University of Venda

TOWARDS AN E-LEARNING ADOPTION FRAMEWORK FOR RURAL-BASED HIGHER EDUCATION INSTITUTIONS IN SOUTH AFRICA

BY

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Declaration

I, Naziyabanu Mohmedsalim Patel, hereby declare that this research for the Master of Commerce in Business Information Systems at the University of Venda entitled **"Towards an e-learning adoption framework for rural-based higher education institutions in South Africa"** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete reference. Some of the material from this research has been accepted and presented in the form of the following publication:

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ABSTRACT

The aim of this research study is to propose an e-learning framework to deliver a guideline for the adoption of e-learning considering all major determinants such as technical, operational, organisational, cultural and socio-economical domains, in the setting of rural-based higher educational institutions. E-learning is a process which has arisen from ICT advancement, and it is coordinated together with the education programs at many universities. In South African tertiary institutions, the adoption rate for e-learning is higher in urban-based higher education institutions and colleges and lower in rural-based higher education institutions. Even though with the supposed capacity that e-learning provides, the bigger part of the e-learning approach in rural-based higher education institutions does not achieve their potential. This study focuses on identifying factors which impact the adoption of e-learning at rural-based, higher education institutions and its challenges. A case study approach is undertaken, using mixed methods for collection of data from the respondents based on e-learning adoption at student, educator and institutional level. The study identified the factors which influence the adoption of e-learning in rural-based HEIs. Eventually, the researcher proposed an e-learning framework which contributes to the e-learning adoption in rural-based HEIs, by establishing a guide for these institutions for enhanced planning, development and implementation tool for e-learning adoption using the Unified Theory of Acceptance and Use of Technology Model. The study identified that the e-learning usage and perception was lower in rural-based HEIs as compared to urban-based HEIs, and performance expectancy, effort expectancy, social influence and facilitating conditions are all major factors which influence the adoption of e-learning.

Keywords: Adoption Framework, E-learning, Rural-based HEIs, Student-Centred Learning, Teaching and learning.

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CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1.Introduction

E-learning is an evolving educational process of technology which is being used all around the globe. E-learning presents several opportunities for rural-based tertiary institutions to guide their educational systems (Jackline, Frederick, & Godfrey, 2012). It has become prominent to accommodate the challenges which are caused by the evolution of technology and its prospective for substantial access to knowledge and education (Alkharang, 2014).

E-learning has numerous potential benefits and it is a new frontier for teaching and learning. It is being used to support education and teaching and learning (Ischebeck, 2017). It is the direct outcome of the fusion of education and technology. This creates a modernized innovative mechanism for the delivery of education. E-learning overcomes obstacles of time, geography and space thereby providing the delivery of education at any time, anywhere and for anyone. The government urges Higher Educational Institutions (HEIs) to use and adopt e-learning programs. However, as e-learning was initiated in developed countries, the e-learning adoption frameworks were developed to suit developed countries (Wang, 2013).

Modern and enhanced education in developing areas accommodates for significant and meaningful employment for university and college graduates, moving towards a knowledge-based economy, and accelerated growth of the national economy (Olsoon, et al., 2011). This is one of the reasons why governments invest laboriously in education. According to Yaghoubi (2008), rural-based higher education institutions are straggling behind urban-based higher education institutions when it comes to e-learning. He also stated that in the developing countries there is a crucial requisite for HEIs to employ the e-learning facilities. This is because the e-learning approach does not fulfill its potential in rural-based regions; they fail, either partially or totally (Suleman, Ssekakubo, & Marsden, 2011). Therefore, it signifies that e-learning has not been fully optimized in these areas.

Novel techniques are still being analyzed and evaluated with the objective of increasing student attentiveness and initiating effective and tailor-made learning environments where the students can attain perpetual learning using a variety of information technology tools. E-learning provides many opportunities to tertiary educational institutions, but these institutions face problems when adopting technology (Al-Adwan & Smedley, 2013; Suleman, Ssekakubo, & Marsden, 2011; Basak, Wotto, & Bélanger, 2016). These challenges were identified and

overcome in this study by providing a framework for e-learning adoption in rural-based HEIs. This study proposed a framework which contributes towards a successful e-learning adoption by developing a guideline for the HEIs for a more efficient application of an e-learning program in the institution and it also serves as an assessment feature for existing e-learning programs which have already been implemented at rural-based HEIs.

1.2.Background to the research study

E-learning functions as a dominant instrument in guiding educational institutions into an advanced degree of advancement. This novel form of knowledge delivery has benefitted higher educational institutions by changing the present teaching system from a set of information to be dispensed, into an everlasting open learning environment, that has emerged into a digital campus (Mulugeta & Buckley, 2015). These expeditious changes in education have completely altered the provision of education.

E-learning has a great prospective to change teaching and learning through the quality and delivery of education. Higher Education Institutions in South Africa are categorized into urban and rural-based (previously disadvantaged) institutions. Even though e-learning is a prominent educational tool, it continues to fall behind more economically developed areas of the country. In rural-based HEIs in South Africa, and specifically in the Limpopo Province, there are inadequate studies on providing an e-learning framework which identifies the challenges and proposes a solution to successfully employ the e-learning program in HEIs. Significant research has been conducted on e-learning around South Africa and around the world, however, little has been directed towards e-learning in rural areas, in particular, the Limpopo Province. This study used the case study of the University of Venda and Vhembe TVET College to identify factors which influence e-learning adoption in rural-based Higher Education Institutions. This study also used the case study of Rosebank College to perform a comparative study for the adoption of e-learning between urban-based HEIs and rural-based HEIs, after which it provided a framework for e-learning adoption in other rural-based HEIs.

The University of Venda (Univen) is a South African rural-based university, which is situated in Thohoyandou of the Limpopo Province. There are approximately 1180 staff members out of which there are around 418 lecturers. The University of Venda currently has approximately 16 000 students (Tshikororo, 2018). E-learning was implemented at the University of Venda in 2014. The e-learning platform-Blackboard (myUniven), was initiated in January 2015 and it is now moving towards mobile learning. The university is lagging behind other universities in

terms of e-learning as it is still developing and hasn't been adopted up to its full potential (Patel, Madzvamuse, & Armstrong, 2017).

Vhembe TVET College is situated in the Limpopo Province and has six campuses. There are approximately 121 educators and 15 000 students (Mugumo, 2018) at Vhembe TVET College. The college does not have a formal e-learning platform, but it intends to incorporate it into its future strategic goals. Founded on the direction of this study, e-learning is the delivery of education in Higher Education Institutions using internet technologies to support learners and institution goals to elevate knowledge transfer. This means that any form of communication through technology for educational purposes falls under the e-learning concept for Vhembe TVET College. This includes the use of any form of communication including social media, instant messaging, chat rooms, video conferencing, forums and many more.

Rosebank College is an urban-based HEI, the Pretoria Campus has approximately 32 lecturers, and 1200 students (Macheque, 2018). The college uses the e-learning platform Blackboard (RC Learn) and offers distance learning to its students. Therefore, it has a well-established e-learning program which is adopted by its educators and students.

1.3.Statement of the problem

Higher Educational Institutions in developing regions of South Africa are increasingly adopting e-learning programs and blending it into their delivery of education. Unisa is one of the largest South African University of distance learning. E-learning was introduced in 2013 and now it has up to 200,000 students which are enlisted on their e-learning program (OERAfrica, 2016). UKZN introduced the platform Moodle in 2010 and is the official learning management system being used at the university (Bagarukayo & Kalema, 2015). At the University of Venda, e-learning through the Blackboard Learning Management System (myUniven) was introduced in 2014 (Nendila, 2015). According to the article, to aid the learning program, University of Venda also initiated allocating Tablets to their students since the year 2015.

Kahiigi, Hansson, Danielson, Tusubira, and Vesisenaho (2013) stated that e-learning provides the means for leapfrogging into the knowledge-driven world. Regardless of that, integrating technology into an institution has its challenges. Due to these challenges, it does not fulfill its potential through delivery and quality of teaching and learning (Kahiigi, Hansson, Danielson, Tusubira, & Vesisenaho, 2013).

In South African universities, the adoption rate is higher in urban-based HEIs compared to rural-based HEIs (Steyn, Harris, & Hartell, 2014). According to Mason and Rennie (2004), the center of focus of rural development should be allocated towards training and education in order to build human capacity through e-learning, which has the power to overcome the educational gaps and raise the standard of living. Looking particularly at rural-based areas of the country, these educational gaps are hampered with poor infrastructure, poor student perception and resistance, high illiteracy rates specific to ICT and poor e-learning promotion strategies (Qureshi, Yasmin, & Whitty, 2012).

E-learning provides a significant number of benefits to students in both urban and rural setups, however, the equality of these benefits is undermined through connectivity issues and technical hitches. Another issue, as identified by Mason and Rennie (2004) is the out-migration of youth to pursue employment and higher education from rural to urban areas which reduce the population density. "Low population body leads to decreased taxation base to reinforce essential services; geographical absence leads to transportation hindrance, distance from markets can be a disadvantage to current and advanced business development and lastly, remoteness leads to a lack of access to education, training, and professional updating" (Mason & Rennie, 2004). E-learning can render new opportunities which draw and preserve the population in the economy.

Looking at Higher Education Institutions in the Vhembe District, there is one university: The University of Venda and more than eight colleges. Out of all of these, only the University of Venda has implemented the e-learning platform (Blackboard) and none of the colleges have any e-learning platforms. However, even though there is no e-learning platform, students in these colleges still engage in e-learning through the use of internet technologies to aid their education program. It is part of the future strategic goals of Vhembe TVET College to include e-learning in their teaching and learning programs. This study performed a comparative study for the adoption of e-learning between urban-based HEIs and rural-based HEIs, and provided an e-learning adoption framework for rural-based HEIs.

1.4.Aim and objectives

The following are the aims and objectives of this study:

1.4.1. Aim

Many rural-based institutions have adopted the e-learning program and have provided valuable tools for education; however, they do not follow a proper framework to develop a quality e-

learning program. The aim of this study was to propose an e-learning framework to provide guidelines for learning adoption considering all major components including technical, operational, organisational, cultural, and socio-economical domains, in the context of rural-based higher educational institutions.

1.4.2. Objectives

The following are the objectives:

- To determine the usage of e-learning at HEIs.
- To identify the perception of e-learning users and potential users towards the e-learning.
- To determine the level of promotion and support that HEIs provide towards e-learning.
- To identify up to what extent does the location of the HEIs influence the adoption of the e-learning program.
- To determine and bridge the gap between the maximum potential benefits and challenges of e-learning.

1.5.Research Questions

The study seeks to answer these key research questions:

- What is the current usage of e-learning?
- What is the perception of e-learning users towards e-learning?
- What is the degree of promotion and support for e-learning being allocated by HEIs in these rural-based institutions?
- How does the location of the HEIs affect the adoption of the e-learning program?
- What are the potential benefits of the adoption of e-learning?
- What are the major challenges faced when implementing e-learning in rural-based HEIs?

1.6.Significance of the study

E-learning, if implemented correctly can advance the development of the economic educational systems of rural-based HEIs (Fischer et al., 2008). Fischer B (2008) also asserts that e-learning provides benefits such as economic competitiveness, the convenience of time place, flexibility accessibility, social equity, overcoming physical and transportation barriers, lifelong learning, access to advanced information.

The challenges faced for e-learning mainly fall under technology, user perception, and management. Rural-based HEIs face further challenges such as poor ICT infrastructure and

resistance to change. If the institution apprehends all the challenges before implementing an e-learning platform and uses a framework which is specified at e-learning adoption in rural-based tertiary educational institutions, it can maximize its potential and also reduce cost and time.

This research study was to propose a framework for rural-based HEIs which are keen on developing a functional and effective learning system for their students and educators. This study identified factors needed to be recognized when implementing the e-learning program and provided direction towards an optimized solution which minimizes the risks and maximizes the potential of this educational tool. The study targeted mainly students and educators, who are the main e-learning users at HEIs, thus making them the main participants of this study as they can provide insight into the current e-learning situation at their institution. This study provided intuition to those stakeholders responsible for planning, developing and implementation of e-learning programs at the HEIs. The results of this study contribute to the knowledge base, as there is not enough literature published regarding e-learning adoption in the Limpopo Province. The results can also be generalized to other rural-based Higher Education Institutions.

The absence proficient empirical research on e-learning acceptance and adoption in this province has led to limited apprehension of user adoption and user acceptance of e-learning. Additionally, more research is required in this area to facilitate HEIs in improving the standard of education. This study focused on investigating the major and controlling factors with their effect on adoption and acceptance of e-learning. It will aid the policy makers and stakeholders of the HEIs through the proposal of a framework through which the adoption of e-learning is improvised.

1.7.Research Motivation

Despite the efficacious implementation of e-learning in rural-based HEIs, many of the e-learning programs are unsuccessful towards achieving their goals. The reasons for this include social inequity based on socio-economic factors, availability of ICT Infrastructure, skills and ICT integration in teaching and learning (Wang, 2013). This motivated the researcher to conduct a study to identify the factors that influence e-learning specific to rural-based setups and develop an e-learning adoption framework that can maximize the capacity of this form of learning in other HEIs.

E-learning in rural-based HEIs is seen to be lagging compared to urban-based setups. The researcher was motivated by the absence of a structured e-learning environment to maximize

the full potential of the platform. There was also limited evidence of a structured e-learning framework which is to be applied for continuous development of the e-learning system.

To achieve the objectives of this study firstly the influence of technology on learning was assessed. The impact of technology was explored further to define the role of technology in education. Secondly, to evaluate the factors which influence e-learning adoption framework by an extensive study of the available e-learning models and adoption frameworks to make e-learning more meaningful. Lastly, a framework for e-learning adoption suitable for rural-based HEIs in South Africa was proposed.

1.8.Research Methodology

The research design which is anticipated at providing the outcome to acquire the research objectives of the study is known as the research methodology. Chapter three provides detailed information on this section. The research methodology suitable for this study is case study methodology. A case study research is an empirical inquiry which explores a contemporary phenomenon within its real-life context when the boundaries between the phenomenon and the context are not clear (Yin, 1984). This study uses e-learning at Univen to propose a framework for other rural-based HEIs such as Vhembe TVET College which haven't yet formally introduced an e-learning program at their institution. This framework will provide better means for e-learning adoption in HEIs specific to rural-based area complications.

1.8.1. Research Design

The general structure coordinated with a variety of components of the research study within which research is done is known as the research design. It encompasses a blueprint of the collection; measurement and analysis of data (Wilamer, 2012). The concepts are arranged in a form which allows the researcher to recognize the drawbacks of the research. Survey design is used for finding a solution for the adoption of e-learning at rural-based HEIs through questionnaires. A survey questionnaire is a method of collecting data on the trends, opinions or attitudes by examining a sample from the population. The results can be concluded towards the complete population of the study (Mugenda & Mugenda, 2003).

1.8.2. Population

A target population is a total group of individuals which have similar bounden traits (Explorable.com, 2009). The participants chosen for this study are students, educators and e-learning facilitators at the University of Venda, Vhembe TVET College, and Rosebank

College. The sample size selected, based on the target population for this study was 920 survey questionnaires combined.

1.8.3. Data Collection

Data can be gathered from two major sources namely primary and secondary data. Data collected directly from the source and through fieldwork is primary data. This is gathered through the distribution of survey questionnaires to the participants. Data can be collected from a vast number of participants though efficiency, convenience and reachability with precise analysis of the results through these questionnaires.

Data is also to be collected from existing literature. This is the review of various documents such as reports, articles and journals and many more. This aids in identifying gaps, structuring the data and making better conclusions.

1.8.4. Data Analysis

Data analysis is the practice of reasoning to understand gathered information which is directed to the description and illustration of patterns and evaluating the details of investigated data (Mwangi, 2014). For the purpose of this study, data was analyzed using the Statistical Package for Social Sciences (SPSS). SPSS is a data analysis tool which is used for analyzing numerical data, it constructs inferential and descriptive statistics. The analysis is aimed towards answering the research questions and achieving the objectives of this study.

1.8.5. Ethical Considerations

According to Leedy and Ormrod (2005), ethical considerations fall under areas such as honesty, anonymity, voluntary participation, right to privacy, informed consent and protection from harm. The research study was submitted to the University Research Ethics Committee (REC) for ethical clearance. Participation for this study was voluntary and approval is sought from the participants beforehand. The researcher provided a consent letter that grants permission to collect data from respondents.

1.9.Scope of the study

This study centers towards Higher Education Institutions in Thohoyandou, Vhembe District of the Limpopo Province in South Africa and Rosebank College (Pretoria Campus). In the Vhembe District, there is one university namely the University of Venda and more than eight colleges. Out of all of these, only the University of Venda has implemented the e-learning platform. However, it is part of the future strategic goals of Vhembe TVET College and other

colleges to include e-learning in their teaching and learning program. This study worked towards proposing a framework for HEIs which have not yet implemented e-learning, by analyzing the experiences of the institution in the district which has implemented the e-learning program (University of Venda). The study also aimed to perform a comparative study of urban-based HEIs vs rural-based HEIs by studying the e-learning adoption at Rosebank College.

The study population targeted comprised of the users and potential users of the e-learning program which include students, educators and e-learning practitioners. The research considered possible benefits and challenges and identify the areas which need to be targeted in order to achieve maximum potential. It considered the perception of the users of the e-learning program, level of usage and university/college support and provides a way forward.

1.10. Delimitations of the study

Only one university in Thohoyandou uses a proper e-learning platform, which means that the study is limited to one or two cases for detailed information. There was no guaranteed participation of the respondents as they may have taken a long period of time to respond to the surveys. Furthermore, respondents may have refused to participate or provide dishonest opinions which may have led to errors in results.

The sample population is bounded to the physical areas that can be accessed and which are within the financial ability of the researcher. The time limitation is also a challenge as the researcher had to complete the research, collect data, wait for responses, analyze and provide results within a specific time frame.

1.11. Dissemination of findings

The researcher will disseminate the research findings through a dissertation to the university and interested parties. The researcher also looks forward to publishing the findings of this study in Information Technology Journals.

1.12. Operational definitions

- **Adoption**

It is the implantation, acceptance, and use of technology up to its optimal potential.

- **Conventional learning**

It is the learning environment that depends on the student and the educator to be physically present and face-to-face in a classroom.

- **E-learning**

For this study, e-learning is defined as the delivery of education in Higher Education Institutions using the internet.

- **E-learning Users**

These are the users of the e-learning program such as the students, educators and e-learning practitioners.

- **HEIs**

Higher Education Institutions which have the potential to blend e-learning programs in their teaching and learning.

- **Mobile Learning**

It is the delivery of education by means of portable devices such as smartphones, tablet and many more.

- **Rural areas**

The human population which is settled in a less economically developed part of the country and has less favorable conditions in terms of education and infrastructure.

- **Urban areas**

The human population which are settled in a more advanced and economically developed part of the country with a more improved standard of living

1.13. Outline of the Study

Chapter 1: Introduction

This chapter provided the background of the study. It identified the aims and objectives of the study. It also focused on highlighting the research methodology from which the research plan is to be derived. It stated the significance, scope, and limitations, and finally a proposition to structure the research report of this study.

Chapter 2: Literature Review

This chapter presented a summary of existing knowledge in the area of e-learning and its adoption. It provided introductory and background information on e-learning. It reviewed

previous studies which have proposed e-learning frameworks and identified the gaps in the literature which are to be addressed by the research contributions.

Chapter 3: Research Methodology

This chapter justified the choice of the research methodology, approach, and design. It used the research objectives to determine the research methodology, the data collection procedures, the tools and techniques for the collection and analysis of the data.

Chapter 4: Presentation of research findings

This chapter discussed and presented the analysis and findings of the data collected from quantitative sources. SPSS is the statistical software which was used to analyze the data and present the results in graphical and tabular forms.

Chapter 5: Main Findings and the proposed e-learning adoption framework

This chapter presented the main findings of the study and proposed a framework for the adoption of e-learning in rural-based HEIs.

Chapter 6: Conclusion and Recommendations

This chapter presented the research findings, conclusion and recommendations of this study.

1.14. Summary

This chapter introduced the principles of this study. The background to the study and the problem statement was explained, describing the potential that e-learning has on higher tertiary education. Further, the aim, objectives, research questions were identified and presented. The research methodology that is taken up for this study was reviewed presenting the research approaches that are chosen to achieve the objectives of this study. It also highlighted the scope and limitations of the research study. The next chapter focuses on the extensive review of literature from which this study is moulded on.

CHAPTER TWO: LITERATURE REVIEW

2.1.Introduction

Literature Review underpins the formulation of a research problem, objectives of the study and research questions by analyzing secondary sources of information from an existing knowledge base which corresponds to the area of study (Fischer, et al., 2008). Current literature on e-learning was extensively reviewed and assimilated, based on the objectives of this study. This delivered a foundation for this research study based on recently published work to develop a more sufficient framework that can be used by HEIs when implementing an e-learning program.

2.2.E-learning Overview

The subsections below present an overview of e-learning. It provides an introduction, different views and concepts which complement the subject area.

2.2.1. What is e-learning?

E-learning definitions have been interpreted in numerous ways from previous literature. It is also known as online learning, computer-based learning, distance learning, web-based learning, and many more. It is the delivery of information to individuals through computer technology through the internet (Welsh, Wanberg, Brown, & Simmering, 2003). E-learning is a learning instrument which makes use of web browsers for the interaction of students with the learning system (Hassanzadeh, Kanaani, & Elahi, 2012). According to Biehl and Prescott (2013), e-learning reinforces traditional learning which is dispatched electronically through network technologies. Vanve, et al. (2016) contend that it is a gradual shift from conventional learning to computer-based learning which is collaborative, flexible and personalized learning in a learning environment consisting of students, educators, and e-learning facilitators. Vanve, et al. (2016) also state that E-learning provides students with control over their learning, through personalization in terms of content, time and pace of learning and learning sequence. For the aim of this study, e-learning is defined as the delivery of education in Higher Education Institutions using the internet.

E-learning can be viewed differently by every entity. It provides a variation of tools for modern education such as online assessments, chatrooms, video conferencing and other unlimited internet resources. E-learning is not only limited to a virtual classroom created through the computer, internet and an interface but other electronic learning including smartphones, CD-

ROM, TV, Radio which supplements education through multimedia and network capabilities (Denis & Frances, 2014). Denis and Frances (2014) also state that these technologies allow the transmission of knowledge and skills to the intended person, in a timely manner at any suitable place and this is what e-learning is about. It allows a personalized, updated and student-centered learning, as it allows a variety of options for learning which are need-specific and focus on personal and professional advancements.

For the aim of this study, e-learning is defined as the delivery of education in Higher Education Institutions using the internet.

2.2.2. Conventional learning vs e-learning

Conventional learning is a learning environment within the scope of a traditional classroom, viewed as a teacher-centered approach (Wanwipa, 2013). The learners communicate and gain knowledge passively at the same time and place. The educator also controls the structure and timing of the lessons.

E-learning is a virtual learning environment, viewed as a student-centered approach. It allows internet-enabled learning, using computers, tablets or smartphones as an educational medium (Wanwipa, 2013). Moreover, students and educators could communicate at any time and anywhere, building a collaborative community and creating an independent learning environment (Weng, 2008).

A combined approach is however used by most higher education institutions, which is known as blended learning (Weng, 2008) or hybrid approach (Lansari, Tubaishat, & Al-Rawi, 2007). This is a method which combines both conventional learning and e-learning as learners attend lectures to gain basic knowledge as well as use the e-learning program such as attending online lectures, tutorials, participating in online group chats, self-assessment activities and many more to amplify the learning effect. Blended learning is not only a combination of e-learning and conventional learning, but it is also dependent on social collaboration and community development and its maintenance is a major factor to be considered in blended learning (Kundi & Nawaz, 2014). If there is an incompatibility between the institution and the learners and educators, blended learning can fail.

This study focused on two cases: University of Venda and Vhembe TVET College. The University of Venda uses blended learning method as it offers the e-learning program through the e-learning platform Blackboard, and it combines it with conventional learning. However,

Vhembe TVET College does not have an official e-learning platform but makes use of social media as an interface to deliver educational tools between students and educators.

2.2.3. E-learning platforms

E-learning platforms are the computer software that provides an interface through which e-learning activities take place (Piotrowski M, 2010). E-learning depends on technology and needs a network, software, and hardware infrastructure. It is a web-based environment which can be retrieved using web browsers over the internet or intranet (campus network). Guenaneche and Radigales (2008) assert that e-learning platforms incorporate several management tools, communication, monitoring, and evaluation as a software application to provide technical assistance to students and educators to upgrade their education, this can either be pure e-learning or combined learning. There are proprietary and open source software which are used for e-learning programs. These include Blackboard, Saba, Moodle, Dokeos, DotLRN, ATutor and many more (Guenaneche & Radigales, 2008). Guenaneche and Radigales (2008) mention that the e-learning platforms provide features such as authentication, generation, and viewing of content, communication through different media with educators and other students, online assessments, reports of activities and assessments, and evaluation.

2.2.4. Blackboard at University of Venda and Rosebank College

The University of Venda and Rosebank College are using Blackboard as its e-learning platform. Blackboard provides a virtual environment to offer a variety of features such as online submission of tests and assignment, online management of assignments and tests, document exchange, sharing of study resources, immediate communication, and notification dispatch. It is integrated with conventional learning to provide learners with a new learning environment. Learning resources are uploaded onto the platform which can be accessed and downloaded by the students. However, at the University of Venda, not every student and educator make use of this platform. According to Patel, Madzvamuse, and Armstrong (2017), the reasons for this include the absence of computer literacy, training, and motivation. There is also lack of adequate support offered by the institution to increase awareness of the platform and a lack of a suitably devised e-learning policy to serve as a guideline for implementation and support.

2.2.5. The role of social media as an e-learning platform at Vhembe TVET College

Pavlovic M, Vugdelija, and Kojic (2015) argue that e-learning platforms are limited and inflexible for its users and are defined through the settings of the administrator. They also state

that social media is a powerful tool which forms part of the e-learning program independent of a platform and includes features of an active and stimulated e-learning environment for the learners. Nowadays, most students and educators use smartphones, tablets, iPads, and other portable devices. These devices support social media applications such as Twitter, Wikipedia, WhatsApp, Facebook, Instagram, Snapchat and many more. These social connections can be added to support education and augment education. Social media incorporates a range of applications and tools under a variety of applications to deliver a significant number of resources to assist students on a course (Janjić, Miličić, & Spariosu, 2012).

Vhembe TVET College does not have an official e-learning platform, however, it cannot be excluded from the study as social media is a platform on its own which can fall under e-learning. Students and educators make use of social platforms such as WhatsApp, Facebook, emails and many more. E-learning is defined as the delivery of education in Higher Education Institutions using internet technologies. This includes internet technology such as e-learning platforms, social media and many more.

2.2.6. Mobile learning

The major features of mobile technology are mobility and computing. This offers another form of admittance to a Learning Management System (LMS). The continuous access to an LMS via mobile technologies creates novel educational opportunities for HEIs (Fahad, 2009). As most campuses now offer Wi-Fi to its students, it provides resources to students as well as educators to use web and communication technology for educational purposes. E-learning programs such as Blackboard, Moodle and many more also have smartphone applications which can be downloaded. This allows learners to access their resources and receive immediate support through their personal devices without the need of a computer.

