe space where they can comment, they can talk to their friends about it, classmates about it. And it's a, a central place where they all can go

-So in terms of getting the message out or distributing notes it became easy. Whether it's a worksheet, whether it's a questionnaire, whether it's something that I want them to do before they come to class. I also send different content format, text, links and YouTube videos, So the one who didn't read the article could look at the clip

I post something online and know they're going to know it before class. I insert links within my module as class pre-activity. Students upload assignments and to send them back to me.

-. I started using emails because I found that reliable

-I'm testing as I go along, If it doesn't work for me or I find the students struggle with it then I won't use it again

P 2: Case study 1 - 2:50 [C1C: I use technology to facil..] (93:97) (Super)

Codes: [Ped Framework: C1C]

No memos

C1C: I use technology to facilitate two subjects. Physical Science I and Medical Imaging in Oncology I.

on the internet they can actually see a little video how these electrons are orbiting the nucleus.

- I can share McGraw link with the students regarding their prescribed textbook.

There are elements that are not suitable at all but I can use the interface to communicate things to them. So it's not always where I'll find a video clip or something fancy. There are features in the Learner Management System that I can still use even though my subject is not suitable for other forms or some educational technology.

_____ 54

Code: Ped Framework: C1E {2-0}
P 2: Case study 1 - 2:28 [C1E: Social media, Facebook. Q..] (26:32) (Super)
Codes: [Ped Framework: C1E]
No memos
C1E: Social media, Facebook. QR Codes.Prezi Cognition I use it for learning myself, to keep abreast with the latest developments and what other people are doing. I follow people whom I value their curated materials.
-then I also use it for learning and teaching in a social constructivist context.
-students actually can continue with their learning beyond their time and space frame of university life.
- the way I feel about learning styles is that one needs to accommodate for a range of learning styles in your teaching and learning approach and technology definitely, and my project does help to achieve that.
- We're forever just seeing whether there is any way in which technology can support what it is that we want to achieve pedagogically already. it's very important for us that the tool doesn't drive the process but the pedagogy does
- if you're coming in from the point of what is it that you want the students to learn or how do you want them to engage with the material, then the technology presents us with the whole range of other ways of achieving
P 2: Case study 1 - 2:57 [C1E: the technology that we've..] (101:102) (Super)
Codes: [Ped Framework: C1E]
No memos
C1E: the technology that we've introduced was actually pretty easy for students to adopt and it was easily integrated. I'm using Facebook a lot in student groups to take that learning beyond the physical campus studio. there's a lot of engagement and interaction that happens, even after, in the evenings and later
_____
Code: pedagogical approach {1-0}
P 2: Case study 1 - 2:218 [rather than just giving conten..] (521:521) (Super)
Codes: [critical thinking - Family: PEDAGOGICAL FRAMEWORK CASE 1] [pedagogical approach]
No memos
rather than just giving content and testing them on that content, you want students to develop a process of thinking and critically reflecting on the material.
_____
_____
Code: PEDFRAME C2A {2-0}
P 3: Case study 2 - 3:40 [C2A: because you do get those ..] (63:68) (Super)
Codes: [PEDFRAME C2A - Family: PEDAGOGICAL FRAMEWORK]
No memos
C2A: because you do get those visual students that will respond more, and those who work at their pace alone.
- I'm actually going to go with the students to the lab and then we're going to work on it together and just to encourage participation and everything.
-eJournals and videos to help them with their worksheets and understanding of the component
-different learning approaches: Poster design and I put latest articles relating to the topic and then you get a mark for participating in the discussions.
- I'd say there are some limitations because you do get students that will need you there physically --Some prefer f2fI wouldn't say it caters for everybody's learning styles but most of them because they are technologically inclined and they like working with 55

technology and they like working with technology and figuring out new things
- if they've missed a section and they couldn't come to class they can go to Blackboard they can print it.
P 3: Case study 2 - 3:79 [C2A: for some components defin..] (118:118) (Super)
Codes: [PEDFRAME C2A - Family: PEDAGOGICAL FRAMEWORK]
No memos
C2A: for some components definitely it is suitable because some of it has a lot of useful theory.Other sections need f2f for practical sessions.

_____

Code: PEDFRAME C2C {4-1}
P 3: Case study 2 - 3:30 [C2C: Bb. ejournals - In fact a..] (42:50) (Super)
Codes: [PEDFRAME C2C - Family: PEDAGOGICAL FRAMEWORK]
No memos
C2C: Bb. ejournals
- In fact all my subjects that I teach are all online.
- I came to realise that the only person that is actually learning the most on all of this is the lecturer
- you've got to prepare your lecture and then you've got to disseminate it and the students are just there passively
- we were actually doing in this department student centeredness even before that word came out. So to me the students needed to actually do their own learning.
- They make their own questions and they make their own answers to those questions
-blended approach
- I tell them, if I don't teach you any content relating to Radiography as long as I teach you how to teach yourself or you know how to learn from yourself
- they can learn at any time
P 3: Case study 2 - 3:68 [C2C: group discussions, exampl..] (108:113) (Super)
Codes: [PEDFRAME C2C - Family: PEDAGOGICAL FRAMEWORK]
No memos
C2C: group discussions, example, here's a video, here's an article. Now you come together as a group and discuss what is being said there and then you tell me and then we all discuss
- I think every single subject can be taught using technology.
- we do have work integrated learning or clinical training
- in Radiography we get 5,000 applications for 70 places;
- they go through a rigorous NBTs test as screening procedure, So when you analyse those results you discover that; Some of them can't even spell or some of them can't even read, some of them can't even write
-indicating that students from schools are actually not prepared for tertiary education
P 3: Case study 2 - 3:88 [C2C: seventy percent of our co..] (141:142) (Super)
Codes: [PEDFRAME C2C - Family: PEDAGOGICAL FRAMEWORK]
No memos
C2C: seventy percent of our content of Radiography had to be taken out to make way for this thirty percent general knowledge because the Vice-Chancellor believes in this student centeredness, this neo-liberalism where have to teach our students other skills.
-a portfolio approach
P 3: Case study 2 - 3:98 [C2C: , I put them into groups...] (159:160) (Super) 56

