

University of KwaZulu - Natal
Inyuvesi yakwa Zulu - Natal

**Perceptions of Technical and Vocational Education and Training (TVET) lecturers
on Digital Learning: A case of Umfolozi TVET.**

**Dissertation submitted in partial fulfilment of the requirements of the degree of
Master of Business Administration**

Graduate School of Business and Leadership
College of Law and Management Studies

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DECLARATION

I, Nandipha Mbanga, declare that:

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Signature: Nandipha Mbanga

Date : 15 January 2018

DEDICATION

I dedicate this thesis to the Lord Almighty for His grace, love and protection throughout the course of my studies. Part of this work is dedicated to all women, especially from the African continent, for their ability to support, shape and instil the attributes of virtue and work ethic to their offspring under trying circumstances.

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ABSTRACT

Key words: Perception; digital learning; TVET lecturers; mixed method, DHET

This study investigated the perceptions of TVET lecturers towards digital learning at Umfolozi TVET College. The main objectives that guided the study were to determine the perceptions of Umfolozi TVET lecturers on digital learning; to investigate the link between the perceptions of the lecturers and the application of digital learning; to assess the readiness and willingness of Umfolozi TVET lecturers towards the application of digital learning; and to establish the support that the DHET is providing their lecturers for eLearning readiness.

The study adopted a mixed method research methodology to investigate the phenomenon, and utilised exploratory research. The study was conducted among 125 lecturers and management at Umfolozi TVET College; both stratified and purposive sampling methods were used to select the participants for the study. A sample size of 75 respondents were selected for both quantitative and qualitative studies. Questionnaires and interviews were the main instruments for data collection, with data quality control being achieved through validity, reliability, trustworthiness and credibility. The quantitative data gathered were analysed by the Statistical Package for the Social Science (SPSS), version 24.0, while the qualitative data gathered were transcribed manually with the help of thematic analysis and transcription. Ethical approval was obtained from the Social Science Research Ethics Committee of the University of KwaZulu-Natal.

The findings from both studies revealed that TVET lecturers perceive that digital learning facilitates interactions and discussions between lecturers and learners, facilitates easy learning in schools, is convenient to use, facilitates and improves teaching, and is user friendly. Furthermore, the findings showed that there is a link between the perceptions of the TVET lecturers and the application of digital learning. Moreover, the TVET lecturers are not ready and willing to apply digital learning in the College. The study recommends that the College, instructors and students are evaluated prior to the implementation of digital learning; the appointment or recruitment of qualified instructors; the adoption of technology; the provision of infrastructure, software, hardware, IT manuals and reading materials; and the training of lecturers.

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CHAPTER 1

GENERAL INTRODUCTION AND OVERVIEW

1.1 INTRODUCTION

“The 4th Industrial Revolution is seen as the pervasiveness of digital technologies that are fusing the physical, digital and biological worlds, and affecting everything about human existence, in particular economies and industries” (Nzimande, DHET budget speech 2017). This revolution is changing the way in which human beings live, work and relate to one another. The reality of this phenomenon is that it presents both a big opportunity and simultaneously a threat to the development of the African continent. Whilst it is an opportunity to fast track economic development, it can also be a platform for the further reproduction of unequal global economic development. In engaging with this reality, human beings have to at the same time develop skills for the industrialisation of the African continent. The emergence of the 4th Industrial Revolution forces humans to ponder on what kind of institutions they require in their post-school system, and in particular, what kind of TVET colleges are needed. The most important skills needed are those that will enable people to be critical, agile, and adaptable to rapid digital technological changes. Building up the abilities of the populace, especially the TVET personnel and learners, are at the heart of the South African transformation agenda (Nzimande, 2017).

Following the 4th Industrial Revolution, the South African government embraced the introduction of information and communication technology (ICT) to support teaching and learning among schools in the country. Several scholars and stakeholders of education have suggested the necessity to move from the conventional lecture room scenario, where students are viewed as unassertive recipients of instructive learning, to a state where interactivity, cooperation and collaboration is prioritised (Nyambane & Mzuki, 2014). In order to support this inevitable change, equipment and programming designers have introduced contemporary innovative apparatuses, more particularly tablet gadgets, as powerful implements to support teaching and learning in schools. Ally (2016) discovered that two-thirds of the global population have a mobile telephone, thus the widespread use of digital gadgets is compelling lecturers to implement digital learning in their classrooms.

The South African government has invigorated teachers as well as lecturers across the country to employ modern technologies in order to convey learning or educational programmes. Over the years, the government has provided innovative apparatuses to schools and prepared educators on the best way to utilise them (Sherman & Howard, 2012).

According to (Du Toit, 2005:1), the Education Department in the Western Cape rolled out the Khanya Project in 2001 with a view to promote learning and maximise educators' capacity to use appropriate, available and affordable technology during curriculum delivery" During 2007, 76% of schools in the Western Cape were provided with computer laboratories (Isaacs, 2007; Sherman & Howard, 2012). Similarly, the 'one laptop per child' project was introduced in Gauteng, which provided some schools with tablets, laptops and smart boards to assist in teaching and learning (Makhubu, 2014).

Lund (2012) affirmed that rules for the circulation and utilisation of computerised assets in schools, with the end goal that value and quality in instruction might be accomplished at all levels, has been endorsed by the South African Department of Education through its digital learning strategy instruction as well as the White Paper on e-instruction. Furthermore, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) is advocating for digital learning in order for TVET to be socially and economically relevant in the 21st century. It is in light of this that digital learning (DL) was introduced in TVET Colleges.

TVET remains the most common means where 'trained human resources or manpower are produced for both the economic and industrial growth in developed and developing nations across the world' (Bappa-Aliyu 2012:52). Many countries are integrating TVET across almost all educational levels, i.e. primary, secondary and tertiary institutions. TVET is also a space which is drawing in analysts as well as educationalists around the world, given its role in the socio-economic development of many countries. Research by (Karahocaa, Duldaa, Karahocaa, Yücela, Gulluoglua & Arifoglua, 2015) proposed that the orientation of TVET in tackling the problems of joblessness, poverty and the leap forward in mechanical advancement means that it is one of the sectors that demands the full employment of DL. Yasak and Alias (2015) contended that TVET has evolved from providing well-trained basic operators to providing professional knowledge workers, Yasak and Alias (2015:47) stipulate that the "primary goal of skills training in TVET Colleges globally is to equip youth or learners with practical techniques and skills based on professional knowledge as opposed to manufacturing well-trained basic operators".

Mlitwa and Van Belle (2013) also referred to DL as the application of technological interferences for training, studying and evaluating students to enhance critical thinking abilities, adding that it engages lecturers to spread and give information adequately. According to Mead Richardson and Herd (2015), the promise and potential of DL in TVET globally is now expected to provide graduates who have a much wider set of competencies, in addition to those traditionally required for employment. TVET institutions and their

lecturers are expected to transform into collaborative, responsive, learning organisations to reflect the operating alertness required by businesses. Richardson perceives DL as the key element that will enable graduates to achieve global competencies.

Saud, Shu'aibu, Yahaya and Yasin (2013) asserted that DL should be integrated and aligned to TVET courses, so that the graduates' learning is relevant to their work environments. However, it appears that DL in most TVET Colleges is non-existent. In view of this, Tondeur, Van Keer, Van Braak and Valcke (2014) called for the integration of DL to support teaching and learning in TVET Colleges. They contended that because of its ubiquitous nature, ease of use and financial accessibility, DL, particularly in TVET, has attracted interest from many educational institutions and stakeholders. Tondeur *et al.* (2014) advocated that the utilisation of DL to encourage employability is of paramount importance.

TVET has been an integral part of South African education and training for decades. Between 2012 and 2014 there was much active interest in the application and use of DL in TVET by the stakeholders in the education fraternity. According to the National Plan for 2017-2030, TVET forms the basis of the quality of learning delivered to students towards readiness for the world of work, and therefore towards preparation for employability. Given this imperative, the plan gives focused attention to the capability of the TVET colleges to meet this responsibility sufficiently in all learning programmes where the curriculum dictates the requirement for practical learning or application. Employability is a key success indicator for TVET output, consequently lecturers need to have a contingency plan to deal with the demands of the workplace and be able to equip their students for this prospect (Palvia, Baqir & Nemati, 2017).

Palvia *et al.* (2017) further advocated that TVETs, together with the Department of Higher Education and Training (DHET), have a huge part to play in guaranteeing the sufficient conveyance of the teaching resources for quality teaching and learning to take place.

Davies, Mullan and Felman (2017) also postulated that DL can enhance the productivity of running TVET Colleges, while 15 years of development work conducted in the United States of America confirmed that the employment of digital learning in the classroom can empower schools and colleges to enhance academic results while decreasing costs. Based on the usefulness of DL, publishing companies as well as DL service providers are rolling up their sleeves to ensure that they provide the best digital solution for TVET. The question is, however, how do Umfolozi lecturers perceive DL considering the diversity of their campuses? A thorough review of the literature revealed that there is dearth of research on

perceptions of TVET lecturers towards the usefulness and application of DL, thus it is the current study's intention to research the perception of TVET lecturers regarding DL, citing Umfolozi College as the case study organisation.

The literature suggests that there is a perceptual disjuncture in the TVET literature regarding the introduction and utilisation of DL, which this study aims to address. Again, literature reveals that there are limited studies assessing the readiness and willingness of TVET Colleges to introduce DL. In order to fill this gap, the current intends to empirically investigate the readiness and willingness of Umfolozi TVET to implement DL.

1.2 BACKGROUND TO THE STUDY

The Programmed Logic for Automatic Training Operations (PLATO), a computer-based training, was developed in 1960 at the University of Illinois, Urbana-Champaign, by Professor Don Bitzer (Carrier, Damerow & Bailey, 2017), and is acclaimed as the original model of DL. PLATO assisted students to participate in learning via computers and online connections using super and minicomputers, and since then, lecturers and technicians have worked tirelessly to devise more modern and improved methods to enrich teaching and learning. This shows that DL is certainly not a new concept; PLATO in the 1960s already had dialogue mediums, electronic testing and emails.

According to Carrier *et al.* (2017), the personal computer was invented in the 1980s. Since this time of the 1980's, there has been a substantial build up in, and demand for, the assortment of methods of digital learning.

Personal computer-aided learning advanced briskly, and updated learning supplies, class activities and classrooms were altered to accommodate the new form of digital learning. More than three decades later, digital learning is here to stay.

- According to Isaacs (2017), UNESCO has been vocal about significant changes in the TVET sector, including pushing for significant changes in the conceptualisation, administration, subsidisation and association of TVET to guarantee that the division is fit for reacting viably to the numerous financial, value and practical transformational difficulties of the 21st century. The Third International Congress on Technical and Vocational Education and Training, "Changing TVET: Building aptitudes for work and life', which was held in Shanghai in May 2012, delegates from 107 nations examined the role of TVET in far reaching and economic improvements.

Following this, in the second conference, delegates assessed the change TVET expected to accomplish, including better work, life and long lasting learning prospects. The resultant Shanghai Consensus influenced proposals for governments to empower TVET frameworks to react to the challenges that TVET colleges were expected to accomplish. This includes better work, better life and long lasting learning prospects. One of the Congress' central proposals, under the heading“ ‘Enhancing the relevance of TVET’, was “to promote the integration of digital learning in TVET to reflect the transformations taking place in the workplace and in society at large” (Isaacs, 2017).

Latchem (2017) stated that the principle international announcement on DL in education and training, the Qingdao Declaration, was made at the finale of the International Conference on DL and Post-2015 Education in Qingdao, China (UNESCO, 2015). As per Latchem, the statement was endorsed by elite members of the education and training fraternity from more than 90 nations, which affirmed the representatives' aggregate comprehension of how to release the maximum capacity of DL to accomplish the educational focus on value, access, quality and deep rooted learning in the Sustainable Development Goals (SDGs) for 15 years.

Nevertheless, Carrier *et al.* (2017), found that while the use of DL in TVET. From the above scenarios, it is clear that DL learning is here to stay, as per UNESCO (2015) and Blade Nzimande's (2012) speech in Shanghai. UNESCO's vision for DL is “a world without boundaries where technologies support education to build inclusive knowledge societies”. The association of TVET lecturers has been improving employment in DL, both as a rule and as a method for changing TVET (UNESCO, 2011). Through UNESCO-UNEVOC, UNESCO's specific focus is on creating and enhancing specialised and professional instruction through systems administration and the trading of knowledge amongst all member states around the world. This has put the deployment of DL at the front of UNEVOC's motivation and cultivates their utilisation through workshops, courses and digital interactions (UNESCO-UNEVOC 2013).

The leader of the ESCOUNEVOC International Center for TVET, Shyamal Majumdar, considers that DL has a key role to play in extending access, enhancing quality and improving the importance of TVET. UNESCO-UNEVOC means to additionally investigate the potential for innovation, including mixed media, DL, versatile innovation, Massive Open Online Courses (MOOCs) and open instructive assets (OER) (OEB News Portal, 2016). The Commonwealth of Learning (COL), which is the intergovernmental association of the

Commonwealth of Nations, was created to advance and build up the utilisation of open and distance learning (ODL) across all the Commonwealth's 54 member states. The COL has additionally been helping services and establishments in Commonwealth nations with the Technical and Vocational Skills Development Initiative, which concentrates on the development of policy, competence and viable employments of new innovation to benefit course advancement and quality development in impoverished areas where resources are lacking (Charles-Ogan & Williams, 2015).

Conversely, while the use of DL-based techniques in TVET is written about in reports and strategies, they are not yet broadly and reliably actualised in education in numerous nations, particularly those that are impoverished. In the 21st century, change is inevitable; the main test for TVET is the ability to change its teaching and learning situations to ensure teaching effectiveness, pertinence and the cost of quality successfully (Mohamed & Peerbhay, 2012).

In South Africa, education has been in the spotlight for a number of years, with numerous changes introduced to the curriculum, notably the outcomes-based approach and the learner-oriented approach. According to Nkohl (2014:1), the motive for such changes has been to advance the quality of education for the purpose of growing a knowledge economy that can innovate and present prospects for further economic growth. South Africa's education system is controlled by two national divisions, namely the Department of Basic Education (DBE) and the Department of Higher Education and Training (DHET). The DBE is in charge of primary and secondary school education; it regulates state-funded schools, tuition-based schools, early childhood development (ECD), and special requirements schools.

The DHET's mandate, meanwhile, is tertiary education and vocational training. It presides over Technical and Vocational Education and Training (TVET), adult basic education and training centres (ABET), as well as higher education (HE) institutions, i.e. universities and universities of technology (Education Institutions in South Africa, 2017). TVET embraces career-focused, job-related and artisan instruction and preparation. This band of education and training is also alluded to as post-school education, which encompasses training and the preparation that happens in the wake of leaving school, regardless of whether just with a Grade 9 finished. The main age limitation for a student wishing to learn at the TVET level is that the individual ought to be 16 years or older. There are 50 listed and licensed open TVET schools in South Africa, which run in more than 264 sites throughout the country (Education South African Government, 2017).

Michau, Gentil and Barrault (2015) recommended the use of DL around the development of graduates, adding that the daily tuition ought to encompass the deployment of computerised system of teaching and DL. DL qualifies students, apprentices and lecturers to get access to a body of literature and useful information that they would not access under conventional circumstances.

In this regard, Michau *et al.* (2015) described DL as the utilisation of electronic innovation and media to convey, maintain and upgrade education, learning and evaluation. There is general consensus amongst educational practitioners that DL employs procedures and technology to make, circulate, oversee, and empower learning by means of an electronic system.

A number of reasons triggered this study, including that TVET lecturers and Colleges have different perceptions about the application of DL in teaching and learning. While some believe that DL is important for the survival of TVET Colleges, others argue that it is crucial for their survival in the 21st century. Furthermore, there is scarce research in the South African education landscape in relation to the readiness and willingness of TVET lecturers, TVET Colleges and the DHET to introduce and apply DL in schools. To fill this gap, this current study conducted empirical research amongst TVET lecturers and management at Umfolozi TVET in order to determine their readiness and willingness regarding the implementation and application of DL.

1.3 PROBLEM STATEMENT

The DL concept was employed in the 1990s, when it emerged across South African Higher Educational Institutions and was known to facilitate online learning through network technologies (Ravjee, 2013). In the South African context, DL practices appear in many literature with new vocabulary, policies and structures, as well as budgets. DL has been seen as an aspect of technology-enhanced practice in HE including TVET Colleges which range from e-mail provision, online journals, and networked libraries, to the development of creative software solutions for information management tasks in teaching, research and administrative systems” (Ravjee, 2013:168). In addition to this, Sibanda and Donnelly (2014:230) saw DL as a “flexible learning using ICT resources, tools and applications, focusing on accessing information, interaction among teachers, learners, and the online environment collaborative learning, and production of materials, resources and learning experiences”. Based on these benefits, the study serves to investigate the perceptions of TVET lecturers on digital learning.

According to Isabirye and Dlodlo (2014), the importance of DL in education cannot be over-emphasised. However, the initiation of DL in the South African education framework, and TVET in particular, led to several challenges and compelled lecturers to have DL-based employable aptitudes. This challenge demands a general reorientation in the courses that are offered at TVET. Above all else, research on the pertinence of the reconciliation of DL in teaching and learning at TVET Colleges in SA is extremely constrained. Furthermore, the literature on DL in the South African context suggests that little has been done about the perceptions of TVET lecturers regarding the integration of digital learning in teaching and learning. To fill this gap, this study seeks to empirically investigate the perceptions of TVET lecturers on DL at Umfolozi TVET College. This study will contribute towards the literature available at TVET colleges.

1.4 AIMS OF THE STUDY

The broad aim of the study is to investigate the perceptions of TVET lecturers towards DL at Umfolozi TVET College. In addition, the study aims to assess the readiness and willingness of Umfolozi TVET lecturers to incorporate the DL in teaching.

1.5 OBJECTIVES OF THE STUDY

The study seeks to address the below research intentions:

- i. To establish the perceptions of Umfolozi TVET lecturers on digital learning.
- ii. To investigate the link between the perception of lecturers and the application of digital learning.
- iii. To assess the readiness and willingness of Umfolozi TVET lecturers for the application of digital learning.
- iv. To establish the support that the DHET is providing their lecturers for eLearning readiness.

1.6 RESEARCH QUESTIONS

This research aims to unearth responses to the below research inquiries:

- i. What are the perceptions of Umfolozi TVET lecturers on digital learning?*
- ii. Is there a causal link between the perceptions of TVET lecturers and the application of digital learning at Umfolozi TVET College?*
- iii. Are Umfolozi TVET lecturers ready and willing to apply digital learning in their classrooms?*
- iv. What is the initiative of the DHET in ensuring that TVET lecturers are well trained when it comes to digital learning application at Umfolozi TVET?*

1.7 SIGNIFICANCE OF THE STUDY

This research is significant in many ways. Primarily, the findings emanating from this study will add to the body of knowledge on digital learning not only in South Africa but also in the global context, which will serve as a reference point for scholars, academics and researchers who intend to carry out similar studies in this field. The outcomes of the study will extend frontiers of knowledge in the area of digital learning. Furthermore, the findings from the study will be useful to the government, TVET Colleges and the DHET when formulating policies on digital learning. The study will also help these policy-makers when developing comprehensive policy documents on digital learning. Again, the study will help TVET lecturers and Colleges to adopt digital learning in teaching and learning. The key findings from the study will serve as a guide to the TVET institutions that are using digital learning in the area of teaching and learning. Moreover, the study is significant in that it will help learners to embrace digital learning, thus helping them to improve their academic performance.

1.8 SUMMARY OF THE RESEARCH DESIGN AND METHODOLOGY

Chapter 3 of this study provides the description of the research design and methodology which guides the research study. Garg and Kothari (2014:7) advocated that research methodology should be explored in order to give meaning and a solution to the research problem, while Bryman and Bell (2015:49) suggested that a research design serves as a structure that collects and analyses data; it is the blueprint that researchers can utilise in order to give resolutions to research questions.

The study adopted an exploratory research methodology to empirically investigate the perceptions of Umfolozi TVET lecturers on DL. The choice of this approach was due to the lack of existing research on the use and application of DL in TVET. The study further adopted mixed methods to explore the phenomenon being studied. McMillan and Schumacher (2014) postulated that the mixed method approach augments the legitimacy and trustworthiness of results found through qualitative and quantitative data. Mixed methods involve gathering, analysing, and integrating both quantitative and qualitative data in the same study. There are different kinds of mixed method approaches, including sequential explanatory, sequential exploratory, sequential transformative, concurrent triangulation and concurrent transformative. Sequential exploratory was adopted for this study.

The study was conducted at Umfolozi TVET College, which is one of the nine public Technical and Vocational Education and Training Colleges in KwaZulu-Natal province. The College has five main campuses, namely Chief Albert Luthuli, Eshowe, Esikhawini, Mandeni and RichTek.

The study utilised stratified and purposive sampling techniques to hand pick the participants. Saunders, Lewis and Thornhill (2016) explained that a purposive sampling technique is often used when the researcher uses his/her judgment to choose cases that will best qualify him or her to answer and meet the research objectives. According to Pylkkönen, Drugman and Bisani (2016), stratified sampling is a notable strategy to use to ensure that the sample is representative of all possible occasions and has adequate variation. The main aim is to separate the population into groups called strata, and randomly sample from each group (stratum) separately.

The main data collection instruments in this study were interviews and questionnaires. A personal interview is a social relationship which is designed to facilitate the exchange of information between the interviewees and the researcher (interviewer). Questionnaires, on the other hand, contain a list of items designed to gather information from a particular group of people (Sekaran & Bougie, 2016). Preceding the data collection, a pilot study was conducted to test the research instruments. The data quality control in this study was achieved through validity, reliability, trustworthiness and credibility. The qualitative data gathered from the participants were transcribed and analysed manually through the help of thematic analysis. Quantitative data, on the other hand, were analysed with the help of

Statistical Package for the Social Science (SPSS), version 24.0. The quantitative data analysis employed both descriptive and inferential statistics. The descriptive statistics used were frequency, percentage, mean and standard deviation, while the inferential statistics used included Pearson's product correlation coefficient, multiple regression analysis, analysis of variance (ANOVA), structural equation modelling, chi square, bivariate data analysis and T-tests. Ethical clearance for the study was acquired from the Social Science Research Ethics Committee of the University of KwaZulu-Natal.

1.9 SUMMARY OF THE CHAPTER

This chapter presented a general overview of the study in relation to DL in TVET. It is evident that DL can contribute significantly to the socio-economic development of a developing country. It has also been identified that TVET in particular is regarded as being an instrument that alleviates poverty and enriches production and efficiency. The chapter included the motivation for the study, as well as the focus, problem statement, research questions, research objectives, and summary of the research methodology. The following chapter presents the empirical and theoretical literature on digital learning and TVET.

1.10 STRUCTURE OF THE STUDY

The study has been structured as per the below:

Chapter 1: Introduction and overview: Serves as the introductory chapter, which includes the motivation for the study, the focus of the study, the problem statement, research questions, research objectives, and a summary of the research methodology.

Chapter 2: Literature review: This chapter reviews related literature on digital learning and provides operational definitions of key terms such as perception, digital learning and TVET. It also examines the concept of digital learning from different countries. In addition, the chapter focuses on addressing all the objectives as highlighted above. Furthermore, a conceptual framework is presented and discussed.

Chapter 3: Research design and methodology: This chapter describes the research design and methodology used, and focuses the discussion on the research design, research method, sampling techniques and procedures, data collection instruments, validity and

reliability of the research instrument, data analysis and presentation of results and ethical principles.

Chapter 4: Presentation and analysis of the qualitative data: This chapter presents, analyses, interprets and discusses the findings emanating from both the qualitative and quantitative studies in relation to objectives of the study.

Chapter 5: Presentation and analysis of the quantitative data: This chapter provides and presents, analyses, interprets and discusses the findings which emerged from the study in accordance with all the objectives outlined above.

Chapter 6: Discussion of the findings: Chapter 6 of the study discusses both the qualitative and quantitative findings emerging from the study. Discussions are linked to each of the objectives.

Chapter 7: Conclusion and recommendations: Chapter 7 of this study provides a conclusion and recommendations in respect of the findings emanating from the study as per each objective. Its scholarly contribution to research on the perceptions of TVET lecturers towards digital learning is also included. A suggestion for further research is also furnished in this chapter.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter introduced the study, while this chapter will delineate and discuss the literature on DL. Is there a correlational or causal relationship between the perceptions of TVET lecturers and their assimilation of ICT or DL in the classrooms? In order to find out, the literature presented in this chapter was used to answer the research questions and objectives outlined in the previous section. In relation to the literature utilised in the study, academic journals, scholarly books, books and official documents were examined. This review provides information on what research has been done on the perceptions of TVET lecturers on the assimilation of DL in their classrooms. This theoretical and empirical literature review helps to determine what agreements or inconsistencies there are in previous research, which informs the study on what gaps are in existence in this field of research and how this particular one can assist in closing those gaps. Ultimately it will equip digital learning material providers about the digital solutions on offer to TVET colleges.

2.2 DEFINITION OF KEY TERMS

The three key words which form the central pillar of this study are perceptions, DL and TVET.

2.2.1 Perceptions

According to Michotte (2017), a perception is essentially one stage of the collection method of activity; its natural role is to start and direct the conduct of human beings and animals. Hamlyn (2017), on the other hand, advocated that perception can be attributed to the relationship or collaboration amongst living things and nature; it may not mean a solitary idea but instead a group of ideas

2.2.2 Digital learning

Carrier (2017:1) depicted DL as the employment of technology to the learning and teaching development. Hayes (2017:1) contended that DL may be portrayed as learning that is

encouraged by computerised advancements. Nonetheless, to examine DL only along these lines undermines the imperative intricacies connected to dialect, culture, legislative issues and the economy. She argued that speaking and expanding on learning as though it is straightforwardly encouraged by innovation of any sort puts a solid emphasis on what innovation has or is by all accounts accomplishing. She advocated that this underestimates or decreases the superb role of human contribution in the scholarly world and beyond (Hayes & Jandric 2014), adding that DL must contribute to economic improvements such as educational performance and efficiency.