2.3.E-learning stakeholders

E-learning stakeholders are the individuals or group of individuals who directly or indirectly interact and are affected by the e-learning program at an institution to (Aparicio, Bacao, & Oliveira, 2016). According to Aparicio, Bacao, and Oliveira (2016), students, educators, educational institutions, accredited bodies, content and technology providers can be included as the e-learning stakeholders at an educational institute. However, for this study, the focus remains on students, educators and the educational institution itself which comprises of the e-learning practitioners. The section below discusses the e-learning perception, e-learning usage

and significance of institutional support in connection to the e-learning stakeholders and reviews the critical success factors of e-learning.

2.3.1. E-learning perception

Recognition of the e-learning perception of learners, educators and other faculty members of the university falls under the research objectives. Perception is the manner through which something is comprehended, regarded, or deduced (Dictionary, 2017). Xu (2011) asserts that learners and educators may have a different perception towards e-learning based on the difference in education and cultural backgrounds. He further stated that perception can affect a learner and educators' academic decisions, performance and expectations.

Popovici and Mironov (2015) assert that students have a positive attitude towards innovation in technology, however, they do not have the same attitude towards using these innovative methods towards education. This may be due to the changes that this new learning management system ought to bring. Changes include the lack of a normal classroom environment, technological infrastructure challenges, asynchronous interaction and a different form of feedback between students and educators (Gamal & Aziz, 2011).

According to Keller and Cernerud (2002), the culture of the institution is a key factor which impacts the perception of e-learning students and educators. The culture can differ in terms of location of the HEIs. Perception may differ in rural-based Higher Education Institutions compared to urban-based Higher Education Institutions, which also influences the usage of the e-learning platform. Students may perceive e-learning in a different context based on the infrastructure available and exposure to these new technologies (Makura, 2014). There is considerable variance in the perception towards e-learning between rural and urban regions. This study was aimed at identifying and reducing the gap between the different levels of perception which limit the usage of the e-learning program up to its full capabilities.

2.3.2. Importance of institutional support

E-learning can be implemented and used up to its full capabilities if its stakeholders become more creative and innovative (Denis & Frances, 2014). The major stakeholder, the institution itself, should have the capability of supporting the program at every stage. Continuous training and support for e-learning would lead to the development of skills and acceptance towards technology. Open and distance learning should be a priority for a transformation in education locally, nationally and internationally (Denis & Frances, 2014). Therefore, the institution should work together with its students and educators to have a unified view of e-learning. This

may lead to increased usage of the platform and positively influence the perceptions of the students, building student confidence and improving the reliability of the system. Many higher education Institutions make provisions for e-learning to its learners, however, not much effort is put into promoting the concept to its students and educators. This leads to lower usage of the platform as students and educators are not aware of all the potential benefits that the e-learning program could provide to their teaching and learning. Not only should the ICT infrastructure be provided, but also a way in which the perception and attitude of the e-learners can be influenced in a positive manner.

2.3.3. Critical success factors of e-learning

Table 2.1 provides the critical success factors for e-learning from different studies.

Table 2.1 Critical Success Factors of E-learning

Students/Learner Role	(Soong, Chua, Loh, & Chan, 2001), (Selim, 2007), (Sun, Tasi, Finger, Chen, & Yeh, 2008), (Malik, 2010), (Mosakhani & Jamporazmey, 2010), (Frimpon, 2012), (Basak, Wotto, & Bélanger, 2016), (Kanwal, Rehman, Bashir, & Qureshi, 2017).
Teachers/faculty/instructor/pedagogical Role	(Soong, Chua, Loh, & Chan, 2001), (Selim, 2007), (Sun, Tasi, Finger, Chen, & Yeh, 2008), (Malik, 2010), (Mosakhani & Jamporazmey, 2010), (Frimpon, 2012), (Basak, Wotto, & Bélanger, 2016), (Kanwal, Rehman, Bashir, & Qureshi, 2017).
Information technology Role	(Selim, 2007), (Sun, Tasi, Finger, Chen, & Yeh, 2008), (Malik, 2010), (Mosakhani & Jamporazmey, 2010), (Frimpon, 2012).
Institution Support/Role	(Selim, 2007) , (Mosakhani & Jamporazmey, 2010), (Frimpon, 2012), (Basak, Wotto, & Bélanger, 2016), (Kanwal, Rehman, Bashir, & Qureshi, 2017).

Table 2.1 Critical Success Factors of E-learning (cont'd)

Course	(Sun, Tasi, Finger, Chen, & Yeh, 2008) , (Malik, 2010).
Design and Environment	(Sun, Tasi, Finger, Chen, & Yeh, 2008).
Content Quality	(Mosakhani & Jamporazmey, 2010).
Participant Interaction	(Mosakhani & Jamporazmey, 2010).

Based on the studies in Table 2.1, it can be identified that the major critical success factors lie within student role, educator role, information technology role, institution support, and the course. These factors are examined in more detail further in this chapter with relation to the rural-based context.

2.4.E-learning and the digital divide (globalization)

The constructive use of technology in HEIs is a worldwide matter for researchers, the government, education institutions, learners, educators, and society. These innovative technologies present prospects for developing economies to determine their long-term challenges of national and international remoteness towards education (Kundi & Nawaz, 2014). The quest of the revolution of education through ICT in Africa is becoming prevalent using of global networks for active participation. This shows that e-learning can have excessive capabilities in rural-based economies than urban-based economies because of the higher need for education to increase the rapidity of the advancement and potential for students (Kwofie & Henten, 2011). However, a gap exists between rural and urban-based economies, which creates a difference in the delivery of education.

Rural-based economies are defined as those areas which lack information technology resources and infrastructure, the population has basic skills on using IT solutions as compared to urban regions (Suleman, Ssekakubo, & Marsden, 2011). This gap is called the digital divide and it can create many challenges for the rural-based HEIs. The gap widens from developing economies which fall behind the more developed economies. This situation can be applied to

e-learning, as a digital divide exists between rural-based HEIs and urban-based HEIs. According to Johannes, Beyers, and Hlala (2015), a considerable investment in the education area will be needed to bridge this gap to create a unified system of education and technology. A better quality of education can be provided to rural-based HEIs if the institutions in those areas would move towards the advancement of technology and innovatively tap into the present opportunities that e-learning provides (Denis & Frances, 2014).

2.4.1. Review of e-learning in urban-based HEIs

Urban-based HEIs are successful in e-learning adoption because they have technology infrastructure support which they also receive from not only from within the institution but also the government (Naresh & Reddy, 2015). Improvement of education is not only perceived as the concern of the institution but also the government. Urban-based HEIs usually have access to high-level technology which means they have constant access to the internet, hardware, and software required to support their education. Governments and institutions are aimed towards having a competitive edge which technology provides. This provides students and educators with access to the latest technologies, study materials and many more from around the globe. However, it is not completely a technology infrastructure driven process. The perception of students and educators is also more positive towards e-learning as support is provided from the top management and the institutions are aimed towards research and innovation (Naresh & Reddy, 2015). This creates an information economy which raises the standard of living and contributes towards the competitive edge that institutions are looking for.

University of Cape Town (UCT) originally used Web CT and Moodle (Bagarukayo & Kalema, 2015). Now they are using a customized learning management system called Sakai which is branded by "vula" (Suleman, Ssekakubo, & Marsden, 2011). UCT provides a flexible learning environment as it supports both online learning and mixed-method learning (UCT, E-learning, 2018). The university is responsible to provide support to students and educators. This includes a mandatory course which is taught to first-year students as an introduction to digital literacy. They also provide support through e-learning policies, workshops, and manuals which enable a support system for e-learning users (UCT, Policies, 2017). E-learning has improved over the years and is being effectively used by students and educators (Ssekakubo, Suleman, & Marsden, 2013).

E-learning was introduced at the University of the Witwatersrand (Wits) in 2002 using Web CT as the learning management system (Nkaba, Wits-e, 2012). Since then continuous

improvements have been made and in 2012 the university launched Sakai: Wits-e (Nkaba, 2014). This upgraded the system to include project management, online support documentation, helpdesk, ongoing training. According to Nkaba (2014), e-learning was aligned with the strategic priorities of the university in 2015. This led to the educational technology development and this has ensured a positive progression as a partnership was made with Academic Partnerships (AP) in the USA, in August 2016 to serve students globally and not just South Africa (Wits, 2016).

University of Pretoria (UP) started using e-learning in 1997 through a blended learning approach (Nkonyane, 2017). Initially, the learning management system used was WebCT (Bagarukayo & Kalema, 2015) and now they use Blackboard as the e-learning platform branded as *clickUP*. According to Potgieter and Harding (2016), "UP is a leader in South Africa in terms of implementation of the hybrid learning approach to augment student experience and improve student success". E-learning at UP offers students a combination of both conventional learning enriched by online learning. According to Nkonyane (2017), the system offers an opportunity for deep learning by providing online tools and resources. All undergraduate modules are available online to the students and the uptake of e-learning is very successful, as the number of students, design, and quality of the learning environment has all increased over time (Nkonyane, 2017).

2.4.2. Review of e-learning in rural-based HEIs

Developing or rural-based economies have predominantly been exemplified by a lower standard of living, lower income levels, increasing population, and dependence of technology on a developed economy (Kahiigi, Hansson, Danielson, & Vesisenaho, 2013). E-learning in rural-based HEIs has not fulfilled its potential as the gap through the digital divide still exists. These concerns must be identified and addressed to make provision for a more quality uptake of the e-learning platform by the universities.

According to Suleman, et al. (2011), the barriers towards technology in education include the knowledge gap, high illiteracy rate, internet accessibility, and greater anticipations with lack of marketing strategies, the absence of management support, usability issues and lower level of comfort when using technology solutions.

E-learning is an opportunity for rural-based HEIs to progress the quality of teaching and learning. Even with the technological advancements, the perception of e-learning in urban-based regions is completely different than rural-based regions (Naresh & Reddy, 2015). The

rural-based HEIs are more reliable on conventional learning rather than e-learning. It is seen as an option of learning rather than an innovative method of learning which can provide even more global opportunities to the students.

The divide that exists between technologies can also be classified as the separation of knowledge, needs and expectancies that impact the access to information on what technology produces, technological needs, and how it can be incorporated in the learning environment (Kundi & Nawaz, 2014). This digital divide can be bridged by acquiring and improving prolonging partnerships with the e-learning stakeholders. The rural-based economies should follow the strategies of urban-based economies in terms of e-learning, but also use their own approaches based on the challenges faced in those specific areas when implementing the program.

2.5.Identifying the gap

E-learning is now being implemented in developing regions of South Africa (Isaacs & Hollow, 2012). It is believed that it has a high potential for the local government to meet the incrementing demand of education while facing problems experienced by less developed economies (Andersson & Grönlund, 2009). E-learning provides access to education in remote areas through a cheap and flexible way. However, with new technology comes new challenges, and the challenges in rural regions of a country are more plentiful compared to urban-based regions. For the intent of this study, there was a need to recognize all the benefits and full potential that e-learning can provide. Thereafter, the challenges of e-learning and the locational challenges were to be identified. Only after this thorough research, a framework was created to eliminate or limit these challenges. This will aid HEIs when implementing e-learning to fill the void between the challenges and full potential of this program.

2.5.1. E-learning benefits

There are numerous benefits that e-learning implementation and adoption provide while enhancing the quality of education. These include lower cost compared to the on-campus presence, availability of re-usable content, increased educational opportunities, flexibility in learning, ability to handle an incrementing number of learners, more approaches for human development and many others (Kwofie & Henten, 2011). According to Unwin (2008), the benefits of e-learning for universities include self-paced learning, ease of access to required information, increased student motivation, supports synchronous and asynchronous e-learning,

secure environment for submission of work, efficient student record management and student online activity supervision in real time.

Technologies such as tablets, smartphones and personal computers with internet connectivity have accommodated for flexibility in working procedures that permit employees to do their job "beyond their usual working hours and away from their particular workplace" (Stephens, McGowan, Stoner, & Robin, 2007; Gbur, 2013). This provides learners and educators to communicate at any time. The following are the main categories that the benefits of e-learning fall under.

2.5.1.1.Reduced Costs

E-learning reduces cost as e-learning packages are available to suit the student or institutional funds (Kwofie & Henten, 2011). It offers students the opportunity to study at an institution without acquiring the implicit costs of enrolment and accommodation physically at the campus. It also can accommodate an incrementing number of students. It reduces the cost of printing and distribution. It recompenses for lecturers or lab technician scarcities.

2.5.1.2.Flexibility of time and place

There is ease of access to information and provides students with different approaches towards learning. The students may prefer e-learning or blended learning and can use it either way. The course is available to students and educators at any time and doesn't require them to be physically present. The students and educators can access the educational content, despite their location, therefore, there is a high level of resource availability.

2.5.1.3.Increased collaboration and interactivity

E-learning can foster online interactions even when students are not within the same geographical locations. When students are working on projects or assignments, teamwork is involved. E-learning provides a medium for students and educators to work together with less effort through online interaction. This provides an active learning environment and increases participation through interaction and communication. This makes use of the platform for yet another purpose.

2.5.1.4.Delivery of effective and personalized learning

Information can be stored in different formats using different mediums for an extended period of time (Kwofie & Henten, 2011). This multimedia enhancement develops a student's level

of understanding and expanses their learning experience. It allows them to use tools which they are most comfortable with and suits their learning style and provide personalized learning.

2.5.1.5.Flexibility in the delivery of learning

E-learning provides flexibility in the delivery of learning by presenting it in different forms. E-learning provides the study materials to be presented in form of documents, presentations, visuals, sound, videos and many more. Students could revise the content as many times as they like and learn at their own pace as and not being dependent entirely on the educator. This trims down the learning delivery cycle, increases student satisfaction and decreases stress levels (Arkorful & Abaidoo, 2014).

2.5.1.6.Student Motivation

E-learning provides motivation for students to use innovative technologies to communicate with other students and educators, allowing them to interact and share diverse point of views (Arkorful & Abaidoo, 2014). It promotes independent learning and develops their self-learning skills.

2.5.1.7.Re-Usability of content

E-learning makes provision for re-use of content. The study resources are created and accumulated through a digital medium. They can be reviewed and developed further through research, then modified to adapt different learning environments (Kwofie & Henten, 2011).

2.5.1.8.Efficient records management

E-learning facilitates efficient management of student records and progress as online activity can be monitored in a timely manner. Educators can monitor how many students have been active on the platform, they can monitor the amount of time they spend on the platform and performance on tests and assignments can also be assessed and monitored. It acts as leverage to enhance the daily administration and management functions. It provides educators and e-learning facilitators with a clear view on how students are progressing, and necessary changes based on challenges that they face can be implemented correctly.

2.5.2. E-learning challenges

Technology comes with its opportunities and challenges. One of the major challenges of e-learning is the comprehensive absence of personal and physical collaboration between students and educators (Arkorful & Abaidoo, 2014). It has high costs such as the need for computers or devices as a medium and internet connectivity. Familiarity and experience with the platform is

also a major drawback, as many students and educators may not be familiar with the e-learning platform and this becomes a disincentive to them. The institution itself faces strategic level challenges such as the initial cost of the technology infrastructure, training of staff and faculty, and student training. Other challenges include technological, infrastructural, institutional, and funding support (Kwofie & Henten, 2011).

2.5.3. E-learning challenges in rural-based HEIs

When looking at South Africa, adoption of e-learning is greater in urban-based HEI's compared to rural-based HEI's (Steyn, Harris, & Hartell, 2014). Based on the major critical success factors identified above in the study, the challenges specific to e-learning in rural-based HEIs are identified below. The challenges are divided into five categories namely students, educators, technology, institution and course studied and summarized from a number of studies (Selim, 2007; Kwofie & Henten, 2011; Qureshi, Yasmin , & Whitty, 2012; Mbuli, 2013; Albidewi & Tulb, 2014; Arkorful & Abaidoo, 2014; Chisango, 2014; Naresh & Reddy, 2015; Tarus, Gichoya, & Muumbo, 2015).

2.5.3.1.Students

The following subsection presents the student challenges:

2.5.3.1.1. Perception

A major technological integration challenge is the social and cultural difference that exists between the digital divide. The perception affects how students view and use the e-learning program. Perception also depends on factors such as gender, age, experience, technology awareness and accessibility, computer literacy and cost to learn technology (Naresh & Reddy, 2015).

2.5.3.1.2. Awareness

There is the lack of awareness in some institutions even after e-learning has been implemented in the educational process. Students may not be aware of the technology made available to them or the significance of it thereof (Qureshi, Yasmin, & Whitty, 2012). Students who are unacquainted of the advantages that e-learning provide may ignorantly believe that it is a waste of their time to interact with the platform and not achieve the benefits that technology integration provides to them.

2.5.3.1.3. Motivation

Students usually lack motivation in the e-learning program (Kwofie & Henten, 2011). E-learning needs to first be aligned with student needs, after which it can be seen as a medium to achieve their educational goals. If there is a lack of motivation, the student may drop easily from the program.

2.5.3.1.4. Resistance

Resistance is the extent of a negative attitude towards the transformation towards and use of technology. The dependency on learning through conventional methods and educators providing students with a guideline every step of the way often causes resistance amongst students towards self-learning (Qureshi, Yasmin, & Whitty, 2012). E-learning experiences contemplation, seclusion and absence of personal interaction. This necessitates a convincing motivation to decrease these effects (Arkorful & Abaidoo, 2014). According to Selim (2007), students are more probable to register for e-learning if a positive attitude is present and if the technical staff is available for them at all times to assist and motivate them.

2.5.3.1.5. Computer literacy and training

The degree of expertise plays an important role in the adoption of technology (Qureshi, Yasmin, & Whitty, 2012). Therefore, if students have computer literacy they are more likely to contribute more towards the use of technology. Rural dwellers usually have less computer literacy compared to urban dwellers which put them a step backward.

ICT skills include information, operational and strategic skills. This can be discussed as the ability to work with hardware and software, to be able to look for, choose and handle information on a computer or network and eventually the ability to use technology to achieve individual goals and improve their position in the society (Chisango, 2014). These skills are a necessity for e-learning to be successful and are seen as a challenge for rural-based individuals due to the digital divide.

2.5.3.1.6. Language

South Africa has eleven languages used throughout the country. Computer language is mainly English. Language can form a barrier of the digital divide in a country (Chisango, 2014). It would be less of a challenge if the software could be localized and presented in any languages that the students prefer.

2.5.3.2.Educators

The following subsection presents the educator challenges:

2.5.3.2.1. Technological skills and confidence

E-learning can be viewed positively and as a means for innovation, however, issues lie in the ability to offer their course online (Albidewi & Tulb, 2014). The lack of technological experience and skills which are needed to develop the e-content by the educators hinders as a drawback for a successful e-learning adoption.

E-learning requires proper and continuous training for educators who are not in the field of technology. Basic computer skills are not adequate for utilizing the e-learning platform and providing it as a learning system to their students, thus the need for training (Tarus, Gichoya, & Muumbo, 2015).

2.5.3.2.2. Motivation and Perception

A positive attitude toward technology attributes to motivation towards e-learning. E-learning should be perceived as a benefit rather than a challenge to educators. The educators also can play a major part in the positive perception of e-learning towards the students. They can encourage them to use the platform and integrate it in their lectures successfully if they have a positive attitude towards the platform themselves.

2.5.3.2.3. Time

Another challenge is the time required for educators to learn and manage the course. It might create the issue of conflicting priorities as educators may not have enough time to learn, implement, and present the course online for their students.

2.5.3.3.Technology

The following subsection presents the technology challenges:

2.5.3.3.1. Access

Students in rural-based areas usually do not have sufficient technology and internet connectivity in the comfort of their homes (Qureshi, Yasmin, & Whitty, 2012). People within the same country have access to technology differently based on the digital divide which creates a socio-economic and education gap (Chisango, 2014).

They usually depend on the educational institution for this facility. The availability of computer labs, computers, reliable internet connectivity for students at the institution fall under this

category. It may pose as a challenge if the rural-based HEIs cannot provide for this. However, the costs of implementing technology are becoming cheaper as time goes.

2.5.3.3.2. Cost (infrastructure and support)

E-learning implementation has an expensive initial cost for starting up. The HEIs face costs of technology, infrastructure, and training (Albidewi & Tulb, 2014; Qureshi, Yasmin, & Whitty, 2012). Important fund allocations are also to be made in areas such as maintenance, content development and infrastructural development (Tarus, Gichoya, & Muumbo, 2015). If enough funding is not provided in this area, it may limit the successful adoption of the e-learning program.

ICT infrastructure plays a vital role in the success of e-learning and is a major challenge in the field. Rural-based HEIs usually have lack of infrastructural support. Computers, internet connectivity, computer laboratories have a scarce supply which limits students access to e-learning (Tarus, Gichoya, & Muumbo, 2015).

2.5.3.3.3. Speed bandwidth

The challenges under technology include the need for awareness and a systematic method regarding technology (Naresh & Reddy, 2015). The availability of ICT infrastructure may be deprived which is required for upholding a quality standard of education and speed bandwidth is one of the concerns. There can be heavy traffic caused due to a big number of students, educators and staff constantly using network technologies.

2.5.3.4.Institution

The following subsection presents the institutional challenges:

2.5.3.4.1. Knowledge Management

Ongoing research should be dedicated to the field of e-learning specific to the institution, where current issues are undertaken, studied and analyzed. Thereafter solutions should be provided on how to improve the overall process. E-learning adoption may fail in time if this area is not considered (Kwofie & Henten, 2011).

2.5.3.4.2. Economy and funding

E-learning requires a lot of funds upfront to cover the cost of a software implementation, infrastructure (if not available) and staff. Costs can be involved in designing the courses online. This requires both human and technology development.

2.5.3.4.3. Training of educators and staff

A systematic plan is required to ensure that the educator skills are put to their best use (Mbuli, 2013). The E-learning technology staff expertizing in the field has to be employed and educators need to be trained to ensure that the program is a success. Educators require the ability to gather resources from different areas and present them to the students in a unified format. The educator's perception of e-learning will also influence how the students view the program.

2.5.3.4.4. Rules and regulations

The deficiency in educational technology and insignificant incorporation can characterize negatively towards globalization. If rural-based HEIs do not have governmental support, it may lack a monetary front and effectual support system towards e-learning (Naresh & Reddy, 2015).

2.5.3.4.5. Operational e-learning policies

If institutions affirm policy goals at a management level and plan with milestones trying to achieve these goals, tend to have greater success (Albidewi & Tulb, 2014). According to Tarus, Gichoya, and Muumbo (2015), rural-based HEIs lack e-learning policies. They may exist, but they may not be actively used. An e-learning policy is crucial for the adoption of e-learning at rural-based HEIs as it defines the strategic plans and implementation strategies which ensure that the institution has a competitive edge. It is also important as the lack of effective goals and strategic plans towards e-learning may create hindrances in the quality uptake of the e-learning program.

2.5.3.4.6. Structural support

The HEIs need to ensure that ongoing support is provided to the students and educators. E-learning should be a continuous cycle with planning, implementation, evaluation, and maintenance. Without structural support, e-learning can fail to reach its optimum potential (Mbuli, 2013).

2.5.3.5.Course

The following subsection presents the course challenges:

2.5.3.5.1. Course, presentation and interface design

E-learning facilitators and educators are clearly aware that a well-designed course is needed to promote e-learning. This is not only the interface design but also the student and educator

interactions, rapid feedback and continuous interaction (Albidewi & Tulb, 2014). This poses as a challenge to a successful e-learning adoption.

2.5.3.5.2. Subject content

E-learning content requires time to convert coursework on paper into a digital format. Educators are engaged with routine tasks and do not have sufficient time for the conversion. ICT infrastructure such as computer and internet connectivity is also required in order to do so (Tarus, Gichoya, & Muumbo, 2015).

2.5.3.5.3. Type of course

Every discipline in the field of education cannot utilize e-learning techniques. Not every course is suitable for online study, and some might be more advantageous if taught using conventional methods. Practical skills cannot be fully developed online and maybe less appropriate (Arkorful & Abaidoo, 2014). Therefore the need for face to face interaction falls as a challenge for e-learning based on the type of course (Qureshi, Yasmin, & Whitty, 2012). A blended learning approach may be appropriate to overcome this barrier.

2.6.E-learning Frameworks

This section provides a review of frameworks and theories which have been used and refined in several studies for the adoption, acceptance, and success of e-learning and technology.

2.6.1. A Framework on critical success factors of e-learning

Basak, Wotto, and Bélanger (2016) presented a conceptual framework for the critical success factors of e-learning implementation in higher education. It was developed after an in-depth literature review of 57 articles in this field of research. This framework comprised of eight major dynamics which are shown in Figure 2.1. These eight variables are depicted through the Technology Acceptance Model (TAM), and they influence the perceived ease of use, perceived usefulness, and user acceptance of technology. Most e-learning projects fail to achieve its aim and goals. They face complications in online communication, instructional design and other technical features as there is less focus on quality and the capabilities of e-learning. According to the study, critical success factors have an influence over the adoption of e-learning in higher education and a framework is fundamental in developing and improving the educational system. The growth of technology has led to a growth in educational demands, lifelong learning and non-formal forms of education, which specifically require e-learning implementation. This framework identifies crucial elements for developing and refining the implementation of e-learning in higher education.

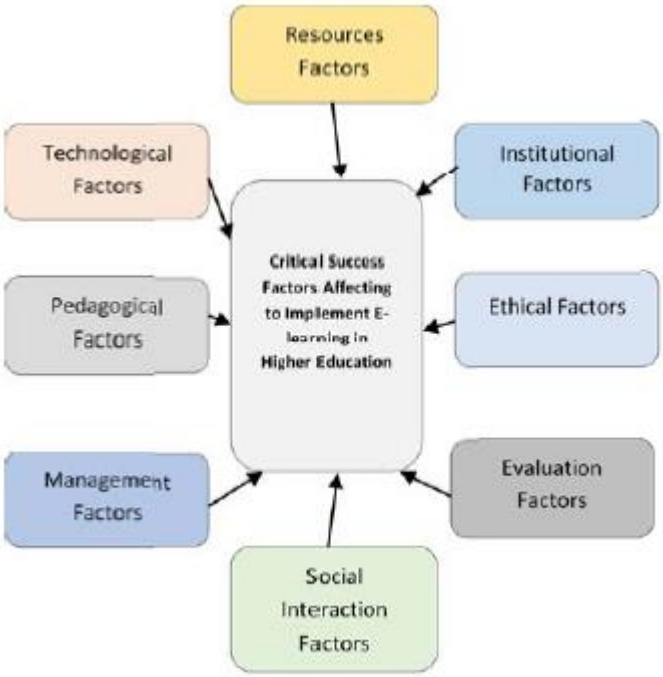

Figure 2.1: A proposed conceptual framework for critical success factors for e-learning implementation in higher education (Basak, Wotto, & Bélanger , 2016)

2.6.2. A framework on learner satisfaction towards e-learning

Malik (2010) proposed a conceptual framework for student satisfaction towards e-learning as shown in Figure 2.2. The study identified elements which play a major role in the satisfaction of students towards e-learning. These factors are also considered as obstacles to a successful e-learning adoption, and if not satisfied may lead negatively to the success of e-learning in higher education. This study was driven on the relationship between students, educators, and technology integration as a whole to improve learner satisfaction. The study also emphasized the administration to consider all these factors. The administration plays a major role in attracting students towards online learning through technical support and interface of the environment. According to the study, if the focus is provided on these issues, it will avert failure and implementation loss.