Codes: [PEDFRAME C2C - Family: PEDAGOGICAL FRAMEWORK]
No memos
C2C: , I put them into groups. I don't let them choose their own groups. (to balance the mix gender
- I split the races so that they allow for that interaction. But our females are very vocal, very vocal)

_____

Code: PEDFRAME C2D {3-0}
P 3: Case study 2 - 3:51 [C2D: Bb, discussion forums - w..] (70:75) (Super)
Codes: [PEDFRAME C2D - Family: PEDAGOGICAL FRAMEWORK]
No memos
C2D: Bb, discussion forums
- we do the pulp and paper technology programmes here. -B.Tech in Pulp and Paper Technology.
-limited contact -blended mode
-learning styles not catered for because of the nature of the material and also the limited time
- unlike the humanities there's not too much to debate and discuss ,for example, the theory of gravitation is well
established, well accepted. What is there to debate about you know? [what about the causes as debate]
P 3: Case study 2 - 3:82 [2D:for communication and for i..] (120:121) (Super)
Codes: [PEDFRAME C2D - Family: PEDAGOGICAL FRAMEWORK]
No memos
2D:for communication and for instructional materia; repository
- I still believe in a piece of paper. Being in the paper industry, I firmly believe in it.
P 3: Case study 2 - 3:95 [C2D: Haven't used it, it needs..] (151:153) (Super)
Codes: [PEDFRAME C2D - Family: PEDAGOGICAL FRAMEWORK]
No memos
C2D: Haven't used it, it needs quite a lot of set up
-2manual testsF: we have assignment work and examination type work
C2E:I wish it was more but my subject is more practical so I use some MCQ quizzes.

_____

Code: PEDFRAME C2F {1-0}
P 3: Case study 2 - 3:63 [emails, dropbox - So I post st..] (83:85) (Super)
Codes: [PEDFRAME C2F - Family: PEDAGOGICAL FRAMEWORK]
No memos
emails, dropbox
- So I post stuff into the classroom, I use the discussion a lot. So each kind of content area I try to have some web
links. I set a task for them, and I have a discussion.
-you can use a variety of media such as videos and podcast:" you can put in the videos and stuff they can listen to or
these little Podcasts and things.

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Code: persimistic {1-0} 57

P 2: Case study 1 - 2:184 [in my opinion, the challenges,..] (391:392) (Super)
Codes: [Challenges - Family: PEDAGOGICAL FRAMEWORK CASE 1] [persimistic]
No memos
in my opinion, the challenges, whichever route you take, there is going to be challenges. These challenges aren't greater in my opinion. The benefits outweigh the challenges.
=It already tells the student, there's a certain calibre, there's a certain quality of education that you can expect and it's going to be expected in future.

_____

Code: Plan-in line with T nLpolicy {1-0}
P 5: Teaching and Learning Plan 2012-2016 Sept 2011.pdf - 5:1 [is Teaching and Learning Plan ..] (1:115-1:219) (Super)
Codes: [Plan-in line with T nLpolicy]
No memos
is Teaching and Learning Plan follows a procedural requirement in the CPUT
Teaching and Learning Policy

_____

Code: plan strategy linked policies {1-0}
P 5: Teaching and Learning Plan 2012-2016 Sept 2011.pdf - 5:2 [In addition to the Teaching an..] (1:563-1:1102) (Super)
Codes: [plan strategy linked policies]
No memos
In addition to the Teaching and Learning Policy, the Plan is informed by and should
be read and used in conjunction with the following documents that have been
produced to guide CPUT operations:
Vision 2020: The Strategic Plan of the Cape Peninsula University of
Technology, and specifically the strategic goals related to Curriculum,
Teaching and Learning
Institutional Operating Plan (November 2006)
Assessment Policy
Community Engagement Policy
Audit report on the Cape Peninsula University of Technology July 2011

_____

Code: plan structure {1-0}~
P 5: Teaching and Learning Plan 2012-2016 Sept 2011.pdf - 5:3 [It is important to note that t..] (1:1105-1:1380) (Super)
Codes: [plan structure]
No memos
It is important to note that the Teaching and Learning Plan is structured thematically
to identify clearly the objectives, measures, targets and timelines, and persons
responsible for implementing the Plan.
This Plan builds on the March 2010 progress report of the 2008-2

_____

Code: Planning {3-0}
P 2: Case study 1 - 2:131 [-online planning at the beginn..] (216:216) (Super)
Codes: [Faculty readiness - Families (2): MOTIVATOIN CASE 1, PEDAGOGICAL FRAMEWORK CASE 1] [Mot-attitude - Family: 58

MOTIVATION] [Planning] [workload]
No memos
-online planning at the beginning increases the workload. Towards the end of the year it reduces the workload. Many lecturers don't have time for all the planning. Most of us already have notes or lecture material in paper form prepared and ready to use for online course development.
P 2: Case study 1 - 2:167 [-they complain about workload;..] (350:350) (Super)
Codes: [mot worload - Family: MOTIVATOIN CASE 1] [Planning]
No memos
-they complain about workload; It takes lots of preparation time and it takes lots of thinking.
P 3: Case study 2 - 3:22 [prepare your lecture] (45:45) (Super)
Codes: [Planning]
No memos
prepare your lecture