On the other hand, Alliance for Excellent Education (2016) portrayed DL as any instructional practice that effectively uses technology to strengthen a student's learning experience. It emphasises high-quality instruction and provides access to challenging content, feedback through formative assessment, opportunities for learning anytime and anywhere, and individualised instruction to ensure all students reach their full potential to succeed in college and a career. DL comprises many different solutions or tools, as well as applications to support and empower lecturers, including online courses, blended or hybrid learning, and digital content and resources.

Davies, Mullan and Felman (2017:6) advocated that DL can improve the efficiency of running an education programme. Evidence from 15 years of project work in the United States suggests that systematic curriculum redesign using digital learning can enable institutions to improve learning outcomes and reduce costs simultaneously. On average, these projects achieved savings of 31 per cent, with 72 per cent of projects resulting in improved student outcomes, with outcomes in the other 28 per cent remaining constant.

2.2.3 Technical Vocational Education and Training (TVET)

South African education is controlled by two national divisions, namely the Department of Basic Education (DBE) and the Department of Higher Education and Training (DHET). The DBE is accountable for primary and secondary school education and regulates public schools, private schools, early childhood development (ECD) centres, and special needs schools.

On the other hand, the DHET's mandate covers tertiary education and vocational training. It presides over TVET, adult basic education and training centres (ABET) as well as higher education (HE) institutions, i.e. universities and universities of technology (Education I

institutions in South Africa 2017). TVET comprises vocational, occupational and artisan education and training. This band of education and training is also referred to as post school, meaning it refers to education and training that takes place after leaving school, even if only with a Grade 9 completed. The only age restriction for a person wishing to study at the TVET level is that the person should be 16 years or older.

2.3 THEORETICAL BACKGROUND

From the literature, the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975), the theory of planned behaviour (TPB) (Ajzen, 1991), the technology acceptance model (TAM) (Davis, 1989), and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh, Morris, Davis & Davis, 2003) have been widely reported to be effective in predicting acceptance among users in educational settings. In the TRA, behaviour is posited to be determined by an individual's intention to perform the behaviour and intention is a function of that person's attitude toward the behaviour and his or her 'subjective norm' (Ajzen & Fishbein, 1980). While attitude toward behaviour refers to the amount of pleasure a person derives from performing a behaviour, subjective norm is defined as the extent to which an individual is motivated to comply with the views others hold about the behaviour. The TPB is an extension of the TRA, which includes perceived behavioural control, defined as what factors influence an individual's decision through that person's perception of how easy or difficult it would be to perform a behaviour (Ajzen, 1991).

The TAM was proposed by Davis (1989) with an expressed desire to explain a user's level of technology acceptance. In the TAM, actual technology use is determined by one's behavioural intention to use a particular technology, while behavioural intention is affected by one's attitude toward usage, and by the direct and indirect influences of perceived usefulness and perceived ease of use. Both perceived usefulness and perceived ease of use jointly affect attitude toward usage, whereas perceived ease of use has a direct impact on perceived usefulness (Davis, 1989). Having reviewed the above and five other models of technology adoption, Venkatesh *et al.* (2003) proposed the UTAUT to explain users' intentions to use technology and subsequent usage behaviour. This theory relies on four key constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) to predict both usage intention and behaviour. Considering the evidence drawn from empirical studies that employed the above theories and models, Teo (2010a) developed a model depicting technology acceptance as a multidimensional construct

comprising five factors: perceived usefulness; perceived ease of use; attitude towards technology use; subjective norm; and facilitating conditions (cf. Figure 2.1).

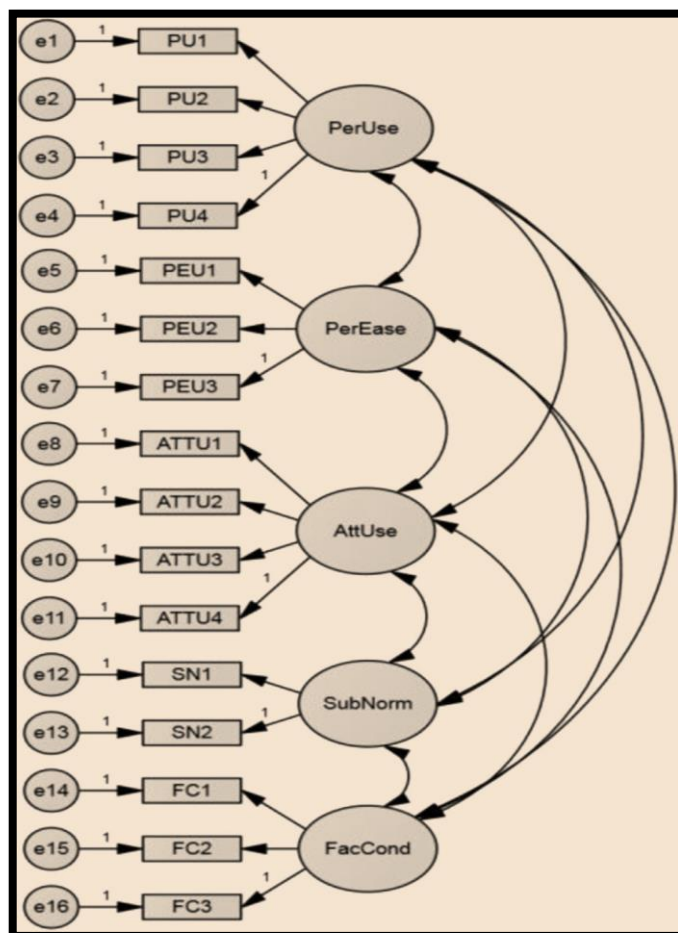


Figure 2.1: Model depicting technology acceptance as a multidimensional construct (Teo / Computers & Education 75, 2014:127–135)

The following theories were used as the foundation of this study:

- The Technology Acceptance Model (TAM).
- The Unified Theory of Acceptance and Use of Technology model (UTAUT).
- The Technical Pedagogical Content Knowledge model (TPACK).

2.4 REVIEW ON PERCEPTIONS OF TVET LECTURERES ON DIGITAL LEARNING

The study focuses on reviewing the perceptions of TVET lecturers on Digital Learning, which will eventually lead to its reception and implementation. Latchem (2017:28) advocated that digital learning can be performed ubiquitously; it can mostly serve the needs of students residing in rural, regional, inaccessible and socio-economically disadvantaged communities.

Nevertheless, it cannot happen on its own, *i.e.* it will never improve the performance of the TVET colleges if it is not utilised or accepted. Its effectiveness lies entirely in the acceptance of lecturers who are the facilitators of learning in the classroom. Montrieux *et al.* (2015:2) concurred by advocating that perceptions of lecturers are vital to the employment of digital learning at colleges.

The TAM proposed by Davies (1989) is one of the most often used and valid models regarding technology adoption (Teo *et al.*, 2012). TAM explains how users accept and use technology and focuses on two dimensions: perceived usefulness (PU) and perceived ease of use (PE) for technology acceptance. PU is defined as an individual's belief for a specific technology that affects one's work performance, whereas PE is defined as solely the belief of an individual for a specific technology. PU indicates one's attitude towards computer use, whereas PE indirectly indicates the attitude of an individual through PU (Davis, 1989; Davis *et al.*, 1989). PU and PE were actually incorporated in the theory of reasoned action (TRA) by Fishbein and Ajzen (1975). Both of these influence an individual's attitude towards using a system, which, in turn, explain the individual's behavioural intention to use the system. Besides these, perceived enjoyment was measured as an intrinsic motivator by Venkatesh *et al.* (2002). PU, PE, and perceived enjoyment were together described as 'technology acceptance factors' in a study by Hsu and Lin (2008).

The adoption approach describes and explains the adoption decision of users applying different individual and social decision making theories. Three widely used models include the TAM the Theory of Reasoned Action (TRA), and the extension of TRA into a Theory of Planned Behaviour (TPB) (Pedersen, 2003). The TAM (Van Akkeren & Cavaye, 1999) suggests that when a user is presented with a new technology, a number of factors influence their decision regarding how and when they will use it. This includes its perceived usefulness and its perceived ease of use. TAM is acknowledged to justify why users or lecturers adopt or neglect digital learning. According to TAM, one's actual use of a technology system is influenced directly or indirectly by the user's behavioural intentions, attitude, perceived usefulness of the system, and perceived ease of the system. TAM also proposes that external factors affect intention and actual use through mediated effects on perceived usefulness and perceived ease of use. According to Davis (1989), perceived usefulness and perceived ease of use are important factors that influence the attitude of individuals toward a particular technology. The TAM posits that perceived ease of use and perceived usefulness have a direct effect on one's attitude toward the use of digital learning, and perceived ease of use has a positive effect on perceived usefulness. Cheung and Vogel

(2013:164) defined attitude as the degree to which a user is interested in using the system, adding that attitude toward the system determines behavioural intentions, which in turn, lead to actual system usage.

However, the TAM does not account for the influence of personal control factors on behaviour. Other factors, such as economic factors and outside influences from suppliers, customers and competitors, are also not considered by the TAM (Van Akkeren & Cavaye, 1999).

Selim (2003:345) stated that there was a need to investigate TAM with web-based learning. He concluded that the model fitted the collected data and that the usefulness and ease of use turned out to be suitable determining factors of the acceptance and use of a course website as an operational and proficient learning technology. Perceived usefulness can be defined as the extent to which a lecturer believes using digital learning will boost his or her teaching. Meanwhile perceived ease of use is defined as the extent to which one believes using digital learning will be free of cognitive effort (cf. Figure 2.2).

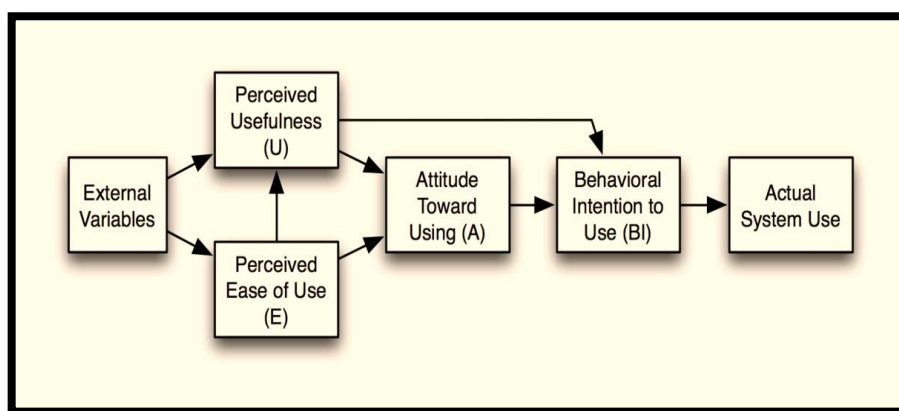


Figure 2.2: Technology Acceptance Model (Cloete & Courtney 2002:2)

2.5 CAUSAL LINK BETWEEN PERCEPTIONS OF TVET LECTURERS AND THE APPLICATION OF DIGITAL LEARNING

The Unified Theory of Acceptance and Use of Technology (UTAUT) is a technology acceptance **model** formulated by Venkatesh and others in "User acceptance of information technology: Toward a unified view". The **UTAUT** aims to explain user intentions to use an information system and subsequent usage behaviour. The UTAUT2 model was accepted and extended to examine lecturers' perceptions on acceptance and continual use of digital learning.

The UTAUT2 model was an extension of the UTAUT model of 2003. The core modifications made to the original model were the inclusion of three new constructs, namely price value, hedonic motivation, and habit, making a total of seven constructs. The seven constructs have been hypothesised to have direct determinants of usage intention and behaviour. The variables - gender, age, experience, and voluntariness of use - moderate the key relationships in the model. The UTAUT2 model is shown in Figure 2.3.

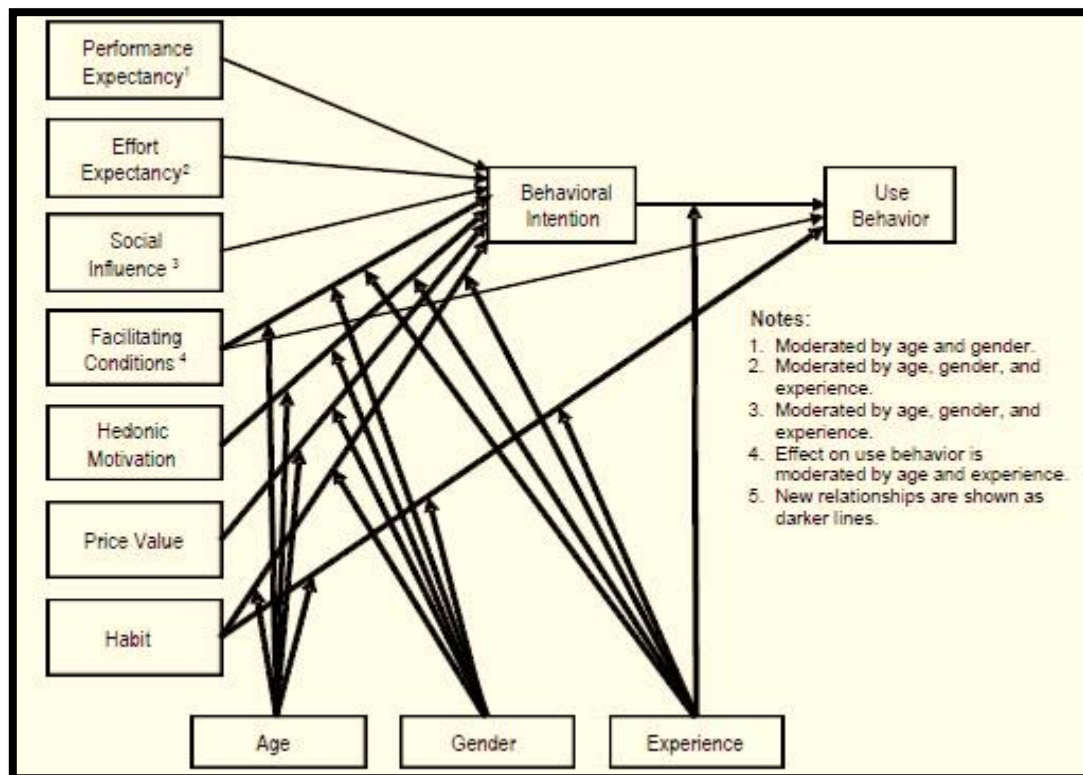


Figure 2.3: The UTAUT model (Venkatesh *et al.* 2012:160)

Performance expectancy

Performance expectancy is defined as the degree to which users believe that using a certain technology will enable them to accomplish activities more quickly and efficiently. It is the strongest predictor of acceptance and use of several applications in both voluntary and involuntary settings (Venkatesh *et al.* 2003). In TVET's perspective, this theory posits that lecturers will believe that digital learning will enhance their teaching environment as they will achieve their goals timeously and proficiently.

Effort expectancy

Effort expectancy is the level of simplicity associated with lecturers' use of technology (Venkatesh *et al.*, 2012). When technology is perceived to be user friendly, users intend to continuously use it Xu, Lin & Chan (2012). As per this study, for TVET lecturers to adopt and apply digital learning in their classrooms, they should perceive it to be user friendly.

Social influence

Social influence is the extent to which users perceive that important others (e.g. family & friends) believe they should use a particular technology Venkatesh *et al.* (2012). In the context of this study, it represents the degree to which lecturers perceive that others believe they should use multimedia-enhanced content. According to social influence theory, users tend to comply with other important referees' opinions Bagozzi & Lee (2002). Therefore, when people who are important to the lecturers (such as headmasters and colleagues) recommend the use of multimedia-enhanced content, they are likely to follow their suggestions. In this regard, it is important to include social influence as one of the constructs in the modified research model. The proposition is derived as follows: social influence has a positive effect on lecturers' acceptance and use of multimedia-enhancement.

Facilitating conditions are defined as the degree to which users believe that an organisational and technical infrastructure exists to support use of a certain technology Venkatesh *et al.* (2003). In this context, it refers to lecturers' perceptions of the availability of resources and support to use multimedia-enhanced content. These resources include availability of computers that can be used to access DVDs, a reliable Internet connection to access the LMS, and other related resources. Therefore, a lecturer's decision to accept and continue the use of digital learning content will be influenced by their perception of the availability of these resources. The proposition is derived as follows: facilitating conditions have an effect on teachers' acceptance and the use of digital learning content.

Habit

Habit is the inclination to repeatedly use technology as a result of learned behaviour Venkatesh *et al.* (2012). In addition, Venkatesh and his colleagues described habit as having both a direct effect on use and an indirect effect through behavioural intention. In this study, habit is the extent to which lecturers tend to use digital learning content repeatedly

because of learning. It is anticipated that lecturers will continuously employ digital learning content after they have interacted with and are familiar with the content in both LMS and DVDs. The proposition is derived as follows: habit has an effect on lecturers' acceptance and use of digital learning content.

Hedonic motivation

Hedonic motivation is defined as the fun or pleasure derived from using a certain technology Venkatesh *et al.* (2012). Users normally attach importance to good or happy feelings resulting from using the technology Xu *et al.* (2012), therefore lecturers will accept and continue to use the developed digital learning content if they feel good or happy when using it.

Hedonic motivation is defined as the pleasure derived from using a certain technology and was discovered to be more vital than performance expectancy Venkatesh *et al.* (2012). If lecturers cannot obtain enjoyment from using digital content, they may discontinue their usage due to an unpleasant experience. Hedonic motivation thus has an effect on lecturers' acceptance and use of digital learning content. Hedonic motivation is Venkatesh *et al.* (2012).

Behavioural Intention

Venkatesh *et al.* (2003) suggested that behavioural intention to use a given technology has a significant influence on usage behaviour. In this study, the behavioural intention has been adapted to be an independent variable to measure teachers' acceptance and use of multimedia-enhanced content.

Assimilating technology into the teaching and learning at TVET necessitates that the college personnel comply as they would be given a mandate to implement the process, but they are the ones who have to buy into and adopt the idea first. Ponnepureddy, Priskin & Ohnmacht (2017) argued that trusting the usefulness and reliability of the product will yield high perceptions, in other words, there must be a sense of trust that the product will yield the results it was intended to produce. It goes without saying that TVET lecturers need to believe that digital learning will do likewise. Lecturers also need to be made aware that the technology is not there to replace them or to replace good teaching, but is there to enhance

the learning process. The role of DL in teaching and learning needs to be evaluated from the perspective of teaching and learning rather as technology.

Blended learning, meaning the incorporation of digital learning into the classroom, should be portrayed as a means for adding the developing 'science of learning' to create valuable and competent learning experiences for students. Khambayat (2011) advocated that the emphasis should be on the learning and teaching of the subject matter, rather than on the use of digital learning.

2.6 DIGITAL LEARNING READINESS

Continuous learning is the most important aspect for dynamic organisations. E-learning provides the necessary environment and appropriate tools for task-oriented, up-to-date and continuous learning. Digital learning also makes organisations capable of training their geographically scattered workforce, giving them current knowledge and skills with greater efficiency but at less cost. Rohayani (2015) mentioned that, to introduce digital learning, colleges should be prepared with proper environmental and technological aspects. Readiness for an organisation intending to adopt DL can be defined as the mental or physical preparedness of that organization for some DL experience or action.

According to Edumadze *et al.* (2014:3), readiness denotes the situation or a circumstance of a person that makes it feasible for him/her to connect productively in a given learning activity. Digital learning readiness, however, alludes to the state or condition of colleges, lecturers and students to take part in utilising digital learning as an instrument of educational transmission.

Saekow and Samson (2011:126) advocated that it is important to understand that readiness isn't a one-time action; rather it is a continuous process. As more and more organisations decide to join and expand on DL interventions, it becomes critical to assess their readiness to utilise technology for a successful implementation and to match learning strategies with local needs. Moreover, in order to reduce the risk of DL interventions, past failures should also be scrutinised.

In agreement with the new belief in sustainable development, education is expected to provide communities with knowledge, skills and opinions that are pertinent to the demands of modern society. In order for TVET to be relevant and competitive in the global world,

there should be a focus on skills enhancement coupled with the technological innovations that modern society has grown accustomed to.

2.6.1 Components of digital learning readiness

Orazalina, Zavalko, Yessekeshova, Tashkenbayeva and Aldabergenova (2016:3477) explained that the college lecturer's readiness for using digital tools is denoted by three components: motivational, cognitive and operational. On the other hand, Kotsik, Tokareva, Boutin and Chinien (2009:1880) claimed that a specific state of affairs should happen before digital learning can be effectively executed in TVET; they identified strategic readiness, pedagogical readiness, organisational readiness, and technical readiness, which are described below.

2.6.1.1 *Strategic readiness*

Strategic readiness is accomplished by developing an inclusive master strategy for the incorporation of DL into TVET. The strategy ought to incorporate the vision, mission, values, objectives, strategies, time period and assessment plan for DL proposals, and is obligated to draw up a budget to accommodate expenditure correlated to hardware and software, connectivity, upkeep and staff coaching. Furthermore, the strategy has to depict the ideas of DL facilitated learning with regard to modern practices, and should be extensively circulated amongst every key partner.

2.6.1.2 *Pedagogical readiness*

Pedagogical readiness concentrates on the interaction between DL, the existing instruction and learning practice. To be pedagogically ready, TVET colleges need to complete an assessment on the compatibility of DL with the current philosophy of learning; an examination of diverse prospects for incorporating DL in TVET; and an appraisal of the technological proficiency requirements of teachers and learners, warranting that DL will meet the students' educational needs and that lecturers are able to encourage the incorporation of DL into their classrooms.

2.6.1.3 *Organisational readiness*

Organisational readiness concentrates on educators' contributions to incorporating DL into TVET. The accompanying key questions are utilised to measure organisational readiness. To what extent do TVET institutions embrace innovation and change? Do lecturers support the incorporation of DL in TVET? Has the vital authority been provided to champion and rally support for DL assimilation? Has the availability of training support systems been communicated to TVET lecturers?

Organisational readiness also ascertains that the necessary actions have been taken to ensure that TVET lecturers possess the necessary DL competencies. These competencies include conducting needs assessments to establish the DL comfort level of teachers; establishing minimum training standards; developing training plans; and instituting appropriate mechanisms to monitor training results.

2.6.1.4 *Technical readiness*

Technical readiness tackles issues identified with infrastructural necessities for DL incorporation. The following key question is used to assess technical readiness. Has a summary of existing technologies been established?

2.7 DIGITAL-LEARNING READINESS COMPONENTS

Government, industry, education, and society are identified as the key components in the first level of DL readiness. In the second level, readiness is evaluated based on connectivity; capability (a country's ability to deliver and consume digital learning, literacy rates, and trends in training and education); content; and culture. The finding by Rosenberg(2000) as cited by Assegaff,(2015) focused on the concept of sustainability and proposed the components of business readiness, the changing nature of learning and e-learning, the value of instruction and information, the role of change management, the reinvention of training organisations to support e-learning efforts, the e-learning industry, and personal commitment. Chapnick (2000) proposed the components of psychology, sociology, environment, human resources, finance, technology, equipment, and content readiness determine the DL readiness. Overall e-learning readiness is defined by seven key components.

- **College Readiness** refers to the link between a college's priorities and the characteristics of their digital learning efforts. Colleges operate in a highly competitive environment where strategy, environment, and attention to internal problems affect their viability and profitability.
- **Technology Readiness** focuses primarily on technical infrastructure. Content readiness studies issues concerning e-learning content material such as interactivity, reusability, interoperability, etc.
- **Training Process Readiness** refers to the ability of organisations to organise, analyse, design, develop, implement and evaluate a concrete training programme.
- **Culture Readiness** determines an organisation's perceptions and cultural parameters concerning digital learning adoption and use.
- **Human Resources Readiness** refers to the availability and set-up of the human support system. In this component some parameters such as receptivity and the prerequisites of humans to learn successfully in the new environment are defined.
- **Financial Readiness** refers to the budget allocation and investment for establishing a robust e-learning set-up.

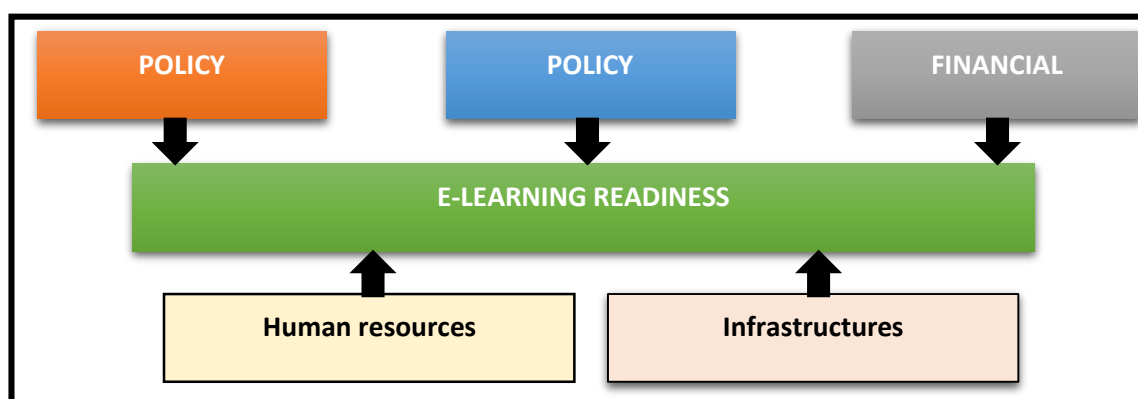


Figure 2.4: Digital-learning readiness dimensions (adapted from Borotis & Poulymenakou)

2.8 TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPACK) MODEL ON DIGITAL READINESS

The lecturers' readiness for implementing Digital Learning in the classroom will compel them to have skills that will refurbish the learning content through the model called Technological Pedagogical Content Knowledge (TPACK). According to Harvey and Caro (2017:1), Koehler and Mishra introduced TPACK in 2005 as a model for fostering and accepting the incorporation of digital learning in the classroom. TPACK is constituted of three areas: lecturer education, lecturer professional advancement and technology incorporation.