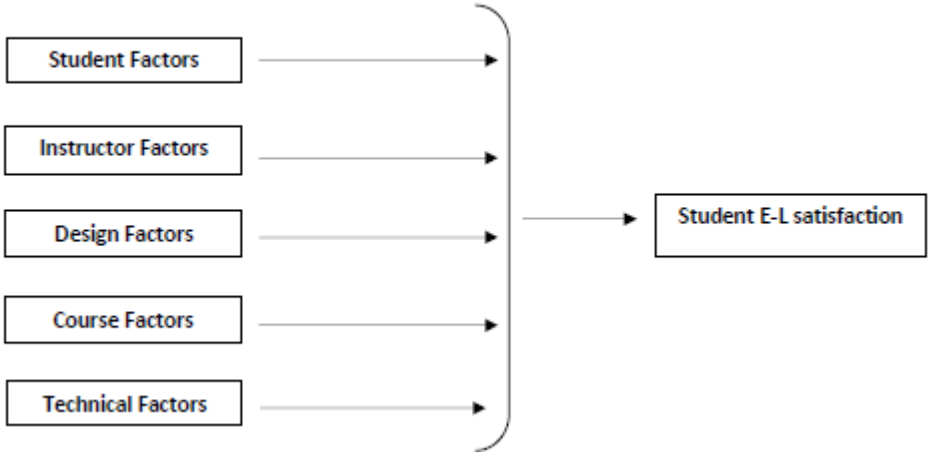

Figure 2.2: A conceptual framework for e-learning satisfaction (Malik, 2010)

2.6.3. E-learning Success Research framework

Reynolds (2012) presented a detailed framework for an organizational e-learning success framework. According to the study the main factors for the success of e-learning comprise of the system, information and support quality, including student preference and change management. The study also identified the need for the evaluation of e-learning through a holistic approach at every stage in order to assess and justify the progress. It also identified the need for learning and development opportunities provided to the employees to support positive learning and return on investment (ROI) to the organization. The framework assists organizations to plan and design for providing a positive outcome to the expectations of the stakeholders.

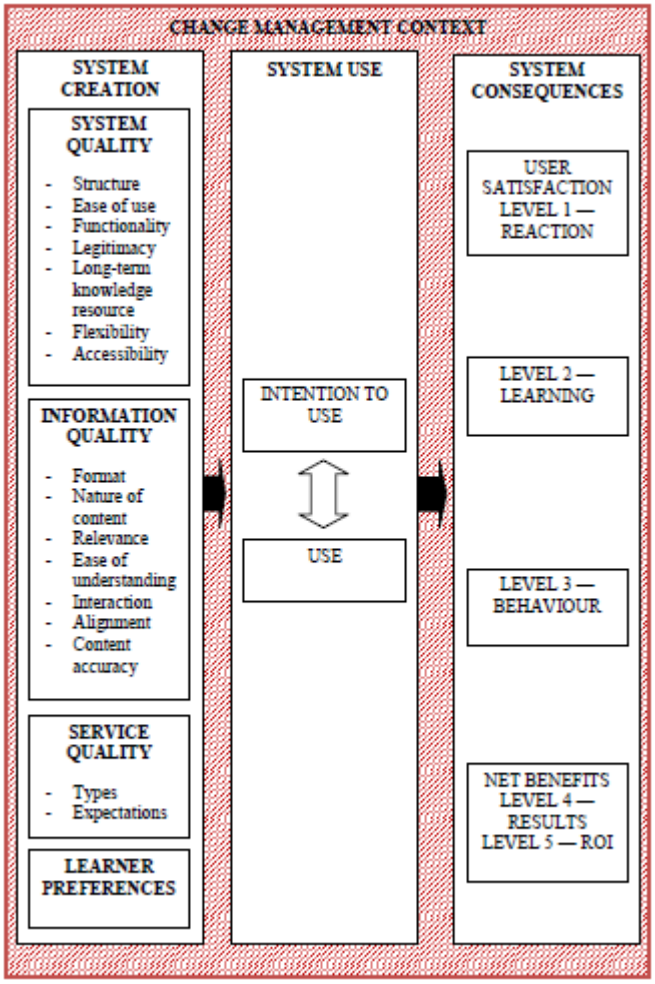

Figure 2.3: Organisational E-learning Success Research Framework (Reynolds, 2012)

2.6.4. An ICT adoption framework for education

Nurjanah, Santoso, and Hasibuan (2017) proposed an e-learning adoption framework. This can be applied to e-learning, as e-learning falls under the concept of ICT. According to the study, every component contributes differently to the adoption of ICT. According to Figure 2.4, finance plays an important role as it affects the infrastructure. A successful ICT adoption is reached if there is efficient infrastructure readiness, the users of the application are computer literate and skilled, and, there is a policy and policy support in place.

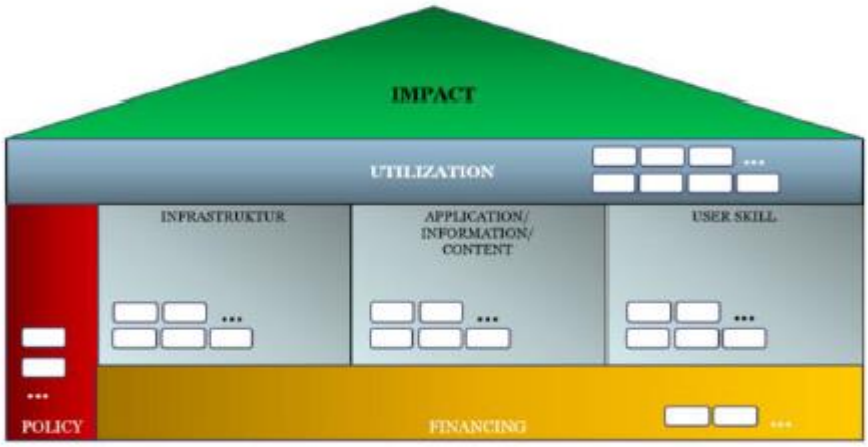

Figure 2.4: The proposed ICT adoption framework for education (Nurjanah, Santoso, & Hasibuan, 2017)

2.6.5. Eight Component Framework for e-learning

Khan (2001) developed an e-learning framework which addressed the eight factors for the success of e-learning. These include technological, pedagogical, interface design, management, evaluation, ethical, institutional and resource support factors as shown in Figure 2.5. Based on this study, all eight factors are to be tackled to create a successful e-learning experience. It provides a logical plan to facilitate the implementation of e-learning by capturing the institution's capability of e-learning by addressing the eight factors. It provides guidance on e-learning planning, design, development, implementation, delivery, and evaluation (Taha, 2014).

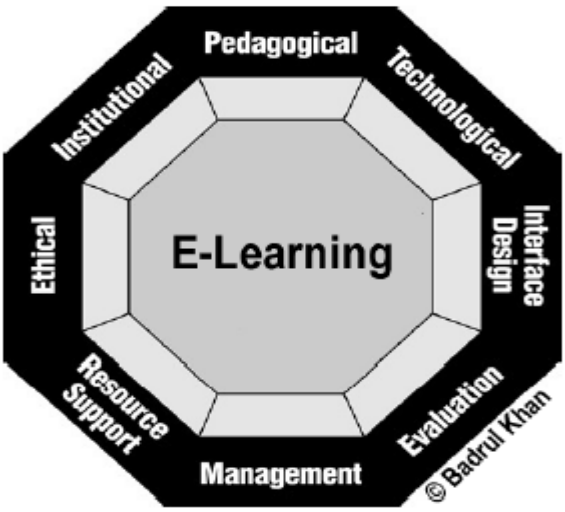

Figure 2.5: The Eight component framework for e-learning (Khan, 2001)

2.7.Study gaps to be addressed

From the literature reviewed above, there is a need for an empirical study for e-learning adoption frameworks in rural-based HEIs. Most studies focus on e-learning implementation at Higher Education Institutions as a whole rather than focusing on rural-based contexts.

Many studies have provided frameworks for e-learning adoption in developing countries. Even though the context of developing countries can be generalized to rural-based context, it cannot reflect specific issues which are limited to the rural-based context only. This study provides a context-based framework specific to South African rural-based HEIs.

Even though models exist for the e-learning adoption in the rural-based context (Steyn & Belle, 2015), results may differ based specific locations. Very few studies exist on e-learning adoption frameworks in Limpopo. Studies exist on frameworks for integrating ICT in rural-based schools (Amedzo, 2007), however education differs at a higher education level aspect.

When looking at e-learning adoption, most studies are student and educator centered (Selim, 2007; Sun, Tasi, Finger, Chen, & Yeh, 2008; Kanwal, Rehman, Bashir, & Qureshi, 2017; Alkharang, 2014; Sanchez & Hueros, 2010; Fahad, 2009). Others are more technology focused and neglect the other important criteria such as student, educators, institution and course (Amedzo, 2007; Chisango, 2014; Mason & Rennie, 2004). If studies do exist on different factors, it may be limited to single disciplines only. The role of institution and course are just as crucial as the others.

This study was aimed to combine all five of the major aspects (student, educator, technology, institution, and course) and chooses participants from various fields. Even though this aspect has been studied, there is a need to deepen the analysis in on these factors to identify the root causes and potential benefits and align it in a way which ensures optimum adoption of the e-learning program (Andersson & Grönlund, 2009). Majority of the e-learning adoption frameworks are also based on the TAM model which lacks many key factors as compared to the UTAUT Model (Nicholas, Olanike, Chiazor, Azeta, & George, 2016).

According to Kundi and Nawaz (2014), there lies a gap between theoretical solutions and practical solutions provided towards e-learning as a technology. They also stated that a conservative approach is used to provide solutions which leads to a technocratic solution. This study aimed at addressing this issue. This study looked at the critical success factors for e-learning, relates them to the challenges faced in attaining these critical success factors, carried

out research through survey questionnaires and provides a framework based on the UTAUT Model for e-learning adoption in rural-based HEIs.

2.8.Summary

In order to propose an e-learning framework, the challenges faced by rural-based HEIs need to be identified, studied and solved to influence its success rate. The review of literature above provides insight on e-learning at rural-based HEIs. The e-learning overview is provided, and the stakeholders of e-learning are identified. The digital divide that exists is explained in detail. It is followed by critical success factors of e-learning and the benefits and challenges that arise from them. Different types of models are reviewed and analyzed. The next chapter presents the research methodology of how data is to be collected and analyzed.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1.Introduction

This chapter provides an overview of the procedures to be fulfilled in order to achieve the goals of this study that are posed in chapter one. It outlines action strategies from the preliminary stage of the research that is the research questions and provides answers which form conclusions of the study (Yin, 2008). This ensures that the focus is on the research problem and the goals of the study are accomplished. The overall aim of this study was to propose a framework for the successful adoption of e-learning at rural-based HEIs, therefore the methodology to achieve this aim is presented in this chapter.

The research methodology adopted for this study is a case study methodology. This chapter shows how quantitative research questions are addressed. It first presents the research methodology, discusses and justifies the research approaches used. It illustrates the research design that is adopted by this study, in addition, it discusses the advantages and disadvantages of using survey methods. It presents the development of the population and sampling. The methods for collection and analysis of data are identified and ethical considerations are discussed. Finally, the reliability and validity of the research study are illustrated.

3.2.Research Methodology

As the interest of this study is to portray the current e-learning progress and adoption at Univen, Rosebank College and Vhembe TVET College, and propose a framework for a successful adoption of e-learning at rural-based HEIs, a case study methodology was most appropriate as the researcher observed and collected data from the current members of the population which included students and educators at the rural-based HEIs.

Case study methodology aims to answer research questions by obtaining evidence from the case settings (Gillham, 2000). Yin (1984) suggested that the following conditions establish the type of research methodology to be used: the types of research questions, the level of control of the researcher, and the level of focus on the contemporary events required. Case study methodology permits the investigator to answer questions such as ‘what’, ‘why’, ‘who’ and ‘how’. This falls under the first condition. The next condition is the level of control, case study methodology allowed the researcher to gather data from primary and secondary sources as well as direct observation and interviews from e-learning users at Univen, Rosebank College and Vhembe TVET College. As case study is used to deliver a holistic in-depth investigation

(Zainal, 2007), it allowed the researcher to collect data from different artefacts including documentation, direct observations, and interviews, it provides primary focus on the subject.

This study is a multiple-case design rather than a single case, as it focuses on e-learning at the University of Venda, Vhembe TVET College and Rosebank College According to Zainal (2007), a single-case design lacks robustness, it is limited to a specific occurrence and the results are not solid enough to be generalized to other scenarios. Therefore multiple case study methodology would allow for results to match through the actual source of evidence rather than relying on sampling logic.

3.3.Research Approaches

Research is a methodical procedure of collection, analysis, and interpretation of information to be able to upsurge the interpretation of a phenomenon which is being investigated (Leedy & Ormrod, 2013). There are three common research approaches, these include quantitative, qualitative and mixed method approach. The research approaches are discussed and based on the information below. The most fitting approach chosen for this study was the mixed method approach.

3.3.1. Quantitative Approach

Quantitative research quantifies the data which is collected and analyzed (Bryman & Bell, 2011). Quantitative research is the ability to reason with numbers and other mathematical concepts (Neuman, 2014). This approach was acquired from the belief that the human phenomenon and its related variables can be examined objectively (Kinn, 2005). It tests research objective theories by examining the relationships among different variables, which can be measured using instruments (Creswell, 2009). Creswell (2009) also stated that this approach utilizes numeric data, close-ended questions with pre-determined answers which are measured and automated. The results can then be analyzed numerically using statistical tests.

The researcher distinctly stated the research questions which met the objectives and, all facets are prudently and accurately designed before the data collection. The data collected was in numeric form, and statistics can be generalized more widely to investigate causal relationships and predict conclusions. When analyzing the data, a substantial amount of imprecise data can be presented graphically using statistical tables. The key aspect of quantitative research is to increase objectivity, generalisability, and replicability of the findings of research (Harwell, 2011).

For this study, a quantitative approach was found to be most suitable for the majority of the data collection, through specifically defined questions to examine the relationship or consequences for certain events, in this case, the adoption of e-learning at rural-based HEIs. This study was focused on identifying factors which influence the e-learning adoption in rural-based HEI's and developing a framework for successful adoption of the program. Therefore, this approach allowed the researcher to determine the evaluation of the proposed framework. The approach also allowed the researcher to set predetermined responses and to establish a standardized manner of collecting data. The results that are derived from this approach were generalized to predict possible outcomes by investigating causal relationships on variables. The findings are not subjected to any intervention from the researcher.

As the researcher's focus was on Univen, Vhembe TVET College and Rosebank College, the quantitative approach allowed many respondents to be incorporated in the sample. The large amounts of data would then be quantified and provided mathematical summaries which answered the research questions which were based on well-known theories. This method delivers an approach to further expand on what has already been discovered from previous qualitative studies and allows the transfer and generalization of results (Alkharang, 2014), working towards proposing a framework for a successful e-learning adoption at rural-based HEIs.

3.3.2. Qualitative Approach

The qualitative approach adopts numerous philosophical assumptions, strategies of inquiry and data collection, analysis and interpretation techniques (Creswell, 2009). Creswell's procedures relied on text and image data and have distinctive steps in data analysis and strategy of inquiry. This approach is used to investigate and comprehend the significance that individuals or groups attribute to a social or human situation. The Qualitative approach examines the understanding of a given subject, social and cultural norms; and it also investigates people's experiences, relationships, and meanings (Agustin, 2015).

The results are flexible as this study focused on providing individual meaning to the complexity of the situation. A qualitative approach is subjective in nature and focuses on meanings and processes, this is a non-numerical approach which analyses data from focus groups, direct observation, open-ended questions and in-depth interviews (Alkharang, 2014). The researcher also opted for this research to collect data through direct observations. The results come from

the interpretation of the researcher, founded on the understanding, knowledge, and experience of the researcher.

3.3.3. Mixed Method Approach

A mixed method approach integrates both the quantitative and qualitative approaches (Creswell, 2009). It allows both open-ended and closed-ended questions to be asked in the survey, thus analyzing both types of data. This approach combines the quantitative and qualitative data to provide an understanding of the research problem rather than selecting one approach only. For this study, a mixed method approach was selected. However, the majority of the data is quantitative as it allowed the researcher to answer questions more objectively, controlling bias and providing the ability to generalize and replicate the results.

3.4.Research design

Research design indicates the way in which data collection and analysis are organized to achieve the objectives of the study (Mwangi, 2014). Mwangi also stated that it is a structure and blueprint of plans to obtain solutions to research queries. The research design is the plan of actions that guide the researcher on how to conduct the research (Chisango, 2014). There are several models that have been developed to estimate the adoption and acceptance of technologies. Since this study focused on proposing an e-learning adoption framework at rural-based HEIs, it is vital to have a background on the models which are best suitable for study.

3.4.1. Research Model-Technology Acceptance models

To make the e-learning program an effective tool in education, its acceptance and adoption have to be identified. This is known as the acceptance of technology, for which models are available. There are nine superior models that can be used to explain technology acceptance behaviors, as presented by Venkatesh, Morris, and Davis (2003). These include Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM), combined TAM - TPB, Unified Theory of Acceptance and Use of Technology (UTAUT), Diffusion of innovations (DOI), Social Cognitive Theory (SCT), Motivational Model (MM), and Model of PC Utilisation (MPCU). The model (UTAUT) which was most suitable for this study has been reviewed and described below.

The Unified Theory of Acceptance and Use of Technology (UTAUT) model in Figure 3.2 is a widely used framework for explaining and assessing technology adoption in diverse contexts (Nicholas, Olanike, Chiazor, Azeta, & George, 2016). The core objective of this study is to identify the adoption and acceptance of e-learning at HEIs. This objective has to be addressed

using a model which addresses all the major objectives of this study. From the eight models stated by Venkatesh, Morris, and Davis (2003), the UTAUT Model comprises of four key concepts (Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions) and four other variables (Gender, Age, Experience, Voluntariness of Use) which are relatively close to this study.

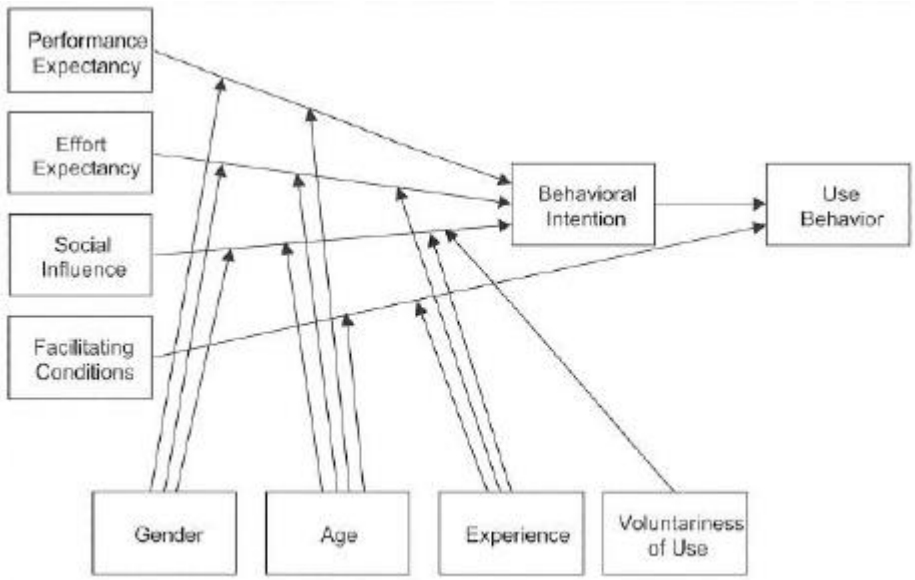

Figure 3.2: UTAUT Model

Venkatesh, Morris, and Davis (2003) explain the constructs as follows:

- (PE) Performance Expectancy is the extent to which individuals deem that the use of technology will aid in accomplishing improvements in their work performance.
- EE (Effort Expectancy) is the extent of easiness which is linked to the use of technology.
- FF (Facilitating Conditions) is the extent to which individuals consider that the institution's infrastructure (technology, training, funding, availability, and accessibility to technology) exists to aid the use of system.
- SI (Social Influence) is the point to which the individual perceives the importance of the use of the system based on what others believe.
- The other variables (Gender, Age, Experience, and Voluntariness of Use) are employed to manage different relationships in the model.

3.4.2. Conceptual Framework

UTAUT Model was chosen to be the best fitting for this study. It not only considers the technology aspect of the study, but also demographic factors and experience. These factors in

line with the technological aspect, have an influence on the adoption of technology. However, it does not address all the objectives of this study. It lacks important concepts which form the core of this study which are e-learning usage, e-learning benefits, e-learning challenges, and location challenges. The researcher modified the UTAUT Model provided by Venkatesh, et al. (2003), and proposed a conceptual framework with added dimensions to meet the objectives of this study as seen in Figure 3.3.

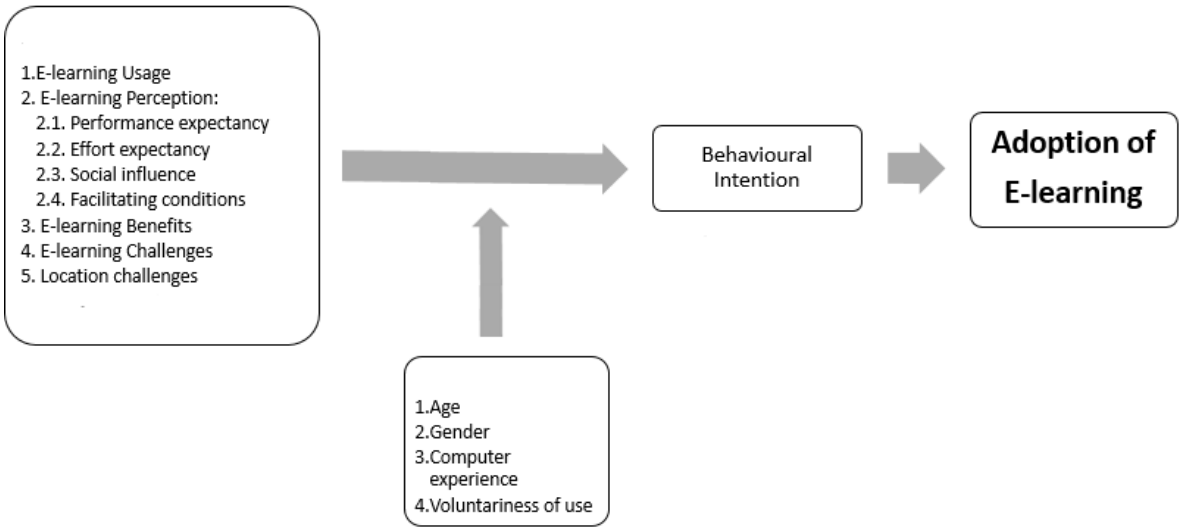

Figure 3.3: Conceptual Framework derived from UTAUT Model

The UTAUT Model can assist in predicting the perception of e-learning in rural-based HEIs, from which an e-learning framework can be derived. The usage, obstacles and benefits classified in the literature review based on the critical success factors are infused with the UTAUT model to provide solutions that can be implemented by educational institutions in developing areas of the country, which will serve as a guideline on the best possible way to fully optimize the e-learning program and its potential.

3.4.3. Survey Design

The most suitable approach for data collection for this study would be the survey design. A survey design assimilates information about individuals or groups on individuals, about their attitudes, opinions, and previous experiences, by producing questions for them using questionnaires or interviews (Neuman, 2014). For this, the study employed a quantitative approach. The participants are students and educators at Higher educational institutions. Therefore, data can be collected using survey questionnaires and close-ended questions.

A survey research design is a conceptual structure within which research is conducted. It provides the researcher with a blueprint for the collection; measurement and analysis of data (Wilamer, 2012). The ideas are organized in a manner which makes it possible for the researcher to identify the limitations and inadequacies of the research. It can be defined as a logical plan which sheds light on how to conduct the research.

Survey design is an approach to collecting data by asking questions (SSRIC, 2018). This approach is used for finding a solution for the adoption of e-learning at rural-based HEI's. Survey design is a method of data collection of quantifiable information of the trends, opinions, or attitudes of a population by studying a sample from that population. Those results can then be generalized to the entire population of the study. It can be exploratory, descriptive, or explanatory which involves advanced statistical analysis (Mugenda & Mugenda, 2003).

Survey design is preferred by the researcher because it provided the ability to collect data without any manipulation of the variables as it is descriptive in nature and report the results according to status quo and as they are. According to Susan (2012), survey design is simple to manage, little time is needed to develop the survey, it is cost-efficient, it can be administered online which reduces geographical dependence, and significant amounts of data can be collected and analyzed using survey software. However, the drawbacks include respondents not persuaded to provide honest responses, the respondents may not be fully aware of the subject, as the respondents are limited to specific answers, data errors may occur.

This study required data collection from a significant number of students based on their e-learning experience. The researcher can set pre-determined responses which are most suitable for the research study. It allows gaining general information about the participants quickly, and all the required information can be collected in a structured and consistent manner.

3.5.Population and sampling

The population and sampling techniques which were used for this research study are discussed. According to De Vaus, Research Design in Social Research (2002), the fundamental principle of research is the ability to generalize the results. There are two types of generalization which include statistical generalization and replication. These two generalizations ensure that a small sample yields the same results for a large population and the results can be replicated under

different scenarios with similar research objectives. The population and sampling selected for this study are aimed at achieving this goal.

3.5.1. Population

A research population is known as a well-defined collection of objects or individuals within a certain population that have similar binding characteristics that are the major focal point of a scientific query (Explorable.com, 2009). The research population can also be known as the units of findings of the survey that are served to generalize the results to the whole population (Lavrakas, 2008).

The research population for this study was defined to include students, educators and e-learning practitioners at University of Venda and students at Vhembe TVET College and Rosebank College since this target population is within the reach of the researcher. The target population was considered appropriate for this study as it constituted of the main individuals involved in e-learning.

3.5.2. Sample

A sample is a group of participants chosen from an entire population with the intention of acquiescing information about the population as a whole (Salaria, 2012). The aim of a sample is to reflect the population it is intended to characterize.

There are many techniques that can be used to select a sample. The two main techniques are probability and non-probability sampling. Probability sampling provides every sample for an equal chance of being selected (Showkat & Parveen, 2017). Therefore, it can be used for generalization of the results of the sample to the population (Merriam, 2009). The purpose of this study is to generalize the results to other rural-based higher education institutions, therefore probability sampling through quantitative research is a method of choice. Showkat and Parveen (2017) have also listed different probability sampling methods that include simple random sampling, cluster sampling, multi-stage systematic sampling, stratified random sampling, and systematic random sampling.