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Code: recom gov intervene and intiaitive {1-0}
P 2: Case study 1 - 2:253 [Government should not push all..] (668:668) (Super)
Codes: [recom gov intervene and intiaitive]
No memos
Government should not push all this money and providing all this hardware, the teachers don't know how to use the hardware so they don't know how to teach the students.
_____
Code: recom gove community interventions {1-0}~
P 2: Case study 1 - 2:251 [Let's just have a standard in ..] (666:666) (Super)
Codes: [recom close camapus gaps] [recom gove community interventions] [recommandations- standardized distribution of resources]
Memos: [STRATEGIES]
Let's just have a standard in which all the lecture venues, all the students are exposed to a particular standard of technology by exposure. Let's just have that standard. so like our community where we're coming from where there's the gap between the very rich and the very poor. You get that also in our very learning environment. The same university, the same campus
_____
Code: recom online guidelines {1-0}
P 2: Case study 1 - 2:257 [how we teach children and lear..] (673:673) (Super)
Codes: [con mental rights - Family: CONTENT CASE 1] [recom online guidelines]
No memos
how we teach children and learners to behave online. You know the digital literacy – we should pay attention to privacy issues, intellectual property issues and then I think with high media content you know to make sure that when we design learning that we always give a low tech alternative.
_____ 59

Code: recommandations- adapt content {1-0}
P 2: Case study 1 - 2:248 [I think we shouldn't just foll..] (634:634) (Super)
Codes: [recommandations- adapt content]
No memos
I think we shouldn't just follow the Euro-centric model of high media dense material but also allow for the more text based and simple designs

_____
Code: recommandations- standardized distribution of resources {1-0}
P 2: Case study 1 - 2:251 [Let's just have a standard in ..] (666:666) (Super)
Codes: [recom close camapus gaps] [recom gove community interventions] [recommandations- standardized distribution of resources]
Memos: [STRATEGIES]
Let's just have a standard in which all the lecture venues, all the students are exposed to a particular standard of technology by exposure. Let's just have that standard. so like our community where we're coming from where there's the gap between the very rich and the very poor. You get that also in our very learning environment. The same university, the same campus

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Code: recommandations-effective use of technology {1-0}
P 2: Case study 1 - 2:247 [You can give them the best res..] (635:635) (Super)
Codes: [recommandations-effective use of technology]
No memos
You can give them the best resources that there is, But if they do not know how to use it it's a waste, Teachers need skills and knowledge to use technology effectively.

_____
Code: Reputation fo rinstuttion {1-0}
P 2: Case study 1 - 2:254 [Preparedness. I think if we're..] (670:671) (Super)
Codes: [Reputation fo rinstuttion] [Teaching Preparedness]
No memos
Preparedness. I think if we're presenting lessons in this manner it's very professional. It's also gives the student an impression of the institution or the course or the department
-it would be nice to know that there is support to count on

_____
Code: Research dri {1-0}
P 2: Case study 1 - 2:64 [I use technology and videos as..] (103:103) (Super)
Codes: [Research dri - Family: PEDAGOGICAL FRAMEWORK]
No memos
I use technology and videos as a research tool
_____ 60

Code: Research driven approach {4-0}
P 2: Case study 1 - 2:35 [forever just seeing whether th..] (31:31) (Super)
Codes: [Research driven approach - Family: PEDAGOGICAL FRAMEWORK]
No memos
forever just seeing whether there is any way in which technology can support
P 2: Case study 1 - 2:160 [They like research and present..] (314:314) (Super)
Codes: [mot creative learning - Family: MOTIVATOIN CASE 1] [Research driven approach - Family: PEDAGOGICAL FRAMEWORK]
No memos
They like research and presenting kind of tasks. I've also used digital story telling to – in project work, to avoid the whole issues of plagiarism and to get students to use media that they are familiar with and they get excited about.
P 3: Case study 2 - 3:36 [research assignment] (59:59) (Super)
Codes: [Research driven approach - Family: PEDAGOGICAL FRAMEWORK]
No memos
research assignment
P 3: Case study 2 - 3:251 [Researchers are reluctant beca..] (611:611) (Super)
Codes: [Government subsidy - Family: COUNTRY'S ED CONTEXT CASE 1] [Research driven approach - Family: PEDAGOGICAL FRAMEWORK]
No memos
Researchers are reluctant because they don't feel supported or encouraged, be it financially or time-wise
_____
Code: research purpose plagiarism {1-0}
P 4: e-Learning policy 2011.pdf - 4:13 [The same plagiarism detection ..] (4:500-4:647) (Super)
Codes: [research purpose plagiarism]
No memos
The same plagiarism detection system must also be
made available to all academics in all other academic offerings where
applicable.
(see CPUT P
_____
Code: Resistance to change {4-3}
P 2: Case study 1 - 2:162 [The first thing that a lecture..] (345:345) (Super)
Codes: [Faculty readiness - Families (2): MOTIVATOIN CASE 1, PEDAGOGICAL FRAMEWORK CASE 1]
[Resistance to change - Family: PEDAGOGICAL FRAMEWORK]
No memos
The first thing that a lecturer would tell you is workload. I have too much work and I don't have time to try out new technologies
P 2: Case study 1 - 2:172 [It's attitude, resist to chang..] (357:358) (Super)
Codes: [age - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Attitude - Family: MOTIVATOIN CASE 1]
[Resistance to change - Family: PEDAGOGICAL FRAMEWORK]
No memos 61

It's attitude, resist to change they don't want to go beyond what they've always done
- the younger generation definitely approach their teaching differently
P 3: Case study 2 - 3:84 [I still believe in a piece of ..] (121:121) (Super)
Codes: [Resistance to change - Family: PEDAGOGICAL FRAMEWORK]
Memos: [challenges]
I still believe in a piece of paper. Being in the paper industry, I firmly believe in it.
P 3: Case study 2 - 3:287 [There wouldn't be so much resi..] (688:688) (Super)
Codes: [Resistance to change - Family: PEDAGOGICAL FRAMEWORK]
No memos
There wouldn't be so much resistance to things like Blackboard because it's not that they don't want to use the technology necessarily. Sometimes, it's just they don't know how.