According to Koehler and Mishra (2009), the content, pedagogical and technological knowledge in DL must be significant:

- Pedagogical knowledge (PK) contains information about the learning methods, class supervision techniques, lesson preparation, assessment and the skills and know-how of the lecturer.
- Content information (CK) includes the method and mindfulness about the topic that will be learnt in class. It's basic that learning is developed on the firm technique and logical hypothesis based substance information (CK) yet similarly, the speaker's academic information (PK) must be comprehensive regarding the procedures, strategies and practices of learning, and of their willingness to be understudies in this manner, framing the instructive substance information (PCK).
- Technological content knowledge (TCK) is the ability to utilise and master digital gadgets in order to enhance and integrate digital learning into the curriculum.
- Technological pedagogical knowledge (TPK) is one's comprehension of the impact of digital learning on learning and education development.

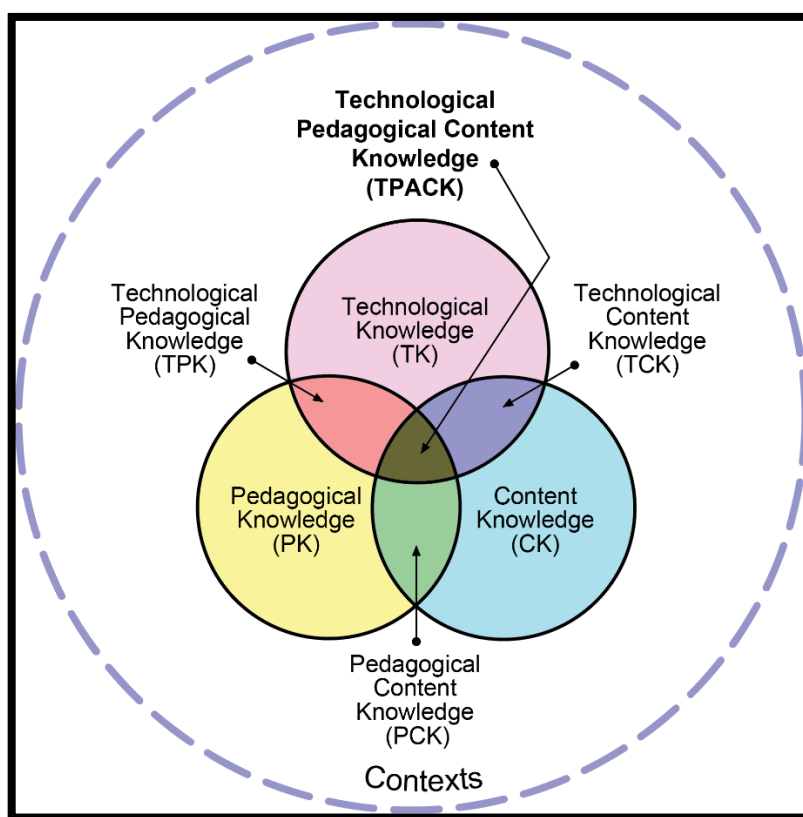


Figure 2.5: Illustration of the TPACK framework (Mishra & Koehler, 2006; reproduced with permission of the publisher, © 2012, <http://tpack.org>)

2.9 GOVERNMENT AND NON-GOVERNMENTAL ORGANISATION PARTNERHSIP WITH TVET

According to Isaacs (2017), Innovation in Vocational Education and Skills Training in Africa INVEST Africa programme was established in 2010 by the Commonwealth of Learning (COL) in partnership with the Commonwealth Association of Polytechnics in Africa (CAPA). Therefore, the aims of INVEST Africa were to develop capacity unequal in the use of educational media and technology in CAPA member institutions in order to:

- Grow access to TVET to the marginalised segment.
- Aid the baffled and joblessness youth who are bolted out of the formal training structures.
- Talk to disparate tuition opportunities cultivated by imbalances in light of social positioning, i.e. rural, sexual category and socio economic factors.
- Advance the nature, status and competence of TVET.

In a meeting in 2013, Alison Mead Richardson, the INVEST coordinator, expressed that the most significant factor in incorporating DL and blended learning of and on campus relies mainly on the dedication and management of the college management.

Johan Fouche, the COL advisor who tutored the management and staff on the utilisation of Moodle, stated that, it is the deep desire and the aspiration of the management to be on top of their game, the management has a strong passion to conquer and take the colleges they lead forward (Personal correspondence, May 2014).

The Rift Valley Teacher Training Institute is situated in the district of Uasin Gishu in Kenya, a home to the incredibly famous Kenyan competitors. Importantly, Edwin Tarno believes that their foundation is infiltrated with a similar winning soul.

Sangster Jere, the vital of the Zambian Technical and Vocational Teachers College, has been depicted as a "lioness of a pioneer". With calm quality and assurance, she gives clear direction, heading and support to her staff as to the utilisation of DL and adaptable

techniques. She frequently reports to the INVEST Africa people group about her work, the advance she is making and the difficulties she is encountering.

Both she and Edwin Tarno lead by "strolling the discussion" and being obvious and dynamic early adopters. They take an interest vocally in instructional meetings and support their staff with motivational supplications and sayings. Not just have they gone up against full responsibility for imaginative methodologies, they have likewise championed and pulled in neighbourhood accomplices, including government services, other TVET organizations, contributor offices and private sector establishments.

2.10 GOVERNMENT PARTNERSHIP AND SUPPORT TOWARDS DIGITAL LEARNING

Both principals and champions acknowledge the supportive role played by their respective governments and national TVET ministries in encouraging their institutions to adopt new methods. Tiony Apdi Kirwa commented that, "INVEST has been an important change driver . . . but we would not be able to do it without our partnership with our national Ministry" (Personal communication, April 2015). In 2013, the Kenyan government enacted the TVET Act to address some of the weaknesses in the system. Kenya has also made some significant gains in integrating entrepreneurship in TVET and increasing female enrolment in the sector. Another 60 technical training institutes are to be built in 2015, with a further 200 planned for future years. These new institutions will add to the existing 660 institutions in the country. The Ministry of Higher Education, Science and Technology has also provided ICT infrastructure support for these institutes. The policy environment in Zambia is also becoming more conducive to the adoption of open, distance and flexible learning. A national policy for these means of delivery and a national DL strategy are being prepared at the time of writing by the Ministry of Education, and the Ministry of Communications and Transport has developed a national ICT policy. Together these will provide an enabling environment for TVET institutions to advance in the educational applications of ICTs (Konayama, 2013).

2.11 PERCEPTIONS OF TVET LECTURERS TOWARDS ICT IN OTHER COUNTRIES

The incorporation of DL or blended learning into classrooms poses a test for education ministries, which need to be relevant in the 21st century. Mai (2016) argued that lecturers need to incorporate content knowledge, technological knowledge and pedagogical knowledge into the digital learning process. Their perceptions of digital learning will

determine governments' success rates in their efforts to incorporate technology into the classroom.

While technology provides many new opportunities for issues like learning styles, student-centered instruction and the promotion of higher-level thinking, a teacher's attitudes and beliefs often stop them from fully integrating technology into their course design. This hesitation leads to technology being used as a substitute for other tools in their traditional teaching styles instead of as a new approach to instruction. Many factors appeal to teachers to use computer technology in their classrooms, including computer self-efficacy, personal technology use, positive lecturer perceptions and beliefs towards technology, and access to professional development in the computer technology arena. All of these are significant in motivating teachers to use technology (Gilakjani, Leong & Ismail, 2013). The current study compares DL in other countries to South Africa, as they have similar education systems and because they have implemented DL in most of their TVET Colleges. Furthermore, the comparison is necessary in order to allow local TVET Colleges to draw lessons from TVET Colleges in other countries.

2.11.1 FIJI

In the 21st century, learning technologies have increasingly become pervasive within various forms of learning environments. Institutions of higher education are more than ever turning to these technologies to resource and support their teaching and learning environments under distributed circumstances, face-to-face or blended learning. Recently, the Fijian Ministry of Education systematically introduced learning technologies into Fiji's technical colleges to support teaching and learning. However, prior to the widespread deployment of these technologies, little information was available on educators' perceptions of the value of these technologies, and the extent to which this could influence adoption. Research was thus conducted to gain a better understanding of lecturers' perceptions of the value of learning technologies and factors likely to influence their decisions to adopt and integrate these technologies into teaching, as well as challenges they were likely to face.

A survey was administered to 55 self-selected lecturers involved in teaching within three Polytechnics in Fiji. Although the overall findings suggested that the lecturers strongly value the contribution of learning technologies in enhancing student learning, a number of factors likely to influence the rapid adoption of these technologies were identified. These included perceptions towards technology and perceived usefulness of technology in teaching, the

institutional cultural environment, as well as resources available to support uptake. The research thus contributed to the knowledge on individual, contextual and cultural influences in the adoption of learning technologies into teaching Kumar and Daniel (2016).

2.11.2 Saudi Arabia

According to Bridges (2003), principals' and lecturers' beliefs are of paramount importance. Effective digital learning requires principals to take the lead in helping lecturers to develop a vision of technology use that will benefit student learning. Since beliefs are thought to influence and shape classroom practices, Ertmer & Ottenbreit-Leftwich (2010) and Prestridge (2012) argued that it is important to be able to identify the beliefs of teachers and principles of the school community.

TVET Colleges that are fruitful in coordinating DL into the educational programs are regularly guided by an extensive design called the technology use plan (TUP). These designs accomplish more than give a plan to the arrangement of goals the school would like to accomplish. The designs likewise portray the general logic of the employment of DL and investigate how DL will enhance teaching and learning.

A TVET college principal can play a critical role in facilitating lecturer change when he/she believes in the significance of supporting lecturers and giving them an opportunity to try new technological approaches to effectively implement modern educational technologies in the classroom Somekh (2008).

An organisation's leadership perceptions and beliefs can shape the use of online learning technologies and affect the willingness of college faculty members to teach using online technology Harrison (2011). A survey by Mitchell and Geva-May (2009) indicated that online technology implementation can be affected by an administration's perception, because the majority of administrators are inclined to encourage staff to teach using online technologies to enhance student learning. Therefore, a study linking principals' and lecturers' beliefs may be able to identify the convictions influencing the role and application of DL technologies in educational processes Alghamdi and Prestridge (2015).

2.11.3 Nigeria

Nwokocha (2015) argued that a substantial body of literature and evidence has shown that teachers' perceptions play a critical role in adopting instructional pedagogy. According to Pajares (1992), beliefs about teaching include a perception about what it takes to be an effective teacher. The way lecturers view modern technology will, to a large extent, determine the level and degree of usage. Despite the availability and recommendation of innovative method of instruction which have been tested and found viable for the improvement of learning, male and female lecturers alike still exhibit absolute loyalty and dependence on the expository method, in which they simply deliver a pre-planned instruction to the learner with or without the use of modern technologies.

According to Abdelraheem (2004), lecturers form an impression which is favourable or otherwise, depending on specific traits they possess and what they attribute to the method. Their perception of instructional approach is predicated upon what they feel the method can do in the teaching-learning process. Lecturers' instructional approaches, perceptions and utilisation are influenced by their philosophy and their resistance to adopting new technologies Abdelkareem (2004).

The way a lecturer views the role of media in the classroom will also to a large extent determine the level and degree of its usage. As stated by Nwokocha (2014), in recent years in Nigeria, most tertiary institutions have shown a rapidly growing trend in introducing digital learning into educational curricula. Unfortunately, the sustainable use and integration of these modern technologies in education delivery in tertiary institutions has remained a fantasy due to a number of constraints (Nwokocha & Onwuchekwa 2014). The unsatisfactory manner of practice in the delivery of business education programmes in line with technological innovations has created a vacuum in the attainment of the national technology objectives and the non-performance of graduates in the business world. New technologies are seen as the bedrock of national survival and development in a rapidly changing global environment.

Lecturers today, however, face the challenge of utilising and integrating computer-related technologies into their instructional delivery in a manner that enhances students' learning and achievements. The appropriate use of these resources in business education delivery

in the classrooms can help equip future business educators with the necessary knowledge and skills to use the same tools effectively in their classroom (Miller, in Nwokocha & Onwuchekwa, 2014). As noted by Hennessy, Harrison and Wamakote (2010), effectively introducing technology into schools is also largely dependent upon the availability and accessibility of modern technology resources (e.g. hardware, software and communications infrastructure). They observed that if technology cannot be accessed by the lecturer, as in so many educational settings in Sub Saharan Africa, then it will not be used. Eichoiz and Rogers (1994) also suggested that there are psychological components in lecturers' perceptions of media, finding a significant personality difference between acceptors and rejecters of new media. Other researchers have also said that some lecturers appear to perceive media as threatening and perhaps inhumane. The success of modern technology utilisation in education depends on the development of various competencies throughout the educational system. This hinges on a lecturer's professional development, the competency of educational administrators in using the technology, and dedicated support specialists to ensure the continued viability of modern technology tools in education.

2.11.4 Uganda

Okello (2013) argued that the factor influencing the perceptions of people positively towards TVET and digital learning use in the classroom are the economic benefits derived from TVET skills. Positive perceptions towards the incorporation of digital learning among lecturers can open doors towards the relevance of the current TVET in line with the oil industries in Uganda. He emphasised that a digital survey needs to be done to see how the nation would develop TVET to be competitive in the oil exploitation in the country, and came up with a model that he argued should be applied in order to reform education in favour of TVET.

Finally, the implications for lecturer education and ongoing professional development were identified and aligned with the overall pedagogic framework.

Teaching and learning systems and processes creating major implications in the education systems such as paradigm shifts, active learning, constructivism, change in approach and curriculum have been at the forth front of discussion in Uganda (Okello, 2013). However, the author also emphasised that technology must not replace a good pedagogy.

2.11.5 Iran

In Iran, digital learning web 2.0 was introduced because of the high failure rate of engineering students, and the dissatisfaction of employers with the quality of new graduates in the labour market. Their professional skills, such as critical thinking and communication, as well as the low efficiency of traditional teaching methods and the large potential of educational technologies, left much to be desired. Continental asserted that 21st century engineers should have technical proficiency and be culturally aware, creative, entrepreneurial, agile, flexible, and mobile. These skills are unlikely to be developed in a traditional educational system.

In order to obtain lecturers' perceptions about knowledge, learning, and teaching, the TVET lecturers were asked to describe the basic knowledge and skills that engineering students and graduates had to achieve, their teaching methods, their justification for using that method, and how they evaluate their students' achievements. Furthermore, to analyse lecturers' perceptions about educational technologies, especially Web 2.0 applications for engineering education, the lecturers were asked to describe the quality of existing DL facilities for educational aims and match them to their actual needs, and their opinion about using Web 2.0 tools such as Blogs, Wikis, YouTube, and Facebook for engineering courses. Finally, they were asked to explain their approach to Web 2.0 applications and their potentials and challenges for engineering education.

Felder in Zarei, Daud and Azizi (2017), claimed that engineering graduates' inefficiency is due to the traditional approach to engineering education, including engineering curricula, teaching and learning methods and materials, and other educational and supportive activities. He asserted that the traditional approach, which is based on the positivism paradigm of knowledge and behaviourism approach to educational psychology, should be reformed to the constructivist paradigm to knowledge and learning theories, including cognitive and social constructivism. In this approach, students actively engage in learning activities and the instructors play the role of a learning facilitator instead of knowledge transferor.

Web 2.0 applications have great potential for the improvement of the quality of teaching and learning in higher education. Social networks such as Facebook, media sharing sites such as YouTube, blogs such as Word Press, and wikis such as Wikipedia, as the most famous Web 2.0 applications, provide various facilities to individuals and groups to generate, share, analyse, and promote knowledge. These applications enable instructors to

design various learning activities based on different learning theories, including cognitive constructivism, social constructivism, and connectivism.

According to Dabbagh and Kitsantas (2012), Web 2.0 tools can be used on three different levels by university students, including managing personal information, facilitating social interaction and collaboration, and information aggregation and management. They explained how different tools such as blogs, media sharing tools and social networking sites can play a role at each level, asserting, for example, that a wiki can be used as a personal environment for knowledge organisation and management. In addition, students can edit collaboratively or put their own reflections in as comments. Furthermore, students can evaluate themselves by monitoring the improvement of their activities in the wiki across time.

Regarding the characteristics of current engineering students, as a part of the new generation of learners who have grown up with and become accustomed to these digital tools, the effective use of these tools for facilitating teaching and learning activities should be considered more. For instance, social networking tools such as Facebook and Twitter have become very popular with students, thus the presence of such tools should be regarded as an opportunity whose potential should be employed to the fullest.

Researchers such as Zarei *et al.* (2017) have suggested that the varied and effective applications of these tools in teaching and learning engineering courses increase student performance and effecting teaching.

For instance, considering the significance of communication skills and teamwork for software engineers, a Web 2.0 personal learning environment was designed and used to enhance analytical and professional skills among software engineering students. In addition, to promote the quality of learning about renewable energy sources, the way these energies were obtained and their practical applications, including problems occurring during field visits, were demonstrated using educational videos which were accessed by the students using YouTube, Facebook and Twitter. The study results confirmed the effectiveness of this approach for enhancing the engineering students' learning and satisfaction. Despite the growth in the number of engineering education departments and students in Iran, the quality of education and its output are less than satisfactory. Considering the huge potential of Web 2.0 applications for improving the quality of teaching and learning, one way to promote the quality of engineering education is to change the

lecturers' perceptions or learning approaches, and to employ Web 2.0 applications more effectively.

2.11.6 South Africa

In South Africa there has not been a study regarding the perceptions of lecturers towards digital learning, however there has been a similar study on the experience of students using blended learning Phahamane (2011). Van Der Poll (2014) mentioned that during his eight years as a TVET educator in information technology, it was evident that educators' perceptions, views and uses of ICTs were essential factors in the culture of teaching and learning practices, however there is insufficient information on these. Findings from research suggest that people's utilisation, views and adoption patterns of technology are entrenched in the social, symbolic and cultural contexts of their organisations. Furthermore, Blom (2016) argued that the perception of South African TVET lecturers should be business-like, considering that TVET graduates have to be absorbed in the labour market.

TVET is seen to be a form of education and training that is characterised by its close relationship with the labour market which is achieved by curricula that faces both ways Barnett (2006), i.e. curriculum that provide general as well as occupational knowledge through their linkages with business and industry. In many cases TVET lends itself to self-employment and informal employment, which are important contributors to the economy and to the social well-being of individuals. Furthermore, TVET has to do with knowledge production in the workplace – an area which is notoriously under-researched, and consequently poorly codified. It appears, therefore, that this form of education and training requires much more than what is considered the average teaching methods for practice-based learning. In addition, as mentioned in the introduction, 'work' (and workplaces) cannot be seen to be static: as work changes, so does the shape and form of its supporting pedagogy' Gamble (2012).

A similar study is cited on google scholar by Krull and Bialobrzaska (2012). The table includes lessons from above mentioned authors, who facilitated the North South TVET ICT conference in 2012. They presented under the topic 'ICT integration in South African TVET colleges', where lecturers were asked their biggest motivators and constraints to using ICT enhanced learning and teaching (cf. Figure 2.6 & 2.7).

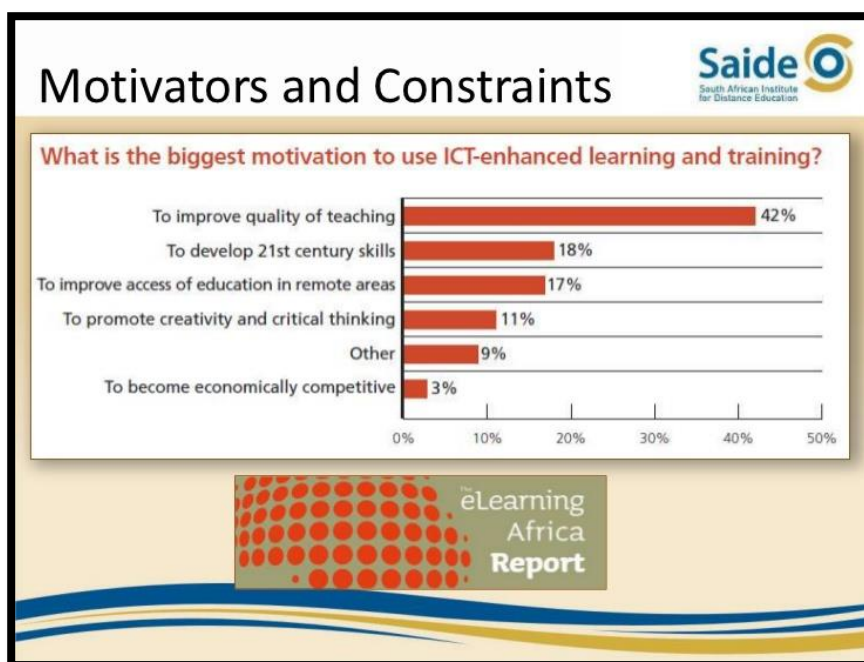


Figure 2.6: Motivators and constraints

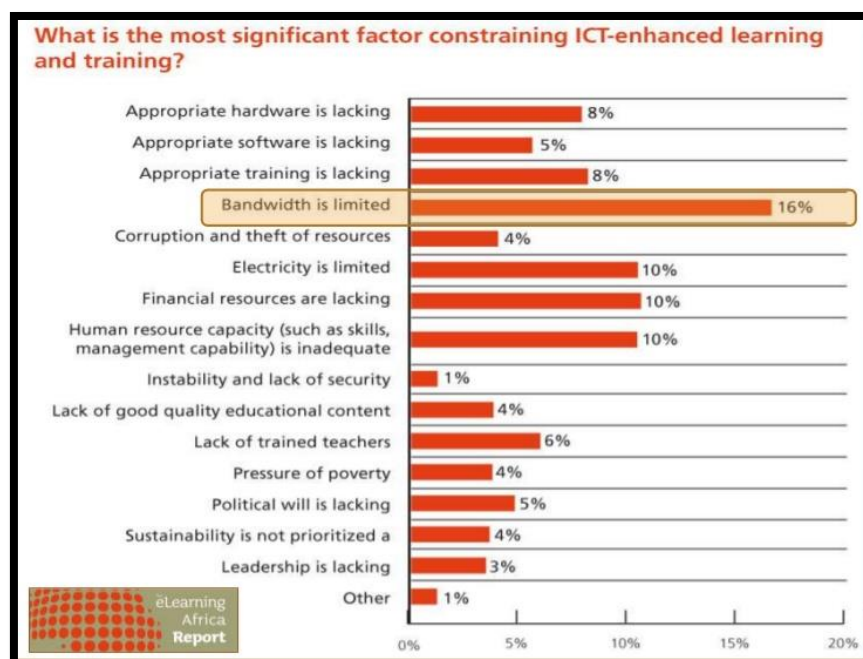


Figure 2.7: Most significant factor constraining ICT-enhanced learning and training

2.12 CONCEPTUAL FRAMEWORK

The conceptual framework of this study is presented in Figure 2.8 is based on Roger's Theory: Diffusion or Adoption of Innovation (Innovation being the Digital Learning at TVET in this case) as well as Venkatesh module on DL. The UTAUT model of performance expectancy and effort expectancy is outlined in the Theoretical Framework.

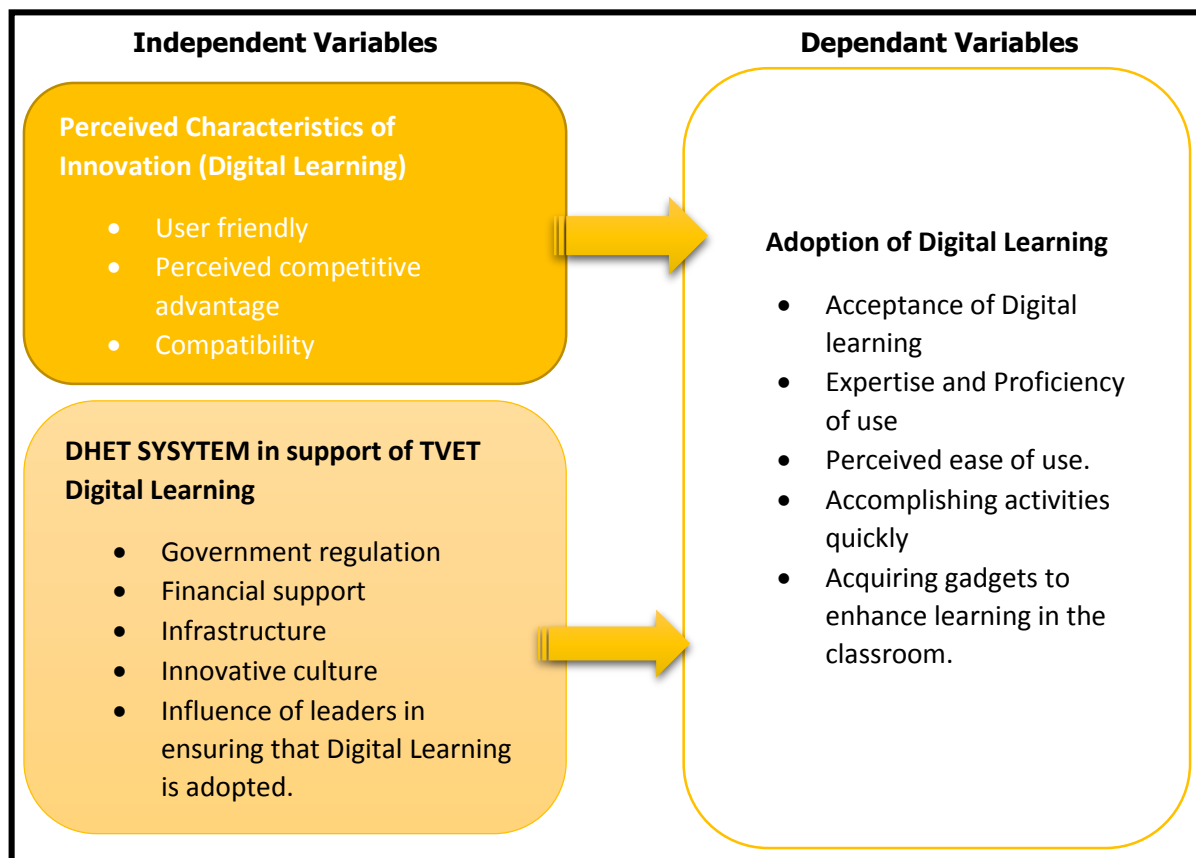


Figure 2.8: Conceptual framework of study

Conceptual framework is based on Roger's Theory: Diffusion or Adoption of Innovation (Innovation being the Digital Learning at TVET in this case) as well as Venkatesh's The UTAUT model of performance expectancy and effort expectancy.