Non-probability sampling permits the researcher to locate, understand and gain insight from a sample (Merriam, 2009). It includes different methods such as volunteer sampling, purposive sampling, snowball sampling, and convenience sampling. For the purpose of this study, non-probability sampling was also suitable to collect data as it allowed for an in-depth study which focused on the issues of central importance.

3.5.3. Sampling Technique

Two forms of sampling techniques were selected for this study, namely simple random sampling and purposive sampling. Simple random sampling falls under probability sampling and is used to select a sample of the students and educators whereby every individual has an equal chance of being selected (Easton & McColl, 2016). It provides an unbiased sample with limited errors and it is highly representative.

Purposive sampling was used to collect data from e-learning practitioners based on their position and influence on the e-learning program. Purposive sampling is a non-probability sampling and is also known as judgment, selective or subjective sampling as the selection depends on the researcher and their own judgment when choosing the participants of the study (Dudovskiy, Research Methodolgy, 2016). The selection criteria play a major role in purposive sampling in order to select the participants to be studied.

3.5.4. Sample selection and size

The sample consisted of the students, educators and e-learning practitioners at the University of Venda and students at Vhembe TVET College and Rosebank College. The sample size selected, based on the target population for this study was 250 student survey questionnaires at the University of Venda and 130 student survey questionnaires each, at Vhembe TVET College and Rosebank College. The study also targeted 413 educators via online surveys and 10 e-learning practitioner survey questionnaires at the University of Venda. These were distributed for the period from May 2018-October 2018. The researcher spent time on site, interacting with the participants to increase the familiarity with the subject of study.

3.6.Data Collection

This is the procedure of collecting information from significant sources to provide answers to the research questions and evaluate the outcome (Dudovskiy, 2018). According to Reynolds (2012), there are three principles for data collection using case study research: using multiple sources, maintaining a clear chain of evidence, and recording data. The researcher's approach to data collection has been described in the following subsection:

3.6.1. Data collection sources

The two main categories of data collection include primary and secondary data collection sources. Primary data is the data collected directly by the researcher. It allows the researcher to focus on important aspects of the study and provides the ability to view the system in reality rather than theoretical use (Mwangi, 2014). It is the source of data which are eyewitness

accounts which are reported by the actual observer in an event. It is the data collected for a specific research problem at hand using procedures to solve the research problem. Primary data collection can include data gathered from questionnaires, interviews, observations, focus groups, documentation and many more (Dudovskiy, 2018). The main purpose of this study is to propose an e-learning adoption framework for rural-based HEIs, this can be achieved by studying usage, perception, university support and adoption of e-learning. The researcher selected a quantitative approach to these factors. For this study, the main tool for data collection was survey questionnaires which allowed the gathering of data directly aimed towards these factors.

Once data was collected using primary data collection, it adds to the existing knowledge base which is made available for researchers to reuse (Hox & Boeije, 2005). This is known as secondary data. Secondary data is the data which has already been collected and can be found within a number of sources such as articles, journals, government reports, and other published material (Dudovskiy, 2018). To gain a better understanding of the adoption of e-learning in rural-based HEIs, an extensive literature review was conducted. This method was used to collect data by reviewing documents such as e-learning policies, strategic plans, reports, articles and journals and many more. A thorough review of the documents was done to guide the process of gathering valuable information to help structure the research, make better conclusions and achieve the outlined research objectives.

3.6.2. Data Collection Methods

There are different data collection methods which can be used dependant on the research approach towards the study. These methods have been explained below.

3.6.2.1.Organizational Contact and Direct Observation

This is the first contact point of the researcher with the case study. The information is gathered initially by organizational contact and observation. This is an informal technique which includes engaging with the participants and institution to understand the social setting and encapsulate the context within which people co-operate. (Marshall & Rossman, 2011). This also includes information about the institution in general, such as the background of the HEI, the implementation of e-learning and current practices on the promotion of e-learning. The researcher spent time on site in order to gain a better understanding of the organization and its participants.

3.6.2.2.Organizational Documentation

Documentation on the e-learning implementation, development and evaluation are to be gathered. This data can be requested directly from the organization for research purposes. E-learning strategies, goals and success levels can also be identified by studying e-learning policies, strategic plans, and reports of the institution. Each of these documents adds context to the study by supplementing observations and data collection through questionnaires. The data collection through documentation provided an overall illustration on the e-learning implementation at the University of Venda which aided in identifying dimensions for the e-learning framework which was to be proposed by this study. It also identified the degree of promotion and support provided to the students and educators from the institution, which is one of the objectives of this study.

3.6.2.3.Questionnaires

Primary data for this study was collected through survey questionnaires. It is a widely used research instrument in quantitative research. It allows the collection of data to be precise and aims directly at achieving the research objectives of the study (Saunders, Lewis, & Thornhill, 2003). Questionnaires should have a specific purpose which is linked to the research objectives and it must be made clear from the beginning on how the findings shall be used (Loose & Worley, 1994). Questionnaires are prudently constructed questions, often with scoring options and closed-ended questions. Closed-ended questions are used to collect data in a structured manner which facilitate a more accurate and convenient form of data analysis.

Questionnaires are widely used in educational research which offers data on participant views, beliefs, perceptions and attitudes (McMillan, 2011). Therefore, it suits the objectives of this study. This method also allows saving of time and reduced costs. Data can be collected from a vast number of respondents with efficiency, convenience, and reachability with precise analysis of results. It also allows maintaining the anonymity of the participants which encourages more confident and honest responses.

In this study, in order to reach students at a much faster pace with greater response, questionnaires were printed, and hand-delivered to students which are allocated in various parts of the campus including library, canteen, residential areas, lecture halls and computer labs of both University of Venda, Vhembe TVET College, and Rosebank College. Web-based questionnaires were distributed online to educators of the University of Venda as it can reach a wide audience all over the university in different schools and departments.

3.6.3. Questionnaires Design

The questionnaire was derived from the variables and constructs of the UTAUT Model and the objectives of the study. The questions were derived, combined and improvised from the following studies: (Taha, 2014; Song, 2010; Selim, 2007; Kahiigi, Hansson, Danielson, & Vesisenaho, 2013; Qureshi, Yasmin , & Whitty, 2012; Keller & Cernerud, 2002; Alkharang, 2014; Patel, Madzvamuse, & Armstrong, 2017; Nicholas, Olanike, Chiazor, Azeta, & George, 2016). These studies used the UTAUT Model to study the e-learning perception, and the other objectives were added as other constructs of the conceptual framework to study the adoption of ICT or e-learning.

The types of questions included dichotomous questions, which have only two responses which are either yes or no. The questionnaire also included multiple choice questions where the respondent was asked to choose an option from a set of pre-determined answers. However, many questions also allowed the respondent to choose one, or more than one response. The study mainly included the Likert-type questions which were used to determine adoption through the UTAUT Model. The Likert-type questions have a five-point scale affixed at SD-Strongly Disagree, D-Disagree, N-Neutral, A-Agree, SA-Strongly Agree. The respondents were asked to indicate their level of agreement or disagreement with the statement. Table 3.1 shows how the questionnaires were derived based on the objectives of this study.

Table 3.1 Student Survey design

Student Survey		
Dimension	Variables	Instrument
Background Info	• Gender • Age • Level of education	• Dichotomous • Multiple-Choice • Multiple-Choice

Table 3.1 Student Survey design (cont'd)

Computer Literacy and Voluntariness of use	• Computer Literacy • Usage of ICT facility at campus • Usage of e-learning at the institution • Preferred mode of study	• Dichotomous • Dichotomous • Dichotomous • Multiple-Choice
E-learning usage	• Device used to access e-learning • Purpose for using e-learning • Tools used when engaging in e-learning • Average time spent on e-learning • Average time spent on the internet	• Multiple-Choice • Multiple-Choice • Multiple-Choice • Multiple-Choice • Multiple-Choice
E-learning Perception		
Performance expectancy	• Improved flexibility, performance and productivity • Improved communication • Opportunity to acquire new knowledge • More productive and engaging than conventional learning	• Likert-Type Questions
Effort expectancy	• Useful tool to get educational resources • Interaction is simple, clear and understandable • It is easy to learn • I have the skills	• Likert-Type Questions
Social Influence	• My educators and peers think I should use e-learning • People think I should use e-learning	• Likert-Type Questions
Facilitating conditions	• Internet connectivity • Infrastructural support • Training and support • Immediate ICT Support staff • My educators have the skills • Educators encourage and support the use e-learning • Institution encourages me to use e-learning	• Likert-Type Questions

Table 3.1 Student Survey design (cont'd)

Behavioural intention	• I would support the use of e-learning • I support mixed method	• Likert-Type Questions
E-learning benefits	• Flexibility of time and place • Increased collaboration and interactivity • Effective and personalized learning • Self-paced learning • Rapid and continuous feedback • Access to updated learning material and advanced information • Increased motivation and confidence towards online learning • Reduced commute time to campus	• Multiple-Choice
E-learning challenges	• Lack of awareness • Lack of motivation • Resistance towards technology • Lack of computer literacy and training • Language barriers • No access to computers • No access to the internet • Poor connectivity • Lack of assistance and technical support • Long distance to travel to access facility	• Multiple-Choice
Location Challenges	• Social and cultural differences • Poor perception towards technology and change • Lack of economic development • Lack of research and development • Lack of infrastructure • Lack of training	• Multiple-Choice

Table 3.2 Educator Survey design

Educator Survey		
Dimension	**Variables**	**Instrument**
Background Info	• Gender • Age • School • Years in occupation • Average Student size	• Dichotomous • Multiple-Choice • Multiple-Choice • Multiple-Choice • Multiple-Choice
Computer experience and voluntariness of use	• Access to ICT Infrastructure • ICT Knowledge • Familiarity with the e-learning platform	• Dichotomous • Dichotomous • Dichotomous
E-learning usage	• Implementation in the teaching process	• Multiple-Choice
E-learning Perception		
Performance expectancy	• Improved flexibility, performance and productivity • Improved communication • Acquire new knowledge • More productive and engaging than conventional learning	• Likert-Type Questions
Effort expectancy	• Useful tool to share educational resources • Interaction is simple, clear and understandable • It is easy to learn • I have the skills	• Likert-Type Questions
Social Influence	• My students and peers think I should use e-learning • People think I should use e-learning	• Likert-Type Questions

Table 3.2 Educator Survey design (cont'd)

Facilitating conditions	• Internet connectivity • Infrastructural support • Training and support • Immediate ICT Support staff • My students have the skills • My students are willing to engage in online learning • Institution encourages me to use e-learning	• Likert-Type Questions
Behavioural intention	• I would support the use of e-learning • I support mixed method	• Likert-Type Questions
E-learning benefits	• Flexibility of time and place • Increased collaboration and interactivity • Effective and personalized learning • Rapid and continuous feedback • Access to updated learning material and advanced information • Increased motivation and confidence towards online teaching • Efficient records management	• Multiple-Choice
E-learning challenges	• Lack of Awareness • Lack of Motivation • Resistance towards technology • Lack of Computer literacy and training • Language barriers • No access to computers • No access to the internet • Poor connectivity • Lack of assistance and technical support • Long distance to travel to access facility	

Table 3.2 Educator Survey design (cont'd)

Location Challenges	• Social and cultural differences • Poor perception towards technology and change • Lack of economic development • Lack of research and development • Lack of infrastructure	• Multiple-Choice

Table 3.3 Staff Survey design

Staff Survey		
Dimension	**Variables**	**Instrument**
Facilitating Conditions	• Vision, Mission and Strategic Plan • Goals/Objectives/Policies • Top Management Support • Technology • Support Staff • Culture • Students • Educators	• Likert-Type Questions

3.7.Data Analysis Procedures

Data analysis is the process of organizing, interpreting and reporting of data which has been collected (Zanjani, 2015). It is the procedure of producing order, structure, and meaning to the data which has been collected (Vosloo, 2014). Data analysis identifies themes, patterns, and trends among variables (Leedy & Ormrod, 2013). Data analysis is a systematic approach towards which numerical data is analyzed to find evidence which either contradicts or support a study or hypothesis (Griffiths, 2018). Data analysis focuses on answering the research questions through statistical procedures by interpreting and deducing logical conclusions from the data which has been collected so the outcome of the research study is met.

The data was analyzed using the SPSS (Statistical Package for Social Sciences). This technique was selected because SPSS analyses data according to nominal, ratio, interval and ordinal

scales. This is a helpful tool to breakdown data and acquires meaningful insights from huge sets of data. E-learning usage, benefits, and challenges of e-learning were addressed using close-ended questions, SPSS provide an organized descriptive statistical data based on the frequency and percentage of responses for close-ended questions. These were represented using bar graphs or pie charts. E-learning perception was addressed using the Likert-type questions. The 5-point Likert scale was analyzed using SPSS and present the data in a graphical tabular form showing frequencies and percentages. Cross-tabulation was used to compare variables in different categories in order to determine how it affects the adoption of e-learning.

The data collected for this study was sorted, coded and entered into SPSS to produce tables, graphs and other form of statistics. This assisted in answering the research questions of this study based on e-learning adoption and achieve the objectives of this study.

3.8.Validity and Reliability

The survey questionnaires that are used in this study are intended to acquire valid and reliable measurements which play a role in establishing credibility and truthfulness of the findings. The validity is the degree up to which a research tool measures the variable it is intended to measure. It helps in achieving the answer of whether the data collection technique collects the data that is intended to be collected (Wagner, Kawulich, & Garner, 2012). If the procedures are transparent, it creates a persuasive case for the validity of the interpretation of the results (Zanjani, 2015) and suggests the truthfulness of the research tool. Content validity was applied to this study by pre-testing the survey questionnaires. Construct validity was achieved by applying exploratory factor analysis to the study. The validity of this study is also ensured as two supervisors provided guidance and feedback on the research study and research instruments. The study also developed an abstract theory and conclusions based on data collections from multiple case-studies, these results can be generalized to other rural-based HEIs. This applied external validity to this study of the ability to generalize results to a target population.

Reliability is the consistency with which a research tool produces the same results every time it is administered, provided that the object which is being measured does not change (Neuman, 2014; Leedy & Ormrod, 2013). It determines the dependability of the research tool. It is concerned with the regularity and consistency of the results that are attained (Bryman & Bell, 2011). For this study, reliability is achieved by presenting every participant with a standardized research instrument which is the questionnaire. The questions were framed in a clear manner

to avoid misleading the participants and suggesting answers. The reliability was also further improved by forming a pilot group to test and assess the survey questionnaire before the actual sample group participates in the study. Changes were made to the questionnaires as highlighted by the pilot group, the questionnaires were shortened as the length of questionnaire discouraged participation and a few technical errors were improvised. Bias is also an important factor under reliability, therefore the anonymity of participants is guaranteed. Therefore, the preliminary testing of the questionnaire ensured that any bias, errors or unnecessary questions were removed and corrected thus increasing the reliability of the research instrument. Lastly, in SPSS Cronbach's Alpha test was conducted to measure the reliability of the factors that influence e-learning adoption.

3.9.Ethical considerations

Ethical considerations should be considered when planning and implementing research. The researcher should protect their participants, acquire the trust of their participants, foster the integrity of the research study and safeguard against any misconduct (Creswell, 2009). These are the moral choices and behavior which are guided by norms and standards of behavior (Cooper & Schindler, 2014). Ethical considerations fall under areas such as honesty, anonymity, voluntary participation, right to privacy, informed consent and protection from harm (Leedy & Ormrod, 2005). Creswell (2009) stated that it is an obligation to respect the rights, values, desires, and needs of the participants.

3.9.1. Ethical Clearance

This study adheres to the ethical guidelines as prescribed by the Ethics Research Committee at the University of Venda in order to ensure the integrity of the study. The researcher applied for the permission to conduct research at the University of Venda and Vhembe TVET College. The research proposal, consent form, and all necessary documents were submitted to the Research Ethics Committee for ethical clearance after which full clearance was gained.

3.9.2. Informed consent

Participation for this study is voluntary and approval is sought from the participants beforehand. The researcher provided a consent letter that grants permission to collect data from respondents. The data was collected after participants agreed to participate and being fully aware that the data will be used for this research study.

3.9.3. Privacy, Confidentiality, and Anonymity

The participants have a right to privacy and are fully informed about the objectives of the study, and they are made aware that their responses were confidential and would only be used for academic purposes. The names of the respondents were not to be stored. The participants were also informed that the analysis and report of the findings will not include individual identification.

3.9.4. Plagiarism

The researcher has declared that this research study is her own work and that all the sources which have been used have been acknowledged.

3.9.5. Harm and Risk

The participants are not harmed physically or emotionally by participating in the study. They have the right not to disclose certain information about themselves or also not answer specific questions they are hesitant to respond to. They have the right to discontinue participation at any time that they feel uncomfortable.

3.10. Summary

This chapter identified the most suitable research methodology for the study. Based on the objectives of the study, a mixed method approach towards data collection is found most appropriate due to the nature of the study. Technology acceptance models were analyzed, and the best fit chosen for this study is the UTAUT Model and the conceptual framework is presented under this chapter. The population and sample size are identified and selected. The data collection instrument selected is a survey questionnaire and the data analysis are done using SPSS. Finally, the issues regarding validity, reliability and ethical considerations are also examined. This chapter summarizes the research methodologies that were used to collect data, obtain results and propose a framework for the adoption of e-learning at rural-based HEIs.

CHAPTER FOUR: PRESENTATION OF RESEARCH FINDING

4.1.Introduction

The previous chapter focused on research methodology and explained data collection procedures. This chapter presents and reports the research findings based on the analysis of the data collected from the survey questionnaires. This chapter is directed towards answering the research questions of the study which are as follows:

- What is the current usage of e-learning?
- What is the perception of e-learning users towards e-learning?
- What is the degree of promotion and support for e-learning being allocated by HEIs in these rural-based institutions?
- How does the location of the HEIs affect the adoption of the e-learning program?
- What are the potential benefits of the adoption of e-learning?
- What are the major challenges faced when implementing e-learning in rural-based HEIs?

These questions have been answered with regard to the University of Venda, Vhembe TVET College, and Rosebank College. The purpose of this chapter is also to determine the suitability of the elements in the proposed conceptual framework. The chapter is divided into four parts, based on different participants namely; students, educators, institution and e-learning adoption framework. The data collected is presented in the form of frequency tables and graphical illustrations.

4.2.Part 1: Student Survey Results

This part presents the student survey results at the University of Venda, Vhembe TVET College, and Rosebank College. The survey consisted of closed-ended questions directed towards demographic information, e-learning usage, e-learning perception, e-learning benefits, and challenges and location challenges.

Looking at the response rate, a total number of 250 questionnaires were distributed at the University of Venda, out of which 92.8% (232/250) were received and 7.2% (18/250) were not returned. Out of the questionnaires that were returned, 5.2% (13/250) of them were incomplete. From these 13 questionnaires, 2.4% (6/250) were considered significantly incomplete and were therefore eliminated from the study, however, 2.8% (7/250) of the incomplete questionnaires were still used in the study as the missing data was relatively low. Table 4.1 shows the response

rate of students. The students at the University of Venda provided a significant response of 90.4% excluding the incomplete questionnaires that were eliminated from the study.

At Vhembe TVET College, 130 questionnaires were distributed, however, only 66.2% (86/130) of them were returned. From the questionnaires that were returned, 4.6% (6/130) were incomplete. However, the missing data was extremely low therefore they still formed part of the study.

A total number of 130 questionnaires were distributed at Rosebank College, out of which 85.4% (111/130) were received and 14.6% (19/130) were not returned. Out of the questionnaires that were returned, 10.7% (14/130) of them were incomplete. From these 14 questionnaires, 7.7% (10/130) of them were considered significantly incomplete and were eliminated from the study, 3.1% (4/130) of the incomplete questionnaires were still used in the study as the missing data was relatively low.

Table 4.1 Student response rate

Institution	Targeted Respondents	Actual Respondents	Response Rate
University of Venda	250	226	90.4%
Vhembe TVET College	130	86	66.2%
Rosebank College	130	101	77.7%

4.2.1. Section A: Background Information

This section presents the demographic information about the participants of this study. This includes gender, age group and current level of education respectively. According to Islam, Rahim, Tan, and Hasina (2011), these demographic factors have a substantial effect on the effectiveness of e-learning and suggest a careful review of these factors as they can play a role in the adoption of e-learning. Table 4.2 demonstrates the demographic information about students at the University of Venda, Vhembe TVET College and Rosebank College

At the University of Venda, 50.9% (115/226) were female respondents and 49.1% (111/226) were male respondents, therefore this depicts almost an equal distribution of gender. The next question sought to establish the age group of the respondents. According to Table 4.2, 11.6% (26/226) students were between the age of 15-19 years, 81.8% (184/226) were between the age of 20-29 years, 3.1% (7/226) were between the age of 30-39 years and 3.6% (8/223) were 40 and above. This shows that majority of the students were between the age group if 20-29 years at the University of Venda. The respondents were also asked their current level of education. According to Table 4.2, 13.3% (30/226) of the respondents were 1st year students, 31.0%

(70/226) of the respondents were 2nd year students, the majority of respondents were 3rd year students which were 37.2% (84/226), 6.2% (14/226) were honours students, 3.5% (8/226) were Masters students, followed by 2.2% (5/226) of the respondents which were PhD students. Based on the results, the majority of the students were undergraduate students.

At Vhembe TVET College, 72.1% (62/86) were female respondents and 27.9% (24/86) were male respondents, there were more female respondents than male. The next question was to establish the age group of the respondents. 8.1% (7/86) students were between the age of 15-19 years, 79.1% (68/86) were between the age of 20-29 years, 9.3% (8/86) were between the age of 30-39 years and 3.5% (3/86) were 40 and above. This shows that majority of the students at Vhembe TVET College are also between the age group if 20-29 years. Looking at the current level of education, 15.1% (13/86) of the respondents were 1st year students, 37.2% (32/86) of the respondents were 2nd year students, the majority of respondents for Vhembe TVET college were also 3rd year students which were 47.7% (41/86).

Looking at Rosebank College, 56.4% (57/101) were female respondents and 43.6% (44/101) were male respondents. There were more female respondents compared to male respondents, but the difference was not a lot. The next question sought to establish the age group of the respondents at Rosebank College. 12.9%% (13/101) students were between the age of 15-19 years, 80.2% (81/101) were between the age of 20-29 years, 2.0% (2/101) were between the age of 30-39 years, 4.0% (43/101) were 40 and above and there was a 1.0% (1/101) of missing cases. These results show that the majority of the students at Rosebank College are also between the age group if 20-29 years. According to Table 4.2, 21.8% (22/101) of the respondents were 1st year students, the majority of respondents for Rosebank College was 45.5% (46/101) which were 2nd year students, 32.7% (33/101) were 3rd year students.

Table 4.2. Student Demographic Information

Institution		*University of Venda*		*Vhembe TVET College*		*Rosebank College*	
Measure	*Items*	*Frequency*	*Percentage*	*Frequency*	*Percentage*	*Frequency*	*Percentage*
Gender	**Male**	111	49.1%	24	27.9%	44	43.6%
	Female	115	50.9%	62	72.1%	57	56.4%
Age Group	**15-19**	26	11.6%	7	8.1%	13	12.9%
	20-29	184	81.8%	68	79.1%	81	80.2%
	30-39	7	3.1%	8	9.3%	2	2.0%
	40 and above	8	3.6%	3	3.5%	4	4.0%
	Missing	1	0.4%	0	0%	1	1.0%
Level of Education	**1st Year**	30	13.3%	13	15.1%	22	21.8%
	2nd Year	70	31.0%	32	37.2%	46	45.5%
	3rd Year	84	37.2%	41	47.7%	33	32.7%
	4th Year	15	6.6%	N/A	N/A	N/A	N/A
	Honours	14	6.2%	N/A	N/A	N/A	N/A
	Masters	8	3.5%	N/A	N/A	N/A	N/A
	PhD	5	2.2%	N/A	N/A	N/A	N/A

4.2.2. Section B: Computer Literacy and Voluntariness of Use

The researcher sought to determine the computer literacy and voluntariness of use regarding ICT and e-learning facilities at the HEIs. In this regard, four questions were asked which include: the ability to use computer and internet facilities, use of computer facility on campus, use of Blackboard (University of Venda and Rosebank College) and preferred mode of study. However, as Vhembe TVET College has not yet implemented an e-learning platform; the third question differed as they were asked whether or not they engage in e-learning via social media for educational purposes.

4.2.2.1.Ability to use ICT facilities

The participants were asked to indicate whether they know how to use computer and internet facilities. Based on figure 4.1 below, at University of Venda, 92.9% (210/226) students agreed that they know how to use the ICT facilities, and 7.1% (16/226) stated that they do not know how to use ICT facilities. At Vhembe TVET College, 97.7% (84/86) students stated that they know how to use ICT facilities whereas 2.3% (2/86) stated that they do not know how to use ICT facilities. In Rosebank College, 99% (100/101) students agreed that they know how to use ICT facilitates and 1.0% (1/101) students stated that they do not know how to use ICT facilities.

The above results show that most of the students are computer literate, therefore giving them the ability to use the e-learning program with more ease than others. However, Rosebank College which is an urban-based HEI has the highest frequency of students who know how to

use ICT Facilities as compared to University of Venda and Vhembe TVET College which are rural-based HEIs.

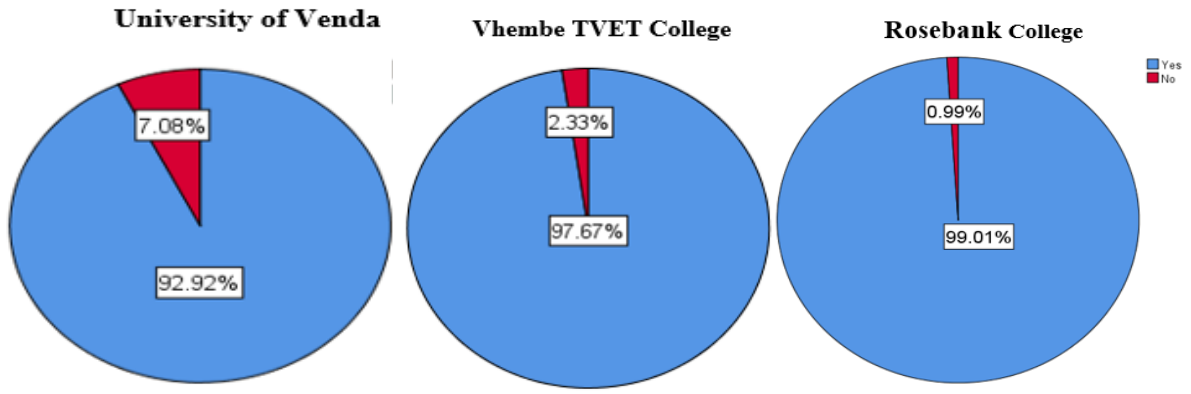

Figure 4.1. Ability to use ICT Facilities

4.2.2.2.Use of ICT facilities

The respondents were asked if they use the computer and internet facilities provided by the university. This includes the computer facilities provided at the ICT labs and library available for use to the students. According to Figure 4.2 below, 91.6% (207/226) students indicated that they use the computer facility provided by the university, whereas 8.4% (19/226) of students indicated that they do not use it.