_____

Code: role of lectures {1-0}
P 4: e-Learning policy 2011.pdf - 4:34 [All lecturers making use of te..] (8:1649-8:1879) (Super)
Codes: [role of lectures]
No memos
All lecturers making use of technology will have the same basic academic
qualities required at a higher education Institution, but will need additional
understanding of the effective utilisation of technology in their teaching.

_____

Code: Screening {1-1}
P 3: Case study 2 - 3:71 [they go through a rigorous NBT..] (112:112) (Super)
Codes: [Screening - Family: PEDAGOGICAL FRAMEWORK] [unreadiness - Family: MOTIVATION]
No memos
they go through a rigorous NBTs test as screening procedure, So when you analyse those results you discover that;
Some of them can't even spell or some of them can't even read, some of them can't even write

_____

Code: self efficacy {1-0}
P 3: Case study 2 - 3:194 [Responsibility. If you want to..] (441:441) (Super)
Codes: [self efficacy - Family: PEDAGOGICAL FRAMEWORK]
No memos
Responsibility. If you want to get a qualification you have to do the work.

_____

Code: self motivation {1-0}
P 2: Case study 1 - 2:141 [I think it's a personal intere..] (257:257) (Super)
Codes: [self motivation]
No memos
I think it's a personal interest because I'm interested in technology and I'm interested in education as well but I'm also interested 62

in how the students learn.

_____

Code: self regulatory learning {2-0}~
P 3: Case study 2 - 3:24 [students needed to actually do..] (46:46) (Super)
Codes: [self regulatory learning - Family: PEDAGOGICAL FRAMEWORK]
No memos
students needed to actually do their own learning.
P 3: Case study 2 - 3:25 [They make their own questions ..] (47:47) (Super)
Codes: [self regulatory learning - Family: PEDAGOGICAL FRAMEWORK]
No memos
They make their own questions and they make their own answers

_____

Code: Simulation {4-1}
P 2: Case study 1 - 2:52 [how these electrons are orbiti..] (94:94) (Super)
Codes: [Simulation - Family: PEDAGOGICAL FRAMEWORK]
No memos
how these electrons are orbiting the nucleus.
P 2: Case study 1 - 2:65 [to show them not the theory an..] (103:103) (Super)
Codes: [Simulation - Family: PEDAGOGICAL FRAMEWORK]
No memos
to show them not the theory and the principles of science, but seeing how science works
P 2: Case study 1 - 2:68 [-hands-on experiments are outd..] (105:105) (Super)
Codes: [open source - Family: CONTENT] [Simulation - Family: PEDAGOGICAL FRAMEWORK]
No memos
-hands-on experiments are outdated but you can actually now log in to Crocodile Chemistry a programme that allows
my students do the experiment digitally.
P 2: Case study 1 - 2:207 [I use a lot of open courseware..] (492:493) (Super)
Codes: [Authenticity - Family: PEDAGOGICAL FRAMEWORK CASE 1] [Simulation - Family: PEDAGOGICAL
FRAMEWORK]
No memos
I use a lot of open courseware.. I get information how they do things and useful programmes to teach so students can
practically see things physically, at microscopic level you know in order in order to give them more detail and all that
- For authentic content I make sure that we use reputable websites, like your open courseware.

_____
_____

Code: sociocultural aspects {2-0}
P 2: Case study 1 - 2:221 [Science is a universal languag..] (525:527) (Super)
Codes: [sociocultural aspects] 63

No memos

Science is a universal language

-African learner has a very strong cultural foundation in terms of how certain things work

- Lightning to them might have something to do with their ancestors.

P 2: Case study 1 - 2:219 [one student left the course be..] (528:528) (Super)

Codes: [sociocultural aspects]

No memos

one student left the course because he thinks Science is not for him because his parents want him to become a traditional healer.

_____

Code: socioeconomic {9-0}

P 3: Case study 2 - 3:78 [socio-economically developing ..] (116:116) (Super)

Codes: [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]

No memos

socio-economically developing country, I think we should be going the route of what's affordable, wide accessibility.

P 3: Case study 2 - 3:209 [C2D:not really free C2E: irrel..] (504:505) (Super)

Codes: [content challenges - Families (2): CONTENT, CONTENT CASE 1] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]

No memos

C2D:not really free

C2E: irrelevant. Nothing available for us. they're nice enough but I think we teach more in-depth

P 3: Case study 2 - 3:210 [if they're working somewhere a..] (507:507) (Super)

Codes: [content access - Families (2): CONTENT, CONTENT CASE 1] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]

No memos

if they're working somewhere and can afford some technology

P 3: Case study 2 - 3:227 [University has a 40 user licen..] (558:558) (Super)

Codes: [content access - Families (2): CONTENT, CONTENT CASE 1] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]

No memos

University has a 40 user license, otherwise it would just be too expensive

P 3: Case study 2 - 3:242 [Open resources is the way to g..] (599:599) (Super)

Codes: [open source - Family: CONTENT] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]

No memos

Open resources is the way to go, just developmentally and economically, pedagogically

P 3: Case study 2 - 3:243 [OER's initiatives to be suppor..] (600:600) (Super)

Codes: [open courseware - Family: CONTENT] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK] [underresourced schools]

No memos

OER's initiatives to be supported at schools where there's a big shortage of textbooks and we always hear of non-delivery or short delivery of textbooks and kids don't have this and that and it costs a fortune.