As seen in the above framework, the perceived characteristics of innovation and the DHET system in support of TVET DL contribute to the adoption of DL in TVET Colleges. With reference to the conceptual framework, user friendly, perceived competitive advantage and compatibility are important factors that determine perceived characteristics of innovation. These indicators or factors are important when implementing DL. Furthermore, the framework suggests that government regulation, financial support, infrastructure, innovative culture and the influence of leaders in ensuring that DL is adopted are critical factors that determine the preparedness of the DHET to support DL system in TVET Colleges. The framework reveals that DL is driven by a number of factors, such as acceptability of DL, expertise and proficiency of use, perceived ease of use, accomplishing activities quickly, and acquiring gadgets to enhance learning in the classroom.

2.13 CONCLUSION

The chapter reviewed both the empirical and theoretical literature on DL, and provided the conceptual definitions of the variables (perceptions, TVET and DL) that form part of the study. The chapter proceeded to offer a comprehensive discussion on perception of TVET lecturers on the introduction and application DL. It further discussed the causal link between the perceptions of TVET lecturers and the application of DL. In addition, the chapter compared DL in South Africa to other countries, and presented various theoretical and conceptual frameworks.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The previous chapter reviewed both the empirical and theoretical literature on DL, while this chapter provides a description of the research methodology used to guide this study. Garg and Kothari (2014:7) suggested that research methodology is a method that is used in order to give meaning and find a solution to a research problem, noting that it is imperative for researchers not to be confined in mastering the research methods or techniques to be employed when conducting research but also the methodology.

The chapter commences with the research objectives and questions, before outlining the research design and justifying the adoption of both the design and methodology.

The chapter thereafter provides a brief summary of the research location, the target population, the sampling strategy and the sample size.

The chapter then describes the data collection and the instrument used, and explains how the data were analysed. A brief description of ethical considerations follows, before the limitations of the study are discussed.

The chapter will follow the below schematic representation (cf. Figure 3.1).

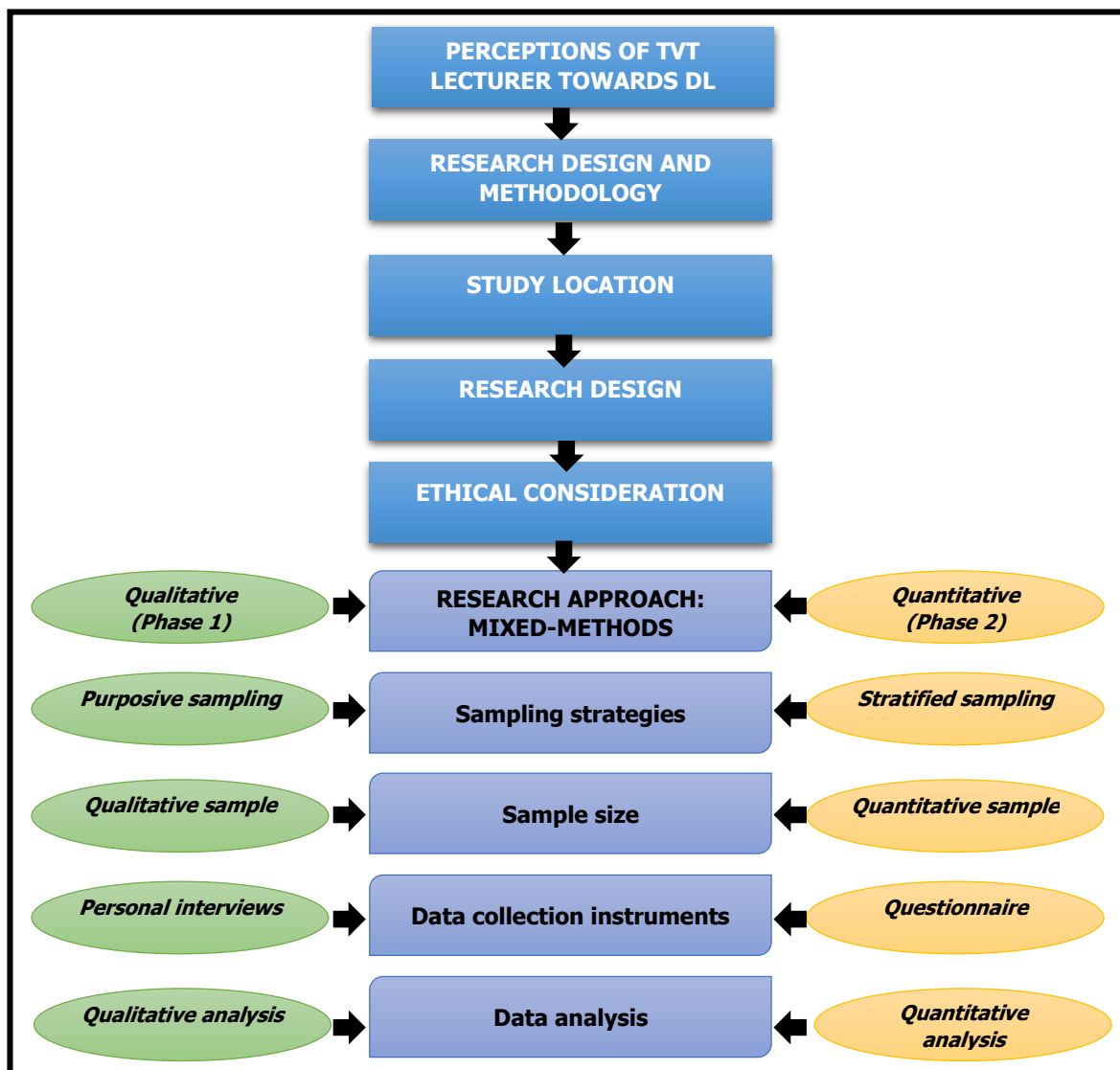


Figure 3.1: Structure of the chapter

3.2 STUDY LOCATION

The study was conducted at Umfolozi College, which is one of nine public Technical and Vocational Education and Training Colleges in KwaZulu-Natal province. The College has five main campuses, namely Chief Albert Luthuli, Eshowe, Esikhawini, Mandeni and RichTek, and encompasses seven skills centres, which are located at Sundumbili, Isithebe, Eshowe, Nseleni, Heatonville, Esikhawini and the ZCBF Community Park. A range of national business and engineering programs, such as the National Certificate (Vocational) and N4-N6 programs are offered by the College. An extensive selection of skills programs ensures that Umfolozi meets the need for skills training at the grassroots level, and learner ships and co-operative programs are also very common at the College. A sample for this study was derived from staff across the five campuses. The choice for conducting the study at

Umfolozi College was because one of its campuses, Esikhawini, hosted a digital learning workshop in May 2017, which was conducted by the digital learning service providers for staff members and the general public. The workshop was four hours long, and the main aim was to create and increase awareness of digital learning solutions that could be incorporated into the classroom. In addition to this, it aimed to engage potential clients in digital solutions.

DL is an inevitable part of higher learning in present day South Africa; any graduate will have to be equipped with utilising digital learning to its optimum, because we live in a globally networked society. The third justification is that the senior management of the college and specialist lecturers in digital learning attended the annual North South TVET digital conference in Cape Town in August 2017.

The North South Initiative is a venture between the College of Cape Town, False Bay College and Haugaland Skole (Norway), which has a focus on institutional Information and Communication Technologies (ICTs). The partnership was structured during 2012 with a view to assisting each other with institutionalising support and development for E-learning and other educational technologies. During the initial discussions, it was decided that the partnership would begin with the hosting of a digital conference, which would be designed to support teaching and learning practices through the incorporation of digital learning. Subsequently, the 3rd International North South TVET Digital Learning Conference idea was born and it was agreed that the event would take place annually. The North South Initiative was officially launched with the signing of a partnership agreement by the three college principals on Tuesday 25 September 2012. The group who attended the North South conference constituted the sample for the qualitative research.

3.3 TARGET POPULATION OF THE STUDY

The entire target population for qualitative and quantitative research was 125 respondents - 25 for qualitative and 100 for quantitative, therefore $N = 125$. The sample determination plan was derived from Sekaran (2013) (cf. Table 3.1).

Table 3.1: Sample determination plan

POSITION	POPULATION	SAMPLE
College Principal	1	1
Campus Managers	5	5
Quality Assurance Manager	1	1
Deputy Principal Academic Services	1	1
Deputy Principal Corporate Services	1	1
Assistant Director Curriculum Services	1	1
Heads of departments for National Certificate Vocational (NCV)	5	5
Heads of departments for National Accredited Technical Education Diploma (NATED)	5	5
Lecturers	100	50
Senior lecturers	5	5
Total population	125	100

3.4 RESEARCH DESIGN

Hovarth (2017:5) pointed out that the objective of research design is to establish and explore incidents and their associations with others, while Bryman and Bell (2015:49) suggested that research design serves as a structure that collects and analyses data. Rose, Spinks and Canhoto (2015:75) added that research design is the blueprint that researchers can utilise in order to find resolutions to research questions.

3.4.1 Exploratory research

Sekaran and Bougie (2016) expressed the view that exploratory research is conducted when there is a lack of scope or very little known about the phenomenon being studied. Literature on digital learning suggests that there is limited research in South Africa regarding the perceptions of TVET lecturers towards digital learning, therefore the application of an exploratory research design in this study enabled a detailed investigation to establish the perceptions of TVET lecturers towards digital learning in South Africa. This design also permitted a deeper and more comprehensive understanding of the perceptions that are held by TVET lecturers towards digital learning in South Africa.

3.5 RESEARCH METHODOLOGY

This section of the chapter focuses on how the study was conducted. It pays critical attention to the research method, sampling strategies, sample size, data collection instruments, pilot study, data quality control, measurement scale, data analysis, ethical consideration and limitations.

3.5.1 Research method or approach

Patten (2017) referred to research methods as building blocks of a scientific enterprise, advocating that they are the 'how' for building systematic knowledge. Furthermore, Litosseliti (2017) postulated that research methods cannot be disentangled from the research questions or more extensive research atmosphere in which they are used. There are three major research methods, viz qualitative, quantitative and mixed methods. This study utilised mixed method.

3.5.2 Mixed-method research

McMillan and Schumacher (2014) explained that the mixed method approach augments the legitimacy and trustworthiness of results found through qualitative and quantitative data. As a method, it focuses on collecting, analysing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than a single approach. In addition, it is a holistic approach to research that involves the discovery of facts or information. Creswell and Poth (2017) described mixed method as an open model that occurs in a natural setting, where the researcher develops a level of detail from high involvement in the actual experiences of the respondents.

Creswell (2013) also noted that mixed methods are meant to maximise the strengths of the quantitative and qualitative approaches, and to reduce their likely limitations. Creswell (2013) further suggests that there are two main benefits to be derived from using the mixed method approach, the first being that separate approaches can be employed for dissimilar intentions in one study, which augments the researcher's confidence to adequately address the most important issues. The second benefit is that it facilitates triangulation of the results.

3.5.2.1 Types of mixed-methods

According to Saunders *et al.* (2016:171) there are different kinds of mixed method studies or approaches, including sequential explanatory, sequential exploratory, sequential transformative, concurrent triangulation and concurrent transformative. In this study, the sequential exploratory mixed method was used to explore the perceptions of TVET lecturers towards digital learning in South Africa. Saunders *et al.* (2016:171) further mentioned that

the sequential exploratory method is characterised by an initial phase of qualitative data collection and analysis, followed by a phase of quantitative data collection and analysis. This study adopted the suggested sequence.

There are several justifications as to why the researcher decided to use the mixed method approach in this study. These include the desire to collect information about a wider range of interests regarding the perceptions of TVET lecturers on digital learning; to generate deeper and comprehensive insight into the phenomenon under investigation; to improve the significance of interpretation of the results; to enhance the convergence and collaboration of the main findings; to allow for an appropriate emphasis to be made at the various stages of the research process; and to describe idiosyncratic circumstances, approaches, opinions and practices of different participants in the study. Furthermore, Bharmal, Guillemin, Marrel, Lambert, Arnould, Fatoumata, Hennessy and Dias-Barbosa (2017) postulated that mixed methods research eliminates some of the difficulties that emanate from employing only one approach, thus delivering a better analysis of the available data.

3.6 QUALITATIVE STUDY: PHASE 1

Cresswell and Poth (2017:7) stated that qualitative research is a situated activity that locates the observer in the world. Qualitative research consists of a set of interpretive, material practices that make the world visible; they turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings and memos.

3.6.1 Sampling strategy and procedures

Sampling refers to the art of selecting a subset of persons or things from a larger population. Kothari (2014:147) reiterated that sampling is the method of attaining evidence on an entire population by scrutinising a portion of it. Bernard (2017:114) mentioned that there are two main types of sampling strategy, namely probability and non-probability sampling. Since the study used a mixed method approach, both probability and non-probability sampling strategies were employed to select the participants for the study.

3.6.2 Non-probability sampling

A non-probability sampling strategy is often used in qualitative research to select participants for a study. With this sampling, items for the sample are selected deliberately by the researcher using a subjective approach, i.e. the probability of selecting population elements is unknown (Odoh, 2015). This sampling strategy has various sampling techniques, such as quota sampling, purposive sampling, snow ball sampling and double sampling. For the purposes of the qualitative component of this study, the purposive sampling technique was the most appropriate. Saunders, Lewis and Thornhill (2016) contended that a purposive sampling technique is often used when the researcher uses his or her judgment to choose cases that will best qualify him or her to answer and meet the research objectives. A total of $N = 12$ were purposively sampled in the qualitative phase. A purposive sampling technique in this study was used to select individuals on the basis of prior judgment about their relevance to DL, and focused only on those with prior experience in DL in the College.

3.6.3 Data collection instrument

The nature of this study required the use of interviews as the main instrument for data collection.

3.6.3.1 Interviews

Interviews are the most popular and powerful instruments of data collection in qualitative studies. A personal interview is a social relationship which is designed to facilitate the exchange of information between an interviewee and the researcher (interviewer). According to Alshenqeeti (2014), an interview is a conversational encounter between the participants and interviewer, whose aim is to gather descriptions of the respondents with respect to their interpretation of the meanings of the phenomenon being studied. Alshenqeeti (2014) further contended that the quantity and quality of information exchanged between the interviewees and interviewer depends on how astute and creative the interviewer is in understanding and managing the relationship.

The study used semi-structured interviews to collect the qualitative data. According to David and Sutton (2014), a semi-structured interview is non-standardised and is frequently used in qualitative analysis. David and Sutton (2014) also suggested that with semi-structured

interviews, the researcher has a list of key themes, issues, and questions to be discussed. With this kind of interview, the researcher has the ability to alter the questions depending on the direction of the interview, but the interview is guided by an interview schedule which is constructed based on the objectives of the study. The interview schedule for this research consisted of five broad sections (cf. Appendix A).

As mentioned above, the interview was conducted among the staff who occupy the top management positions at Umfolozi College. Consent forms were signed before the audio-taped interviews commenced. All the interviews were conducted in the various offices of the participants at Umfolozi College. Prior to the interviews, every participant was provided with a copy of the interview schedule. Each interview was conducted for approximately 25 to 40 minutes.

3.6.4 Qualitative data analysis

The data process was completed in two phases; the qualitative data was analysed first, followed by the quantitative data. According to Sekaran and Bougie (2013), data analysis involves the art of breaking up, separating and disassembling the data or information collected into smaller parts or units. Moshikaro (2012) and Sekaran and Bougie (2016) suggested that qualitative data analysis goes through three stages, i.e. data reduction, data display and drawing a valid conclusion. The qualitative data were analysed with the help of NVivo 10.1 software, which is one of the most popular qualitative data management programmes that has its roots in the NUD*IST (Zamawe, 2015).

Zamawe (2015) suggested that the NVivo software is characterised by character-based coding, rich text competencies and multimedia functions that are crucial for qualitative data management. Furthermore, it has in-built facilities that enable people from different geographical areas to work on the same data files at the same time through a network. NVivo ensures the easy, effective and efficient coding of the data, which makes retrieval easier. NVivo also assists the researcher to enhance the accuracy of qualitative studies. In this study, NVivo assisted the researcher to generate and organise the various themes for easy analysis.

In a qualitative study, there are two methods of analysing data - content and thematic analysis - depending on the nature of the phenomenon. Thematic analysis was the most appropriate for this study. Saunders *et al.* (2016) suggested that a thematic analysis is crucial to analyse classifications and

present themes or patterns that relate to the information or data collected through a sequence of interviews, observations, documents or websites. Furthermore, it is employed to illustrate the data in great detail and deals with diverse subjects via interpretations.

3.6.5 Trustworthiness and credibility

Sekaran and Bougie (2016) claimed that the main aim of trustworthiness in a qualitative research is to ensure that the results are sincere. Trustworthiness is achieved by ensuring that the obtained findings are legitimate and mirror the exact views of the participants. The researcher reported exactly what transpired on the field during the data collection process, and ensured that the interview schedule was adhered to ensure the collection of reasonable, unbiased and valid data.

Anney (2014) argued that credibility is the assurance and conviction associated with the research findings; it is used to quantify whether or not the research findings from the participants' original data are true. Moreover, it wants to establish whether the findings are a true reflection of the participants' original views. To achieve credibility of the data, engagement with the data was carried out intensively to demonstrate clear links between the data and the interpretations. Regular discussions with statisticians and experts were held and adjustments were made in accordance with the suggestions and recommendations of qualitative studies.

3.7 QUANTITATIVE STUDY: PHASE 2

According to Brannen (2017), quantitative research is typically associated with the process of numerative induction. One of its main purposes is to discover how many and what kinds of people in the general or parent population have a particular characteristic which has been found to exist in the same population.

3.7.1 Probability sampling strategy

Odoh (2015) advocated that a probability sampling strategy is used in quantitative studies, where every element of the population has an equal chance or opportunity of being selected from a defined population. A stratified sampling technique was used to select the participants for the quantitative component of the study. According to Pylkkönen, Drugman and Bisani (2016), stratified testing is used for protecting the scope of various sorts of cases in the sample. The main aim is to separate the population into groups called strata, and randomly sample from each group (stratum) separately. The reason for choosing stratified sampling for Umfolozi TVET was its diverse campuses, ranging from urban to deeply rural. (Garg & Kothari 2014) put forward that if the population from which a sample is to be drawn does not constitute a homogenous group, then a stratified sampling technique must be applied so as to obtain a representative sample. This study derived its sample from each of the five main campuses, as per Maheshwari and Thomas (2017), who commented that a stratified sampling method is adopted when the researcher has a need to concentrate on a specific group.

There are two types of stratified sampling techniques, namely proportionate and disproportionate stratified sampling. The disproportionate sampling method was utilised to select the respondents for the study as the population in the stratum was not homogeneous, i.e. the population of the respondents across the five campuses were not the same. Furthermore, the population in each campus was sub-divided into departments, from which the respondents were finally selected to participate in the study. Marlow and Boone (2011:142) referred to these as subsamples.

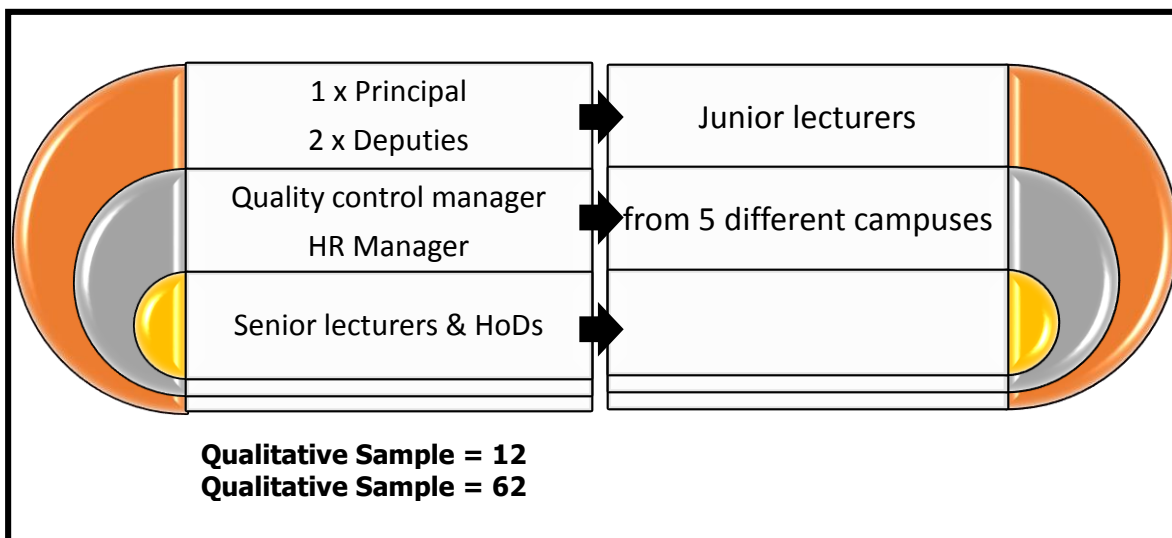


Figure 3.2: Proportionate and disproportionate stratified sampling techniques

3.7.2 Sample size

Sekaran and Bougie (2016) expressed that sample size refers to a subset or elements of the entire population that is chosen for inclusion in a specific study. A sample size is usually drawn from the sample frame, but not the total population. A sample frame, as portrayed by Enticott, Shawyer, Vasi, Buck, Cheng, Russel, Kakuma, Minas and Meadows (2017), represents a record of a target population from which the sample is chosen, and ideally contains all elements in the target population.

However, with the quantitative phase, a sample size of 100 participants was taken from the different categories of lecturers: Post level 1 lecturers for NCV and Post level 1 lecturers for NATED. Table 3.2 below demonstrates the various positions of the population and sample size.

Table 3.2: Positions, population and sample for the quantitative study

POSITIONS	POPULATION	SAMPLE
Lecturers in the five campuses	100	62
TOTAL	100	62

The following criteria were used to select the sample for the study. Participants had to be an employee of Umfolozi College, should have been working with the College for more than a year, and must have attended the digital learning workshop hosted by Umfolozi College and organised by the Digital Learning service providers in May 2017. Moreover, the participant needed to have knowledge or experience of digital learning.

3.7.3 Data collection instrument: Questionnaire

The nature of this study required a questionnaire to be the main instrument for data collection. Kothari and Garg (2014) argued that questionnaires are the heart of a survey operation, and are mostly used in a large study which is comprised of a big group of people. They contain a list of items designed to gather information from a particular group of people (Sekaran & Bougie, 2016). Rose *et al.* (2014) described questionnaires as a particular type of data collection instrument that uses a standardised, structured set of questions to measure variables, such as respondent attitudes, that are of interest to the researcher. Questionnaires were administered to the participants in lower management positions in the College, and consisted of five broad sections (cf. Appendix B).

The questionnaires were constructed in English as the study was conducted in an academic environment and they were designed in accordance with the study objectives. The questionnaires were also explained to the users, which enabled them to complete them at their own convenience, while allowing some time to think about their answers. The questions were precise, short and clear, and ambiguous questions were avoided. Furthermore, the questionnaires facilitated the collection of vast amounts of data with minimal effort.

3.7.4 Quantitative data analysis

According to Sekaran and Bougie (2013), data analysis involves the art of breaking up, separating and disassembling the data or information collected into smaller parts or units. The quantitative data gathered were analysed with the help of Statistical Package for the Social Science (SPSS), version 24.0. SPSS is a versatile package that allows many different types of analyses, data transformations and forms of output. Having analysed the data, both descriptive and inferential statistics were employed to interpret the results. A descriptive statistic is a statistical tool which is used to summarise or describe numerical data (Sekaran & Bougie, 2013). A descriptive statistic viz. frequency distribution was used to analyse the demographic data. Furthermore, the descriptive statistics used included range, mean and standard deviation.

Rose *et al.* (2015) postulated that inferential statistics are used to draw inferences about a population from a given sample size. Inferential statistics refers to the evaluation of population value as well as statistical confirmation of the research hypothesis. There are two main statistical significance tests that can be applied in quantitative research, namely non-parametric and parametric tests. Parametric tests were used for this study, which included Pearson's product correlation coefficient, multiple regression analysis, analysis of variance (ANOVA), structural equation modelling, chi square, bivariate data analysis and t-tests.

3.8 PRETESTING OF THE RESEARCH INSTRUMENTS

The research instruments were tested through a pilot study before the main data collection. Hilton (2017) described a pilot study as a method of checking that the questions work as intended and are understood by those individuals who are likely to respond to them. Grimm (2010) argued that a pilot study is a very important step in survey research, in order to

ensure that all kinds of errors associated with survey research are reduced. This helps to significantly improve the quality of data. Hazzi and Maldaon (2015) claimed that a pilot study represents a vital step for conducting a full-fledged study, as it is a small scale study that is used to test the research methods and procedures to be used on a large scale. Hazzi and Maldaon (2015) postulated that a well-conducted pilot study assists researchers to design a clear road map that can be followed when conducting the full-scale research.

The pilot study was conducted among 10 staff in the College, in both senior and junior management positions. The pilot study lasted for only one week, after which the researcher incorporated the suggestions, views and recommendations of the participants in the final draft of the interview schedule and questionnaires. The pilot study assisted the researcher to determine the feasibility of the study and the research procedures before the full scale research, and enabled her to determine whether the study was worth pursuing. Furthermore, the pilot study assisted the researcher to address critical issues that were likely to affect the study.