At Vhembe TVET College, as per observation, there are computer labs available for the students to use, but the campus does not offer Wi-Fi. 45.3% (39/86) students indicated that they use the computer facility at campus, whereas 54.7% (47/86) indicated that they do not use the computer facility provided at campus.

At Rosebank College, 91.1% (92/101) indicated that they use the ICT facilities provided at campus and 8.9% (9/101) indicated that they do not use the ICT facilities provided at campus. These results show that the majority of the students at the University of Venda and Rosebank College use the ICT facilities provided by the institution, however, at Vhembe TVET College, the use of computer facility is the least. Students tend to use the ICT facilities more if they engage in e-learning (Goyal, Purohit, & Bhagat, 2010) and therefore that might be the reason why the usage is low at Vhembe TVET College as they do not offer an e-learning program.

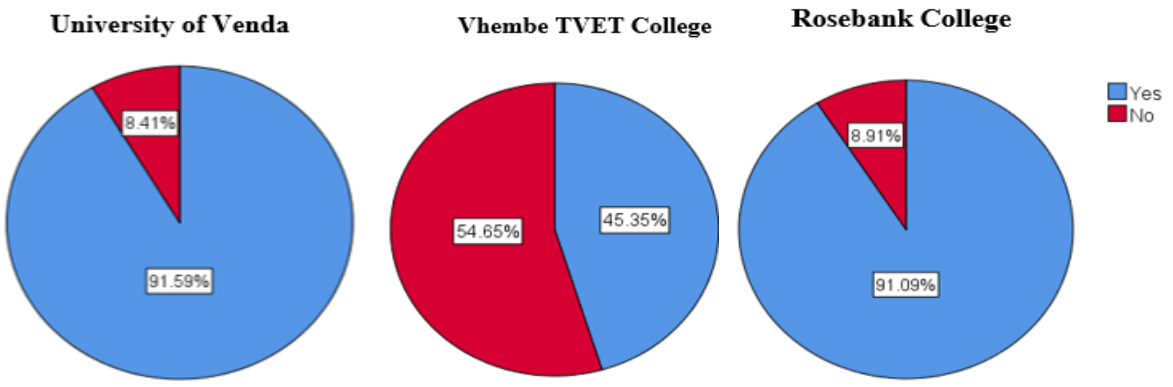

Figure 4.2. Use of Computer Facility

4.2.2.3.Use of the e-learning platform at University of Venda

This question sought to indicate the usage of the e-learning. The students at the University of Venda and Rosebank College were asked to indicate whether they use the e-learning platform implemented by their institution. The students at Vhembe TVET College were however asked a different question as they do not have an official e-learning platform. The students at Vhembe TVET College were asked if they engaged in e-learning via social media for their education.

At University of Venda, according to Figure 4.3, 51.8% (117/226) students use Blackboard, 25.7% (58/226) students do not use Blackboard and 22.6% (51/226) students do not know about it at all. Only half the students use Blackboard, this depicts poor communication and promotion from the Institution to its students as 22.6% of the students were not aware that an e-learning platform is available for them to use.

At Rosebank College, 87.1% (88/101) students agreed that they use the e-learning platform implemented by the institution whereas 12.9% (13/101) indicated that they do not use the e-learning platform. This is a positive reflection on e-learning adoption as majority of the students use Blackboard as compared to the University of Venda.

At Vhembe TVET College, the students were asked if they engage in e-learning via social media. There was a case of 4.7% (4/86) of missing data, therefore only 82 responses were considered. According to Figure 4.3, 75.6% (62/82) indicated that they use social media for e-learning purposes whereas 24.4% (20/82) indicated that they do not. These results show that through personal motivation, students tend to use technology for educational purposes. This

indicates a positive perception towards technology and may lead to increased adoption in e-learning when the platform is to be implemented.

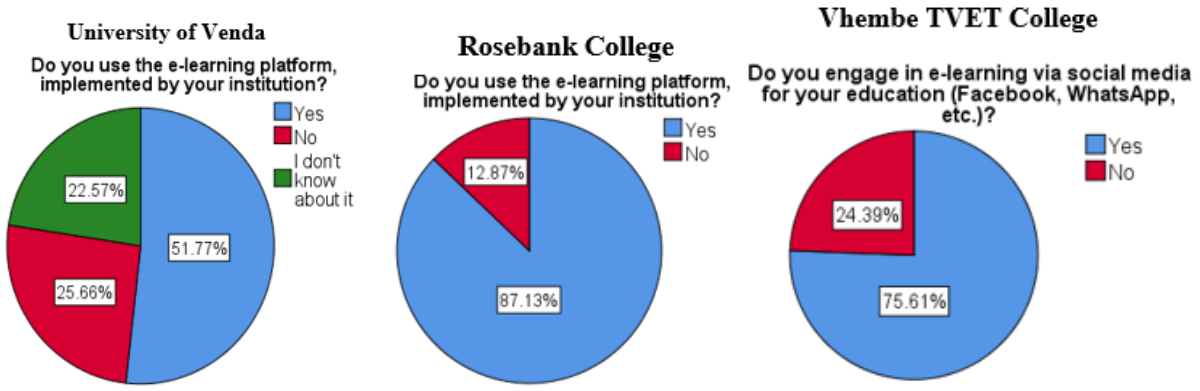

Figure 4.3. Usage of E-learning

4.2.2.4.Preferred mode of study

The participants were asked to indicate their preferred mode of study, Figure 4.4 displays the outcome at the three institutions. At the University of Venda, there was a case of 1.3% (3/226) of missing data and therefore the valid percentile was used to depict results. Out of 223 students, 53.4% (119/223) preferred conventional learning, 38.1% (85/223) preferred e-learning, 8.5% (19/223) preferred blended learning.

At Vhembe TVET College, 88.4% (76/86) preferred conventional learning, 5.8% (5/86) preferred e-learning and 5.8% (5/86) preferred blended learning. There was no case of missing data. Majority of the students preferred conventional learning over any other mode of study.

At Rosebank College, there was a case of 4.0% (4/101) of missing data, therefore the responses were from 97 students. 18.8% (19/97) students preferred conventional learning, 32.7% (33/97) preferred e-learning, and 44.6% (45/97) students preferred blended learning. Looking at the results above, majority of the students at the University of Venda and Vhembe TVET College prefer conventional learning whereas at Rosebank College they prefer blended learning. This shows that at rural-based HEIs students still are resistance towards change and prefer the traditional methods of learning.

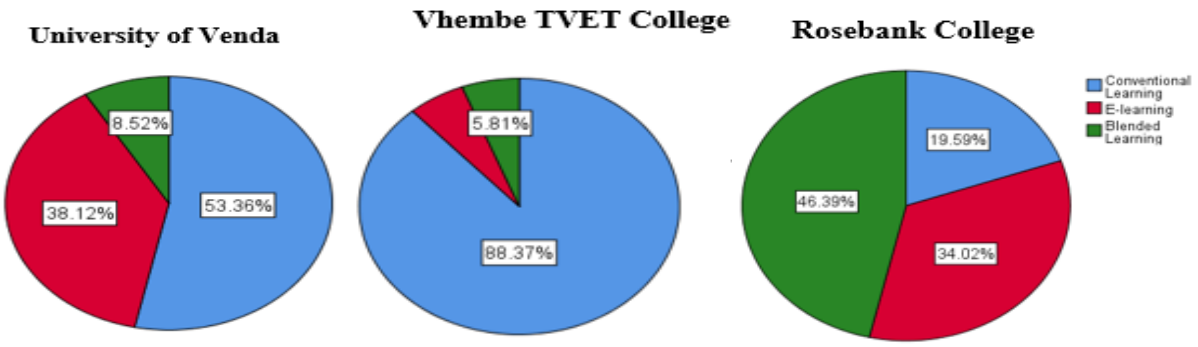

Figure 4.4. Preferred mode of study

4.2.3. Section C: E-learning Usage

This section is aimed towards the research objective of determining the e-learning usage at the University of Venda and Rosebank College. This section was excluded from the survey distributed at Vhembe TVET College as they have not yet implemented the e-learning platform. These questions are specific to the use of e-learning platform-Blackboard are based on devices used to access e-learning, purposes for the use of e-learning, tools engaged in when using e-learning, time spent on e-learning and time spent surfing on the internet.

4.2.3.1.Device used to access e-learning

The respondents were asked to classify the devices that they use to access the e-learning platform. Based on the results in Table 4.3, at the University of Venda there were 434 responses out of which majority of the students 22.1% (96/434) use their laptops, 19.8% (86/434) students use smartphones, 18.9% (82/434) students use a desktop, and 15.4% (67/434) of students use tablets to access Blackboard. 23.7% (103/434) stated that they do not use any device at all. These results depict that majority of the students do not use Blackboard and those which do use, use their laptops or smartphones to access it. It is encouraging that students use their smartphones for e-learning purposes. The device that is least used is tablets, however, all students at University of Venda are provided with tablets (Nendila, 2015) which means that it is not being used as much as it should under the e-learning platform.

At Rosebank College, there were a total of 243 responses from 101 participants. 25.1% (61/243) use desktop to access Blackboard, 28.0% (68/243) use laptops, 28.4% (69/243) use their smartphones, 13.6% (33/243) use tablets and 4.9% (12/243) use none. Majority of the students at Rosebank College access e-learning via smartphone followed by laptops. This shows less dependence on the institution for computer facilities as compared to the University of Venda. There is also a major gap between the students who do not use e-learning/ devices

to access e-learning at the University of Venda and Rosebank College. This shows that e-learning is more readily accessed and used in urban-based HEIs than rural-based HEIs.

Table 4.3. Devices used to access Blackboard

		Univen		Rosebank	
		N	Percent	N	Percent
Device used to access blackboard[a]	Desktop	82	18.9%	61	25.1%
	Laptop	96	22.1%	68	28.0%
	Smartphone	86	19.8%	69	28.4%
	Tablet	67	15.4%	33	13.6%
	None	103	23.7%	12	4.9%
Total		434	100.0%	243	100.0%

4.2.3.2.Purpose for using e-learning

This question sought to identify the purposes for which students use Blackboard. There was a total of 423 responses at the University of Venda, Table 4.4 shows that students mostly use Blackboard for accessing study material which is 26.2% (111/423), followed by 17.3% (73/423) students who use Blackboard to keep up to date with announcements,15.6% (66/423) students use it to engage with other students in group discussion and 15.1% (64/423) students use it for online tests or assignments. 25.8% (109/423) of the students selected none, which depicts that students are not seriously engaging with Blackboard.

At Rosebank College, there were 263 responses from 101 students. Most students use Blackboard to access study material which is 28.9% (76/263), 27.4% (72/263) students use Blackboard to engage in group/discussion forums, 24.0% (63/263) use Blackboard for online tests/assignments, 14.4% (38/263) use it to keep up to date with announcements from educators, and 5.3% (14/263) indicated that they do not use Blackboard for any purposes. When comparing both institutions, it is evident that e-learning is adopted and used for more purposes at Rosebank College as compared to the University of Venda.

Table 4.4. Purpose for using Blackboard

		Univen		Rosebank	
		N	Percent	N	Percent
Purpose for using blackboard[a]	Access study material	111	26.2%	76	28.9%
	Online Tests/Assignments	64	15.1%	63	24.0%
	To keep up to date with announcements from the educator	73	17.3%	38	14.4%
	To engage with other learners in group/discussion forums	66	15.6%	72	27.4%
	None	109	25.8%	14	5.3%
Total		423	100.0%	263	100.0%

4.2.3.3.Tools used to engage in e-learning

To determine the usage of e-learning, it is also important to identify the tools in which students engage while using Blackboard. Based on the statistical results in Table 4.5, at University of Venda there were a total of 503 responses, out of which 18.9% (95/503) indicated that they use email, 14.9% (75/503) indicated that they use social networking, 12.3%(62/503) indicated that they use search engine, 7.2% (36/503) indicated that they use audio/video content, 6.8% (34/503) each indicated engaging in virtual classroom and discussion forums, followed by 6%(30/503) in video conferencing, and the least engaging tool was 5.4%(27/503) for the use of CD-ROM. A total of 21.9% (110/503) students indicated that they do not use any tools at all, and majority of them use email, social networking, and search engines. This shows that students at the University of Venda do not fully engage with Blackboard and do not optimize the features that the platform provides.

At Rosebank College, there were 319 responses, out of which majority of the students which is 16.6% (53/319) indicated that they use social networking, followed by 15.0% (48/319) who indicated that they use email. 14.1% (45/319) indicated that they use search engine, 12.2% (39/319) indicated that they use audio/video content, 10.7% (34/319) indicated engaging in virtual classroom and discussion forums, followed by 10.3% (33/319) in video conferencing, followed by 5.4% (19/319) who indicated the use of CD-ROM. 5.0% (16/319) students indicated that they do not use any tools at all, which was the least response from all the options. This is a positive response as the majority of the students engage in e-learning through various tools as compared to the University of Venda.

Table 4.5. Tools used to engage in e-learning

		Univen		Rosebank	
		N	Percent	N	Percent
Tools used to engage with blackboard[a]	E-mail	95	18.9%	48	15.0%
	Search Engine	62	12.3%	45	14.1%
	Virtual Classroom	34	6.8%	34	10.7%
	Social Networking	75	14.9%	53	16.6%
	Video Conferencing	30	6.0%	33	10.3%
	Discussion forums	34	6.8%	32	10.0%
	Audio/Video content	36	7.2%	39	12.2%
	CD-ROM	27	5.4%	19	6.0%
	None	110	21.9%	16	5.0%
Total		503	100.0%	319	100.0%

4.2.3.4.Time spent on e-learning and the internet

The participants at the University of Venda were asked to indicate the amount of time they spend on the e-learning platform, and the amount of time they spend surfing on the internet per week. The purpose of this question was to determine the usage of e-learning compared to other internet activities. There was a 0.9% (2/226) case of missing data for the question based on time spent surfing on the internet and therefore the valid percentile was used. Based on the findings in Figure 4.5, 47.3% (107/226) specified that they spend 0 hours per week on e-learning, whereas only 1.3% (3/224) do not spend any time surfing on the internet. 28.3% (64/226) students indicated that they spend 1-5 hours per week on e-learning whereas 27.2% (61/224) indicated that spend the same number of hours surfing through the internet. 16.4% (37/226) indicated that they spend 6-15 hours per week on e-learning and 36.3% (81/224) indicated that they spend those many hours surfing on the internet. 5.3% (12/226) indicated that they spend 16-20 hours per week on e-learning, whereas 17.4% (39/224) indicated that they spend the same number of hours surfing on the internet. Lastly, 2.7% (6/226) students indicated that they spend 21 hours or more on e-learning and 17.9% (40/224) spend the same time on the internet.

Based on the results achieved, there is a large decrement on the time students spend on e-learning as the time increases. This indicates that even though students have accessibility to the internet and engage in online activity, they prefer not to spend time on the platform.

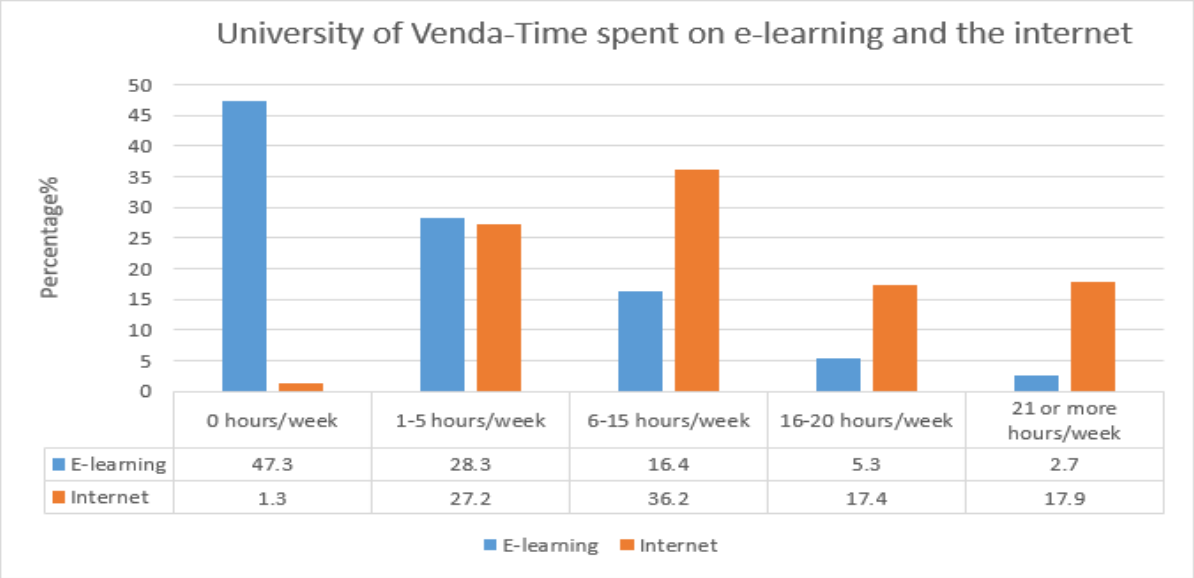

Figure 4.5. Time spent on e-learning and the internet-University of Venda

Figure 4.6 shows the outcome for time spent on e-learning and the internet at Rosebank College. There was a 1.0% (1/101) case of missing data for the question based on time spent surfing on the internet and therefore the valid percentage was used. 8.9% (9/101) of students specified that they spend 0 hours per week on e-learning, whereas 1.0% (1/100) indicated that they spend 0 hours per week surfing on the internet. 46.5% (47/101) students indicated that they spend 1-5 hours per week on e-learning whereas 26.0% (26/100) indicated that spend the same number of hours surfing through the internet. 34.7% (35/101) indicated that they spend 6-15 hours per week on e-learning and 33% (33/100) indicated that they spend the same number of hours surfing on the internet. 7.9% (8/101) indicated that they spend 16-20 hours per week on e-learning, whereas 21% (21/100) indicated that they spend the same number of hours surfing on the internet. 2.0% (2/101) students indicated that they spend 21 hours or more on e-learning, whereas 19.0% (19/100) spend the same time on the internet.

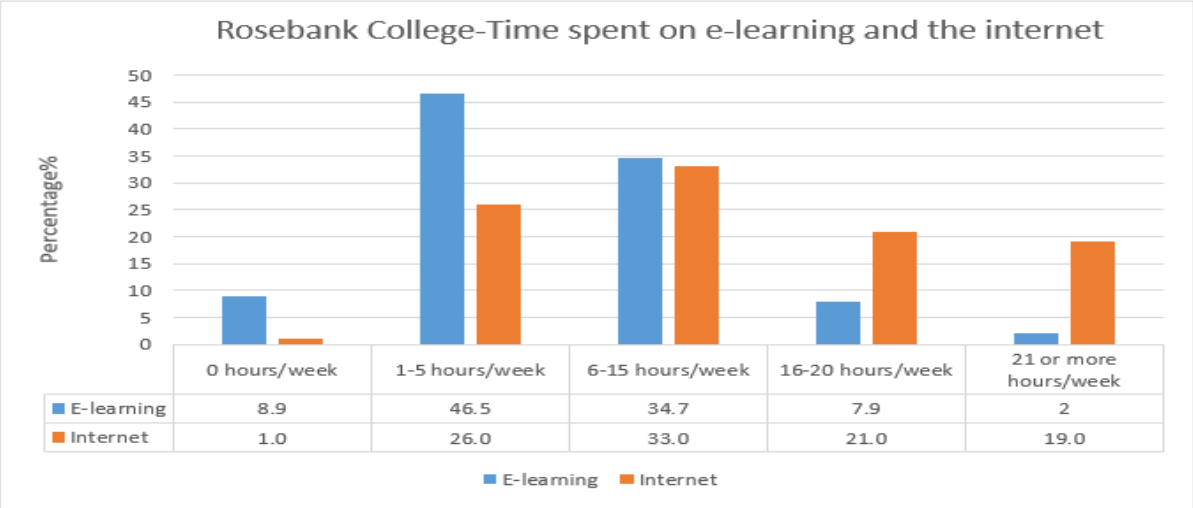

Figure 4.6. Time spent on e-learning and the internet-Rosebank College

Based on the above analysis, it is evident that students at Rosebank College spend more time on both e-learning and surfing on the internet then the University of Venda. This may be due to the difference in perception towards technology which shall be studied further in this study. This shows the need for change in perception towards technology in rural-based HEIs, so it can be readily adopted and used by the students.

4.2.4. Section D-E-learning Perception

This section outlines the student perception of e-learning at the University of Venda, Vhembe TVET College, and Rosebank College. One of the research objectives of this study included identifying the perception of e-learning users, thus forming an integral part of the questionnaire. This section also addresses another research objective which is to determine the level of promotion and support that the HEIs provide towards e-learning, this falls under the facilitating conditions. The four indicators used to identify perception which were derived from the UTAUT Model include performance expectancy, effort expectancy, facilitating conditions and social influence.

4.2.4.1.Performance expectancy

According to the UTAUT Model (Venkatesh, Morris, & Davis, 2003), performance expectancy is the level up to which individuals believe that the use of technology will aid in accomplishing improvements in their work performance.

4.2.4.1.1. Improved flexibility, performance and productivity

The results in Table 4.6 indicate that majority of the students at the University of Venda, 41.2% of students agree that the use of e-learning improves flexibility, performance, and productivity

in education. At Vhembe TVET College, 39.5% of students agreed to this statement and at Rosebank College, most of the students (53.5%) also agreed to this statement. The percentage was also highest at Rosebank College as compared to the other institutions.

Standard deviation measures how concentrated the data is around the mean, if it is more concentrated the smaller the standard deviation (Rumsey, 2018). For this study, the smaller the deviation, the more important the statement as the majority of the respondents have similar views. The standard deviation is the lowest for Rosebank College, followed by the University of Venda then Vhembe TVET College. It may be lower for Vhembe TVET College as they have only experienced e-learning via social media, therefore their opinion is limited to that experience.

Table 4.6. Improved flexibility, performance and productivity

The use of e-learning improves flexibility, performance and productivity in education							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	14	6.2	20	23.3	1	1.0
	Disagree	14	6.2	2	2.3	5	5.0
	Neutral	39	17.3	4	4.7	7	6.9
	Agree	93	41.2	34	39.5	54	53.5
	Strongly Agree	62	27.4	21	24.4	33	32.7
	Total	222	98.2	81	94.2	100	99.0
Missing	999	4	1.8	5	5.8	1	1.0
Total		226	100.0	86	100.0	101	100.0
Standard Deviation		1.112		1.524		.825	
Mean		3.79		3.42		4.13	
Level of Agreement		Agree		Agree		Agree	

4.2.4.1.2. Improved communication

According to Table 4.7, the majority of the students at the University of Venda, 44.2% of students agreed that the use of e-learning of e-learning improves communication with educators and other students. At Vhembe TVET College, the majority of the students (36.0%) agreed to this statement. At Rosebank College, most of the students (54.5%) also agreed to this statement. The percentage was highest at Rosebank College as compared to the other institutions. The standard deviation is the lowest for Rosebank College, followed by the University of Venda then Vhembe TVET College.

Table 4.7. Improved communication

The use of e-learning improves communication with educators and students							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	4	1.8	14	16.3	0	0
	Disagree	18	8.0	7	8.1	5	5.0
	Neutral	39	17.3	5	5.8	16	15.8
	Agree	100	44.2	31	36.0	55	54.5
	Strongly Agree	61	27.0	23	26.7	24	23.8
	Total	222	98.2	80	93.0	100	99.0
Missing	999	4	1.8	6	7.0	1	1.0
Total		226	100.0	86	100.0	101	100
Standard Deviation		.963		1.441		.778	
Mean		3.88		3.53		3.98	
Level of Agreement		Agree		Agree		Agree	

4.2.4.1.3. New opportunities

According to Table 4.8, majority of the students at the University of Venda, 38.5% of students agreed that e-learning provides an opportunity to acquire new knowledge. At Vhembe TVET College, 33.7% strongly agreed to this statement. At Rosebank College, 49.5% of the students agreed to this statement. Students at Vhembe TVET College have a more positive perception towards this statement as compared to the other institutions. The standard deviation is the lowest for Rosebank College, followed by the University of Venda then Vhembe TVET College.

Table 4.8. New opportunities

E-learning provides an opportunity to acquire new knowledge							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	8	3.5	18	20.9	1	1.0
	Disagree	12	5.3	4	4.7	5	5.0
	Neutral	34	15.0	4	4.7	8	7.9
	Agree	87	38.5	25	29.1	50	49.5
	Strongly Agree	78	34.5	29	33.7	34	33.7
	Total	219	96.9	80	93.0	98	97.0
Missing	999	7	3.1	6	7.0	3	3.0
Total		226	100.0	86	100.0	101	100.0
Standard Deviation		1.031		1.567		.845	
Mean		3.98		3.54		4.13	
Level of Agreement		Agree		Strongly Agree		Agree	

4.2.4.1.4. E-learning Productivity

According to Table 4.9, majority of the students at the University of Venda, 41.2% of students agreed that e-learning is more productive and engaging in learning activities than conventional learning. At Vhembe TVET College, 30.2% strongly agreed to this statement. Majority of the responses were towards disagreeing (27.9%) and strongly disagreeing (14.0%) towards the statement. This shows that most students at Vhembe TVET College are either uncertain or do not believe that e-learning can be more engaging and productive than conventional learning. At Rosebank College, 46.5% of the students agreed to this statement. Students at Vhembe TVET College have a more negative perception towards this statement as compared to University of Venda and Rosebank, which have a more positive perception to the productivity of e-learning. The standard deviation is the lowest for Rosebank College, followed by the University of Venda then Vhembe TVET College.

Table 4.9. E-learning Productivity

E-learning is more productive and engaging in learning activities than conventional learning							
		Univen		**Vhembe TVET**		**Rosebank**	
		N	**Percent**	**N**	**Percent**	**N**	**Percent**
Valid	**Strongly Disagree**	10	4.4	12	14.0	3	3.0
	Disagree	17	7.5	24	27.9	8	7.9
	Neutral	55	24.3	26	30.2	24	23.8
	Agree	93	41.2	16	18.6	47	46.5
	Strongly Agree	45	19.9	8	9.3	17	16.8
	Total	220	97.3	86	100.0	99	98.0
Missing	**999**	6	2.7	0	0	2	2.0
Total		**226**	**100.0**	**86**	**100.0**	**101**	**100**
Standard Deviation		**1.032**		**1.173**		**.956**	
Mean		**3.66**		**2.81**		**3.68**	
Level of Agreement		**Agree**		**Neutral**		**Agree**	

Based on the above analysis, students at Rosebank College (urban-based HEI) have a more positive perception towards e-learning based on performance expectancy, followed by University of Venda and finally Vhembe TVET College (rural-based HEIs). This can be depicted through the high percentage and lowest standard deviation.

4.2.4.2.Effort expectancy

Effort expectancy in the UTAUT Model is the degree of easiness associated with the use of technology (Venkatesh, Morris, & Davis, 2003). The information below presents effort expectancy at the University of Venda, Vhembe TVET College, and Rosebank College.