P 3: Case study 2 - 3:258 [we do have more students from ..] (643:643) (Super)

Codes: [despondent communties] [gov initiiatives - Family: COUNTRY'S ED CONTEXT CASE 1] [socioeconomic - Family: 64

PEDAGOGICAL FRAMEWORK]
Memos: [campus disparities]
we do have more students from generally, from a disadvantaged background in the Midlands, Maritzburg. I think probably 80% of our intake are NSFAS Students here. I think that percent might be lower in Durban
P 3: Case study 2 - 3:275 [they generally have access to ..] (658:658) (Super)
Codes: [bandwith - Families (2): COUNTRY'S EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1] [internet acccess] [interrupted learning] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
No memos
they generally have access to a computer but it's the cost of the Internet
P 3: Case study 2 - 3:283 [-I think pedagogically, well, ..] (683:683) (Super)
Codes: [access to learning - Families (3): COUNTRY'S EDUCATIONAL CONTEXT, MOTIVATION, PEDAGOGICAL FRAMEWORK CASE 1] [content access - Families (2): CONTENT, CONTENT CASE 1] [Content curator/development - Families (2): CONTENT, CONTENT CASE 1] [open courseware - Family: CONTENT] [Quality education - Family: PEDAGOGICAL FRAMEWORK] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
No memos
-I think pedagogically, well, socio-economically developing country, I think we should be going the route of what's affordable, wide accessibility. So the whole idea of open appeals to me and to a lot of people for that reason. Free, open education resources. A lot of which is high quality stuff.
_____
Code: Socioeconomic status {1-0}
P 9: tedre et al framework.docx - 9:9 [Mental models] (40:40) (Super)
Codes: [Attitude towards e-learning] [Cognitive development] [confidence] [Gender - Family: Gender] [Immaterial rights] [Income] [Intrinsic and extrinsic motivation] [language - Family: Hindrances] [Learning styles] [Mental models] [Socioeconomic status] [workload]
No memos
Mental models
_____
Code: Some are active. The majority .. {1-0}
P 3: Case study 2 - 3:175 [Some are active. The majority ..] (334:334) (Super)
Codes: [Some are active. The majority .. - Family: PEDAGOGICAL FRAMEWORK]
No memos
Some are active. The majority however, if it's not for marks, they're not interested
_____
Code: Some have very fancy phones an.. {1-0}
P 2: Case study 1 - 2:128 [Some have very fancy phones an..] (212:213) (Super)
Codes: [Some have very fancy phones an..]
No memos
Some have very fancy phones and some have none.
So then I usually ask them to work two-two together

_____

Code: some of these people don't hav.. {1-3}
P 3: Case study 2 - 3:257 [some of these people don't hav..] (640:640) (Super)
Codes: [lack of basic needs - Family: Hindrances] [some of these people don't hav.. - Family: PEDAGOGICAL FRAMEWORK]
No memos
some of these people don't have electricity

_____

Code: Sometimes, it's just they don'.. {1-3}
P 3: Case study 2 - 3:288 [Sometimes, it's just they don'..] (688:688) (Super)
Codes: [Sometimes, it's just they don'..]
No memos
Sometimes, it's just they don't know how.

_____

Code: strat- bandwitdth {1-0}~
P 2: Case study 1 - 2:250 [There must be reliable interne..] (665:665) (Super)
Codes: [strat- bandwitdth] [strat- reliable internet connection] [strat IT support]
No memos
There must be reliable internet connection, students require WiFi we need IT department support, good bandwidth and access.

_____

Code: strat- implementation {1-0}
P 2: Case study 1 - 2:259 [Policy implementation; Its eff..] (674:674) (Super)
Codes: [strat- implementation]
No memos
Policy implementation; Its effectiveness must be measured constantly

_____

Code: strat- reliable internet connection {1-0}
P 2: Case study 1 - 2:250 [There must be reliable interne..] (665:665) (Super)
Codes: [strat- bandwitdth] [strat- reliable internet connection] [strat IT support]
No memos
There must be reliable internet connection, students require WiFi we need IT department support, good bandwidth and access.

_____

Code: strat-recommendation {1-0}~
P 2: Case study 1 - 2:260 [I would like to see all our st..] (702:702) (Super)
Codes: [strat-recommendation]
No memos 66

I would like to see all our students at the same level in terms of embracing educational technologies, using the right technology for the right purpose

_____

Code: strat IT support {1-0}
P 2: Case study 1 - 2:250 [There must be reliable interne..] (665:665) (Super)
Codes: [strat- bandwitdth] [strat- reliable internet connection] [strat IT support]
No memos
There must be reliable internet connection, students require WiFi we need IT department support, good bandwidth and access.

_____

Code: strat lecturer tech support {1-0}
P 2: Case study 1 - 2:252 [as lecturers it is important t..] (667:667) (Super)
Codes: [strat lecturer tech support]
No memos
as lecturers it is important to know when to use technology and, but to have a reason why we're using that technology for that lesson.

_____

Code: Structured randomized quizzes {1-1}~
P 3: Case study 2 - 3:93 [Structured randomized quizzes] (144:144) (Super)
Codes: [Structured randomized quizzes - Family: PEDAGOGICAL FRAMEWORK]
No memos
Structured randomized quizzes

_____

Code: student centeredness {1-1}
P 3: Case study 2 - 3:23 [student centeredness] (46:46) (Super)
Codes: [student centeredness - Family: PEDAGOGICAL FRAMEWORK]
No memos
student centeredness

_____

Code: students want technology {1-0}
P 2: Case study 1 - 2:166 [Students force us to use techn..] (349:349) (Super)
Codes: [mot diverse attitudes - Family: MOTIVATOIN CASE 1] [students want technology]
No memos
Students force us to use technology at the satellite campus one of the students asked me, why don't we use something like Vula or something like Moodle?