3.9 MEASUREMENT SCALE

Measurement in research means assigning numbers or qualitative attributes to objects using some specified rules. This study used a 5 point Likert scale, with the response choice scoring weights being: Strongly Agree =1; Agree= 2; Neutral = 3, Disagree =4 and Strongly Disagree = 5.

3.10 DATA QUALITY CONTROL

Data quality control forms an important aspect of a good research study. Data quality control was achieved in this study through validity, reliability, trustworthiness and credibility.

3.10.1 Validity and reliability

Saunders *et al.* (2016) recommended that validity is the appropriateness of the measures used, the accuracy of the analysis of the results, and the generalisation of the findings. It also illustrates how valid the research conclusions are. Similarly, Rose *et al.* (2015), stated that validity is about whether the research findings are authentic, i.e. they have not been contaminated. The validity of the study was achieved through confirmatory factor analysis,

which was used to determine the construct validity for each subsection of the questionnaire. To determine whether factor analysis was appropriate for the questionnaire, Kaiser's Measure of Sample Adequacy (MSA) was computed for each confirmatory factor. This gave an indication of the inter correlations among variables in the questionnaires. An MSA of 0.5 is an indication that the data are appropriate for factor analysis (Sekaran & Bougie, 2016).

According to Sekaran and Bougie (2013), reliability refers to how trustworthy the research instrument is. This implies that the research instrument chosen gives the same results. According to Sekaran and Bougie (2016:161), reliability is a major concern when a psychological test is used to measure some attributes or behaviours. Data are considered reliable when it consistently provides the same scores over a period of time. Saunders *et al.* (2016) concurred with other researchers by advocating that reliability is the extent to which measurements are repeatable when different people perform the measurements on different occasions, under different conditions, with supposedly alternative instruments that measure the same thing. In this study, reliability was achieved by using Cronbach's alpha coefficient.

A Cronbach's alpha coefficient is widely used as a reliable instrument to indicate how well various items are positively correlated to one another (Sekaran & Bougie, 2016). The Cronbach's alpha is based on the inter-item correlations; it is recommended that if the items in the questionnaires are strongly correlated with each other, their internal consistency is high and the alpha coefficient will be close to one. On the other hand, if the items are poorly formulated and do not correlate strongly, the alpha coefficient will be close to zero. Sekaran and Bougie (2013) argued that a Cronbach's alpha coefficient value of 0.90 is considered to have high reliability. On other hand, a Cronbach's alpha coefficient value of 0.80 is regarded as having moderate reliability, while a Cronbach's alpha coefficient value of 0.70 is considered to have low reliability.

3.11 ETHICAL CONSIDERATIONS

Armstrong, Langlois, Laparidou, Dixon, Appleton, Bath, Snooks and Siriwardena (2017) advocated that consent models and the jargon used must be at the level of the respondents, so that words utilised may not be ambiguous or used conflictingly. The gatekeeper's letter for the ethics application was obtained from Umfolozi College from the Principal of the college, Mr Sam Zungu (cf. Appendix C.) Ethical clearance was also received from the Social Science Research Ethics Committee of the University of KwaZulu-Natal (cf. Appendix D).

Ethical issues such as informed consent, privacy, confidentiality and anonymity were addressed with the participants as the researcher was collecting the data.

3.11.1 Informed consent

Informed consent was obtained from the respondents after permission was granted by the appropriate authority at Umfolozi College. A written informed consent form was given to each respondent, which the researcher asked them to read carefully before signing. The participants were informed that they could voluntarily withdraw from the study at any time without any problem should they wish to do so. Once the participants agreed to voluntarily participate in the study, the researcher made the necessary arrangements and appointments with them, and proceeded to conduct the study in their offices or the staff room.

3.11.2 Privacy and confidentiality

The information gathered from the respondents will be kept in a secure and safe place agreed upon by the researcher's supervisor and UKZN. The researcher will make sure that the questionnaires and all the recordings and transcribed materials from the interviews are stored on CD and kept safely in a locked compartment, which will be provided by the supervisor in the University. The data will be kept for a period of five years, after which it will be destroyed in accordance with the University's policy.

3.11.2 Anonymity

The researcher made every effort to ensure the anonymity of the data by substituting the participants' names with pseudonyms, as well as by limiting identifying information within the thesis, oral presentations and subsequent publications.

3.12 LIMITATIONS AND DELIMITATIONS OF THE STUDY

The researcher encountered multiple limitations in this study, which are highlighted below. Furthermore, the researcher provides a description of how these limitations were minimised or avoided.

- **Unwillingness of the participants.** The researcher believed that most participants were unwilling to participate in the study because of work commitments. Academic staff are always busy with activities such as teaching, research, publications, conferences, workshops

and marking, therefore it was difficult for them to honour appointments, which had to be rescheduled several times. In order to address this limitation, the researcher was persistent and planned in advance to meet the participants.

- **Scope of the study.** The scope of the study was another limitation that may have affected the analysis of the study, as it was limited to only the staff at Umfolozi College. Under normal circumstances, a study of this nature should have been conducted in two or more institutions, so this made it difficult to generalise the findings. To address this limitation, the researcher made sure that enough information was collected from the participants to support the generalisation of the findings, and mixed methods were employed.
- **Time.** Time was a very big limitation which affected the completion of the entire study. The study employed a mixed method approach, which demands more time from a researcher, therefore the researcher devoted more than four hours to the study on a daily basis, and extra hours over the weekend.

3.13 CONCLUSION

This chapter discussed the research methodology which guided the study, and highlighted the main research questions and objectives which formed the basis of the entire study. An exploratory research was chosen because not much research has been done on the phenomenon under investigation, while a mixed method approach was chosen because it allowed for a thorough investigation to be carried out. Likewise, the study proposed the use of both stratified and purposive sampling methods for the selection of the participants. Furthermore, a sample size of 75 was proposed based on the target population of the study. The study proposed the use of both interviews and questionnaires as the main data collection instruments. A five point Likert scale was chosen as the measurement scale, and a pilot study was used to test the research instruments before the actual study commenced. Validity, reliability, trustworthiness and credibility were the main instruments for ensuring data quality control in this study, and the ethical issues addressed included anonymity, informed consent, confidentiality and privacy. The limitations of the study were also highlighted in the chapter.

CHAPTER 4

QUALITATIVE DATA ANALYSIS AND PRESENTATION OF THE RESULTS

4.1 INTRODUCTION

Chapter 3 discussed the research design and methodology which guided the entire study, while this chapter presents an analysis of the qualitative data and an interpretation of the results based on each of the objectives of the study. The data collected from the participants were transcribed manually into English using the thematic analysis described in Chapter 3. To achieve the purpose of this study, the main objectives that were addressed were:

- i. to determine the perceptions of Umfolozi TVET lecturers on DL;
- ii. to investigate the link between the perceptions of the lecturers and their application of DL;
- iii. to assess the readiness and willingness of Umfolozi TVET lecturers on the application of DL; and
- iv. to establish the support that the DHET is providing their lecturers towards training.

4.2 OBJECTIVE 1: PERCEPTIONS OF UMFOLOZI TVET LECTURERS ON DL

This section of the study investigated the perceptions of Umfolozi TVET lecturers on digital learning. The data collected from the participants through the interviews were analysed using the thematic analysis, whereby the data were coded and categorised into main themes and subthemes. The results of the study reveal that Umfolozi TVET lecturers hold different perceptions about the introduction of digital learning. The main and subthemes are presented in Figure 4.1 below.

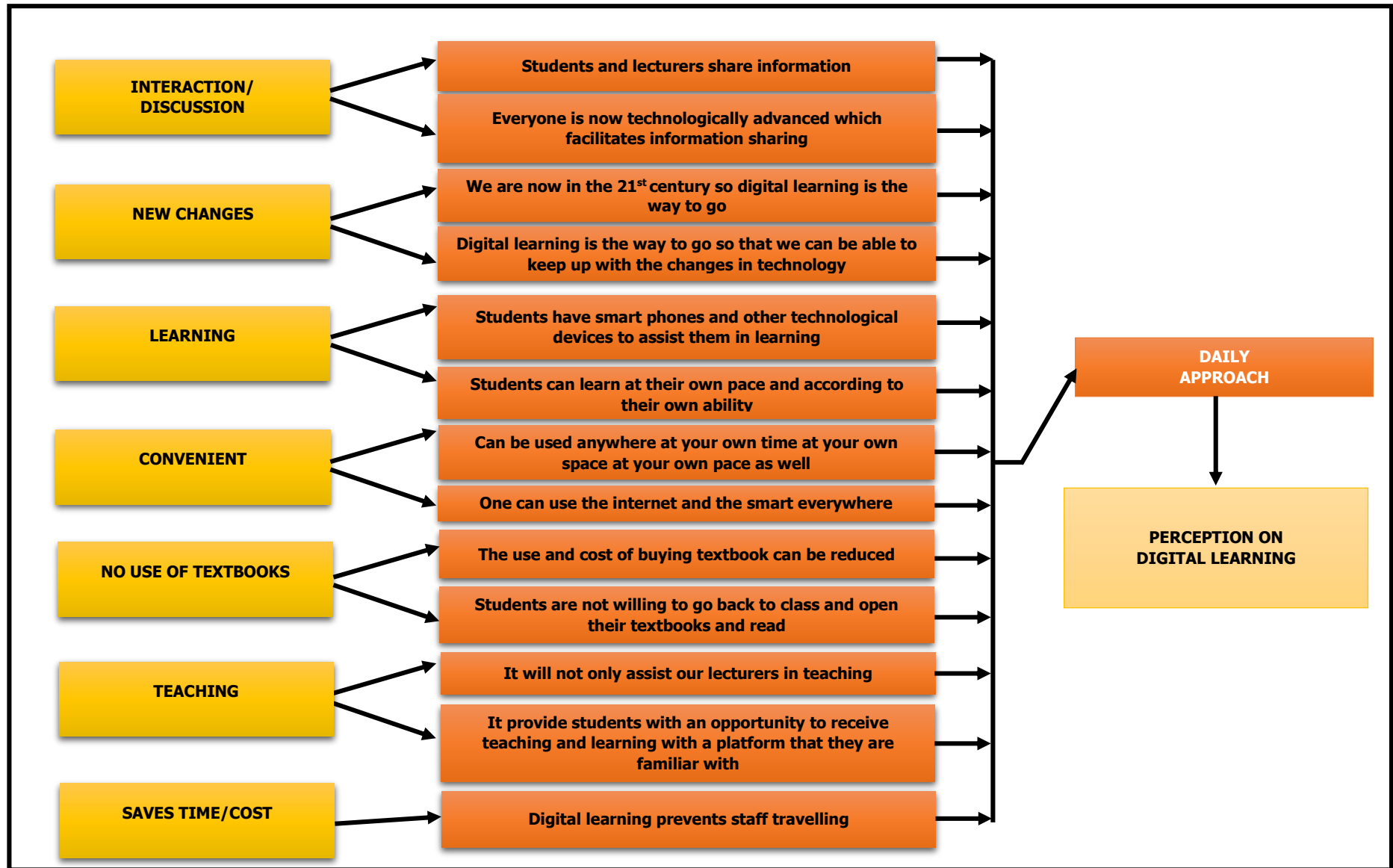


Figure 4.1: Main themes and subthemes on perceptions of TVET lecturers on digital learning

4.2.1 DL is perceived to facilitate interactions/discussions between learners and lecturers

The results of the study reveal that digital learning in Umfolozi facilitates interaction and discussion between lecturers and learners. Based on the interviews, seven of the participants perceived digital learning as an aspect of technology which makes it easier for lecturers and learners to interact on one platform. One of the participants said that:

"Digital learning provides the platform where lecturers and students can share information and this facilitates interaction. So that was my expectation of digital learning is that the student must be able anywhere to interact and to be able to upload assignments at a certain time. If the TVET college can have its distance class online by means of digital learning it will save the college infrastructure, no classroom, might not be a lecturer in front of the class because I can talk about this Get Smarter who has a partnership with UCT and some of our college managers did the project through it and that was absolutely an online course where we had videos the tutor explained what are we going to do in this week" (Participant 6).

Furthermore, a participant said that:

"There was a programme that we did in the college where there were computers installed and those computers were to improve communication amongst the staff so if logged on you could communicate with other campuses on the project that you are doing and you are stuck. Even the staff, for communication they are communicating with the students everything will be easier but I think there are a lot of benefits" (Participant 10).

Another participant expressed the view that:

"Digital learning globally we are communicating through digital learning and even in the universities they are using this programme and I think it is high time that we use digital learning in our colleges. Students do not have to wait to meet the lecturer now, a question can be asked they can respond" (Participant 11).

From the above quotes, it can be seen that the participants perceived that digital learning is the best way to go because it allows both learners and lecturers to share vital information using one platform. For example, digital learning can be used by lecturers to upload assignments and lecture notes via one platform. Lecturers can also use digital learning to send bulk e-mail to students at the same time.

4.2.2 Keeping up with new changes and technology

The majority ($n=8$) of the participants in Umfolozi College perceived that digital is the best way to go in order to embrace new technological advancements. One participant said that:

"I think the fact that we are now in the 21st century is what we call industrial revolution where everything has turned digital now the benefits thereof will be the majority of the students that we have enrolled, they are using technology and I think they respond much better because you are teaching a person in the classroom that will go home and watch TV" (Participant 1).

Another participant (who is a lecturer) responded by expressing the view that:

"In my own view I believe that digital learning is the way to go so that we can be able to keep up with the changes in technology. There have been a lot of changes and I still think that we are behind. Everything is now technologically advanced so if we apply digital learning it will not only assist our lecturers it will also benefit our students when they get employment" (Participant 3).

A participant narrated how he perceived digital learning:

"I think it is very important that the college can move to digital learning because when you teach students if you are using the old and primitive way it is different totally different from what is being done currently because now everyone is being exposed to cell phones, TVs and computers (Participant 9).

Another participant said:

"Our target market of students have changed. We need to address their needs as well, our student no longer want to read and write textbooks when they are exposed to digital games, social media, laptops, tablets and when you ask them to go back to class and open a textbook and read my ten year old son does not use a dictionary he uses Google for everything. So in terms of that our target market has changed number one, number two the way of delivering has to be changed accordingly as well and the visual impact and the audio impact and the amount of information that the student can grasp" (Participant 11).

4.2.3 Facilitates easy learning

Almost all ($n = 10$) of the participants perceived digital learning to be a technology that facilitates easy learning in schools. The participants expressed the view that digital learning facilitates student learning because it allows student to get access to quick and useful information. One of the participants said:

"Well in my view most students have smart phones and other technological devices and digital learning will provide them with an opportunity to receive teaching and learning within a platform that they are familiar with and that they can relate to and not just the old fashioned chalk and talk teaching and learning. Studies show that students using digital learning are more eager to read and learn than using boring books. Digital learning is more colourful and interactive, they can do electronic search functions to find information quickly so it is definitely a benefit to them" (Participant 4).

Another participant expressed the view that:

"The first thing that just came to my mind is that the student can learn at their own pace and according to their own ability" (Participant 6).

However, one of the participants expressed the view that digital learning does not necessarily facilitate student learning. According to the participant:

"...digital learning does not really cater for the different types of learning styles for students because they themselves have not gone through that phase to understand what is expected of them to assist all students with various different methods of taking information in and now going to a digital era is even more so because not all students will be able to understand and use this new tool because as I have said the way people grow up for 12 years they have learned quite often in the rural areas where we are exposed to students from the rural areas and the lecturers come from the rural areas where they have been spoon fed with getting information now with the digital era it is more difficult to spoon feed them because it is a bombardment of colour, sound, information and to filter that to take what is the most important out of it that is going to be the challenge and I do not know if lecturers are equipped to deal with that" (Participant 8).

A key advantage of digital learning is that it has quicker delivery cycle times than traditional classroom-based instruction. Many institutions are adopting digital learning because of the improvement in student learning, as well as an improvement in learners' attitudes towards learning.

4.2.4 DL is convenient to use

Findings from the study indicate that most of the participants perceive digital learning to be convenient. The participants perceived that digital learning can be used everywhere by lecturers and students, without necessarily going to the classroom. One of the participants explained how digital learning is convenient:

"I think what is good about digital learning is you can use it anywhere at your own time at your own space. So wherever and whenever you can access internet and you have all the gadgets required you can use it, you do not have to be in class even outside the classroom you can use it and you can play it over and over again until you understand and normally there are many diversity because other students they prefer visual or audio so with digital learning there is variety a student has the ability to choose according to their needs and can pace themselves according to how much they can understand in a day" (Participant 7).

Another participant commented that:

"I said if the TVET College can have its distance class online by means of digital learning it will save the college infrastructure, no classroom, might not be a lecturer in front of the class. I have read that the Pearson's Centre for Learning Science and technology has also this passion for game based learning which can be included, making this learning experience more fun and interesting" (Participant 6).

It is evident that with DL, no travel time is needed to get to and from training events; information can be accessed everywhere without going to a physical classroom.

4.2.5 DL facilitates and improves teaching

The results of the study reveal that DL facilitates as well as improves teaching in schools. The majority (n = 7) of the participants perceived that digital learning can be a useful tool to facilitate and improve teaching in schools. One of the participants expressed the view that:

"Students are using technology and I think they respond much better because you are teaching a person in the classroom that will go home and watch TV. As they are travelling home they have a cell phone so they are almost on a minute or an hourly basis they are interacting with the digital or technology. So I think it will benefit in a sense that the curriculum content could be delivered in a much better and improved way which the students will have a better understanding because you will be using the platforms that the students are used to unlike us we are using the board and the chalk and we leave that in the class room as we go home" (Participant 1).

Another participant said that:

"Well in my view most students have smart phones and other technological devices and digital learning will provide them with an opportunity to receive teaching and learning with a platform that they are familiar with and that they can relate to and not just the old fashioned chalk and talk teaching and learning" (Participant 2).

A further participant expressed the view that:

"So if we can use digital learning we will see a lot of improvement and the way we deliver our lessons and especially our curriculum and the fact that even industry because we are a TVET college so we are technical we are vocational we are what the industry needs" (Participant 3).

DL was thus strongly recommended as an effective tool for improving teaching in schools, as it helps make teaching and learning more meaningful and fun when properly used.

4.2.6 DL is perceived to reduce cost and time

The findings from the study show that most of the participants perceived that digital learning reduces cost and time in schools. One of the participants at Umfolozi College said that:

"Well if I may say it will be benefit of using digital learning because as for now let me just speak on behalf of Umfolozi, we have had engagements but we have never been successful. We are still using the hard copies, textbooks but this I believe will reduce the cost of buying textbooks because they are quite expensive. According to the funding that is taking place, students are allowed to take their books away so each year we must buy a new set of books because we cannot retrieve books from the students, so that is posing a challenge in terms of when the college struggles financially to pay the suppliers, the students will sit for a number of months without books and it is a challenge and that affects

the performance of the lecturers and the student themselves so that is a serious challenge for me. That is what I will say the digital learning is cost effective, it will cut costs it adds on you as a student" (Participant 8).

Another participant explained that:

"Digital learning will save time for lecturers to go to the library, they can just connect the internet and research. Even in teaching in our days we had projectors and we understand that when you are teaching you have to use old methods, for example visual contents, so that the student can learn everything." (Participant 12).

4.2.7 Impact of digital learning on the daily approach of lecturers

The findings from the study show that DL impacts on the daily activities or approach of lecturers. Based on the results of the study, a participant expressed the view that:

"Ok let me give you a background, I was a teacher I was teaching in a deep rural school the only thing that I knew was to use a cell phone but when I came to college the laptop even though I used it to type my assignments and everything but in terms of using for emails and all those things I did not use it, but when I came here everything is simply straightforward in terms of digital learning. You go to Google, if there is something that you do not understand there is Google, if you want to send an email there is internet, communication is much easier there is no way of saying no I am going to wait for you I am going to fax a document. So in terms of my daily approach to work first thing when I come to work even when I wake up in the morning the first thing I check my emails so that I know when I come to the office those are the things that I must attend to immediately before I can do anything else" (Participant 3).

Another participant said that:

"Well I am not a lecturer myself but doing moderation as a quality manager and doing class visits, they will have to prepare very well to make sure that they research well different media and the syllabus. I think it will definitely add value because quite often syllabuses are not reviewed often. So the information that was initially in there is outdated, so with digital learning they have got the opportunity to bring in new technology, new innovative information that is relevant to the now and the future, so that will definitely then add value for the student for work placement, so that will prepare them better because it is the most up to date information" (Participant 4).

However, one of the participants expressed a different view:

"I think a lot, one thing I feel most people will say it is irritating the work follows you, know you wake up in the morning you switch on your phone if it wasn't on 24 hours, there are messages, emails from work, there are Watts app and all of those" (Participant 1).

DL is an important tool which affects the daily activities of workers. Most workers, especially lecturers, are familiar with the use of digital learning, because many institutions are changing from the trading method of teaching to modern ways of doing things.

4.3 Causal link between perceptions of TVET lecturers and the application of digital learning

The second objective of the study explored the causal link between the perceptions of TVET lecturers and the application of digital learning. The results of the study show that there is a significant relationship between digital learning, teaching and learning. The findings from the study are displayed in Figure 4.2 below.

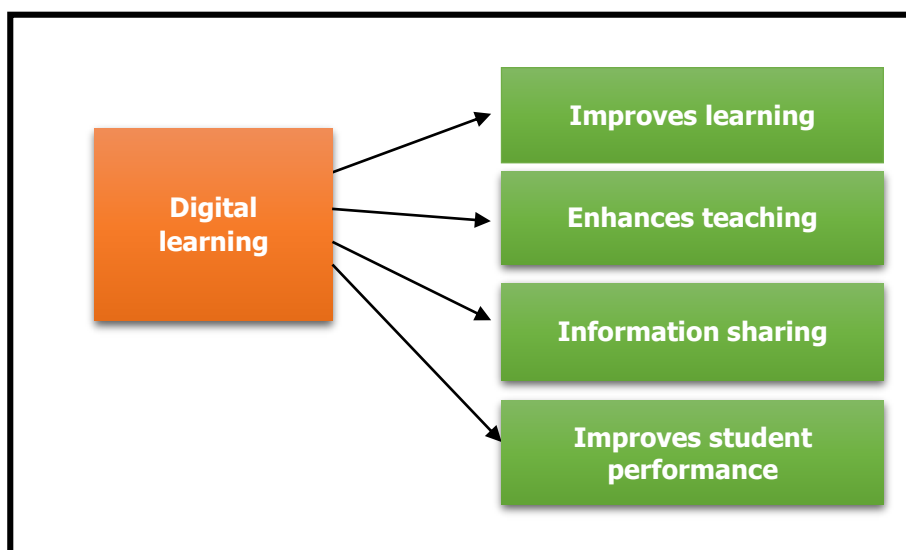


Figure 4.2: Causal link between the perceptions of TVET lecturers and the application of digital learning

4.3.1 The link between digital learning and student learning

The results from the study reveal that there is a significant relationship between digital learning and student learning. The majority ($n = 8$) of the participants expressed the opinion that digital learning impacts positively on student learning. One of the participants said that:

"I think it is very important to get the buy-in of the lecturers into the digital learning by providing them with statistical evidence that digital learning has proved itself to keep the attention of students better and to improve the ability to retain information, as well as the opportunity for them to broaden the scope of information sharing with the students by using various digital platforms with the most relevant and up to date information" (Participant 4).

4.3.2 Relationship between digital learning and teaching

The results from the study show that there is a positive or strong relationship between digital learning and teaching. The majority of the participants are of the view that digital learning promotes effective teaching. One of the participants said that:

"Ok it starts actually with my very first one where I said it will have a huge impact on the lecturers' collaboration time that they might spend more efficiently on a student in need in the beginning, but I understand that it is very easy to actually build once you start with it but obviously in the beginning like anything that you learn it will take time to ensure that the material is absolutely accurate. The implementation will take time but in the end it will be much more satisfying to make use of the variety of information bringing across. I think for a lecturer who is really passionate they will embrace digital learning" (Participant 6).

Another participant said that:

"It will benefit the College a lot, because for example our College is behind in other schools; learners are using this and they are already advanced, so when they join us we take them a hundred steps backwards, so for me if the College can adopt this digital learning it will be massive for us - not only for us but also for the lecturers that we have. The lecturers that we have, we still have the old type of people; they need to be work shopped. Whatever they are using they need to be introduced to this one" (Participant 8).

Digital learning has been introduced into many schools with a view to making teaching easier for lecturers, i.e. it is easy for lecturers to download as well as upload lecture notes onto whatever platform has been developed by the institution.

4.3.3 Correlation between DL and information sharing

Findings from the study suggest that there is a strong correlation between a digital learning system and information sharing. A participant expressed the view that:

"Well our quality management system is digital. It is a web pay system; it is a software programme that we purchased in England called Clara mentis that has been written for quality systems. In this system everything is web-based, so when we review a policy or a procedure or a document it is immediately uploaded so within seconds everybody can see it. It has been linked to the system and it has the most relevant information. The system also provides for Twitter groups, where the lecturers have been linked and they can talk to each other or the subject people, the English people can talk to each other. It is a normal like a Facebook type of thing that has been built in this programme that they can interact with each other. It is again like this normal digital learning it is to change people's perceptions and now buy in. So the programmes make provision, we have created the groups for them to interact with each other because of the vast distances - our one campus is near Durban the another one is right next to the Mozambique border, so it is like we are in the middle; it is like a one and a half hour drive to Duran and another two hour drive to Bambanani which is at the border" (Participant 4).

The relevance of digital learning in this 21st century cannot be underestimated, as information is the life of every organisation. Digital learning not only enhances teaching and learning, but it also helps people to share information or ideas as quickly as possible. Digital learning enables people to get access to vital information.

4.3.4 The link between DL and student performance

The results of the study further indicate that there is a positive relationship between digital learning and student performance. A participant indicated that:

"Well I think there has to be a capacity building, create awareness because for some people these are new things so by exposing probably the majority of our lecturers it could assist us even in improving significantly the performance of learners and so forth" (Participant 1).