4.2.4.2.1. Useful tool for education

According to Table 4.10, most of the students at the University of Venda (39.4%) agree that e-learning is a very useful tool for education as the educational resources are easily available. At Vhembe TVET College, the majority of the students (37.2%) also agreed to this statement. At Rosebank College, most of the students (39.6%) agreed to this statement. The percentage was highest at Rosebank College as compared to the other institutions however, the standard deviation is the lowest for the University of Venda, followed by Rosebank College then Vhembe TVET College. The most popular response for all three institutions was to agree with the statement which depicts a positive perception towards this section.

Table 4.10. Useful tool for education

E-learning is a very useful tool for education as the educational resources are easily shared or made available							
		Univen		**Vhembe TVET**		**Rosebank**	
		N	**Percent**	**N**	**Percent**	**N**	**Percent**
Valid	**Strongly Disagree**	8	3.5	13	15.1	3	3.0
	Disagree	11	4.9	3	3.5	7	6.9
	Neutral	50	22.1	3	3.5	21	20.8
	Agree	89	39.4	32	37.2	40	39.6
	Strongly Agree	62	27.4	29	33.7	28	27.7
	Total	220	97.3	80	93.0	99	98.0
Missing	**999**	6	2.7	6	7.0	2	2.0
Total		**226**	**100.0**	**86**	**100.0**	**101**	**100.0**
Standard Deviation		**1.009**		**1.407**		**1.017**	
Mean		**3.85**		**3.76**		**3.84**	
Level of Agreement		**Agree**		**Agree**		**Agree**	

4.2.4.2.2. Interaction with e-learning

According to Table 4.11, majority of the students at the University of Venda (40.7%) agreed that interaction with e-learning is clear and understandable. At Vhembe TVET College, the majority of the students (41.9%) agreed to this statement. At Rosebank College, most of the students (40.6%) also agreed to this statement. The standard deviation is the lowest for the University of Venda, followed by Rosebank College then Vhembe TVET College.

Table 4.11. Interaction with e-learning

Interaction with e-learning is clear and understandable							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	12	5.3	12	14.0	5	5.0
	Disagree	18	8.0	5	5.8	12	11.9
	Neutral	55	24.3	8	9.3	25	24.8
	Agree	92	40.7	36	41.9	41	40.6
	Strongly Agree	43	19.0	20	23.3	16	15.8
	Total	220	97.3	81	94.2	99	98.0
Missing	999	6	2.7	5	5.8	2	2.0
Total		226	100.0	86	100.0	101	100.0
Standard Deviation		1.060		1.331		1.063	
Mean		3.62		3.58		3.52	
Level of Agreement		Agree		Agree		Agree	

4.2.4.2.3. Learning how to use

Based on the results in Table 4.12, the majority of the students at the University of Venda (30.5%) are uncertain that learning how to use e-learning is easy. This shows a lower level of confidence towards the introduction of new technology. However, the majority of the remaining students agree (30.5%) and strongly agree (17.7%) that learning how to use e-learning is easy. The results may, however, depict that students may be facing difficulties while using Blackboard at the University of Venda. At Vhembe TVET College, the majority of the students (38.4%) agreed to this statement. At Rosebank College, most of the students (50.5%) also agreed to this statement. The standard deviation is the lowest for the University of Venda, followed by Rosebank College then Vhembe TVET College.

Table 4.12. Learning how to use

Learning how to use e-learning is easy							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	11	4.9	12	14.0	4	4.0
	Disagree	21	9.3	6	7.0	4	4.0
	Neutral	79	35.0	14	16.3	13	12.9
	Agree	69	30.5	33	38.4	27	26.7
	Strongly Agree	40	17.7	16	18.6	51	50.5
	Total	220	97.3	81	94.2	99	98.0
Missing	999	6	2.7	5	5.8	2	2.0
Total		226	100.0	86	100.0	101	100.0
Standard Deviation		1.053		1.303		1.073	
Mean		3.48		3.43		4.18	
Level of Agreement		Neutral		Agree		Strongly Agree	

4.2.4.2.4. Required Skills

Based on the results in Table 4.13, the majority of the students at the University of Venda (33.6%) agreed that they have the necessary skills required to learn using e-learning. At Vhembe TVET College, the majority of the students (31.4%) agreed to this statement. At Rosebank College, most of the students (53.5%) also agreed to this statement. The standard deviation is the lowest for Rosebank College, followed by the University of Venda then Vhembe TVET College.

Table 4.13. Required Skills

I have the necessary skills required to learn using e-learning							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	9	4.0	9	10.5	0	0
	Disagree	18	8.0	13	15.1	5	5.0
	Neutral	58	25.7	10	11.6	13	12.9
	Agree	76	33.6	27	31.4	54	53.5
	Strongly Agree	59	26.1	22	25.6	27	26.7
	Total	220	97.3	81	94.2	99	98.0
Missing	999	6	2.7	5	5.8	2	2.0
Total		226	100.0	86	100.0	101	100.0
Standard Deviation		1.074		1.343		.781	
Mean		3.72		3.49		4.04	
Level of Agreement		Agree		Agree		Agree	

Based on the above analysis, students believe that that is easiness associated with the use of e-learning. However, students at the University of Venda (rural-based HEI) are neutral about the statement that learning how to use e-learning is easy. Rosebank College (urban-based HEI) had the highest percentage towards a positive effort expectancy compared to the other institutions.

4.2.4.3.Social Influence

Social influence is the extent to which the individual perceives the importance of the use of the system based on what others believe (Venkatesh, Morris, & Davis, 2003).

4.2.4.3.1. Educators and Peers

According to Table 4.14, most students at the University of Venda (36.7%) agreed that their educators and peers think that they should use e-learning. However, at Vhembe TVET College, the majority of the students (38.4%) disagreed to this statement. This shows that there is no motivation or influence coming from the educators or peers to use e-learning. At Rosebank College, most of the students (66.3%) also agreed to this statement. The standard deviation is

the lowest for Rosebank College, followed by Vhembe TVET College and the University of Venda.

Table 4.14. Educators and Peers

My educators/peers think I should use e-learning							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	25	11.1	8	9.3	3	3.0
	Disagree	33	14.6	33	38.4	3	3.0
	Neutral	51	22.6	25	29.1	7	6.9
	Agree	83	36.7	17	19.8	67	66.3
	Strongly Agree	29	12.8	3	3.5	20	19.8
	Total	221	97.8	86	100.0	100	99.0
Missing	999	5	2.2	8	9.3	1	1.0
Total		226	100.0	33	38.4	101	100.0
Standard Deviation		1.200		1.007		.816	
Mean		3.26		2.70		3.98	
Level of Agreement		Agree		Disagree		Agree	

4.2.4.3.2. People influencing behavior

Based on the results in Table 4.15, most of the students at the University of Venda (33.2%) agree that other people who influence their behavior or whose opinions they value , they think should use e-learning. 31.4% of students at Vhembe TVET College agree to the statement. This shows that even though educators and peers do not encourage them to use e-learning, other people do. Looking at Rosebank College most of the students (45.5%) agreed to this statement. The standard deviation is the lowest for Rosebank College, followed by the University of Venda and Vhembe TVET College.

Table 4.15. People influencing behavior

Other people who also influence my behavior or whose opinions I value think that I should use e-learning							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	20	8.8	12	14.0	9	8.9
	Disagree	36	15.9	8	9.3	9	8.9
	Neutral	57	25.2	19	22.1	19	18.8
	Agree	75	33.2	27	31.4	46	45.5
	Strongly Agree	33	14.6	15	17.4	17	16.8
	Total	221	97.8	81	94.2	100	99.0
Missing	999	5	2.2	5	5.8	1	1.0
Total		226	100.0	86	100.0	101	100
Standard Deviation		1.175		1.300		1.150	
Mean		3.29		3.31		3.53	
Level of Agreement		Agree		Agree		Agree	

The above results show that social influence affects the University of Venda and Rosebank College positively. However, it is evident that students at Vhembe TVET College are more influenced by other people than their educators to use e-learning.

4.2.4.4.Facilitating Conditions

This is the level up to which individuals consider that the institution's infrastructure (technology, training, funding, availability, and accessibility to technology) exists to aid the use of system.

4.2.4.4.1. Internet connectivity

E-learning requires efficient internet connectivity for students to work online. This should be provided by the institution if they want e-learning to be adopted by their students. The results are presented in Table 4.16. When the students were asked about internet connectivity at their institution, at University of Venda majority of the students (35.4%) agreed that they have the required internet connectivity to use e-learning followed by 29.6% of students who strongly agreed to the statement. At Vhembe TVET College, majority of the students disagreed (37.2%) to the statement, this shows that ICT infrastructure is poor. At Rosebank College, majority of the students agreed (35.6%) and strongly agreed (28.7%) on this statement. The standard deviation is the lowest for Rosebank College, followed by the University of Venda and Vhembe TVET College. The results show that the institutions that have implemented e-learning have the required internet connectivity, and Vhembe TVET College must cater for these students by providing efficient internet connectivity for e-learning in the future.

Table 4.16. Internet connectivity

The required internet connectivity to use e-learning is available at my institution							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	14	6.2	12	14.0	5	5.0
	Disagree	16	7.1	32	37.2	10	9.9
	Neutral	44	19.5	14	16.3	20	19.8
	Agree	80	35.4	10	11.6	36	35.6
	Strongly Agree	67	29.6	14	16.3	29	28.7
	Total	221	97.8	82	95.3	100	99.0
Missing	999	5	2.2	4	4.7	1	1.0
Total		**226**	**100.0**	**86**	**100.0**	**101**	**100.0**
Standard Deviation		**1.147**		**1.324**		**1.134**	
Mean		**3.77**		**2.78**		**3.74**	
Level of Agreement		**Agree**		**Disagree**		**Agree**	

4.2.4.4.2. ICT Infrastructure

Table 4.17 presents the views of students on whether or not their institution has an efficient infrastructure to use and support e-learning. At the University of Venda, 43.4% agreed to this statement. At Vhembe TVET College, 33.7% disagreed to this statement whereas at Rosebank College 50.5% of students strongly agreed to this statement. The standard deviation is the lowest for Rosebank College, followed by the University of Venda followed by Vhembe TVET College. These results show that at Rosebank College (urban-based HEI) the students have a more unified view towards the availability of ICT infrastructure at their institution compared to the other institutions. The University of Venda also had a positive result but was less strong than Rosebank College. At Vhembe TVET College most students disagreed to the availability of ICT infrastructure which is a negative response and would affect the adoption of e-learning.

Table 4.17. ICT Infrastructure

The required ICT infrastructure to use and support e-learning are available at my institution							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	11	4.9	14	16.3	0	0
	Disagree	17	7.5	29	33.7	2	2.0
	Neutral	36	15.9	18	20.9	2	2.0
	Agree	98	43.4	12	14.0	46	45.5
	Strongly Agree	60	26.5	8	9.3	51	50.5
	Total	222	98.2	81	94.2	101	100.0
Missing	999	4	1.8	5	5.8	0	0
Total		**226**	**100.0**	**86**	**100.0**	**101**	**100.0**
Standard Deviation		**1.073**		**1.218**		**.640**	
Mean		**3.81**		**2.64**		**4.45**	
Level of Agreement		**Agree**		**Disagree**		**Strongly Agree**	

4.2.4.4.3. Training and support

According to Table 4.18, most of the students at the University of Venda (25.2%) disagree that training and support for e-learning are continuously available at the institution. 30.2% of students at Vhembe TVET College also disagreed to this statement. At Rosebank College majority of the students (61.4%) agreed to this statement. This shows that training and support for e-learning is available at Rosebank College (urban-based HEI) as compared to University of Venda and Vhembe TVET College. The standard deviation is the lowest for Rosebank College, then Vhembe TVET College and the University of Venda.

Table 4.18. Training and Support

Training and support for e-learning are continuously available at my institution							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	26	11.5	12	14.0	1	1.0
	Disagree	57	25.2	26	30.2	4	4.0
	Neutral	55	24.3	24	27.9	7	6.9
	Agree	56	24.8	10	11.6	62	61.4
	Strongly Agree	27	11.9	9	10.5	27	26.7
	Total	221	97.8	81	94.2	101	100.0
Missing	999	5	2.2	5	5.8	0	0
Total		226	100.0	86	100.0	101	100.0
Standard Deviation		1.215		1.194		.763	
Mean		3.00		2.73		4.09	
Level of Agreement		Disagree		Disagree		Agree	

4.2.4.4.4. ICT support staff

Based on the results in Table 4.19, most of the students at the University of Venda (24.3%) disagreed that ICT support staff is available for assistance at the institution. Most students at Vhembe TVET College also disagreed (40.7%) to this statement. At Rosebank College majority of the students (66.3%) agreed to this statement. These results show that ICT support staff for e-learning are available at Rosebank College (urban-based HEI) as compared to University of Venda and Vhembe TVET College. The standard deviation is the lowest for Rosebank College, then Vhembe TVET College and the University of Venda.

Table 4.19. ICT Support Staff

ICT Support staff are/would be available for assistance with e-learning at my institution							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	27	11.9	12	14.0	0	0
	Disagree	55	24.3	35	40.7	7	6.9
	Neutral	44	19.5	24	27.9	6	5.9
	Agree	53	23.5	11	12.8	67	66.3
	Strongly Agree	42	18.6	0	0	21	20.8
	Total	221	97.8	82	95.3	101	100.0
Missing	999	5	2.2	4	4.7	0	0
Total		226	100.0	86	100.0	101	100.0
Standard Deviation		1.315		.902		.742	
Mean		3.13		2.41		4.01	
Level of Agreement		Disagree		Disagree		Agree	

4.2.4.4.5. Educator skills

According to Table 4.20, most of the students at the University of Venda (29.2%) are uncertain that their educators have the necessary skills to teach using e-learning. Majority of the students at Vhembe TVET College (29.1%) are also neutral about this statement. This shows that most students do not know the capability of their educators to teach using e-learning. At Rosebank College majority of the students (55.4%) agreed to this statement. The standard deviation is the lowest for Rosebank College, followed by the University of Venda and Vhembe TVET College. These results depict a higher level of skills in urban-based HEIs.

Table 4.20. Educator Skills

My educators have the necessary skills to teach using e-learning.							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	18	8.0	24	27.9	2	2.0
	Disagree	32	14.2	13	15.1	4	4.0
	Neutral	66	29.2	25	29.1	13	12.9
	Agree	64	28.3	14	16.3	56	55.4
	Strongly Agree	41	18.1	6	7.0	26	25.7
	Total	221	97.8	82	95.3	101	100.0
Missing	999	5	2.2	4	4.7	0	0
Total		226	100.0	86	100.0	101	100.00
Standard Deviation		1.176		1.277		.854	
Mean		3.35		2.57		3.99	
Level of Agreement		Neutral		Neutral		Agree	

4.2.4.4.6. Educator Support

According to Table 4.21, most of the students at the University of Venda (28.8%) agree that their educators encourage and support the use of e-learning. However, 39.5% of students at Vhembe TVET College are uncertain about this statement. Majority of the other students strongly disagreed (16.3%) or disagreed (33.7%) to this statement. This shows that students at Vhembe TVET College are not encouraged or supported to use e-learning by their educators. At Rosebank College majority of the students (73.3%) agreed to this statement. This shows that educators at Rosebank College are more encouraging and supportive than the other institutions. The standard deviation is the lowest for Rosebank College, then Vhembe TVET College and the University of Venda.

Table 4.21. Educator Support

My educators encourage and support the use e-learning							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	25	11.1	14	16.3	0	0
	Disagree	41	18.1	29	33.7	3	3.0
	Neutral	51	22.6	34	39.5	9	8.9
	Agree	65	28.8	9	10.5	74	73.3
	Strongly Agree	39	17.3	0	0	15	14.9
	Total	221	97.8	14	16.3	101	100.0
Missing	999	5	2.2	86	100.0	0	0
Total		226	100.0	0	0	101	100.0
Standard Deviation		1.261		.889		.600	
Mean		3.24		2.44		4.00	
Level of Agreement		Agree		Neutral		Agree	

4.2.4.4.7. Institutional Support

Institutional support is very integral to e-learning adoption as stated in the literature review. According to Table 4.22, most of the students at the University of Venda (27.0%) are uncertain that the institution encourages them to use e-learning. Majority of the students at Vhembe TVET College (39.5%) agree to this statement. This reflects a positive influence coming from the institution to support e-learning if they implement it. At Rosebank College majority of the students (59.4%) agreed to institutional support being provided. The standard deviation is the lowest for Rosebank College, followed by the University of Venda and Vhembe TVET College.

Table 4.22. Institutional Support

In general, my institution encourages me to use e-learning							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	23	10.2	9	10.5	2	2.0
	Disagree	42	18.6	7	8.1	1	1.0
	Neutral	61	27.0	9	10.5	5	5.0
	Agree	50	22.1	34	39.5	60	59.4
	Strongly Agree	44	19.5	23	26.7	33	32.7
	Total	220	97.3	82	95.3	101	100.0
Missing	999	6	2.7	4	4.7	0	0
Total		226	100.0	86	100.0	101	100.0
Standard Deviation		1.262		1.277		.749	
Mean		3.23		3.67		4.20	
Level of Agreement		Neutral		Agree		Agree	

Based on the above results for facilitating conditions, Rosebank College has the most support from the institution as compared to the rural-based HEIs. At Vhembe TVET College, it is evident that there is a lack of infrastructure, skills, and support. The University of Venda has an efficient infrastructure to support the program which serves as a sign of improvement as compared to previous years (Patel, Madzvamuse, & Armstrong, 2017). However, students are uncertain or disagreed to the availability of training and support, ICT Support staff, educator skills, and institutional support. The level of uncertainty and disagreement shows that students may not believe that the educators use or have the skills to teach using e-learning and there is less motivation from the university itself to promote e-learning. These cases may lead to a lower adoption rate of e-learning.

4.2.4.5.Behavioural Intention

This shows the intention of the participants to use e-learning based on their perception on all the other factors mentioned prior to this subsection.

4.2.4.5.1. Support use of e-learning

Based on the results in Table 4.23, the majority of the students at University of Venda (39.8%), Vhembe TVET College (43.0%) and Rosebank College (49.5%) agree to the statement that they personally support the use of e-learning. However, the results at Rosebank College outweigh the rural-based HEIs. The standard deviation is the lowest for Rosebank College, followed by the University of Venda and Vhembe TVET College.

Table 4.23. Support use of e-learning

I personally support the use of e-learning							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	9	4.0	12	14.0	1	1.0
	Disagree	14	6.2	3	3.5	3	3.0
	Neutral	26	11.5	6	7.0	2	2.0
	Agree	90	39.8	37	43.0	50	49.5
	Strongly Agree	81	35.8	24	27.9	44	43.6
	Total	220	97.3	82	95.3	100	99.0
Missing	999	6	2.7	4	4.7	1	1.0
Total		226	100.0	86	100.0	101	100.0
Standard Deviation		1.056		1.329		.753	
Mean		4.00		3.71		4.33	
Level of Agreement		Agree		Agree		Agree	

4.2.4.5.2. Blended learning

According to Table 4.24, most of the students at University of Venda (38.5%), Vhembe TVET College (41.9%) and Rosebank College (58.4%) agree to the statement that e-learning can be integrated with conventional learning to receive benefits of both learning methods. The standard deviation is the lowest for Rosebank College, followed by the University of Venda and Vhembe TVET College. The results at Rosebank College (urban-based HEI) are more positive then University of Venda and Vhembe TVET College (rural-based HEIs).

Table 4.24. Blended learning

I believe that e-learning can be integrated with conventional learning to receive benefits of both learning methods							
		Univen		Vhembe TVET		Rosebank	
		N	Percent	N	Percent	N	Percent
Valid	Strongly Disagree	9	4.0	13	15.1	0	0
	Disagree	11	4.9	6	7.0	3	3.0
	Neutral	30	13.3	2	2.3	6	5.9
	Agree	87	38.5	36	41.9	59	58.4
	Strongly Agree	83	36.7	25	29.1	32	31.7
	Total	220	97.3	82	95.3	100	99.0
Missing	999	6	2.7	4	4.7	1	1.0
Total		226	100.0	86	100.0	101	100.0
Standard Deviation		1.042		1.399		.682	
Mean		4.02		3.66		4.20	
Level of Agreement		Agree		Agree		Agree	

The above results show that if motivated in the right, students would adopt e-learning at rural-based HEIs.

4.2.5. Section E – E-learning benefits and challenges

The researcher pursued to explore the benefits and challenges that the use or possible use of e-learning through Blackboard may provide the students at the University of Venda. This section addresses two research objectives which are to determine and bridge the gap between the maximum potential benefits and challenges of e-learning and to identify up to what extent does location of the HEIs influence the adoption of e-learning. Three questions were asked in this section which were based on the benefits of e-learning, challenges of e-learning and location challenges of e-learning. The respondents were asked to indicate all possible benefits or challenges that they have or may face during the use of e-learning.

4.2.5.1.Benefits of e-learning

This question sought to identify all the benefits and potential benefits that students believe that they have. The results are shown in Table 4.25.

Table 4.25. Students- Benefits of e-learning

	Univen		Vhembe TVET		Rosebank College	
	N	Percent	N	Percent	N	Percent
Flexibility of time, place and delivery of education	155	19.1%	56	18.9%	64	17.8%
Increased collaboration and interactivity with educators and students	102	12.6%	31	10.4%	48	13.4%
Delivery of effective and personalized learning	105	12.9%	32	10.8%	51	14.2%
Self-paced learning	120	14.8%	43	14.5%	58	16.2%
Rapid and continuous feedback	73	9.0%	30	10.1%	26	7.2%
Access to updated learning material and advanced information	90	11.1%	38	12.8%	45	12.5%
Increase in level of confidence and motivation towards online learning	80	9.9%	35	11.8%	30	8.4%
Reduced commute time to campus	81	10.0%	27	9.1%	34	9.5%
None	6	0.7%	5	1.7%	3	0.8%
Total	**812**	**100.0%**	**297**	**100.0%**	**359**	**100.0%**

At the University of Venda, there was a total of 812 responses to this question as the participant could choose more than one response. According to Table 4.25, 19.1% (155/812) believe that e-learning provides flexibility of time, place and delivery of education. 12.6% (102/812) believe e-learning increases collaboration and interactivity with educators and students. 12.9%

(105/812) students believe that e-learning provides the delivery of effective and personalized learning.14.8% (120/812) students believe that e-learning offers self-paced learning. 9.0% (73/812) students believe that it offers continuous feedback.11.1% (90/812) students believe that e-learning provides access to updated and advanced information. 9.9% (80/812) believe that e-learning increases the level of confidence and motivation towards online learning.10% (81/812) believe that e-learning reduces commute time to campus and 0.7% (6/812) believe that there are no benefits for e-learning. Based on the above, at the University of Venda; majority of the students believe that e-learning provides flexibility of time, place and delivery of education; self-paced learning and delivery of effective and personalized learning.

At Vhembe TVET College, there were 297 responses from 86 participants. 18.9% (56/297) believe that e-learning provides flexibility of time, place and delivery of education. 10.4% (31/297) believe e-learning increases collaboration and interactivity with educators and students. 10.8% (32/297) students believe that e-learning provides the delivery of effective and personalized learning.14.5% (43/297) students believe that e-learning offers self-paced learning. 10.1% (30/297) students believe that it offers continuous feedback.12.8% (38/297) students believe that e-learning provides access to updated and advanced information. 11.8% (35/297) believe that e-learning increases the level of confidence and motivation towards online learning.9.1% (27/297) students believe that e-learning reduces commute time to campus and 1.7% (5/297) believe that there are no benefits for e-learning. Based on the above analysis, at Vhembe TVET College, majority of the students believe that e-learning provides flexibility of time, place and delivery of education; and self-paced learning and access to updated learning material and advanced information.

Looking at Rosebank College, there were a total of 359 responses. 17.8% (64/359) believe that e-learning provides flexibility of time, place and delivery of education. 13.4% (48/359) believe e-learning increases collaboration and interactivity with educators and students. 14.2% (51/359) students believe that e-learning provides the delivery of effective and personalized learning.16.2% (58/359) students believe that e-learning offers self-paced learning. 7.2% (26/359) students believe that it offers continuous feedback.12.5% (45/359) students believe that e-learning provides access to updated and advanced information. 8.4% (30/359) students believe that e-learning increases the level of confidence and motivation towards online learning.9.5% (34/359) believe that e-learning reduces commute time to campus and 0.8% (3/359) believe that there are no benefits for e-learning. Based on the above, at Rosebank

College; majority of the students believe that e-learning provides flexibility of time, place and delivery of education; self-paced learning and delivery of effective and personalized learning.

From the above results, it can be depicted that students are aware of the benefits of e-learning and perceive them in a similar way, regardless of the location of the institution.

4.2.5.2.Challenges of E-learning

The researcher aimed to determine the challenges the participants faced or could face during the use of the e-learning platform-backboard. These challenges also address another research question of this study, which is to determine the level of promotion and support that HEIs provide towards e-learning. The results are presented in Table 4.26.

Table 4.26. Students-Challenges of e-learning

	Univen		Vhembe TVET		Rosebank College	
	N	Percent	N	Percent	N	Percent
Lack of awareness	92	9.6%	32	9.4%	7	4.9%
Lack of motivation	101	10.5%	39	11.4%	15	10.4%
Resistance towards use of e-learning	67	7.0%	27	7.9%	9	6.3%
Lack of computer literacy and training	93	9.7%	30	8.8%	4	2.8%
Low levels of English competency	64	6.7%	26	7.6%	3	2.1%
No access to computers	89	9.3%	28	8.2%	5	3.5%
No access to the internet	71	7.4%	29	8.5%	4	2.8%
Poor/ No Wi-Fi connection	117	12.2%	52	15.2%	4	2.8%
Long distance to travel to access the computer/internet facility	72	7.5%	27	7.9%	24	16.7%
Lack of assistance and technical support	94	9.8%	27	7.9%	7	4.9%
Lack of assistance/expertise from the educators	95	9.9%	21	6.2%	11	7.6%
None	7	0.7%	3	0.9%	51	35.4%
Total	962	100.0%	341	100.0%	144	100.0%

At the University of Venda, a total number of 962 responses were received. Out of these responses 9.6% (92/962) identified lack of awareness as a challenge, 10.5% (101/962) selected lack of motivation, 7.0% (67/962) selected resistance towards use of technology, 9.7% (93/962)

selected lack of computer literacy and training, 6.7% (64/962) selected low levels of English competency, 9.3% (89/962) selected no access to computers, 7.4% (71/962) selected no access to internet, 12.2% (117/962) selected poor Wi-Fi connection, 7.5% (72/962) selected long distance to travel to access the ICT facilities, 9.8% (94/962) selected lack of assistance and technical support as a challenge, 9.9% (95/962) selected lack of assistance and expertise from the educators and 0.7% (7/962) selected none. Based on the above results, the major obstacles of e-learning for the students at the University of Venda includes poor Wi-Fi connectivity, followed by lack of motivation and lack of assistance/ expertise from educators. These challenges are directed towards lack of promotion and institutional support towards e-learning.