_____

Code: Suitability {13-10} 67

P 2: Case study 1 - 2:22 [I insert links within my modul..] (20:20) (Super)
Codes: [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
I insert links within my module as class pre-activity
P 2: Case study 1 - 2:26 [tracks activities and keeps re..] (24:24) (Super)
Codes: [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
tracks activities and keeps records
P 2: Case study 1 - 2:46 [suitable for Communication; it..] (91:91) (Super)
Codes: [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
suitable for Communication; it is suitable for Academic Literacy
P 2: Case study 1 - 2:48 [video has a very educational c..] (91:91) (Super)
Codes: [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
video has a very educational content. it gives the students a very different perspective from the normal lesson that you have in class
P 2: Case study 1 - 2:55 [I can ask them to do formulas ..] (99:99) (Super)
Codes: [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
I can ask them to do formulas in Applied Stats
P 2: Case study 1 - 2:67 [without technology my subject ..] (104:104) (Super)
Codes: [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
without technology my subject would be dead
P 2: Case study 1 - 2:113 [Traceability is critical, you ..] (178:178) (Super)
Codes: [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
Traceability is critical, you need evidence of everything and that might be one of the reasons why I latched onto Blackboard because it keeps records
P 2: Case study 1 - 2:179 [Radiography is a technology dr..] (386:386) (Super)
Codes: [Attitude - Family: MOTIVATOIN CASE 1] [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
Radiography is a technology driven profession our whole base, everything revolves around technology.
P 2: Case study 1 - 2:208 [Without the internet I would b..] (512:512) (Super)
Codes: [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
Without the internet I would be lost
P 3: Case study 2 - 3:20 [In fact all my subjects that I..] (43:43) (Super) 68

Codes: [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
In fact all my subjects that I teach are all online.
P 3: Case study 2 - 3:73 [it's perfect because we can ha..] (115:115) (Super)
Codes: [Global exposure and participation] [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
it's perfect because we can have a portal on the web
P 3: Case study 2 - 3:86 [My subject is practical hands-..] (124:125) (Super)
Codes: [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
My subject is practical hands-on.
I think that there's a lot of ways to use the technology. For me video is my mainstream.
P 3: Case study 2 - 3:212 [I use foreign content right no..] (534:534) (Super)
Codes: [Content curator/development - Families (2): CONTENT, CONTENT CASE 1] [content relevance - Families
(2): CONTENT, CONTENT CASE 1] [Suitability - Family: PEDAGOGICAL FRAMEWORK]
No memos
I use foreign content right now quite a bit because if you look at Radiography and Nuclear Medicine it is international.

_____
Code: Support Infrastructure {1-0}
P 4: e-Learning policy 2011.pdf - 4:8 [The University shall assure th..] (2:1549-2:1830) (Super)
Codes: [Support Infrastructure]
No memos
The University shall assure that the Institution's administrative policies and
procedures allow for an effective and efficient ICT structures and
infrastructure with sufficient resource allocation to support and maintain the
quality of e-learning in all offerings and services

_____
_____
Code: Teaching Preparedness {1-0}
P 2: Case study 1 - 2:254 [Preparedness. I think if we're..] (670:671) (Super)
Codes: [Reputation fo rinstuttion] [Teaching Preparedness]
No memos
Preparedness. I think if we're presenting lessons in this manner it's very professional. It's also gives the student an
impression of the institution or the course or the department
-it would be nice to know that there is support to count on

_____
Code: technical challenges {1-0}
P 2: Case study 1 - 2:132 [Technical challenges.I actuall..] (218:218) (Super)
Codes: [interrupted learning] [technical challenges] 69

No memos
Technical challenges.I actually complained because this is now just before their first assessment, but they can't log on to Blackboard. I didn't really use it at the satellite campus because we had major problems in terms of logging on
_____
Code: technical vs pedagogical support deplited {1-0}
P 4: e-Learning policy 2011.pdf - 4:9 [Additional support to academic..] (2:2261-2:2531) (Super)
Codes: [technical vs pedagogical support deplited]
No memos
Additional support to
academics on the use of other technologies will be rendered by The Fundani
Centre for Higher Education Development (ETU) in the research and
development of current and new developments in all teaching pedagogy that
may make use of technology
_____
Code: Technology exposure & Support Infrastructure {15-3}
P 2: Case study 1 - 2:86 [Through ePortfolio the student..] (133:133) (Super)
Codes: [3. Motivation - Families (2): MOTIVATION, MOTIVATOIN CASE 1] [MULTIMEDIIA] [Technology exposure & Support Infrastructure]
No memos
Through ePortfolio the student taps into various resources. ePortfolio has multimedia: it has text, videos, photos, -and it has pictures whatever the student is dealing with that the student wants to bring it in.
P 2: Case study 1 - 2:108 [I have noticed that it is more..] (167:167) (Super)
Codes: [confidence] [Gender - Family: Gender] [Technology exposure & Support Infrastructure]
No memos
I have noticed that it is more, how exposed the student is to that particular technology that the student is going to be confident and be able to use it. I think, because we make it compulsory that is why we haven't picked up the trend yet, If you are not exposed to technology it doesn't matter whether you a boy or a girl,
P 2: Case study 1 - 2:123 [In terms of their ability, we ..] (186:186) (Super)
Codes: [information sharing] [Technology exposure & Support Infrastructure]
No memos
In terms of their ability, we find that students just naturally learn from each other.
P 2: Case study 1 - 2:156 [think learners will be motivat..] (308:308) (Super)
Codes: [ICT skills] [Technology exposure & Support Infrastructure]
No memos
think learners will be motivated as long as they can see that there is something in it for them.e.g. assessment grade
P 2: Case study 1 - 2:186 [In my faculty we train future ..] (396:396) (Super)
Codes: [aims of education - Families (2): COUNTRY'S EDUCATIONAL CONTEXT, PEDAGOGICAL FRAMEWORK CASE 1] [Technology exposure & Support Infrastructure]
No memos
In my faculty we train future teachers: So we must prepare our students to be ready for that period, where they go into the classroom and use technology effectively. Not to be scared to work with these learners and I think that is why it's so important 70