Digital learning has proven to be an important technological tool for improving student performance worldwide, as it has exposed students to many things which are not necessarily taught in the classroom. Digital learning provides opportunity for students to find answers or solutions to their assignments. This not only facilitates learning, but also improves performance.

4.4 TVET LECTURERS' READINESS AND WILLINGNESS TO APPLY DIGITAL LEARNING

The third objective of the study explored the TVET lecturers' readiness and willingness to apply digital learning in their respective classrooms. Both the main and sub-themes were identified in relation to this, as per Figure 4.3.

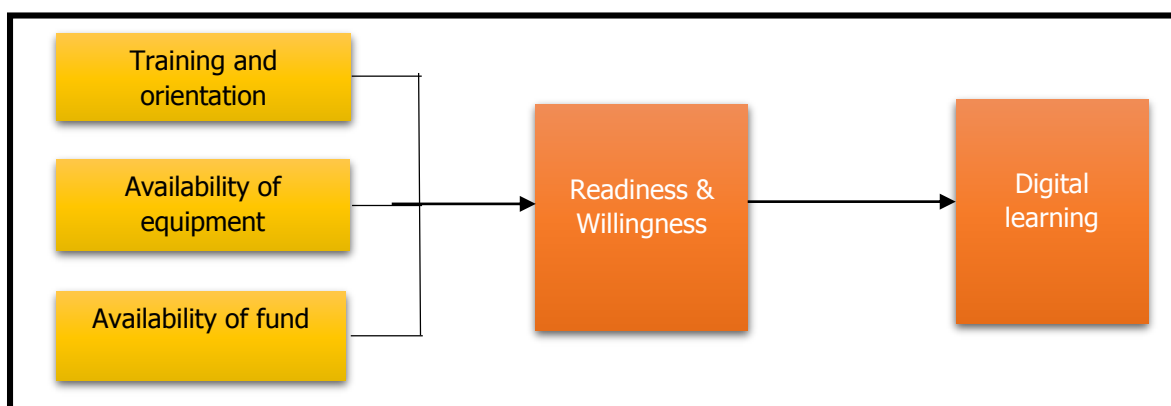


Figure 4.3: TVET lecturers' readiness and willingness to apply digital learning

4.4.1 Training and orientation

Training and orientation programmes are important in determining the readiness and willingness of an institution towards the implementation of digital learning. Training is the process of learning the skills that one needs to do a job, and is closely related to confidence, as adequate training will ideally improve one's confidence level towards the use of digital

learning. Orientation, on the other hand, refers to the process of introducing people to the norms, cultures, values and principles that run within an organisation. The study shows that not all the lecturers or employees at Umfolozi College are equipped with the necessary training to enable them to use the digital learning system. A few participants expressed the view that the College does not take any steps to train people on a digital learning system. One of the participants said that:

"I must admit that not all of them I would say are equipped and proficient. It also depends on the age, some of them they come from the old school they still do not believe, they are reluctant into getting you know like touching a computer, carrying an iPad and so forth is not their thing" (Participant 1).

Another participant said that:

"Obvious because we only had one workshop and only the selected few went for the workshop. I can say at this present moment they are not well equipped so they might need another training and more room for improvement" (Participant 5).

In addition, one of the participants expressed the view that:

"The readiness and willingness to adopt digital learning can be determined by how well the institution is training its staff towards the application of digital learning. Instructors or lecturers must be trained to use e-learning tool at their disposal if the full benefits of e-learning is to be obtained. Training as a factor will increase performance levels"

4.4.2 Availability of DL equipment

The readiness and willingness of an institution to implement a digital learning system in an institution can be determined by the availability of equipment that supports digital learning. One of the participants said that:

"I know that there have been engagements at senior level but the current status is that across Umfolozi we have old computers and they are really affecting us as a result we had to open a computer lab, it was not meant to be used today just because computers are not responding" (Participant 4).

Another participant expressed the view that:

"I cannot say they are well equipped but I can say they are exposed to digital learning because in this campus we have IT and several programmes also we have the ERD. It is about digital because they have computers; they are using the computers to deliver the courses. So I will say that most of them are former IT students and they are lecturing IT so they are used to this so they are well equipped with the digital learning and they are proficient" (Participant 12).

However, one of the participants was of the view that the College is equipped with learning equipment. According to the participant:

"Umfolozi has embraced or is in the process of embracing digital learning so there is a number of initiatives that we are pushing at the moment, one is the public management course which is going online which we can actually do appeal to a different target market and do the course as we do traditionally full time and we do in the afternoons part time but also do it on distance and via digital systems so in terms of that our lecturers have also undergone some training in terms of how to do that we have also orientated some of our students on what to expect in the new year with this as well. There is also the Ulearning system which Ridge tech has embraced where you do things online instead of coming to class so there has been initiatives in terms of this our lecturers have even done dummy recording of lesson presentations which can be uploaded on digital systems where a lecturer could be doing if you are using the system or this platform where it can be done digitally and with that video a lecturer at Ridge tech or students at Ridge tech, Eshowe and Esikhawini can be doing it at the same time if there is a TV or a system in place. So the initiative is there however it is not all our lecturers that have been exposed to this simply because we have not taken the next step forward which I am hoping maybe your paper will push it forward as well, but lecturers are aware of it they are embracing it but again not all lecturers because not all programmes and all lecturers are full for this as well" (Participant 11).

The relevance of the availability of digital learning equipment in determining the readiness and willingness of an organisation towards the implementation of digital learning cannot be over-emphasised. Digital learning readiness has many dimensions and focuses on this question: Do the schools have the needed software and hardware? From the findings above, it appears that Umfolozi College does not have the necessary equipment to support digital learning.

4.4.3 Availability of funds to support digital learning

Readiness and willingness to use digital learning in an institution can also be measured in terms of the amount of money or budget allocated to digital learning; digital learning is an expensive programme that requires a huge amount of money. The results of the study reveal that funding is a big hurdle to the introduction of digital learning in Umfolozi College. One of the participants said that:

"So they have started with that initiative but again budgetary constraints we were unable to roll it out on all of our sites, we managed to roll it out here in one of our campuses in Richards Bay at the Ridge Tech but we could not expand it to the other campuses then at Esikawini campus. We again tried to introduce a programme which was called Kmaths it was an intervention that was meant to bridge the gap between what the NCV students were currently learning because you know that almost all NCV programmes they have either mathematics or maths literacy now we have found that the students end up having poor certification rates because of that maths so we were introducing this platform where the students will be issued each one of them a tablet and it is loaded with mathematic content with all the problem solving and all of those things they are going to do but again when we are starting it was a pilot now we wanted to roll it out but the issues were around inadequate resources so we had to stop with that initiative but I think in a nutshell there are initiatives that have been implemented by both TVET as well as the colleges" (Participant 1).

Another participant said that:

"We are a public institution so budget wise will depend on the state grant. I am not confident that we can have budget set aside but I know the head of the institution is so into it in fact he had Ridge Tech initiate they were calling in eLearning that is one concept. I do not know how far they got with that, they started talking to other countries, Korea so the willingness and the love is there but if we had resources. Exactly, the talk they are keen of saying that universities are full you must go to TVET but the budget is not walking the talk. They speak high of us but we are under budgeted by billions. So I will say DHET is not forthcoming in terms of provisions in terms of money in terms of programs, you even know basic education when they were introducing OBE there were workshops there was a lot of money to make sure that it kick starts you put emphasis on it you train people to make sure, with us we do not see that energy instead we see that money is reduced as a result even enrolment is being reduced" (Participant 2).

However, one of the participant disagreed with the others, saying that:

"I think it is the college because the DHET give grants and allocate funds so for us it was a matter of prioritising. I think one of the things that have hit us most was the migration where everything now is centralised on DHET because earlier money was released and we could manoeuvre and do things according to what we want so now sometimes the DHET will say this money is specifically for this and nothing more so you cannot tamper with it" (Participant 8).

4.5 INITIATIVES TOWARDS THE TRAINING OF TVET LECTURERS IN DIGITAL LEARNING APPLICATION

The last objective of the study investigated the initiatives taken by the DHET to train TVET lecturers towards the digital learning application. The main themes from the study are summarised in Table 4.4 below.

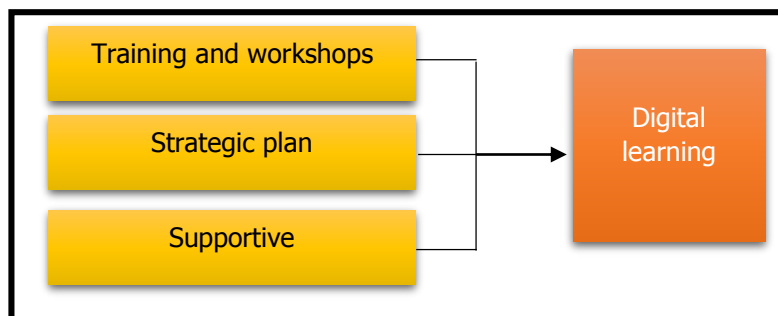


Figure 4.4: Main themes from the study

4.5.1 Strategies to support digital learning

The study sought to find out from the participants what strategies or back-up plans are in place at the DHET to educate and support lecturers encountering problems with digital learning. The findings from the study suggest that the DHET does not have adequate strategies in place to support the implementation and use of digital learning at Umfolozi College. According to one of the participants:

"Well I must be frank with you at the moment I am not sure what strategies are in place in order to assist us normally where DHET is involved are involved with the people that are keeping the student records the financial part of it, those are the people from now and again will have workshops with DHET but as far as the end user as a lecturer and a student I am not sure" (Participant 8).

4.5.2 Training and workshops for TVET lecturers

The results of the study show that the DHET has an initiative towards the provision of training and workshops for TVET lecturers regarding the implementation and use of digital learning. Based on the interviews, one of the participants said that:

"I think there has been a number of initiatives that have been trying to assist colleges to migrate to the digital space, however one needs to highlight the fact that there has not been adequate resources in general for the TVET sector, maybe now after the hash tag fees must fall or the fees commission report with the new minister, once we get to know the content of the report maybe we will then see there is a move towards supporting TVET education but there has been initiatives from both the department and colleges like for instance in our college we started a project partnering with a college from South Korea they were assisting us to introduce something called Ulearning, we are the one that I think is known as eLearning then they have already migrated to Ulearning which is a platform that was found to be much cheaper than eLearning because of the data reasons and so forth particularly in South Africa the data is very expensive but Ulearning was going to minimise those costs" (Participant 10).

Another participant said that:

"All that I am aware that I do not know whether it was a seminar or conference or workshops my lady who is dealing with the training and development specifically she will be able to tell me exactly like I have mentioned our IT lecturer they went for certain interventions but whether it was to gain more knowledge or concentrate especially on those subjects that require it that I cannot say but yes DHET is doing this by means of the seminars and the conferences and what I am aware of not specifically digital learning but might come out of your responses from the lecturers itself what I know is that there were lectures say for instance NCV Maths that there are extra workshops that they have to attend in order to sharpen the saw, I do not know if office data processing was one of them.

One of the participants commented that:

"To tell you the truth I do not think DHET has given...I am not sure not unless there is an ICT conference that some staff would attend. Oh yes, come to think of it ICT lecturers attend ICT conferences and they share a lot of information" (Participant 10).

However, one of the participants disagreed, saying that:

"From the DHET side we have not had any initiatives in terms of training lecturers for digital learning. Whatever has come through has come through with college itself so maybe if they implement the pilots then DHET would do that. DHET is very thorough in terms of training lecturers if subject content changes, curriculum changes so we have witnessed that I must give credit for that when the syllabus changes they do provide training when a new programme comes in they do provide training but I have not seen any training for this and the reason I am assuming this is maybe because it has not been launched in KZN or in our area it could be launched in another province but KZN I have not seen it being done but I am quite sure if it is launched they would provide the backup training at regional level or national level like they have done with other programmes but not for digital learning as yet" (Participant 11).

4.5.3 DHET support towards the provision of TVET's infrastructure, needed software and hardware

The findings from the study show that the DHET has been supporting Umfolozi College with the provision of TVET's infrastructure, needed software and hardware towards the implementation and use of digital learning. Some of the participants said that:

"The department is the one that is providing us with the finances so I will say that the department is supportive to any material that supports the college because if you look at the software some of the things need to be installed in our computers and stuff so sometimes in a few years we do find ourselves having to change computers, change word programs, change IT programmes in order to support the teaching and learning so I will say that DHET is supportive" (Participant 4).

"I wouldn't say DHET the budget that they have from the government you may find that we are all TVET colleges but we all have different infrastructure it depends on the management of the campuses or the colleges so I rather speak about TVET colleges infrastructure like in our colleges they are investing in it like you have mentioned earlier that you have visited our college so we were all on that day it was a special day where we had to be stopped from our daily activities and all campuses where there that alone shows that we are being supportive and remember I did mention about questionnaires from us I did mention what they want from us in what we need should be put in place to continue being known as the best college so they are very supportive and in one of our campuses we have a special lab that they call maths lab where though the idea is being introduced and somehow due to finances it is on hold but the structure is there and it is existing where students are being where the setup is we have an overhead projector where we can write on it, it has got speakers and everything but it is like you are in a 3D movie where you can see everything as if you are actually in there" (Participant 7).

"The money that we are getting as a college is only for teaching and learning and it is not enough they are supporting and there is very little in the kitty so you end up having infrastructure that is almost ten years old if you look at a computer if you look at the computer used for the LO exam those computers give the technicians problems prior to the exam. So DHET is there supporting us but somehow we find ourselves struggling so much that it impacts on teaching and learning and at central office we find ourselves being helpless and we cannot give our staff and students what we would want them to have" (Participant 10).

CHAPTER 5

PRESENTATION AND ANALYSIS OF QUANTITATIVE RESULTS

5.1 INTRODUCTION

The previous chapter presented and analysed the qualitative results of the study. This chapter proceeds to present and analyse the quantitative results of the study, which are linked to the objectives of the study. The main objectives of the study were to investigate the perceptions of Umfolozi TVET lecturers on DL, to establish a causal link between the perceptions of TVET lecturers and the application of DL, to determine TVET lecturers' readiness and willingness to apply digital learning in the classrooms, and to identify initiatives of the DHET to ensure that TVET lecturers are well trained in digital learning applications. The results of the study are presented using frequencies and descriptive and inferential statistics, as indicated in the previous chapter. The results on the biographical characteristics of the participants are first presented, followed by the results on the main objectives.

5.2 FREQUENCY

5.2.1 Demographic information of the respondents

This section of the study deals with the biographical characteristics of the participants' gender, age, educational qualifications, work experience, employment status, position and campus.

Table 5.1: Demographic characteristics of the participants
(Table continues on next page)

CHARACTERISTICS		<i>N</i>	%
Gender			
	Males	21	33.9
	Females	41	66.1
	Other	---	0.0
Race			
	African	56	90.3
	Coloured	--	0.0
	Indian	5	8.1
	White	1	1.6
	Other	--	0.0

Age groups			
	20-25 years	1	1.6
	26-30 years	8	12.9
	31-35 years	27	43.5
	36-40 years	24	38.7
	41-45 years	2	3.2
	46-50 years	--	0.0
	51 years and above	--	0.0
Educational qualification			
	Diploma	20	32.3
	Undergraduate	13	21.0
	Honours	24	38.7
	Masters	2	3.2
	PhD	3	4.8
	Other	---	0.0
Years of experience			
	2-5 years	20	32.3
	6-10 years	15	24.2
	11-15 years	13	21.0
	16-20 years	8	12.9
	21 years and above	6	9.7
Tenure			
	Contract	6	9.7
	Part-time	--	0.0
	Full-time	56	90.3
	Other	--	0.0
Campus			
	Central Office	--	0.0
	Chief Albert Luthuli	10	16.1
	Eshowe	10	16.1
	Esikhawini	15	24.2
	Mandeni	16	25.8
	Richards Bay	11	17.7
Position			
	Lecturer	35	56.6
	Senior lecturer for NCV	6	9.7
	Senior lecturers for NATED	1	1.6
	Post level 1 lecturer for NCV	13	21.0
	Post level 1 lecturers for NATED	6	9.7
	Other	1	1.6

Table 5.1 above shows the demographic characteristics of Umfolozi TVET College. The males constituted 33.9% of the respondents, while females accounted for 66.1%. Regarding race, the results from the study indicated that 90.3% of the respondents were African, 8.1% were Coloured and 1.6% were Indian. In terms of age groups, 1.6% were between the age of 20 and 25 years, 12.9% were between the ages of 26 and 30 years, 43.5% were between the ages of 31 and 35 years, 38.7% were between the ages of 36

and 40 years, and the remaining 3.2% were between the ages of 41 and 45 years. The results of the study revealed that 32.3% had a Diploma in related qualifications offered at TVET, 21% had Undergraduate degrees, 38.7% had Honours degrees in various fields, and 3.2% had Masters in various fields. In relation to working experience, 32.3% had worked between 2-5 years, 24.2% had worked between 6-10 years, 21.0% had worked between 11-15 years, 12.9% had worked between 16-20 years, and the remaining 9.7% had worked beyond 20 years. With respect to tenure, 9.7% of the respondents were contract workers, and the remaining 90.3% of the respondents were full-time workers. 16.1% were staff at Chief Albert Luthuli Campus, 16.1% worked at the Eshowe Campus, 24.2% worked at the Esikhawini Campus, 25.8% worked at the Mandeni Campus, and the remaining 17.7% worked at the Richards Bay Campus. Finally, in terms of position, 56.6% of the respondents were lecturers, 9.7% were Senior lecturers for NCV, 1.6% were Senior lecturers for NATED, 21.0% were Post level 1 lecturers for NCV, 9.7% were Post level 1 lecturers for NATED, and the remaining 1.6% was 'other'.

5.2.2 Perceptions of Umfolozi TVET lecturers on DL

This section of the study explores the perceptions of Umfolozi TVET lecturers on DL. The results of the study are presented in Figure 5.1.

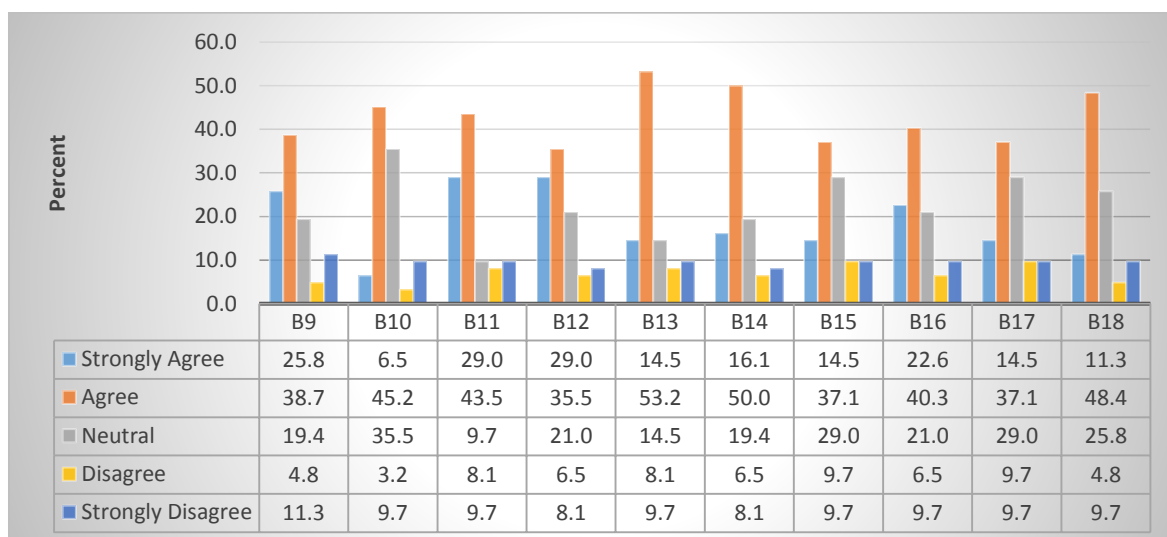


Figure 5.1: Perceptions of Umfolozi TVET lecturers on DL

As per Figure 5.1 above, 64.5% of the respondents perceived DL to be a technological innovation which improves teaching in TVET Colleges, 19.4% neither agreed nor disagreed, and 16.1% disagreed. The results of the study revealed that 51.7% of the respondents

perceived DL to be user friendly, 35.5% were neutral, and the remaining 13.1% disagreed. 72.5% of the respondents perceived DL as a technological innovation that enhances lecturers' professional prestige and status, 9.7% were neutral, and 17.8% disagreed. Furthermore, the results of the study showed that the majority (64.5%) of the respondents agreed that the integration of DL into the College is useful to students and lecturers in diverse ways, 21% were neutral and the remaining 14.6% disagreed. The results of the study further showed that 67.7% of the respondents perceived that DL affords learners flexibility in learning, such that they can learn as individuals or groups, 14.5% were neutral, while the remaining 17.8% disagreed. Additional results showed that 66.1% of the respondents perceived that DL in the College helps lecturers to design different learning activities based on different learning theories, 19.4% were neutral, and the remaining 14.6% disagreed.

The findings also suggested that 51.6% of the respondents perceived that the DL system in the College is useful for uploading lecture notes on the Moodle, 29% were neutral and the remainder (19.4%) disagreed. Furthermore, the results indicated that most (68.3%) of the respondents perceived that DL is very helpful in downloading assignment and quizzes, 21% indicated they were neutral and the remainder (16.2%) disagreed. The study also revealed that 51.6% of the respondents perceived that DL in the College helps lecturers to upload students' grades, 29% were neutral and 19.6% disagreed. Finally, the results of the study showed that 59.7% perceived that the DL system in the College facilitates a discussion forum, 25.8% were neutral and the remaining 14.5% disagreed.

5.2.3 Causal link between the perceptions of TVET lecturers and the application of DL

The second objective of the study investigated the causal link between the perceptions of TVET lecturers and the application of DL. Five items measured the causal link, and the results from the study are presented in Figure 5.2 below.

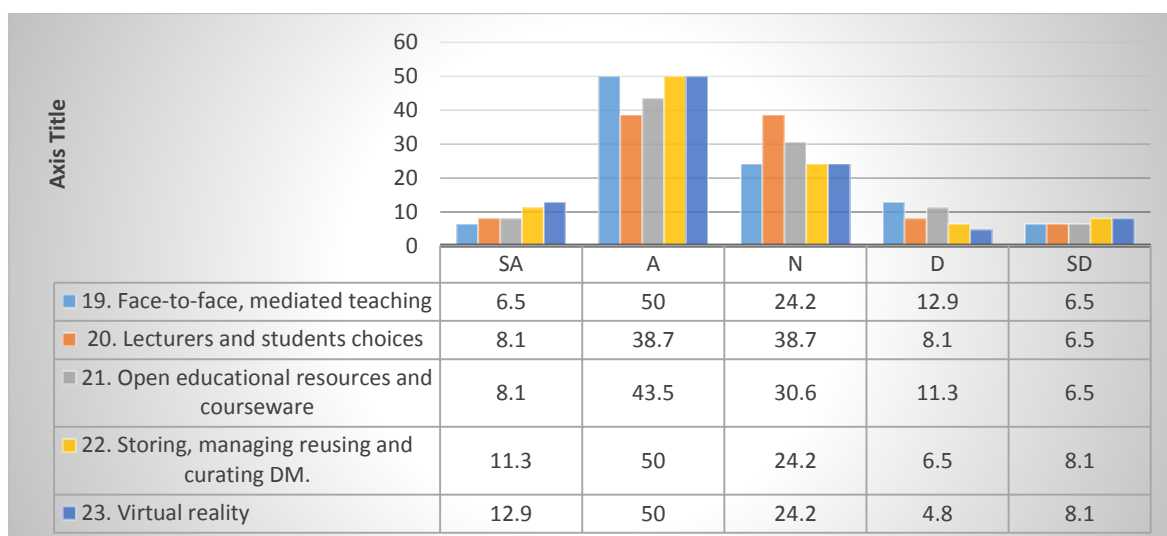


Figure 5.2: Causal link between perceptions of TVET lecturers and the application of DL

As per Figure 5.2 above, 56.5% of the respondents agreed that the application of DL allows for both face-to-face mediated teaching and learning courses which can be delivered by blended learning, 24.2% were neutral and the remaining 19.4% disagreed. 46.8% of the respondents agreed that DL offers lecturers and students choices in the where, when, how, for how long and by what means of study according to their needs and circumstances, 38.7% of the respondents neutral and 14.6% were disagreed. In relation to open educational resources and open courseware, 51.6% of the respondents agreed that the DL system leads to the use of open educational resources (OER) and open courseware (OCW), 30.6% were neutral and the remaining 17.7% disagreed. The findings also suggested that 61.3% of the respondents agreed that DL provides a convenient means of storing, managing, reusing and curating digital materials for the purpose of education, research and administration, 24.2% were neutral and 14.6% disagreed. Lastly, the results of the study showed that 62.9% of the respondents agreed that DL promotes virtual reality (VR), which enables learning from accurate and realistic 3D models of machines, equipment, planetary systems and other phenomena in safe, more convenient and better controlled environments, 24.2% were neutral, and 12.9% disagreed.

5.2.4 Readiness and willingness to apply DL in the classrooms

The third objective of the study investigated the readiness and willingness of TVET lecturers to apply DL in their classrooms. Five items measured this objective.