At Vhembe TVET College, there were a total of 341 responses. 9.4% (32/341) identified lack of awareness as a challenge, 11.4% (39/341) selected lack of motivation as a challenge, 7.9% (27/341) selected resistance towards use of technology, 8.8% (30/341) selected lack of computer literacy and training, 7.6% (26/341) selected low levels of English competency, 8.2% (28/341) selected no access to computers, 8.5% (29/341) selected no access to internet, 15.2% (52/341) selected no Wi-Fi connection, 7.9% (27/341) selected long distance to travel to access the ICT facilities, 7.9% (27/341) selected lack of assistance and technical support, 6.2% (21/341) selected lack of assistance and expertise from the educators and 0.9% (3/341) selected none. Based on the above analysis, the major obstacles of e-learning for students at Vhembe TVET College includes no Wi-Fi connectivity, lack of motivation and lack of awareness. These challenges are like those faced at the University of Venda, however, Vhembe TVET College has not yet implemented an e-learning program, therefore lack of awareness plays an important role as compared to the University of Venda.

Looking at the results for Rosebank college, there were 144 responses received which is relatively low as compared to University of Venda and Vhembe TVET College. 4.9% (7/144) identified lack of awareness as a challenge, 10.4% (15/144) identified lack of motivation as a challenge, 6.3% (9/144) selected resistance towards use of technology, 2.8% (4/144) selected lack of computer literacy and training, 2.1% (3/144) selected low levels of English competency, 3.5% (5/144) selected no access to computers, 2.8% (4/144) selected no access to internet, 2.8% (4/144) selected poor Wi-Fi connection, 16.7% (24/144) selected long distance to travel to access the ICT facilities, 4.9% (7/144) selected lack of assistance and technical support, 7.6% (11/144) selected lack of assistance and expertise from the educators and 35.4% (51/144) selected none. Based on the above results, majority of the students at Rosebank College believe that they do not face any challenges when using e-learning. Most of the challenges that are

faced include long distance to travel to access the computer/internet facility, lack of motivation and lack of assistance/ expertise from the educators. However, the frequency of these challenges is quite low as compared to the rural-based HEIs. This shows that rural-based HEIs face more difficulties when adopting e-learning as compared to urban-based HEIs.

4.2.5.3.Location Challenges

This question sought to distinguish challenges that rural-based HEIs face specifically as compared to urban-based HEIs. The results of this subsection were combined with the educator's responses to the same question to provide a unified and more effective view of challenges that may be specific to rural-based HEIs.

4.3.Part 2: Educator Survey Results

This part presents the educator survey results at the University of Venda. Only educators at the University of Venda were selected for this section to focus more on rural-based HEIs. The reason why educators at Vhembe TVET College were not selected is because they have not yet implemented e-learning. Therefore, this section investigated the usage, perception, challenges, and benefits of e-learning faced by educators in rural-based HEIs who have an established e-learning program to provide a guideline to the rural-based HEIs that have not yet implemented e-learning. The survey consisted of closed-ended questions directed toward demographic information, e-learning usage, e-learning perception, e-learning benefits and challenges; and location challenges.

Online surveys were distributed to all the academic lecturers at the University of Venda. The surveys were created through SharePoint and distributed via online links being sent to all the educators at the University of Venda. Based on the statistics presented in the introduction, there are currently 418 educators at the University of Venda. One of the setbacks of this study was the apathy of the respondents. Only a total of 12.4% (52/418) responses were received from all the educators. There was no case of missing data as the questionnaire was designed to ensure all questions were attended to before they could press the submit button. Table 4.27 presents the response rate for educators at the University of Venda.

Table 4.27 Educator response rate

Targeted Respondents		**Actual Respondents**	
Frequency	**Percentage**	**Frequency**	**Percentage**
418	100%	52	12.4%

4.3.1. Section A: Background Information

This section outlines the background information of the educators at the University of Venda. The results are presented in Table 4.28 which included gender, age-group, field of teaching, years spent in teaching occupation and average size of the students in the class.

61.5% (32/52) respondents were males whereas 38.5% (20/52) respondents were female educators. Looking at age group, 11.5% (6/52) respondents were between the age of 20 to 29, 23.1% (12/52) of the respondents were between the age of 30-39 years, 46.2% (24/52) were between the age of 40 to 49, and finally 19.2% (10/52) of the respondents were 50 and above.

The respondents were asked to identify their school or faculty under which they teach. None of the educators were from the School of Agriculture and the School of Human and Social Sciences, 3.8% (2/52) of the respondents were from the School of Education, 3.8% (2/52) of the respondents were from the School of Environmental Sciences,19.2% (10/52) of the respondents were from the School of Health Sciences, 7.7% (4/52) of the respondents were from the School of Law, 30.8% (16/52) were from the School of Management Sciences, and the majority of the respondents which were 34.6% (18/52) of the respondents were from the School of Mathematical and Natural Sciences.

The respondents were then asked to indicate the number of years spent in the teaching occupation. 19.2% (10/52) of the respondents indicated spending 0 to 5 years, 26.9% (14/52) indicated spending 6-10 years, majority of the respondents which was 38.5% (20/52) indicated spending 11-19 years and lastly 15.4% (8/52) respondents indicated spending more than 20 years in this occupation.

The respondents were lastly asked to indicate the average size of students in their class, 15.4% (8/52) of the respondents indicated having 0-19 students, 11.5% (6/52) indicated having 20-39 students, 7.7% (4/52) respondents indicated having 40-59 students and majority of the respondents which was 65.4% (34/52) respondents indicated having 60 and above students.

Table 4.28. Educator Background Information

Measure	Items	Frequency	Percentage
Gender	**Male**	32	61.5%
	Female	20	38.5%
Age Group	**20-29**	6	11.5%
	30-39	12	23.1%
	40-49	24	46.2%
	50 and above	10	19.2%
School/Faculty	**School of Agriculture**	0	0%
	School of Education	2	3.8%
	School of Environmental Science	2	3.8%
	School of Health Sciences	10	19.2%
	School of Human and Social Sciences	0	0%
	School of Law	4	7.7%
	School of Management Sciences	16	30.8%
	School of Mathematical and Natural Sciences	18	34.6%
Years spent in teaching occupation	**0-5 years**	10	19.2%
	6-10 years	14	26.9%
	11-19 years	20	38.5%
	20 years and above	8	15.4%
Average size of students in class	**0-19**	8	15.4%
	20-39	6	11.5%
	40-59	4	7.7%
	60 and above	34	65.4%

4.3.2. Section B: Computer Experience and Voluntariness of Use

This section sought to determine the computer experience and voluntariness of use regarding ICT and e-learning at the University of Venda. Four questions regarding access to ICT infrastructure, level of technology knowledge, familiarity with the e-learning program and for how long educators have implemented e-learning in their teaching process were asked to the respondents. The responses are presented in Table 4.29.

The respondents were asked to identify if they have the required ICT infrastructure to support e-learning at the University of Venda. 80.8% (42/52) respondents indicated that they have access to ICT infrastructure whereas 19.2% (10/52) respondents indicated that they do not have access to ICT infrastructure. These results show that majority of the educators have access to the required ICT infrastructure to support e-learning.

The respondents were then asked to indicate their level of technology knowledge they have for teaching a blended course. According to Table 4.29, 23.1% (12/52) respondents indicated that they have expert knowledge in technology. The majority of the respondents which were 73.1 (38/52) indicated having adequate knowledge. 3.8% (2/52) respondents indicated having inadequate knowledge in technology and require training.

Respondents were further asked if they were familiar with the e-learning platform (Blackboard) used at their institution. 80.8% (42/52) respondents indicated that they are familiar with the e-learning platform whereas 19.2% (10/52) indicated that they are not familiar with the e-learning platform. Even though majority of the respondents are familiar with the e-learning platform, all educators are supposed to be familiar with the platform or acknowledge that it is available for them to use. Therefore, this depicts poor communication and promotion of e-learning by the institutions as 19.2% of the educators are not familiar with the platform at all.

For the final part of this section, the educators were asked for how long have they implemented the e-learning platform. 50.0% (26/52) of the respondents indicated that they have not yet implemented e-learning. None of the respondents selected 0-6 months which shows there was no recent uptake of e-learning from educators for the current semester. 11.5% (6/52) indicated that they have implemented from 0-6 months. None of the respondents indicated having implemented the e-learning platform since the last 6-12 months. 3.8% (2/52) of the respondents indicated having implemented the e-learning platform for 1-2 years. Majority of the respondents which were 34.6% (18/52) indicated having implemented the e-learning platform for more than 2 years.

Table 4.29. Computer Experience and Voluntariness of Use

Measure	Items	Frequency	Percentage
Access to ICT infrastructure	**Yes**	42	80.8%
	No	10	19.2%
Level of technology knowledge	**Expert Knowledge**	12	23.1%
	Adequate Knowledge	38	73.1%
	Inadequate Knowledge (Require Training)	2	3.8%
Familiarity with e-learning platform	**Yes**	42	80.8%
	No	10	19.2%
Time elapsed since implementation of e-learning in teaching process	**Not yet implemented**	26	50.0%
	0-6 months	0	0%
	6-12 months	6	11.5%
	1-2 years	2	3.8%
	2 years and above	18	34.6%

4.3.3. Section C: E-learning Perception

This section presents the perception of e-learning at the University of Venda by the educators. The four indicators used to identify perception were derived from the UTAUT Model. This

included performance expectancy, effort expectancy, facilitating conditions and social influence.

4.3.3.1.Performance expectancy

According to Table 4.30, majority of the respondents have strongly agreed to the statements that: the use of e-learning improves flexibility, performance and productivity in education (50.0%) and that the use of e-learning of e-learning improves communication with educators and other students (53.8%). Majority of the respondents also agreed to the statement that e-learning provides an opportunity to acquire new knowledge (50.0%). This was also the statement for which the standard deviation was the lowest, this shows the importance of this statement and how it positively affects the respondents. However, majority of the respondents were uncertain that e-learning is more productive and engaging in learning activities than conventional learning (34.6%).

The results show a positive perception towards performance expectancy; however, the respondents are uncertain if e-learning is more productive and engaging then conventional learning.

Table 4.30. E-learning Perception: Performance Expectancy

Comment													
	Strongly Disagree		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**		**Standard Deviation**	**Mean**	**Level of Agreement**
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**			
1. The use of e-learning improves flexibility, performance and productivity in education.	0	0	2	3.8	4	7.7	20	38.5	26	50.0	**.789**	**4.35**	**Strongly Agree**
2. The use of e-learning improves communication with educators and students.	0	0	2	3.8	12	23.1	10	19.2	28	53.8	**.942**	**4.23**	**Strongly Agree**
3. E-learning provides an opportunity to acquire new knowledge.	0	0	2	3.8	8	15.4	26	50.0	16	30.8	**.788**	**4.08**	**Agree**
4. E-learning is more productive and engaging in learning activities than conventional learning.	0	0	10	19.2	18	34.6	14	26.9	10	19.2	**1.019**	**3.46**	**Neutral**

4.3.3.2.Effort expectancy

Based on the results in Table 4.31, most respondents strongly agreed to the statement that e-learning is a very useful tool for education as the educational resources are easily shared and available (65.4%). This is also the statement for which the standard deviation is the smallest which shows the importance of it being used for sharing educational resources online, leading

to a positive perception towards e-learning. Majority of the respondents equally, strongly agreed and agreed to the statement that interaction with e-learning is clear and understandable (26.9%). Most of the respondents agreed to the statements that learning how to use e-learning is easy (53.8%) and that they have the necessary skills required to learn using e-learning (42.3%). Therefore, educators believe that there is a degree of easiness associated with the effort required when using e-learning.

Table 4.31. E-learning Perception: Effort expectancy

Comment													
	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Standard Deviation	Mean	Level of Agreement
	N	%	N	%	N	%	N	%	N	%			
5. E-learning is a very useful tool for education as the educational resources are easily shared and made available.	0	0	0	0	6	11.5	12	23.1	34	65.4	**.699**	**4.54**	**Strongly Agree**
6. Interaction with e-learning is clear and understandable.	2	3.8	10	19.2	12	23.1	14	26.9	14	26.9	**1.196**	**3.54**	**Agree/ Strongly Agree**
7. Learning how to use e-learning is easy.	2	3.8	6	11.5	10	19.2	28	53.8	6	11.5	**.977**	**3.58**	**Agree**
8. I have the necessary skills required to teach using e-learning.	4	7.7	8	15.4	2	3.8	22	42.3	16	30.8	**1.270**	**3.73**	**Agree**

4.3.3.3.Social Influence

As presented in Table 4.32, most respondents were uncertain to both the statements under social influence which include my peers/students think they should use e-learning (34.6%) and other people who also influence their behavior or whose opinions they value think that they should use e-learning (38.5%). The results depict poor motivation and creation of awareness from the people around the respondents.

Table 4.32. E-learning Perception: Social Influence

Comment													
	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Standard Deviation	Mean	Level of Agreement
	N	%	N	%	N	%	N	%	N	%			
9. My peers/students think I should use e-learning.	2	3.8	10	19.2	18	34.6	12	23.1	10	19.2	**1.118**	**3.35**	**Neutral**
10. Other people who also influence my behaviour or whose opinions I value think that I should use e-learning.	4	7.7	4	7.7	20	38.5	16	30.8	8	15.4	**1.087**	**3.38**	**Neutral**

4.3.3.4.Facilitating Conditions

According to the results in Table 4.33, most respondents agree to the following statements: The required internet connectivity to use e-learning is available at my university (46.2%), the required ICT resources to use e-learning are available at my university (53.8%), training and

support for e-learning are continuously available at the university (46.2%), and ICT Support staff are available for assistance with e-learning at my university (42.3%). Most respondents are equally uncertain/agree to the statement that their students have the necessary skills to learn using e-learning. The standard deviation is also lowest for this statement, this shows that more students require more training in order to use e-learning even more effectively. Majority of the respondents (30.8%) agree that the students encourage and support the use of e-learning. The respondents agree to the statement that their university encourages them to use e-learning (42.3%).

Comparing the responses from students at the University of Venda, it is evident that educators are provided with more training and support, aid from ICT Support Staff and encouragement from the university to use e-learning; as the students disagreed to these statements. These results show that the University is more educator-centric then student-centric.

Table 4.33. E-learning Perception: Facilitating Conditions

Comment	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Standard Deviation	Mean	Level of Agreement
	N	%	N	%	N	%	N	%	N	%			
11. The required internet connectivity to use e-learning is available at my university.	10	19.2	6	11.5	2	3.8	24	46.2	10	19.2	**1.426**	**3.35**	**Agree**
12. The required ICT resources to use e-learning are available at my university.	4	7.7	8	15.4	8	15.4	28	53.8	4	7.7	**1.087**	**3.38**	**Agree**
13. Training and support for e-learning are continuously available at my university.	2	3.8	4	7.7	12	23.1	24	46.2	10	19.2	**1.001**	**3.69**	**Agree**
14. ICT Support staff are available for assistance with e-learning at my university.	6	11.5	4	7.7	12	23.1	22	42.3	8	15.4	**1.194**	**3.42**	**Agree**
15. I believe my students have the necessary skills to learn using e-learning.	4	7.7	14	26.9	16	30.8	16	30.8	2	3.8	**1.028**	**2.96**	**Neutral/Agree**
16. My students encourage and support the use e-learning	4	7.7	14	26.9	7	13.5	25	48.1	2	3.8	**1.103**	**3.13**	**Agree**
17. In general, my university encourages me to use e-learning.	6	11.5	8	15.4	8	15.4	22	42.3	8	15.4	**1.251**	**3.35**	**Agree**

4.3.3.5.Behavioural Intention

According to Table 4.34, most of the respondents strongly agreed on the following statements: I personally support the use of e-learning (53.8%) and I believe that e-learning can be integrated with conventional learning to receive benefits of both learning methods (42.3%). This shows that if motivated in the right, educators are highly willing to adopt e-learning.

Table 4.34. E-learning Perception: Behavioural Intention

Comment													
	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Standard Deviation	Mean	Level of Agreement
	N	%	N	%	N	%	N	%	N	%			
18. I personally support the use of e-learning.	0	0	0	0	8	15.4	16	30.8	28	53.8	**.745**	**4.38**	**Strongly Agree**
19. I believe that e-learning can be integrated with conventional learning to receive benefits of both learning methods.	0	0	0	0	12	23.1	18	34.6	22	42.3	**.793**	**4.19**	**Strongly Agree**

4.3.4. Section D: E-learning benefits and challenges

This section presents the e-learning benefits, e-learning challenges and locational challenges that educators encounter or may encounter with through the use of e-learning.

4.3.4.1.E-learning Benefits

This question sought to identify all the benefits and potential benefits that educators at the University of Venda believe that they have. There was a total of 208 responses from the educators as they could choose more than one response. According to Figure 4.7, 20.2% (42/208) respondents believe that e-learning provides flexibility of time, place and delivery of education. 13.5% (28/208) respondents believe e-learning increases collaboration and interactivity with educators and students. 13.5% (28/208) respondents believe that e-learning provides the delivery of effective and personalized learning. 12.5% (26/208) respondents believe that it offers continuous feedback. 14.4% (30/208) respondents believe that e-learning provides access to updated and advanced information. 10.6% (22/208) respondents believe that e-learning increases the level of confidence and motivation towards online learning.10.6% (22/208) respondents believe that e-learning offers efficient records management and 4.8% (10/208) believe that there are no benefits for e-learning. Based on the above results, according to educators, major e-learning benefits include flexibility of time, place and delivery of education; and access to updated learning material and advanced information.

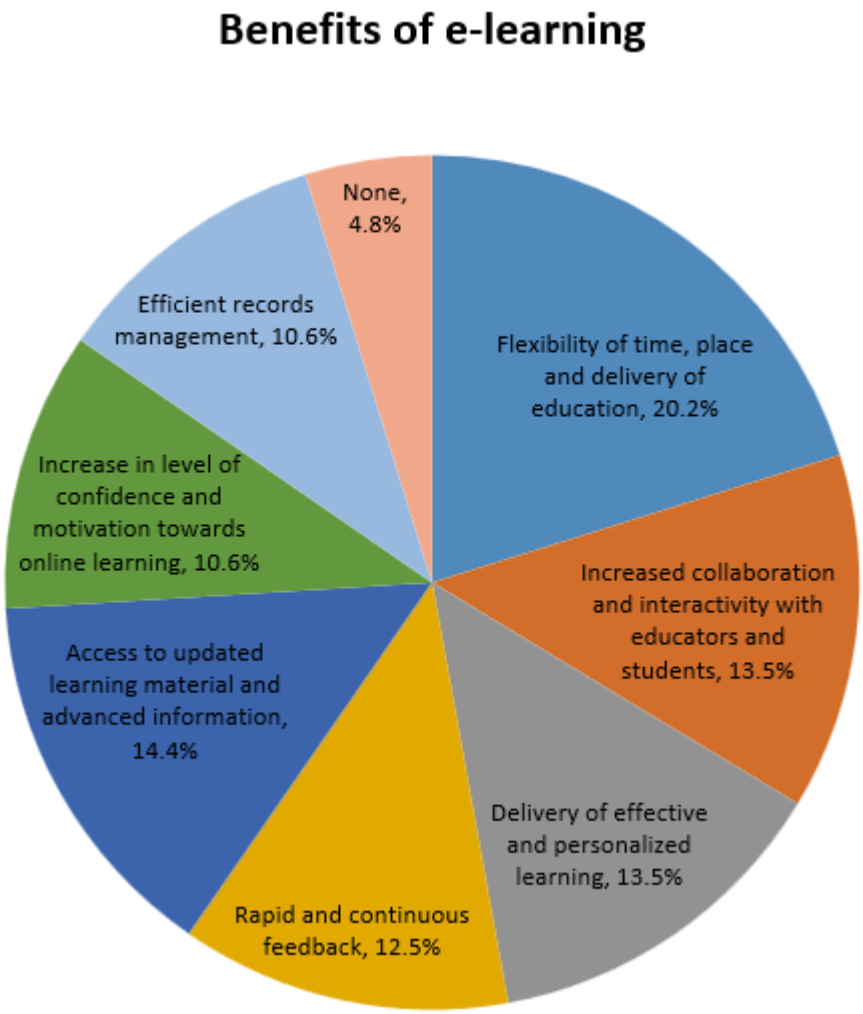

Figure 4.7. Educators- E-learning Benefits

4.3.4.2.E-learning Challenges

Based on the findings in Figure 4.8, a total number of 204 responses were received. Out of these responses 8.8% (18/204) identified lack of awareness as a challenge, 7.8% (16/204) selected lack of motivation, 12.7% (26/204) selected resistance towards use of technology, 10.8% (22/204) selected lack of computer literacy and training, 4.9% (10/204) selected low levels of English competency, 10.8% (22/204) selected no access to computers, , 9.8% (20/204) selected no access to internet, 16.7% (34/204) selected poor Wi-Fi connection, 5.9% (12/204) selected long distance to travel to access the ICT facilities, 9.8% (94/962) selected lack of assistance and technical support as a challenge, 10.8% (22/204) selected lack of assistance and expertise from the educators and 1.0% (2/204) selected none. Based on the above results, the major obstacle of e-learning for the educators is poor Wi-Fi connectivity, followed by

resistance towards use of e-learning. These challenges are directed towards lack of promotion and institutional support towards e-learning, and resistance towards change.

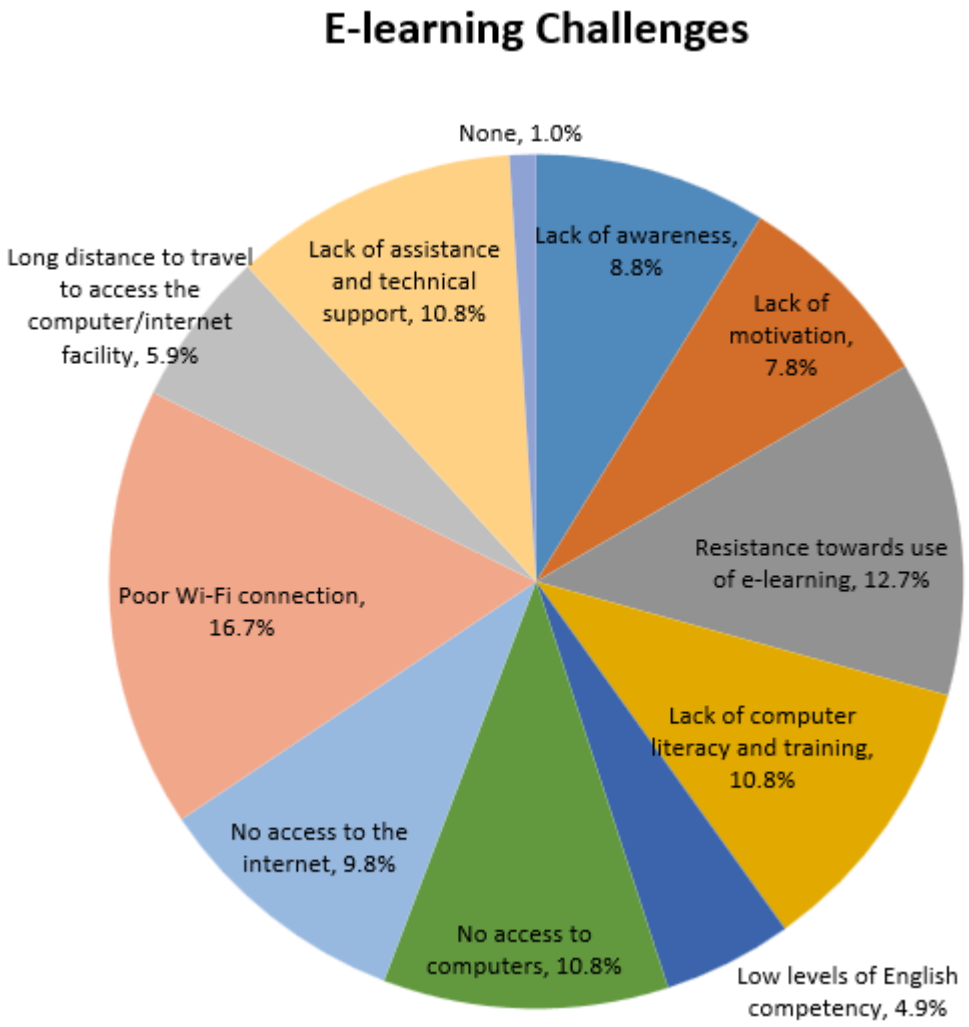

Figure 4.8. Educators- E-learning Challenges

4.3.4.3.Location Challenges

This question sought to identify the challenges faced specifically at rural-based HEIs. This question was included in both the student and educator surveys, and the results were combined to have a unified view towards location challenges. There were a total of 1507 responses, from 465 respondents combined. Based on the results in Figure 4.9, 16.5% (249/1507) identified social and cultural differences as a major challenge, 16.3% (246/1507) selected lack of awareness and perception towards technology and change, 18.5% (279/1507) selected lack of computer literacy and training, 17.5% (264/1507) selected lack of economic development in the area, 14.7% (221/1507) selected lack of research and development in education, 15.5% (234/1507) selected lack of effective Information technology infrastructure i.e. internet access

and computer availability, and lastly 0.9% (14/1507) selected none. These results depict that according to the participants the major challenge that rural-based HEIs face is lack of computer literacy and training, lack of economic development in the area followed by social and cultural differences.

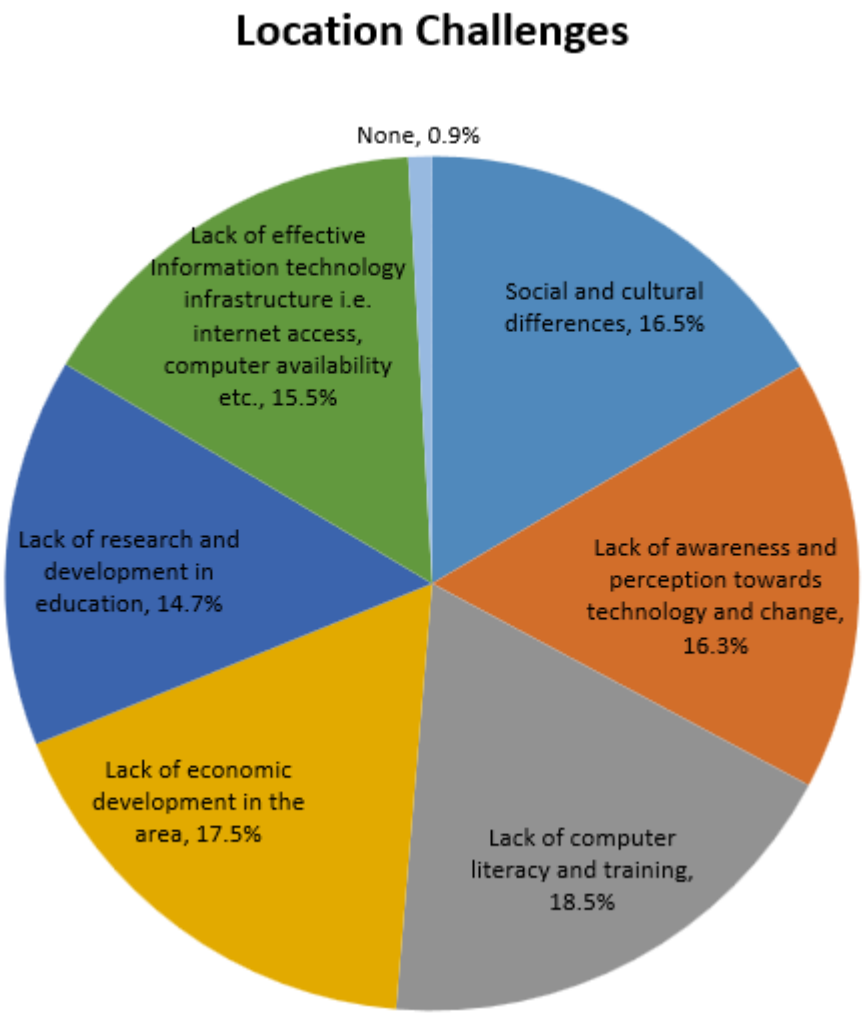

Figure 4.9. Location Challenges

4.4.Part 3: Institutional Results

The following part presents results from the data collected through organizational contact, survey questionnaires and organizational documentation distributed to e-learning practitioners at the University of Venda. The researcher targeted at least 10 staff members in the e-learning

department, however at a further point in the study, it was identified that there is only staff member currently responsible for e-learning at the University of Venda.