for us to expose them to technology now for future.
P 3: Case study 2 - 3:49 [-Some prefer f2fI wouldn't say..] (67:67) (Super)
Codes: [Technology exposure & Support Infrastructure]
No memos
-Some prefer f2fI wouldn't say it caters for everybody's learning styles but most of them because they are technologically inclined and they like working with technology and they like working with technology and figuring out new things
P 3: Case study 2 - 3:158 [students do not just do social..] (277:278) (Super)
Codes: [Technology exposure & Support Infrastructure]
No memos
students do not just do social media, they want to do everything online.
They're active but I expect them and it pushes them out of their comfort zone.
P 3: Case study 2 - 3:169 [I used to think that I would h..] (327:327) (Super)
Codes: [Technology exposure & Support Infrastructure]
No memos
I used to think that I would have to go through a whole lesson, a week of showing students how to log on, where's the url, user name, password and – but I found I was wasting their time and my time.
P 3: Case study 2 - 3:185 [anxiety around computers. you ..] (370:370) (Super)
Codes: [Technology exposure & Support Infrastructure]
No memos
anxiety around computers. you could argue that they're computer literate
P 3: Case study 2 - 3:250 [more important to get all the ..] (609:609) (Super)
Codes: [gov initiiatives - Family: COUNTRY'S ED CONTEXT CASE 1] [ICT skills] [Technology exposure & Support Infrastructure]
No memos
more important to get all the students computer literate, to get all students Smartboard literate
P 3: Case study 2 - 3:253 [government, maybe giving acces..] (613:613) (Super)
Codes: [country curriculum - Families (2): COUNTRY'S ED CONTEXT CASE 1, COUNTRY'S EDUCATIONAL CONTEXT] [gov initiiatives - Family: COUNTRY'S ED CONTEXT CASE 1] [Technology exposure & Support Infrastructure]
No memos
government, maybe giving access to computers in schools earlier, before they get to high school.
P 3: Case study 2 - 3:259 [-access to computers or comfor..] (645:645) (Super)
Codes: [lack of ICT skills - Family: Hindrances] [Technology exposure & Support Infrastructure]
No memos
-access to computers or comfort with ICT as well could be an issue for some students
P 3: Case study 2 - 3:267 [Most of them have smartphones...] (646:646) (Super)
Codes: [Technology exposure & Support Infrastructure]
No memos
Most of them have smartphones. my Moodle site is simpler than a lot of those things that they are doing on social media like the facebook.
P 3: Case study 2 - 3:272 [-if every child is able to att..] (653:653) (Super)
Codes: [4. Country's Context - Family: Hindrances] [Global exposure and participation] [Job market] [Technology exposure & Support Infrastructure] 71

No memos

-if every child is able to attend computer lessons in primary school, for example. Whether they're in your rural school or a Model C School that will affect, ultimately affect how the person is able to use technology later on

P 3: Case study 2 - 3:293 [sometimes I find that they kno..] (725:725) (Super)

Codes: [Technology exposure & Support Infrastructure]

No memos

sometimes I find that they know how to do things that I may not necessary have known

_____

Code: They make their own question {0-0}~

_____

Code: they will be distracted and I .. {1-0}~

P 3: Case study 2 - 3:161 [they will be distracted and I ..] (284:285) (Super)

Codes: [they will be distracted and I ..]

No memos

they will be distracted and I actually think the participation level will be low

-believe in f2f approach more

_____

Code: They're as diverse as the stud.. {1-0}

P 2: Case study 1 - 2:164 [They're as diverse as the stud..] (346:346) (Super)

Codes: [They're as diverse as the stud..]

No memos

They're as diverse as the students.

_____

Code: they've got to send a request .. {1-0}

P 3: Case study 2 - 3:269 [they've got to send a request ..] (648:648) (Super)

Codes: [they've got to send a request ..]

No memos

they've got to send a request to Durban.

_____

Code: TN L policy-Gov legislation and policies linked {1-0}

P 6: TEACHING AND LEARNING POLICY - 2006.pdf - 6:1 [Department of Education, Depar..] (1:394-1:736) (Super)

Codes: [TN L policy-Gov legislation and policies linked]

No memos

Department of Education, Department of Labour, Council for

Higher Education (CHE), The Higher Education Quality

Committee (HEQC), South African Qualifications Authority

(SAQA), South African Qualifications Authority (SAQA)

Industrial and/or Professional Councils: (eg Engineering 72

Council of South Africa, Medical and Dental Council)

_____

Code: tnl-policy provision {1-0}~
P 6: TEACHING AND LEARNING POLICY - 2006.pdf - 6:4 [This policy provides for the a..] (1:2110-2:445) (Super)
Codes: [tnl-policy provision]
No memos
This policy provides for the alignment of institutional teaching
and learning strategies, with regard to: 1. Infrastructural support for Teaching and Learning
2. SAQA criteria and guidelines for the generation of
qualifications and short courses.
3. HEQC programme evaluation criteria 1 (Learning
Activities) and 5 (Teaching and Learning Strategy)
4. HEQC institutional audit criterion 2.21 (Teaching and
Learning)
5. Disciplinary best practices
6. Professional/Industrial council recommendations
7. Affirmation of student diversity

_____

Code: tnl -language {1-0}
P 6: TEACHING AND LEARNING POLICY - 2006.pdf - 6:6 [2 All student guides should in..] (5:1975-5:2131) (Super)
Codes: [tnl -language]
No memos
2 All student guides should include support for students'
language development, such as wordlists, or should refer
students to multi-lingual dictionaries

_____

Code: tnl policy-objective {1-0}
P 6: TEACHING AND LEARNING POLICY - 2006.pdf - 6:3 [To provide parameters and guid..] (1:1363-1:1507)
(Super)
Codes: [tnl policy-objective]
No memos
To provide parameters and guidance for quality practices in
teaching and learning, leading to improved student access,
retention, and success