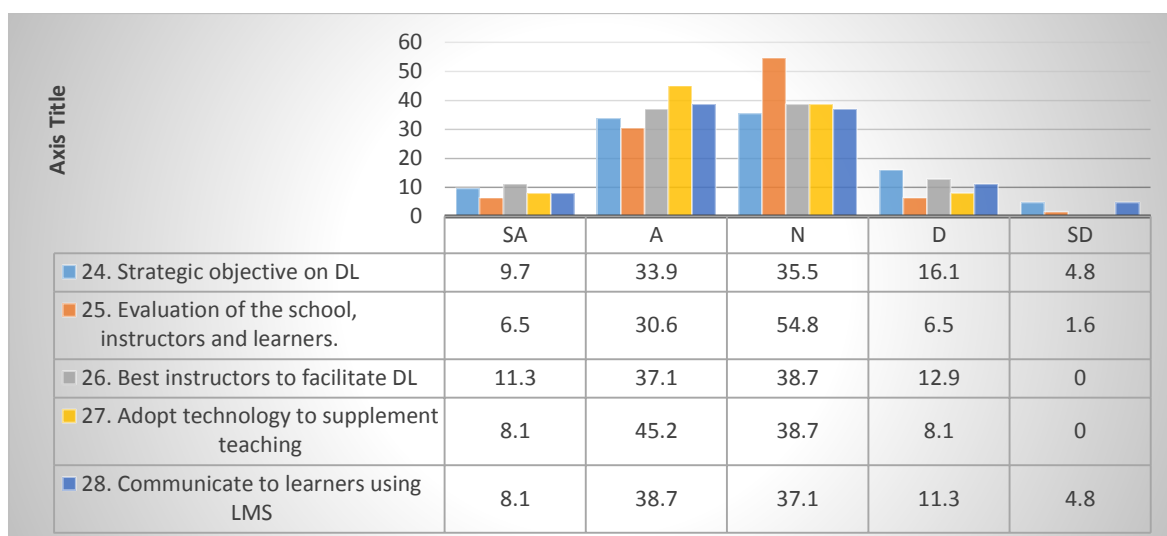


Figure 5.3: Readiness and willingness to apply DL in the classrooms

Figure 5.3 above depicts the TVET lecturers' readiness and willingness to apply DL in their classrooms.).

Almost all the statements show (significantly) lower levels of agreement that TVET lecturers' readiness and willingness to apply DL in their classrooms whilst other neutral is higher (but still greater than levels of disagreement).

The results of the study revealed that 43.6% of the respondents agreed that Umfolozi College has the strategic objectives in place to support the digital learning initiatives, 35.5% were neutral, while the remaining 20.9% disagreed. The findings also showed that 37.1% of the respondents agreed that Umfolozi College usually undertakes an evaluation of the school, instructors and learners, 54.8% were neutral and the remaining 8.1% disagreed.

Another finding of the study revealed that 48.4% agreed that Umfolozi College has the best instructors to facilitate digital learning, 38.7% were neutral and the remaining 12.9% disagreed. The results also showed that 53.3% of the respondents agreed that lecturers at Umfolozi College adopt technology to supplement teaching, 38.7% indicated they were neutral, and 8.1%. Finally, 46.7% of the respondents agreed that instructors, administrators and lecturers at Umfolozi College often communicate to learners using the Learner Management System (LMS), 37.1% were neutral and the remaining 16.1% disagreed.

5.2.5 Initiatives of the DHET towards the training of TVET lecturers on the application of DL

The last objective of the study investigated the initiatives of the DHET towards the training of TVET lecturers on the application of DL. The results from the study are presented in Figure 5.4 below.

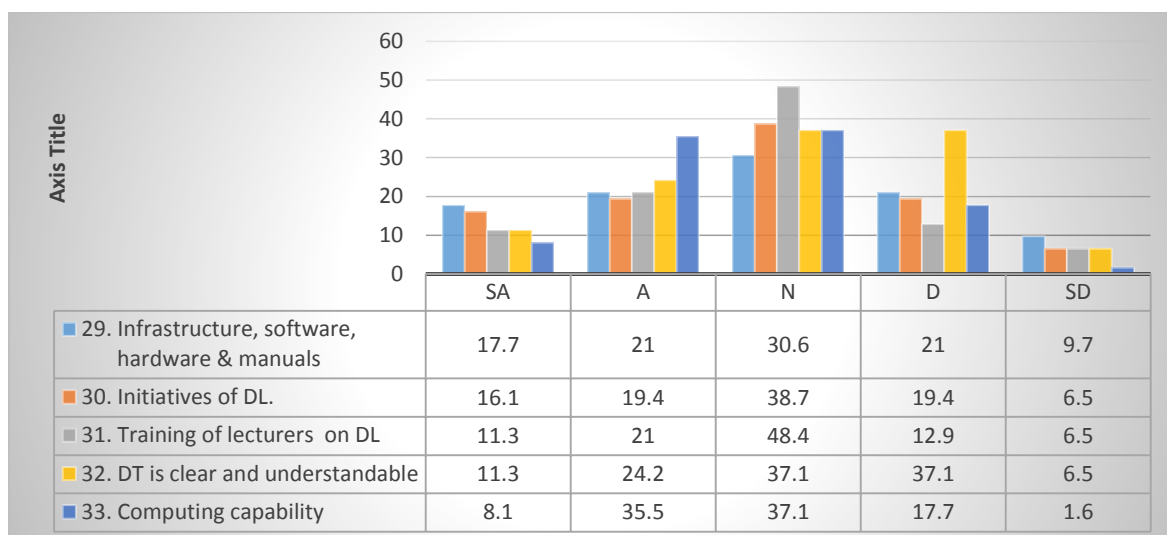


Figure 5.4: Initiatives of the DHET towards the training of TVET lecturers on the application of DL

As per Figure 5.4 above, 38.7% of the respondents agreed that the DHET has provided the infrastructure, necessary software, hardware, IT manuals and reading materials to support digital learning in TVET Colleges, 30.6% were neutral, and the remaining 30.7% of the respondents disagreed. Further results revealed that 35.5% of the respondents agreed that the DHET supports initiatives that ensure TVET lecturers are trained on DL, 38.7% indicated they were neutral, and 25.9% disagreed.

The findings also showed that the respondents agreed that the DHET makes certain provisions to ensure that TVET lecturers are trained on DL, 48% indicated neutral, and 19.4% disagreed. 35.5% of the respondents agreed that through the DHET initiative, the process of developing and delivering digital training at Umfolozi College is clear and understandable, while 37.1% were neutral, however 43.6% disagreed. Finally, 43.6% of the respondents agreed that lecturers know the extent of their students' computing capability before using DL, 37.1% were neutral and 19.3% disagreed.

5.3 DESCRIPTIVE STATISTICS

As mentioned in Chapter 3, descriptive statistics were used to interpret the results of the study based on the four main objectives of the study as highlighted above.

Table 5.2: Perceptions of Umfolozi TVET lecturers on DL

DESCRIPTIVE STATISTICS								
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
	62	3.80	1.20	5.00	2.5774	.90977	.983	.304
Valid N (listwise)	62							

The results in Table 5.2 above show that there is no significant agreement about the perceptions and applications of digital learning in Umfolozi TVET College. This explains why the TVET lecturers have low perceptions of the application of DL.

Table 5.3: Causal link between perceptions of TVET lecturers and the application of DL

DESCRIPTIVE STATISTICS								
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
	62	3.80	1.20	5.00	2.4613	.98769	1.242	.304
Valid N (listwise)	62							

As per Table 5.3 above, the mean score ($M = 2.4613$) reveals that there is no significant agreement that there is a causal link between the perceptions of TVET lecturers and the application of DL.

Table 5.4: Readiness and willingness to apply DL in the classrooms

DESCRIPTIVE STATISTICS								
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
	62	3.40	1.00	4.40	2.6097	.65329	.373	.304
Valid N (listwise)	62							

The mean score ($M = 2.6097$) from Table 5.4 indicates that there is no agreement that there is readiness and willingness to apply DL in the classrooms at Umfolozi TVET College.

Table 5.5: Initiatives of the DHET towards the training of TVET lecturers on the application of DL

DESCRIPTIVE STATISTICS								
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
	62	3.80	1.20	5.00	2.8065	.96562	.069	.304
Valid N (listwise)	62							

Based on the mean score ($M = 2.8065$) in Table 5.5, there is no significant agreement on the initiatives of the DHET towards the training of TVET lecturers on the application of DL.

5.4 INFERENCE STATISTICS

As part of the study, inferential statistics including Cronbach's alpha coefficient, factor analysis, correlation and a t-test were used to interpret the results.

5.4.1 Reliability: Cronbach's Alpha Coefficient

Cronbach's alpha coefficient was used to determine the reliability of the research instrument (questionnaire) used to collect data from the respondents. Reliability was computed by taking several measurements on the same subjects. A reliability coefficient of 0.70 or higher is considered acceptable, while a reliability coefficient of less than 0.70 is considered unacceptable (George & Mallery, 2003; Pallant, 2011). The closer the coefficient alpha is to 1.0, the better the reliability of the measure. This enables the researcher to determine the reliability, consistency and stability of the construct/instrument incorporated in the developed model for proper analysis. The table below reflects the Cronbach's alpha score for all the items that constituted the questionnaire.

Table 5.6: Reliability - Cronbach's alpha coefficient
(Table continues on next page)

		NUMBER OF ITEMS	CRONBACH'S ALPHA
B	Perceptions of Umfolozi TVET lecturers on digital learning	10	0.960
C	Causal link between perceptions of TVET lecturers and the application of digital learning	5	0.936

D	Readiness and willingness to apply digital learning in the classrooms	5	0.799
E	Initiative of the DHET in ensuring that TVET lecturers are well trained in digital learning application	5	0.938
	Total	25	

As per Table 5.6, ten items measured the perceptions of Umfolozi TVET lecturers on DL. The result of the Cronbach's Coefficient Alpha was 0.960, which exceeded the recommended value of 0.70. The study is therefore statistically acceptable and reliable. Again, five items measured the causal link between the perceptions of the TVET lecturers and the application of digital learning, for which the Cronbach's Coefficient Alpha score was 0.936. Furthermore, five items measured the TVET lecturers' readiness and willingness to apply digital learning in the classrooms, for which the Cronbach's Coefficient Alpha was 0.799, which exceeded the recommended value, i.e. it is statistically reliable and acceptable. In addition, five items in the questionnaire measured the initiatives of the DHET in ensuring that TVET lecturers are well trained in digital learning application, for which the Cronbach's Coefficient Alpha score was 0.938. As seen in Table 5.6 above, there were 25 items in the questionnaire and the total Cronbach's Coefficient Alpha score was 0.934.

5.4.2 Pearson correlation

Correlation was used to assess the relationship between perceptions, link, readiness and willingness, and the training of TVET lecturers towards DL.

Table 5.7: Pearson correlation

CORRELATIONS					
		Perceptions	Links	Readiness and willingness	Training
Perceptions	Pearson Correlation				
	Sig. (2-tailed)		.		
	N	62			
Link	Pearson Correlation	.716**			
	Sig. (2-tailed)	.000			
	N	62	62		
Readiness and willingness	Pearson Correlation	.342**	.511**		
	Sig. (2-tailed)	.007	.000		.
	N	62	62	62	
Training of TVET Lecturers	Pearson Correlation	.152	.175	.627**	
	Sig. (2-tailed)	.238	.174	.000	
	N	62	62	62	62
**. Correlation is significant at the 0.01 level (2-tailed).					

Table 5.7 shows the correlation between perceptions, link, readiness and willingness, and the training of TVET lecturers. The Pearson correlation coefficient between perceptions and causal link indicated a positive and significant relationship ($r = 0.716$, $p < 0.01$). This denotes that the perception of TVET lecturers of DL is associated with the causal link between the perceptions of TVET lecturers and the application of DL. The correlation coefficient between the perceptions of TVET lecturers and readiness and willingness signifies a significantly positive relationship ($r = 0.511$, $p < 0.01$). Furthermore, the correlation coefficient between the perceptions and the training of TVET lecturers shows a significantly positive relationship ($r = 0.627$, $p < 0.01$). Among the three variables, the Pearson correlation coefficient between perceptions and causal link ($r = 0.716$, $p < 0.01$) has the highest interplay in the TVET College. This suggests that the association between perceptions and causal link was most crucial to the application of DL in TVET Colleges in South Africa.

5.4.3 Validity-factor analysis

The validity of the self-developed questionnaire was evaluated using Factor Analysis, as per Table 5.8 below. All loadings > 0.45 were considered to be significant, and when an item loaded significantly on more than one factor, only the one with the highest loading was accepted. The items relate to perception of TVET lecturers towards DL (B9 to B18), link between the perceptions and application of DL (C19 to C23), readiness and willingness (D24 to D28), and training of TVET lecturers (E29 to E33).

Table 5.8: Factor analysis
(Table continues on next page)

COMPONENT MATRIX ^A				
	Component			
	1	2	3	4
B9	.685	-.015	.499	.146
B10	.691	-.053	.431	.189
B11	.850	-.276	.282	.064
B12	.765	-.236	.214	.159
B13	.835	-.180	.056	-.117
B14	.832	-.290	.229	-.092
B15	.813	-.209	.284	.000
B16	.862	-.336	.166	.056
B17	.826	-.308	.081	-.163
B18	.782	-.375	.028	-.146
C19	.679	-.090	-.484	-.136
C20	.787	.060	-.352	-.247
C21	.816	-.101	-.352	-.214
C22	.811	-.207	-.320	.104

C23	.791	-.194	-.381	-.058
D24	.487	.386	-.334	-.075
D25	.419	.301	-.192	.702
D26	.535	.565	-.123	.400
D27	.635	.246	-.312	.232
D28	.256	.712	-.136	.167
E29	.374	.816	.117	-.225
E30	.369	.836	.098	-.244
E31	.279	.818	.240	-.145
E32	.300	.769	.219	-.242
E33	.353	.714	.107	.046
Extraction Method: Principal Component Analysis.				
a. 4 components extracted.				

The principle component analysis was used as the extraction method, and the rotation method was Varimax with Kaiser Normalisation. This is an orthogonal rotation method that minimises the number of variables that have high loadings on each factor, which simplifies the interpretation of the factors. The factor analysis/loading showed inter-correlations between variables. Items of questions that loaded similarly imply measurement along a similar factor. An examination of the content of items loading at or above 0.5 (and using the higher or highest loading in instances where items cross-loaded at greater than this value) effectively measured along the various components. All of the statements that constituted the various sections loaded perfectly along a single component. This implies that the statements that constituted these sections perfectly measured what they set out to measure.

5.4.4 One sample T-Test

Table 5.9: T-Test: TVET perceptions on DL, causal link, readiness and willingness, training and gender

ONE-SAMPLE TEST						
	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Perceptions	19.622	61	.000	2.46129	2.2105	2.7121
Link	22.307	61	.000	2.57742	2.3464	2.8085
Readiness & Willingness	31.454	61	.000	2.60968	2.4438	2.7756
Training	22.885	61	.000	2.80645	2.5612	3.0517

* $p < 0.01$

As per Table 5.9 above, there is no significant difference between males and females concerning their perceptions of DL, the causal link between the perception and application of DL, readiness and willingness, and training initiatives, at the 1% level of significance.

5.4.5 ANOVA: Dimensions of perceptions, link and application of DL, readiness and willingness, training and race, age and tenure

As mentioned in chapter three, ANOVA was computed on all the dimensions in relation to perceptions, link and application of DL, readiness and willingness, training, and race, age and tenure.

Table 5.10: ANOVA: Dimensions of perceptions, link and application of DL, readiness and willingness, training and race, age and tenure

DIMENSION	RACE		AGE		TENURE	
	F	P	F	p	F	P
Perception of TVET lecturers on DL	0.442	0.645	0.672	0.614	0.887	0.350
Link between the perception and application of DL	0.468	0.629	1.767	0.148	1.362	0.248
Readiness and willingness to use DL	0.237	0.789	0.373	0.827	1.505	0.225
Training of TVET lecturers	0.945	0.394	0.602	0.663	1.180	0.282

Table 5.10 indicates that there is no significant difference in the perceptions of employees of different races, ages and tenures regarding perceptions, link and application of DL, readiness and willingness, and training.

5.5 CONCLUSION

This chapter presented and analysed the quantitative results which emerged from the study, which were done in accordance with the objectives of the study.

The chapter employed frequency, descriptive and inferential statistics to interpret the results of the study. Frequency distribution was used to interpret the results of the demographic characteristics of the respondents and all the objectives of the study in relation to perceptions, link and application of DL, readiness and willingness, and training, while descriptive statistics such as range, mean and standard deviation were used to analysis the results of the study based on all the objectives.

Finally, inferential statistics such as Cronbach's alpha coefficient, factor analysis, correlation and T-Test were used to interpret the results.

CHAPTER 6

DISCUSSION OF THE FINDINGS

6.1 INTRODUCTION

The previous two chapters presented and analysed both the qualitative and quantitative results of this study, while this chapter proceeds with a discussion of the main findings in accordance with the objectives as outlined above. The first objective investigates the perceptions of Umfolozi TVET lecturers on DL, the second explores the causal link between the perceptions of TVET lecturers and the application of DL at Umfolozi TVET College, the third objective assesses the readiness and willingness of Umfolozi TVET lecturers for the application of digital learning, and the last objective establishes the support that the DHET is providing their TVET lecturers for DL readiness.

6.2 OBJECTIVE 1: EMPLOYEES' PERCEPTIONS OF UMFOLOZI TVET LECTURERS ON DL

The first objective investigated the perceptions of Umfolozi TVET lecturers on DL. The findings are discussed below.

6.2.1 DL is perceived to facilitate interactions between learners and lecturers

The findings from the study showed that DL is perceived to facilitate interactions between learners and lecturers. Based on the qualitative study, seven of the participants perceived DL to be an aspect of technology which makes it easier for lecturers and learners to interact on one platform, however the quantitative study had no findings to this effect. The difference amongst the two parts of the study was that the qualitative study probed the participants on whether DL learning facilitates interactions between learners and lecturers, while the quantitative study did not.

6.2.2 DL is perceived to be in keeping with new changes and technology

Findings from the qualitative study showed that the participants in Umfolozi College perceived that digital is the best way to go in order to embrace changes in technological advancements. However, in the case of the quantitative study, there were no findings to

that effect. It emerged during the qualitative study that DL was introduced in Umfolozi College so as to keep up with new technological advancements. The quantitative study limited the participants to choosing from alternatives, however in the case of the qualitative study, the participants were not limited to choosing from alternative answers, i.e. it allowed the participants to express their opinions.

6.2.3 DL facilitates and improves learning in Umfolozi College

The results of both studies indicated that the implementation, application and use of DL in Umfolozi College improves study learning. With respect to the qualitative study, 10 of the participants perceived DL as a technology that facilitates easy learning, while the quantitative study showed significant agreement that DL improves learning. As 64.5% of the participants perceived that DL improves study learning, it is clear that there is a consensus amongst lecturers and management at Umfolozi College that DL contributes to an improvement in student learning. Jethro, Grace and Thomas (2012:203) discovered that DL “presents an entirely new learning environment for students, thus requiring a different skill set to be successful”. The authors contended that DL offers learners control over content, learning sequence, pace of learning, time, and often media, allowing them to tailor their experiences to meet their personal learning objectives. Adesoji (2011), meanwhile, found that there is a spectrum of opinions on the role of DL in student learning, and argued that students believe that they use ICT more than the lecturers. The students also believe that the use of tablets with academic applications dramatically improves learning. DL is important for education because it can improve the quality of the learning experience, and extend the reach of every lecturer and tutor.

6.2.4 DL is convenient and user friendly

The results of both studies showed that DL is convenient and user friendly. The qualitative findings revealed that eight of the participants perceived that DL can be used everywhere by lecturers and students, without necessarily going to the classroom. The quantitative study also showed significant agreement (52%) that DL is user friendly.

6.2.5 DL system enhances lecturers’ professional prestige and status

Based on the study, the quantitative results indicated that there is a significant agreement (72.5%) that DL enhances lecturers’ professional prestige and status.

6.2.6 DL learning is perceived to be useful to lecturers and learners

Findings from the quantitative research indicated that 54.5% of the respondents agreed that DL is useful to both lecturers and learners, however with respect to the qualitative research, there were no findings to that effect as it did not probe the participants on this aspect.

6.2.7 DL affords learners' flexibility in learning

The results of both studies revealed that there is a strong correlation between DL and learners' flexibility in learning. With respect to the quantitative study, the majority (67.7%) of the respondents indicated that DL affords learners' flexibility in learning, such that they can learn as individuals or groups. DL has become popular because of its potential for providing more flexible access to content and instruction at any time, from any place (Jethro *et al.*, 2012).

6.2.8 DL helps lecturers to design different learning activities

Findings from the study revealed that DL helps lecturers to design different learning activities. Based on the quantitative study, 66.1% of the respondents perceived that DL in the College helps lecturers to design different learning activities based on different learning theories. However, in relation to the qualitative study, there were no findings to that effect, as there was no question on this topic.

6.2.9 DL is useful in uploading lecture notes and student grades

In relation to the quantitative study, more than half (51.6%) of the respondents perceived that the DL system in the College is useful for uploading lecture notes on the Moodle. In terms of the qualitative study, there were no findings to that extent.

6.2.10 DL facilitates an open discussion forum

Findings from the quantitative study showed that 59.7% perceived that the DL system in the College facilitates a discussion forum, but the qualitative study showed no findings to that effect as it had no question on this issue. The question was an open question but none of the participants indicated that DL facilitates an open discussion forum.

6.3 CAUSAL LINK BETWEEN PERCEPTIONS OF TVET LECTURERS AND THE APPLICATION OF DL

The second objective of the study investigated the causal link between the perceptions of TVET and the application of DL. In relation to the quantitative study, four questions out of five showed a positive response, while one showed a negative response.

6.3.1 DL allows for face-to-face conversation

The results of the quantitative study revealed that the majority (56.5%) of the respondents agreed that the application of DL allows for both face-to-face mediated teaching, and learning courses which may be delivered by blended learning. In relation to the qualitative study, there was no findings, i.e. none of the respondents indicated that DL allows for both face-to-face mediated teaching and learning courses which may be delivered by blended learning.

6.3.2 DL promotes students learning

Based on the qualitative study, the results showed that the majority ($n = 8$) of the participants expressed the opinion that digital learning impacts positively on student learning, however the quantitative study had no finding to that effect. One important reason which accounted for the difference in the results was that the qualitative study did not restrict the participants, which allowed them to express their views or opinions. On the other hand, the quantitative study restricted the respondents to providing answers to the questions on the questionnaire. Despite the difference in the results, a general conclusion can be drawn that DL promotes students' learning.

6.3.3 DL leads to OER and OCW

The results of the quantitative results showed that more than half (51.6%) of the respondents agreed that the DL system leads to the use of open educational resources (OER) and open courseware (OCW). The qualitative study had no findings to that extent, however.

6.3.4 DL facilitates information sharing

The qualitative results of the study revealed that there is a strong correlation between the digital learning system and information sharing. Based on the interviews, the majority (n = 9) of the participants expressed opinions that DL facilitates or promotes information sharing. However, in relation to the quantitative study, 61.3% of the respondents agreed that DL provides a convenient means of sharing, storing, managing, reusing and curating digital materials for the purpose of education, research and administration.

6.3.5 DL promotes virtual reality

The quantitative findings showed that most (62.9%) of the respondents agreed that DL promotes virtual reality (VR), which enables learning from accurate and realistic 3D models of machines, equipment, planetary systems and other phenomena in safe, more convenient and better controlled environments. However, in terms of the qualitative study, there were no such findings.

6.3.6 DL promotes student performance

The qualitative results of the study revealed that there is a strong relationship between DL and student performance. From the interviews, most (n = 7) of the participants expressed the view that DL has proven to be an important technological tool for improving student performance worldwide, and has exposed students to many things which are not necessarily taught in the classroom. Further, DL provides an opportunity for students to find answers or solutions to their assignments, which not only facilitates learning but also improves performance.

6.4 TVET LECTURERS' READINESS AND WILLINGNESS TO APPLY DL

The third objective of the study investigated TVET lecturers' readiness and willingness to apply DL. Both the qualitative and quantitative research addressed this objective, however the findings varied.

6.4.1 Strategic objective to support the DL initiatives at Umfolozi College

From the study, it was found that Umfolozi College has no strategic objective to support DL initiatives; just 43.6% of the respondents agreed that Umfolozi College has a strategic objective to support them. Since the number of people who agreed with this statement were less than 50%, it can be agreed that Umfolozi College has the strategic objectives to support the DL initiatives. The qualitative study, on the other hand, had no findings to this effect. Strategic readiness and willingness will be accomplished by developing an inclusive master strategy for the incorporation of DL into TVET. The strategy ought to incorporate the vision, mission values, objectives, strategies, time period and assessment plan for DL proposals (Edumadze *et al.*, 2014). The college is obligated to create a budget to accommodate expenditure correlated to hardware and software, connectivity, upkeep and staff coaching, should depict the ideas of DL facilitated learning with regard to modern practices, and should be extensively circulated amongst every single key partner (Orazalina *et al.*, 2016).

6.4.2 Evaluation of the College, students and instructor

The quantitative findings suggested that Umfolozi College does not usually undertake an evaluation of the school, instructors and learners before the introduction of DL. Based on the results, the majority (54.8%) of the participants neither agreed nor disagreed that Umfolozi College usually undertakes an evaluation of the school, instructors and learners. Since the majority of the respondents were neutral, the researcher cannot conclude that the Umfolozi College often conducts a thorough evaluation of students and instructors. In relation to the qualitative study there was no such findings. The evaluation system concentrates on the interaction between DL, the existing instruction and learning practice. To be pedagogically ready, TVET colleges need to complete an assessment of the compatibility of DL with the current philosophy of learning, an examination of diverse prospects for incorporating DL into TVET, and an appraisal of the technological proficiency requirements for teachers and learners, warranting that DL will meet the students'

educational needs and that lecturers are able to encourage the incorporation of DL in their classrooms (Edumadze *et al.*, 2014).

6.4.3 Availability of DL equipment

The qualitative study found that the availability of DL equipment is a critical factor which determines the readiness and willingness of institutions to adopt DL. The results showed that the majority (n =10) of the participants expressed the view that Umfolozi College has the necessary equipment to support DL. In relation to the quantitative study, there were no such findings. The readiness and willingness largely depends on the kind of equipment that is available to support DL system (Edumadze *et al.*, 2014). This is referred to as technology readiness. According to Edumadze *et al.* (2014), technology readiness is manifested mainly on the technical machines available to enable DL system to function well.

6.4.4 Appointment or recruitment of qualified instructors

The appointment or recruitment of qualified instructors is an important determinant of the readiness and willingness of an institution towards the adoption of DL. The quantitative results of the study revealed that Umfolozi College lacks qualified instructors who will bring new ideas on board towards the introduction of DL, while the qualitative study revealed that most participants expressed the view that human resources is a vital tool to determine the readiness and willingness of an institution towards DL. According to Saekow and Samson (2011), human resources readiness refers to the availability and set-up of the human support system. In this component, some parameters such as receptivity and the prerequisites of humans to learn successfully in the new environment are defined.

6.4.5 Adoption of technology

The readiness and willingness of the TVET College towards the use of DL can be determined based on the kind of technology that has been adopted. From the quantitative study, the results showed that 53.3% of the respondents agreed that lecturers at Umfolozi College adopt technology to supplement teaching. However, in terms of the qualitative study, there were no findings to this effect. According to Edumadze *et al.* (2014), technology readiness focuses primarily on the technical infrastructure. Content readiness incorporates issues concerning e-learning content material such as interactivity, reusability and interoperability.

6.4.6 Availability of funding/financing

The readiness and willingness of an institution to implement a DL system can be determined by the availability of financing, which is the second most important resource in every organisation after human resources. The success and failure of a DL system in TVET depends largely on the availability of funds, as DL is an expensive programme which requires a huge amount of money. The qualitative results of the study revealed that funding is a big challenge to the introduction of DL in Umfolozi College. Edumadze *et al.* (2014) argued that financial readiness refers to the budget allocation and investment for establishing a robust e-learning setup. The authors recommended that institutions intending to implement DL must ensure that there is a constant flow of financial resources to support the DL system. As mentioned above, DL is capital intensive, therefore TVET Colleges must commit themselves financially to its implementation.

6.5 INITIATIVES OF THE DHET TOWARDS THE TRAINING OF TVET LECTURERS

The last objective of the study investigated the initiatives of the DHET in ensuring that TVET lecturers are well trained in DL application. There were five items in the questionnaire which measured the initiatives of the DHET towards the training of TVET lecturers, however the results indicated that the DHET has implemented little or no initiatives towards the training of TVET in applying DL in their classrooms.

6.5.1 Provision of TVET's DL infrastructure, including necessary software and hardware

The initiative of the DHET to support a DL system in TVET Colleges can be determined in terms of its contribution towards the provision of infrastructure and the necessary software and hardware. The quantitative and qualitative findings both showed that the DHET has been supporting Umfolozi College with the provision of infrastructure, software, hardware, IT manuals and reading materials towards the implementation and use of digital learning.

6.5.2 Provision toward training of TVET lecturers

The quantitative findings showed that the DHET does not make provision to ensure that TVET lecturers are trained on DL, however the qualitative results of the study showed the opposite.

6.5.3 Understanding DL system at Umfolozi TVET College

The quantitative results of the study showed that the majority of the respondents disagreed that through the DHET initiative, the process of developing and delivering digital training at Umfolozi College is clear and understandable. However, in relation to the qualitative study, there were no such findings. Understanding the DL system is very important to all stakeholders; a clear and understandable DL system will usually provide stakeholders with vital information on how it functions.

6.5.4 Computing capability learners/students

The quantitative results of the study showed that lecturers' responses and the DHET do not comprehend the computing capability of students towards the use and application of DL. In terms of the qualitative study, there was no such findings, as the research did not probe the participants on this issue. A critical assessment of computing capability of students is important to determine how well they will be able to use the DL system, as DL is an aspect of technology that requires adequate knowledge on the use of a computer.

6.6 CONCLUSION

This chapter discussed the main findings of both the qualitative and quantitative research conducted at Umfolozi College amongst lecturers and management. The discussions were carried out in accordance with each of the objectives. The findings from previous studies were also integrated into the discussion of these findings. The next chapter presents the summary, recommendations and conclusions of the study.

CHAPTER 7

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

7.1 INTRODUCTION

Chapter 6 discussed the main findings of the study, while this chapter presents the conclusions and recommendations of the study in line with the objectives of the study. The overall objective of the study was to investigate the perceptions of Umfolozi TVET lecturers on DL, while the specific objectives were to investigate the link between the perception of lecturers and the application of DL, to assess the readiness and willingness of Umfolozi TVET lecturers towards the application of DL, and to establish the support that the DHET is providing their lecturers for DL readiness in TVET Colleges. The limitations of the current study as well as suggestions for further studies are highlighted and briefly discussed.

7.2 SUMMARY OF THE FINDINGS FROM BOTH STUDIES

The major research findings from both the qualitative and quantitative studies are presented below. The findings on the perceptions of Umfolozi TVET lecturers on DL are first presented, followed by the findings on the link between the perception of lecturers and the application of DL. The next section of the study provides the summary of the findings regarding the readiness and willingness of Umfolozi TVET lecturers to apply DL in their classrooms. The last section presents the summary of the findings regarding the support that the DHET is providing their lecturers for DL readiness in TVET Colleges.

7.2.1 Perceptions of Umfolozi TVET lecturers on DL

The first objective of the study investigated the perceptions of Umfolozi TVET lecturers on DL. The study found that TVET lecturers have differing perceptions about the application of DL, but that DL is perceived to facilitate interactions between learners and lecturers. In addition, the findings from the qualitative study showed that the participants perceive DL is the best way to go in order to embrace the changes in technological advancements. The results of both studies indicated that the implementation, application and use of DL in Umfolozi College improves student learning. Furthermore, the results of both studies showed that DL is convenient and user friendly. The findings also showed that DL reduces costs and less expensive to operate than manual teaching. In addition, the findings showed that there is a strong correlation between DL and learners' flexibility in learning, and that the respondents perceive that DL helps lecturers to design different learning activities based on different learning theories. Moreover, the study showed that the respondents perceive that the DL system leads to the use of open educational resources (OER) and open

courseware (OCW). It was also found that DL is very helpful in downloading assignment and quizzes, as well as uploading students' grades. Finally, the respondents perceived that the DL system facilitates a discussion forum.

7.2.2 Causal link between perceptions of TVET lecturers and the application of DL

As mentioned above, the second objective of the study investigated the causal link between the perception of TVET lecturers and the application of DL. Based on the study, the findings showed that the application of DL allows for both face-to-face mediated teaching and learning courses which may be delivered by blended learning. The results of the study also revealed that DL can take place ubiquitously, i.e. it offers lecturers and students choices in the where, when, how, for how long and by what means of study, according to their needs and circumstances. Moreover, the study indicated that the DL system leads to the use of open educational resources (OER) and open courseware (OCW), and that DL provides a convenient means of storing, managing, reusing and curating digital materials for the purpose of education, research and administration. Lastly, the results of the study showed that DL promotes virtual reality (VR), which enables learning from accurate and realistic 3D models of machines, equipment, planetary systems and other phenomena in safe, convenient and better controlled environments.

7.2.3 TVET lecturers' readiness and willingness to apply DL in their classrooms

The third objective of the study investigated the TVET lecturers' readiness and willingness to apply DL in their classrooms. The findings which emanated from the study clearly show that Umfolozi College is not ready and willing to apply DL in its classrooms, and it has no strategic objective or plan to support the DL initiatives. The findings also highlighted that Umfolozi College does not undertake an evaluation of the school, instructors and learners in relation to the introduction and application of DL. The results of the study further revealed that Umfolozi College lacks the instructors to support and facilitate DL, however it does adopt technology to supplement teaching. Finally, the study suggested that instructors, administrators and lecturers at Umfolozi College often communicate to learners using a Learner Management System (LMS).

7.2.4 Initiative of the DHET in ensuring that TVET lecturers are well trained in DL application

The last objective of the study investigated the initiative of the DHET in ensuring that TVET lecturers are well trained in DL application. Judging from the various responses, it appears that the DHET has few or no initiatives to support the training of TVET lecturers towards the application of DL, including providing infrastructure, software, hardware, IT manuals and reading materials. The findings also suggested that the DHET does not have or implement any initiative towards the process of developing and delivering digital training at Umfolozi College in a clear and understandable manner. Lastly, the study showed that TVET lecturers know the extent of their students' computing capability before using DL.

7.3 RECOMMENDATIONS

Based on the results of the study, the following recommendations are necessary to support the introduction and application of DL in TVET Colleges.

7.3.1 Recommendation 1: Strategic objective or plan on DL

Based on the findings above, the study recommends that TVET Colleges should have a strategic objective or plan which supports the introduction and application of DL. Strategy is an important management tool which serves as a guide to every organisational activity, thus a strategic objective or plan for DL will provide TVET Colleges with direction on how DL learning can be introduced and applied in classrooms. The strategic objective or plan should focus on the long-term rather than the short-term, and should consider what, when, where and how DL will be introduced in the College.

7.3.2 Recommendation 2: Evaluation of school, instructors and learners

With reference to the findings above, the study recommends that TVET Colleges should undertake a thorough evaluation of their schools, instructors and learners when introducing DL, and introduce a proper evaluation system to determine its readiness and willingness to introduce DL. Again, the College must evaluate the needs of their students to determine their readiness and willingness to acceptable DL learning. This will enable the College to make decisions on what kind of DL system should be introduced. Furthermore, a detailed

evaluation of the lecturers is necessary to determine their level of experience in DL, as well as their readiness and willingness to apply DL in their teaching.

7.3.3 Recommendation 3: Appointment or recruitment of qualified instructors

The success or failure of DL systems in schools largely depends on the instructors. Based on the findings, it appears that Umfolozi College does not have instructors who will be responsible for training lecturers and students on the application of DL. It is against this background that the study recommends that TVET Colleges should appoint or recruit qualified instructors who will train staff and students on how DL systems can be used. This will enable the College, students and lecturers to appreciate the relevance of the DL system.

7.3.4 Recommendation 4: Adoption of technology

With reference to the findings, the study recommends that TVET Colleges should adopt technology to support the introduction and application of DL in their classrooms. DL drives on technology, thus TVET Colleges must take advantage of the current technological innovations and advancements to support DL. As DL is an aspect of technological innovation, its sustainability will depend on how well the TVET Colleges take advantage of the new technology.

7.3.5 Recommendation 5: Provision of infrastructure, software, hardware, IT manuals and reading materials

The results of the study revealed that the DHET does not provide TVET Colleges with the infrastructure, software, hardware, IT manuals and reading materials to support DL. Therefore, it is against this background that the study recommends that the DHET take the necessary steps to ensure the provision of these items to TVET Colleges to support the application of DL. In addition, stakeholders such as Transnet, ESKOM which are parastatals, and the NGOs should support the DHET with the provision of infrastructure, software, hardware, IT manuals and reading materials to TVET Colleges.

7.3.6 Recommendation 6: Training of TVET lecturers

In relation to the findings above, this study recommends that both the DHET and TVET Colleges should provide training for lecturers and students towards the use of DL. Training is a key tool for equipping people with skills and knowledge in a particular field.

7.4 CONCLUSION

All the study objectives were fully met through proper investigation. Based on the findings the following conclusions are drawn, which are based on the findings that emerged from each of the objectives.

7.4.1 Conclusion 1: Perceptions of Umfolozi TVET lecturers on DL

Statistically, the study found that Umfolozi TVET lecturers have varied perceptions of the introduction and application of DL. These perceptions are positively related to DL. For example, the majority of the respondents perceived that DL facilitates interactions between learners and lecturers, promotes student learning, improves student performance, is convenient and user friendly, is helpful in downloading assignment and quizzes, is useful in uploading students' grades, and facilitates discussion forums.

7.4.2 Conclusion 2: Causal link between perceptions of TVET lecturers and the application of DL

The study concludes that the application of DL allows for both face-to-face mediated teaching and learning courses which may be delivered by blended learning; offers lecturers and students choices in the where, when, how, for how long and by what means of study, according to their needs and circumstances; and leads to the use of open educational resources (OER) and open courseware (OCW). The findings also suggested that DL provides a convenient means of storing, managing, reusing and curating digital materials for the purpose of education, research and administration, and promotes virtual reality (VR) which enables learning from accurate and realistic 3D models of machines, equipment, planetary systems and other phenomena in safe, more convenient and better controlled environments.

7.4.3 Conclusion 3: TVET lecturers' readiness and willingness to apply DL in the classrooms

The study concludes that Umfolozi College is not ready and willing to implement DL in its classrooms. Umfolozi College has no strategic objective or plan to support DL initiatives; has not evaluated the school, instructors and learners in relation to the introduction and application of DL; and lacks the best instructors to support and facilitate DL.

7.4.4 Conclusion 4: Initiative of the DHET in ensuring that TVET lecturers are well trained in DL application

Based on the findings, the study concludes that the DHET has few or no initiatives to support the training of TVET lecturers towards the application of DL; no initiatives to provide the infrastructure, software, hardware, IT manuals and reading materials to support DL; no provision to ensure that the TVET lecturers are trained on DL; and no initiative to develop and deliver digital training at Umfolozi College in a clear and understandable manner.

7.5 SUGGESTIONS FOR FURTHER STUDIES

The research was limited to the lecturers and management at Umfolozi College, however a study of this nature should have involved students in the College, as they are the people who are going to use DL. This will make it very difficult for the College to assess the challenges and needs of students in relation to DL, therefore further studies on DL should focus on students. The study is also limited in terms of geographic location and coverage, and should have been conducted in two or more TVET Colleges in South Africa. All things considered for additional study, the researcher can explore an investigation on the same topic undertaken in different nine TVET Colleges with their fifty one campuses in KZN, as well as its impact on digital learning and consider those studies for correlation. This thus limits the generalisation of the findings. Furthermore, the study should have included the DHET policy makers, as it plays a key role in the functioning of TVET Colleges in South Africa. The objective which relates to the initiatives of the DHET towards the training of TVET lecturers on DL would have been explored further if the DHET was involved in the study.

7.6 CONCLUSION

This chapter provided a summary, recommendations and conclusions based on the findings in accordance with the objectives that guided the study. The study concludes that TVET lecturers at Umfolozi TVET College perceive DL differently as compared to those in universities, but there is a causal link between the perceptions and application of DL. However, the study concludes that Umfolozi College is not ready and willing to apply DL in its classrooms. These perceptions are mostly influenced by matters beyond their control. Finally, the study concludes that the DHET does not have initiatives in place to support the training of TVET lecturers on DL.

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INTERVIEW SCHEDULE

**UNIVERSITY OF KWAZULU-NATAL
SCHOOL MANAGEMENT, IT & GOVERNANCE
COLLEGE OF LAW & MANAGEMENT STUDIES
WESTVILLE CAMPUS**

INTERVIEW SCHEDULE

**Title: Perceptions of Umfolozi Technical and Vocational Education and Training
Lecturers on Digital Learning: A case Umfolozi TVET.**

Section A: Demographic information

This section of the questionnaire deals with information on the biographical characteristics of the participants regarding their gender, age, educational qualification, work experience, employment status, position and campus.

Please put an X in the most appropriate box which relates to your biographical characteristics

A.1 Gender

1.1 Male	
1.2 Female	
1.3 Other	

A.2 Race

2.1 African	
2.2 Coloured	
2.3 Indian	
2.4 White	
2.5 Other	

A.3 Age

3.1 20-25 years	
3.2 26-30 years	
3.3 31-40 years	
3.4 41-50 years	
3.5 51-60 years	
3.6 61 year and above	

A.4 Educational qualification

4.1 Diploma	
4.2 Undergraduate	
4.3 Honours	
4.4 Masters	
4.5 PhD	
4.6 Other	

A.5 Years of experience

5.1 2-5 years	
5.2 6-10 years	
5.3 11-15 years	
5.4 16-20 years	
5.5 Above 20 years	

A.6 Tenure

6.1 Contract	
6.2 Part-time	
6.3 Full-time	
6.4 Other	

A.7 Campus

7.1 Central Office	
7.2 Chief Albert Luthuli	
7.3 Eshowe	
7.4 Esikhawini	
7.5 Mandeni	
7.6 Richards Bay	

A.8 Position

8.1 College Principal	
8.2 Campus Managers	
8.3 Quality Assurance Manager	
8.4 Deputy Principal Academic	
8.5 Assistant Director Curriculum services	
8.6 Other	

Section B: Research Questions and Objectives**B.9 Perceptions of Umfolozi TVET lecturers on digital learning**

- In your own view, what are the benefits of using Digital Learning at TVET?
- How would you advise an inexperienced lecturer about the use of digital learning?
- Can you explain the way Digital Learning impacts on your daily approach to work?

C.10. Causal link between perceptions of TVET lecturers and the application of digital learning

- How significant do you think the awareness and exposure of lecturers to DL will benefit the college?
- When planning to use digital learning in your lecture or daily work approach, what do you intend to achieve, what are your objectives and intentions?

D.11 TVET lecturers readiness and willingness to apply digital learning in their classrooms.

- How well equipped and proficient are the lecturers in applying digital learning in their classrooms.
- To what extent can Umfolozi TVET alter the budget to accommodate the cost of staff development and material development for digital learning?

E.12 Initiative of the DHET and Umfolozi College in ensuring that TVET lecturers are well trained in digital learning application

- How supportive is the DHET on TVET's infrastructure, needed software and hardware to implement digital learning and systems maintenance?
- What strategies or back up plans does DHET have to educate and support lecturers encountering problems with digital learning

APPENDIX B1**INFORMED CONSENT**

Informed Consent Letter 3C

h no negative
survey/focus
icipant will be

aire or about
umbers listed

take the time

Your participation in this project is voluntary.

You may refuse to participate or withdraw from the study without any negative consequence. There will be no monetary gain or loss for the participant. Confidentiality and anonymity of records will be maintained by the Graduate School of Business.

If you have any questions or concerns about participating in this study, you may contact the researcher at the contact details listed above.

The survey should take you about **20 minutes** to complete this survey.

Sincerely

Investigator's Signature.....

This page is to be retained by participant

**UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND**

MBA Research Project

Researcher: Mrs Nandipha Mbanga (083 315 1234)

Supervisor: Dr Vuyo Mtembu (031-261 8192)

Research Office: Ms P Ximba 031-2603587

CONSENT

I.....(fullnames of participant)
hereby confirm that I understand the contents of this document and the nature of the
research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so
desire.

SIGNATURE OF PARTICIPANT

DATE

.....

...4.9.2017.....

This page is to be retained by researcher

QUESTIONNAIRE

**UNIVERSITY OF KWAZULU-NATAL
SCHOOL MANAGEMENT, IT & GOVERNANCE
COLLEGE OF LAW & MANAGEMENT STUDIES
WESTVILLE CAMPUS**

QUESTIONNAIRE

Title: Perceptions of Umfolozi TVET Lecturers on Digital Learning

Section A: Demographic information

This section of the questionnaire deals with information on the biographical characteristics of the participants regarding their gender, age, educational qualification, work experience, employment status, position and campus.

Please put an X in the most appropriate box which relates to your biographical characteristics

A.1 Gender

1.1 Male	
1.2 Female	
1.3 Other	

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4.1 Diploma	
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4.3 Honours	
4.4 Masters	
4.5 PhD	
4.6 Other	

A.5 Years of experience

5.1 2-5 years	
5.2 6-10 years	
5.3 11-15 years	
5.4 16-20 years	
5.5 Above 20 years	

A.6 Tenure

6.1 Contract	
6.2 Part-time	
6.3 Full-time	
6.7 Other	

A.7 Campus

7.1 Central Office	
7.2 Chief Albert Luthuli	
7.3 Eshowe	
7.4 Esikhawini	
7.5 Mandeni	
7.6 Richards Bay	

A.8 Position

8.1 Lecturer	
8.2 Senior lecturer for NCV	
8.3 Senior lecturers for NATED	
8.4 Post level 1 lecturer for NCV	
8.5 Post level 1 lecturers for NATED	
8.6 Other	

Section B**Perceptions of Umfolozi TVET lecturers on digital learning**

The first objective is to investigate perceptions of Umfolozi TVET lecturers on digital learning. Please indicate with a cross (X) in the appropriate column or box which relate to each question or item using the 5 point Likert scale below: The response choice scoring weights are: Strongly Agree (SA) = 1; Agree (A) = 2; Neutral (N) = 3; Disagree (D) = 4; and Strongly Disagree (SD) = 5.

No.	Statement	5 SD	4 D	3 N	2 A	1 SA
B.9	I consider that the integration of digital learning in the College offers lecturers the opportunity to improve teaching					
B.10	Digital learning system in the College is user friendly (perceived ease of use)					
B.11	Digital learning system in the College can enhance lecturers' professional prestige and status					
B.12	The integration of digital learning in the College is useful to students and lecturers as a whole					
B.13	Digital Learning affords learners' flexibility in learning such that they can learn as individuals or groups					
B.14	Digital learning in the College helps lecturers to design different learning activities based on different learning theories					
B.15	Digital learning system in the College is useful in uploading lecture notes on the Moodle					
B.16	Digital learning is very helpful in downloading assignment and quizzes					
B.17	Digital learning in the College helps lecturers to upload grades					
B.18	Digital learning system in the College facilitates a discussion Forum.					

Causal link between perceptions of TVET lecturers and the application of digital learning

No.	Statement	5 SD	4 D	3 N	2 A	1 SA
C.19	Application of digital learning allows for both face-to-face, mediated teaching and learning courses which may be delivered by blended learning.					
C.20	Digital learning offers lecturers and students choices in the where, when, how, for how long and by what means of study, according to their needs and circumstances					
C.21	Digital learning system leads to the use of open educational resources (OER) and open courseware (OCW).					
C.22	Digital learning provides a convenient means of storing, managing, reusing and curating digital materials for the purpose of education, research and administration					
C.23	Digital learning promotes virtual reality (VR) which enables learning from accurate and realistic 3D models of machines, equipment, planetary systems and other phenomena in safe, more convenient and better controlled environments.					

Readiness and Willingness to apply digital learning in the classrooms

No.	Statement	5 SD	4 D	3 N	2 A	1 SA
D.24	I am satisfied that Umfolozi College has the strategic objectives to support the digital learning initiatives.					
D.25	Umfolozi College usually undertakes evaluation of the school, instructors and learners.					
D.26	I am fully satisfied that Umfolozi College has the best instructors to facilitate digital learning					
D.27	Lecturers at Umfolozi College adopt technology to supplement teaching					
D.28	Instructors, administrators and lecturers at Umfolozi College often communicate to learners using Learner Management System (LMS)					

Initiative of the DHET in ensuring that TVET lecturers are well trained in digital learning application

No.	Statement	5 SD	4 D	3 N	2 A	1 SA
E.29	I am excited that the DHET has provided the infrastructure, needed software, hardware, IT manuals and reading materials to support digital learning					
E.30	I am satisfied that the DHET supports initiatives of ensuring that TVET lecturers are trained in DL.					
E.31	I am pleased the DHET makes certain that TVET lecturers are trained on DL.					
E.32	Through the DHET initiative, the process of developing and delivering digital training at Umfolozi College is clear and understandable;					
E.33	I am happy that lecturers know the extent of their students computing capability before using digital learning					

GATEKEEPER'S LETTER FOR ETHICAL CLEARANCE: UMFOLOZI COLLEGE



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA



Let the future be known

29 August 2017

TO WHOM IT MAY CONCERN:

The purpose of this letter is to grant permission to **Nandipha Mbanga**

As per the request to conduct the research project :

Research Project Title: : Perception of Technical and Vocational Education and Training lectures on Digital Learning : A case of Umfolozi TVET.

Aim of the Research: To determine the perception of Umfolozi TVET lectures on digital learning

Tertiary Institution: UNIVERSITY OF KwaZulu Natal

Faculty: Graduate School of Business and Leadership

Qualification: MBA

Name of Supervisor: Dr Vuyo Mtembu

Study Site Location: Umfolozi TVET College , All Campus

Consent of participants: All participants must be given consent forms to sign before the commencement of study.

Confidentiality: All participants must be guaranteed confidentiality

Permission granted by:



SZ ZUNGU

PRINCIPAL

APPENDIX D

ETHICAL CLEARANCE: SOCIAL SCIENCE RESEARCH ETHICS COMMITTEE OF THE UNIVERSITY OF KWAZULU-NATAL



06 October 2017

Mrs Nandipha Mbanga (216074341)
Graduate School of Business & Leadership
Westville Campus

Dear Mrs Mbanga,

Protocol reference number: HSS/1730/017M

Project title: Perceptions of Technical and Vocational Education and Training (TVET) lecturers on Digital Learning: A case of Umfolozi TVET

Approval Notification – Expedited Approval

In response to your application received on 13 September 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Dr Shamila Naidoo (Deputy Chair)

/ms

Cc Supervisor: Dr Vuyo Mtembu
Cc Academic Leader Research: Dr Muhammad Hoque
Cc School Administrator: Ms Zarina Bullyraj

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbap@ukzn.ac.za / snymann@ukzn.ac.za / mohunp@ukzn.ac.za

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COLLEGE OF LAW AND MANAGEMENT STUDIES

Confirmation of Intention To Submit Thesis

(This Form Is To Be Completed 3 Months before Submission of Masters Thesis & 6 Months before Submission of PHD Thesis/Coursework, form is to be Handed to the supervisor/s for there signature and then a copy is to be sent to the PostGrad Office. Original is kept by the school)

NAME OF STUDENT: NANDIPHA MBANGA

STUDENT NUMBER: 216074341

DEGREE: MASTER OF BUSINESS ADMINISTRATION

SCHOOL: GRADUATE SCHOOL OF BUSINESS

TITLE OF THESIS: PERCEPTIONS OF TVET LECTURERS TOWARDS DIGITAL LEARNING: A CASE OF UMFOLOZI TVET

NAME OF SUPERVISOR: DR. VUYOKAZI MTEMBU

SUPERVISOR SIGNATURE:



DATE OF INTENTION TO SUBMIT: 30-11-2017

POSTAL ADDRESS: P.O. BOX 287, SARNIA, PINETOWN, 3610.

TELEPHONE NUMBER: 031 708 2873

CELLPHONE: 083 315 9427

E-MAIL ADDRESS: nandi.mbanga@gmail.com

DATE: 12-10-2017



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Confirmation of Intention To Submit Thesis