_____

Code: TnL policy-policy groups {1-0}~
P 6: TEACHING AND LEARNING POLICY - 2006.pdf - 6:2 [Curriculum; Assessment; Langua..] (1:55-1:255) (Super)
Codes: [TnL policy-policy groups]
No memos
Curriculum; Assessment; Language Policy; Experiential
Learning; Quality Assurance, Recognition of Prior Learning;
Staff Development, Student Admissions and Access; Student
Support and Development 73

_____
Code: tnl teacher development {1-0}~
P 6: TEACHING AND LEARNING POLICY - 2006.pdf - 6:5 [Development of academic staff ..] (4:98-4:172) (Super)
Codes: [tnl teacher development]
No memos
Development of academic staff with regard to teaching and
learning method

_____
Code: to balance the mix gender {1-0}
P 2: Case study 1 - 2:97 [to balance the mix gender] (159:159) (Super)
Codes: [to balance the mix gender]
No memos
to balance the mix gender

_____
Code: training support {2-1}
P 3: Case study 2 - 3:69 [we do have work integrated lea..] (110:110) (Super)
Codes: [training support]
No memos
we do have work integrated learning or clinical training
P 3: Case study 2 - 3:280 [professional training by INTEC..] (680:680) (Super)
Codes: [Professional development - Family: PEDAGOGICAL FRAMEWORK] [training support]
No memos
professional training by INTEC

_____
Code: trends overseas eventually spi.. {1-0}
P 2: Case study 1 - 2:182 [trends overseas eventually spi..] (382:382) (Super)
Codes: [trends overseas eventually spi..]
No memos
trends overseas eventually spill over to South Africa.

_____
Code: type of students {1-1}
P 3: Case study 2 - 3:177 [we don't have a lot from rural..] (340:340) (Super)
Codes: [Group dynamics - Family: Groups] [Group dynamics [Clone: 1] - Family: Groups] [type of students]
No memos

we don't have a lot from rural – more are from the cities because they're mostly working in industry 74

_____

Code: type of subject on lms {1-0}
P 4: e-Learning policy 2011.pdf - 4:31 [Subjects incorporating e-learn..] (6:2773-6:2986) (Super)
Codes: [type of subject on lms]
No memos
Subjects incorporating e-learning shall be regular CPUT
University academic department subjects, approved through the
usual curriculum approval processes and as defined by the
appropriate academic departments

_____

Code: underresourced schools {1-0}
P 3: Case study 2 - 3:243 [OER's initiatives to be suppor..] (600:600) (Super)
Codes: [open courseware - Family: CONTENT] [socioeconomic - Family: PEDAGOGICAL FRAMEWORK]
[underresourced schools]
No memos
OER's initiatives to be supported at schools where there's a big shortage of textbooks and we always hear of non-
delivery or short delivery of textbooks and kids don't have this and that and it costs a fortune.

_____

Code: underutilized resources {1-0}
P 2: Case study 1 - 2:249 [I've been to schools where I'v..] (636:636) (Super)
Codes: [underutilized resources]
No memos
I've been to schools where I've seen they've got all the resources they have, they hardly use it.

_____

Code: unreadiness {3-2}
P 2: Case study 1 - 2:137 [Some students have a very low ..] (229:230) (Super)
Codes: [lack of ICT skills - Family: Hindrances] [unreadiness - Family: MOTIVATION] [Work ethics]
No memos
Some students have a very low work ethic. Two, they have a very poor conceptual understanding of what they did at
school. Three, they are not well prepared for the world of university and then some of them can't even use a
computer. that's why we have what we call a Basic Computer Literacy Programme.
- one of the main challenges is time.
P 3: Case study 2 - 3:71 [they go through a rigorous NBT..] (112:112) (Super)
Codes: [Screening - Family: PEDAGOGICAL FRAMEWORK] [unreadiness - Family: MOTIVATION]
No memos
they go through a rigorous NBTs test as screening procedure, So when you analyse those results you discover that;
Some of them can't even spell or some of them can't even read, some of them can't even write
P 3: Case study 2 - 3:255 [I think we just have to be car..] (618:619) (Super)
Codes: [Mot-attitude - Family: MOTIVATION] [Quality education - Family: PEDAGOGICAL FRAMEWORK]

[unreadiness - Family: MOTIVATION] 75

No memos
I think we just have to be careful with the quality right from school there needs to be a different way of teaching or getting people to engage. New students expect to be spoonfed
Attitude : but we're paying to come here and be taught

_____

Code: value systems {8-5}
P 2: Case study 1 - 2:93 [In that way I think there's va..] (158:158) (Super)
Codes: [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
In that way I think there's value in it in the sense that they can speak to each other
P 2: Case study 1 - 2:104 [sometimes you find students wi..] (166:166) (Super)
Codes: [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
sometimes you find students will want to associate with whoever shares the same values as them, whoever it is that they can easily relate to. That's what I have found. But sometimes, what I also do is I encourage THEM to choose whoever they want to work with, culture, race etc.
P 2: Case study 1 - 2:106 [spirit of collaboration and te..] (167:167) (Super)
Codes: [collaborative learning - Family: PEDAGOGICAL FRAMEWORK CASE 1] [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
spirit of collaboration and teamwork
P 2: Case study 1 - 2:110 [based on their value systems, ..] (169:172) (Super)
Codes: [cultural dynamics] [Group dynamics - Family: Groups] [Group dynamics [Clone: 1] - Family: Groups] [value systems - Family: PEDAGOGICAL FRAMEWORK]
No memos
Based on their value systems, religions, and culture preferences: Group 1 is actually a mixed, as I say but it's a typical; There's two males, black with three coloured, coloured but from rural areas females.
= the next group is a typical coloured Cape Flats group is a combination again of Muslim with white, but white English females. The fourth group pure Afrikaans white females.
the next group is again black with only one boy. That boy is not even from the Western Cape. Black femaless, one black male. the next group is coloured females only. So, they group themselves according to how they feel comfortable e.g.in their religion or sociocultural..
In Group8 There's three boys and five girls. they're all Muslim.