4.4.1. Institutional Results

The respondent was asked to justify the level of agreement on the statements presented in the survey by marking a cross next to their response. These statements were aimed towards one of the research objectives of this study which is to determine the level of promotion and support that rural-based HEIs provide towards e-learning. The University of Venda was only considered for this part of the study, as it is the only rural-based HEI, from the selected case studies which have implemented an e-learning program (Blackboard).

4.4.1.1.Vision, Mission, and Strategic Plan

The initial strategic plan for Blackboard at the University of Venda followed a "structured methodology designed to asses University of Venda's current capabilities for achieving client goals for online learning, and subsequently document University of Venda's foundations of strength and areas for improvement" (Univen, 2016). According to Table 4.35, the respondent strongly agreed that there are a documented vision, mission and strategic plan for e-learning at the institution, however, is uncertain that it is well known and understood across the organization.

Table 4.35. Vision, Mission, and Strategic Plan

Comment	SD	D	N	A	SA
Vision, Mission and Strategic Plan					
1. There is a documented vision, mission and strategic plan for the e-learning program at the institution.					**100%**
2. The e-learning program vision, mission and strategic plan are well known and understood across the organisation.			**100%**		

4.4.1.2.Goals/Objectives/Policies

According to Table 4.36, the respondent agreed that there are well-defined goals, objectives and policies e-learning at the institution, however, disagreed that it is well known and understood across the organization.

Table 4.36. Goals/Objectives/Policies

Comment	SD	D	N	A	SA
Goals/Objectives/Policies					
3. There are well defined goals, objectives and policies for the e-learning program at the institution.				**100%**	
4. The goals, objectives and policies for the e-learning program are well known and understood across the organisation.		**100%**			

4.4.1.3.Top Management Support

According to Table 4.37, the respondent agreed that there is support and funding from top management for e-learning, however, is uncertain that there are proper mechanisms to recruit qualified employees. The respondent is also uncertain if e-learning decisions, disputes, and challenges are faced and resolved by the top management.

Table 4.37. Top Management Support

Comment	SD	D	N	A	SA
Top Management Support					
5. There is top management support for the smooth running of the e-learning program.				**100%**	
6. There is funding support from the top management for the e-learning program.				**100%**	
7. Proper mechanisms in place to recruit qualified employees in the field of e-learning.			**100%**		
8. The decisions regarding e-learning are executed from top management.			**100%**		
9. Top management resolve all disputes and challenges faced throughout the implementation and use of the e-learning program.			**100%**		

4.4.1.4.Technology

Looking at technology, based on the results in Table 4.38, the respondent is uncertain if there is adequate hardware infrastructure such as computers to support e-learning. However, the respondent strongly agreed to the availability of software and application support for e-learning. The respondent agreed to the statements that there is adequate network infrastructure, this aligns with the results from student and educator surveys. The respondent also agreed to the statement concerning the security of institutional information via the e-learning platform.

Table 4.38. Technology

Comment	SD	D	N	A	SA
Technology					
10. There is adequate hardware infrastructure at the institution to support e-learning.			**100%**		
11. There is adequate software and application infrastructure at the institution to support e-learning.					**100%**
12. There is adequate network infrastructure at the institution to support e-learning.				**100%**	
13. The e-learning program protects the institutions information and content.				**100%**	

4.4.1.5.Support Staff

Based on the results in Table 4.39, the respondent strongly disagreed on the statements that there is an e-learning department dedicated for the support of the e-learning program, there is an adequate number of staff members and the staff have the required skills to maintain the e-learning program. As there is only one staff member responsible for the e-learning program, these results are clearly evident.

The respondent agreed to the statement, that educators are being continuously trained for using the e-learning program. However, the respondent is uncertain if students are being continuously trained for using the e-learning program. These results also align with the results under training and support from the student and educator surveys.

Table 4.39. Support Staff

Comment	SD	D	N	A	SA
Support Staff					
14. There is an e-learning department dedicated to support the e-learning program.	**100%**				
15. There are adequate number of staff members for a smooth running of the e-learning program.	**100%**				
16. Staff have personal, communication, ICT management and team building skills.	**100%**				
17. Educators are continuously being trained for using the e-learning program.				**100%**	
18. Students are continuously being trained for using the e-learning program.			**100%**		

4.4.1.6.Culture

The respondent is neutral on all the statements under culture in Table 4.40, which include the existence of support and collaboration culture, learning and development culture and the existence of knowledge creation and sharing culture. Uncertainty in these areas raises an issue of whether or not e-learning is supportive and fully functioning for students and educators.

Table 4.40. Culture

Comment	SD	D	N	A	SA
Culture					
19. There is existence of a support and collaboration culture			**100%**		
20. There is existence of a learning and development culture			**100%**		
21. There is existence of a knowledge creation and sharing culture			**100%**		

4.4.1.7.Students

Based on the results in Table 4.41, the respondent strongly disagreed that the students have good ICT Skills. The respondent disagreed to the statements that the students use the e-learning program efficiently. This shows the need for regular and continuous training for students to increase their skills towards ICT and e-learning. The respondent strongly agreed to the statement that students require training before they can use the e-learning program and that they also require regular and continuous training.

Table 4.41. Students

Comment	SD	D	N	A	SA
Students					
22. Students have good ICT Skills.	**100%**				
23. Students use the e-learning program efficiently.		**100%**			
24. Students require training before they can use the program.					**100%**
25. Students require regular and continuous training.					**100%**

4.4.1.8.Educators

Based on the results in Table 4.42, the respondent was neutral to the statement that educators have good ICT skills. The respondent disagreed to the statement that educators use the e-learning program efficiently. Lastly, the respondent strongly agreed to the statement that educators require training before they can use the e-learning program and that they also require regular and continuous training.

Table 4.42. Educators

Comment	SD	D	N	A	SA
Educators					
26. Educators have good ICT Skills			**100%**		
27. Educators use the e-learning program efficiently		**100%**			
28. Educators require training before they can use the e-learning program.					**100%**
29. Educators require regular and continuous training.					**100%**

4.4.2. Organizational Documentation

At the University of Venda, there are approximately 16 000 students and 418 educators (Tshikororo, 2018). The e-learning platform-Blackboard is available for all students and educators to use. Based on Univen Statistics (2016) the Blackboard learning management system implementation started in July 2014 at the University of Venda. Training for the educators from various departments was initiated in December 2014. In January 2015 the user accounts were created, which officially initiated the e-learning program. Helpdesk and Support was introduced in 2017 and assistance is provided by student assistants. However, there is only one staff member responsible for e-learning at the University of Venda.

4.4.2.1.E-learning Uptake- Educators

This subsection presents the e-learning uptake at the University of Venda from 2015-2018. The educators who conduct teaching online were known as instructors. In 2015, there were 349 educators (Univen, Univen Statistics, 2016). According to Figure 4. 10, initially e-learning started off with 5 instructor accounts, there were (5/349) user accounts created in January 2015 and increased at a high level and reached up to 132 instructor accounts in December 2016. These results show that e-learning was catered for up to 37.8% of the educators (132/349).

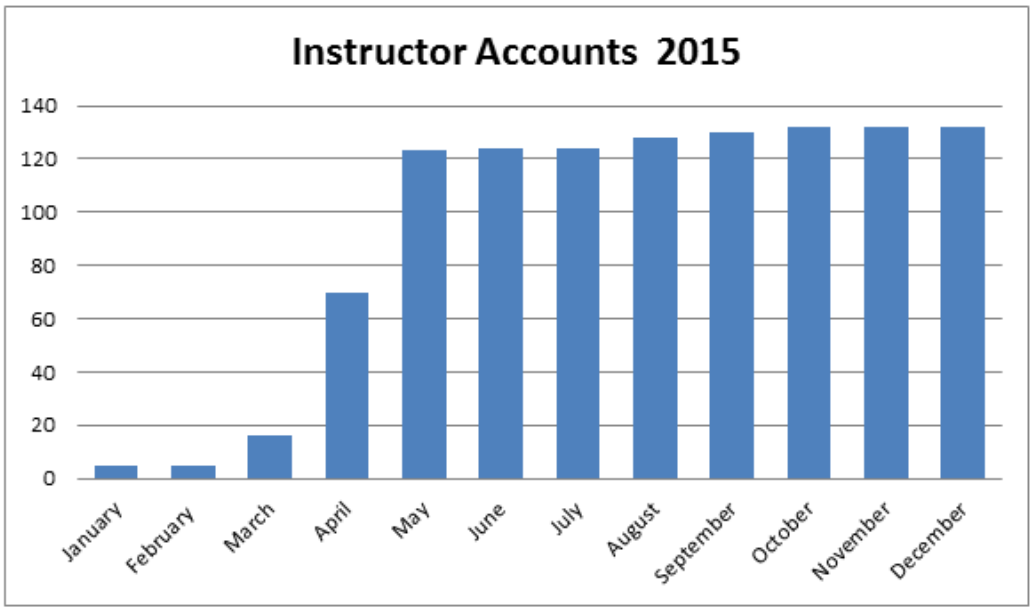

Figure 4.10. Instructor Accounts 2015

Figure 4.11 illustrates the creation of user accounts for 2016. The instructor accounts increased from 132 accounts in January 2016 up to 214 accounts in December 2016. These user accounts catered for about 61.3% (214/349) educators.

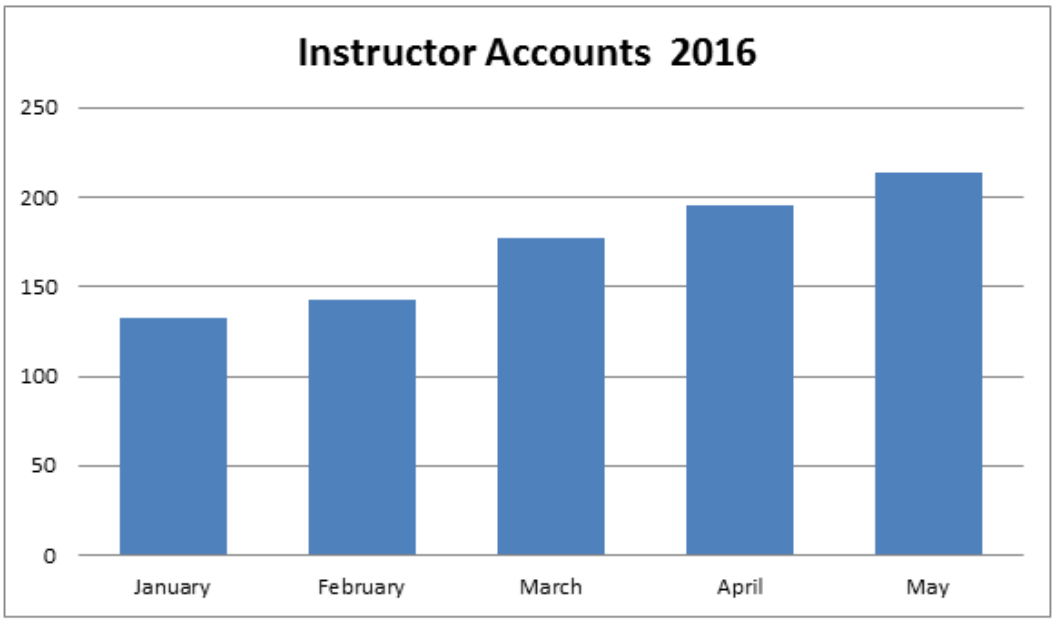

Figure 4.11. Instructor Accounts 2016

Figure 4.12 illustrates the instructor accounts created in the year 2017 (Univen, 2017). However, in the year 2017, instructor accounts were not limited to educators only. Instructor accounts now included lecturers, tutors and anybody who conducts teaching online (Univen, 2017). It should also be noted that the number of users in the system are higher than actual staff members or students due to test accounts, practice courses, short courses, and uptake of students from Univen projects with government departments such as municipalities or other educational institutions taking courses at University of Venda (Univen, 2018).According to Figure 4.12, there was a drastic increase in the creation of user accounts in 2017. The user accounts increased from 242 accounts in February 2017 up to 481 accounts in December 2017.

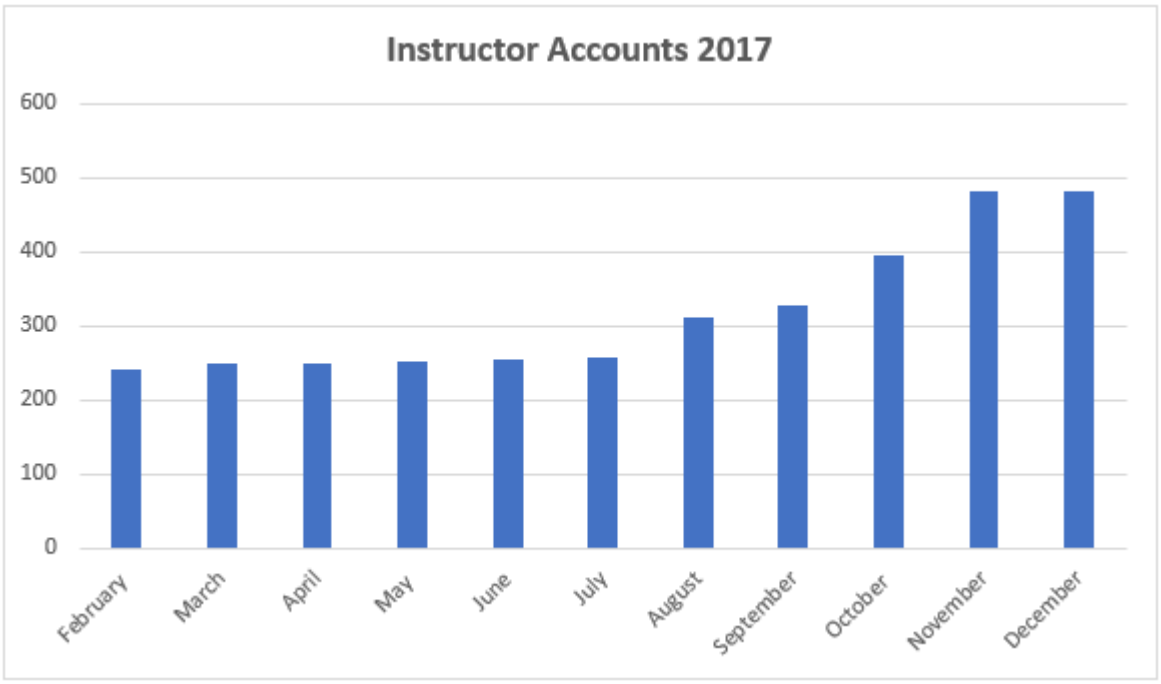

Figure 4.12. Instructor Accounts 2016

Figure 4.13 presents the instructor accounts created in the year 2018 (Univen, 2018). According to Tshikororo (2018), there are currently 418 educators at the University of Venda. However, instructor accounts also include tutors and other people who are involved in the teaching process. Looking at the instructor accounts created in the year 2018, there were 505 accounts in February 2018 and they increased up to 559 accounts in August 2018. These results show that very few accounts were created in 2018 as compared to the previous years. However, this may because the previous years were the initial stages of e-learning and now most instructors

may already be having accounts. These results depict a good uptake of e-learning over the years, as more instructor accounts are being created for use.

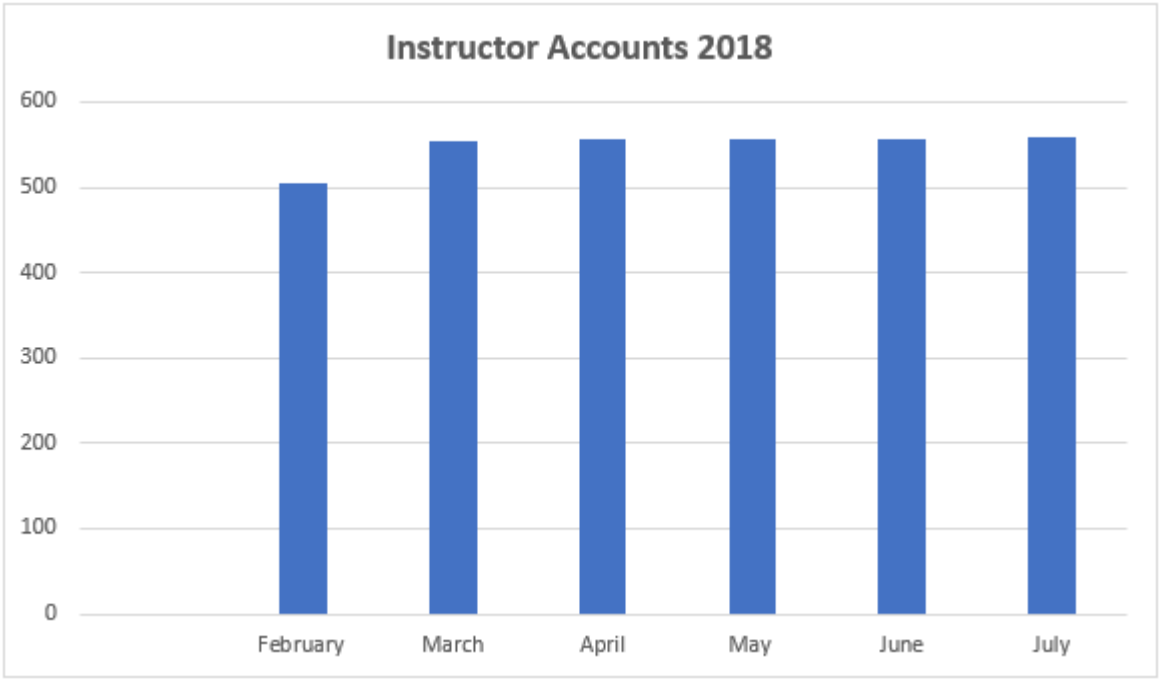

Figure 4.13. Instructor Accounts 2018

4.4.2.2.Instructor Training

Table 4.43 presents the training provided to academics, tutors, e-learning student assistants, CHETL staff members and library staff members on the use of Blackboard till date (Univen, 2018). Training was provided to educators in different schools. The staff members in the School of Environmental Sciences (91.3%) and School of Education (90.9%) were provided with most training. Whereas the School of Mathematics and Natural Science (26.3%) and School of Management Sciences (36.1%) were provided with least training. Overall, 48.7% (222/456) of staff members have been trained over time. 140 tutors from different schools were also trained so they can teach using e-learning to students doing specific courses. 40 e-learning student assistants were trained, these student assistants are responsible for providing training and support to students on e-learning. 4 staff members from CHETL and 10 staff members from the library have also been trained on the use of e-learning. Therefore, a total of 416 people including staff and students have been trained at the University of Venda for e-learning.

Table 4.43. Training provided at University of Venda

	Name of School	Number of Staff trained per school	Total Number of Staff per school	Total Trained (%)
1	School of Agriculture	17	43	39.5
2	School of Law	19	31	61.1
3	School of Education	20	22	90.9
4	School of Health Sciences	37	70	52.9
5	School of Mathematics and Natural Sciences	25	95	26.3
6	School of Management Sciences	26	72	36.1
7	School of Environmental Sciences	42	46	91.3
8	School of Human and Social Sciences	36	77	46.8
	Total Trained for all schools	**222**	**456**	**48.9**
	Tutors Trained for all Schools	140		
	E-Learning Student Assistants	40		
	CHETL	4		
	LIBRARY	10		
	Grand Total of all trained	**416**		

4.4.2.3.E-learning Uptake-Students

According to Figure 4.14, 3340 students accounts were created in March 2015. In December 2015 the student accounts increased up to 6142. In December 2016, there were 9175 student accounts. After this, there was a drastic increase in the student accounts and it reached up to 24 030. In 2018, the student accounts reached up to 26 933. However, these user accounts so not define actual usage of e-learning as these accounts are created for students, practice courses, and other students doing short courses at the University of Venda. There are 3022 active student users for the year 2018 at the University of Venda (Univen, 2018) despite the drastic increase in the creation of user accounts. The approximate population of students at the University of Venda in 2018 is 16 000. Therefore, active students are less than 18%. This determines a very low usage of e-learning.

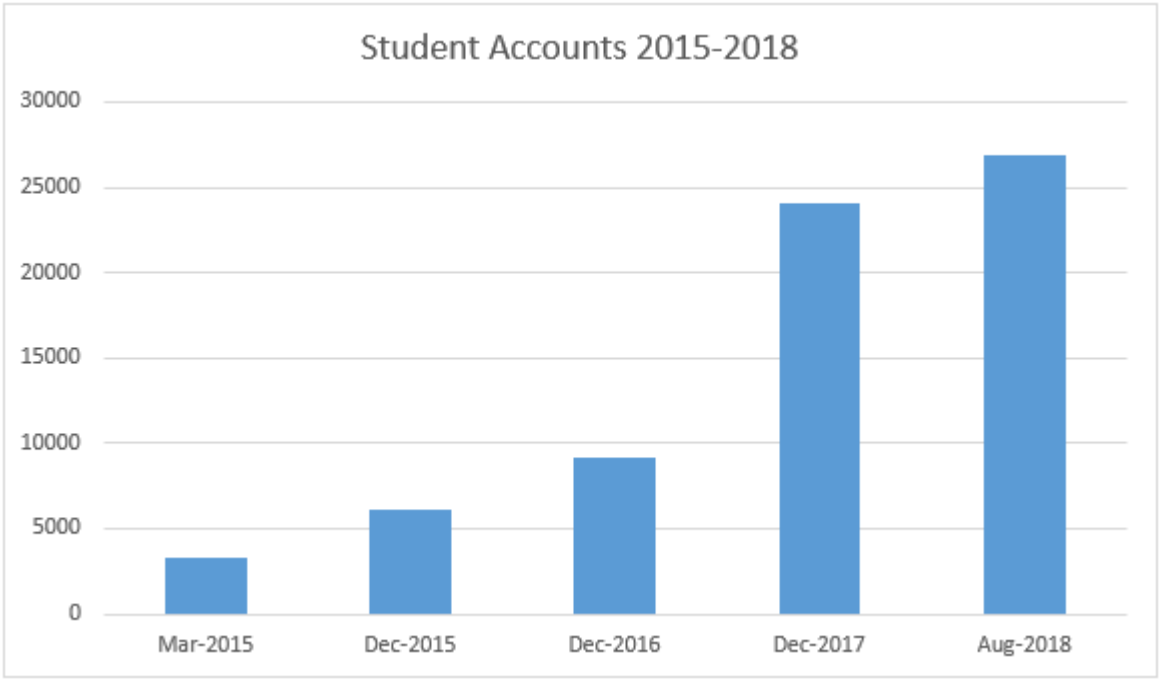

Figure 4.14. Student Accounts 2015-2018

4.5.Part 4: Towards an E-learning adoption Framework

One of the objectives of this study is to propose a framework for the adoption of e-learning at rural-based HEIs. Based on the literature review, the UTAUT Model was considered most suitable for this study. However, it was still tested for validity and reliability of the model through Exploratory Factor Analysis (EFA). For this part of the study, only e-learning at rural-based HEIs was considered, as the framework was aimed specifically towards this area. Therefore, data collected from the University of Venda and Vhembe TVET College was analyzed.

4.5.1.1.Exploratory factor analysis

EFA has been expended to investigate the probable primary factor structure of a set of observed variables without inflicting a preconceived structure on the outcome (Child, 1990). It is effective in measuring relationships amongst variables and in exploring construct validity and simplifying interrelated measures.

The exploratory factor analysis began with the initial phase of the analysis to acquire the eigenvalues for different factors from the data. The Kaiser-Meyer-Olkin Measure of sampling adequacy (KMO) and Bartlett's test of sphericity was conducted to determine the construct validity and to confirm that the data collected was appropriate. A KMO measure should be greater than 0.5 (De Vaus, Surveys in Social Research, 2002) and Bartlett's Test of Sphericity

should reach a significance level of less than 0.05 (Yu & Richardson, 2015) in order to conduct EFA. Table 4.44 shows the results of the test and confirms that the EFA could be conducted. The KMO statistic is 0.911 and the Bartlett's Test statistic is 0.000 which was considered acceptable and concluded that the data is appropriate for factor analysis.

Table 4.44. KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.911
Bartlett's Test of Sphericity	Approx. Chi-Square	3019.675
	df	171
	Sig.	.000

An EFA was conducted on 19 items using SPSS, in order to identify the factors to be extracted and rotated. The total variance explained was examined and presented in Table 4.45 to identify the factors for further analysis. Pett, Lackey, and Sullivan (2003) recommended a factor loading value above 0.50 to be very significant. All the factor loading values in the factor analysis are presented in Table 4.45. A total of 5 factors were extracted for further analysis with eigenvalues greater than 1 describing 39.6%, 9.8%,6.5%, 5.4% and 5.3% of the variance explained.

Table 4.45 Total Variance Explained

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.477	39.351	39.351	7.477	39.351	39.351	3.196	16.822	16.822
2	1.853	9.753	49.104	1.853	9.753	49.104	2.771	14.583	31.405
3	1.230	6.471	55.575	1.230	6.471	55.575	2.653	13.964	45.369
4	1.031	5.428	61.003	1.031	5.428	61.003	2.012	10.592	55.961
5	1.008	5.304	66.306	1.008	5.304	66.306	1.966	10.345	66.306
6	.896	4.717	71.023						
7	.775	4.081	75.105						
8	.619	3.255	78.360						
9	.546	2.872	81.232						
10	.474	2.497	83.729						
11	.434	2.283	86.012						
12	.418	2.202	88.214						
13	.383	2.014	90.228						
14	.368	1.937	92.164						
15	.345	1.818	93.983						
16	.318	1.673	95.655						
17	.289	1.521	97.176						
18	.278	1.463	98.640						
19	.258	1.360	100.000						

Extraction Method: Principal Component Analysis.

The scree plot is the examination of the graph of the EigenValues to look for a natural bend or break point in the data where the curve flattens out (Costello & Osborne, 2005).In order to ensure that the right number of factors were selected, the scree plot as presented in Figure 4.15 was also studied and identified five factors to be extracted.

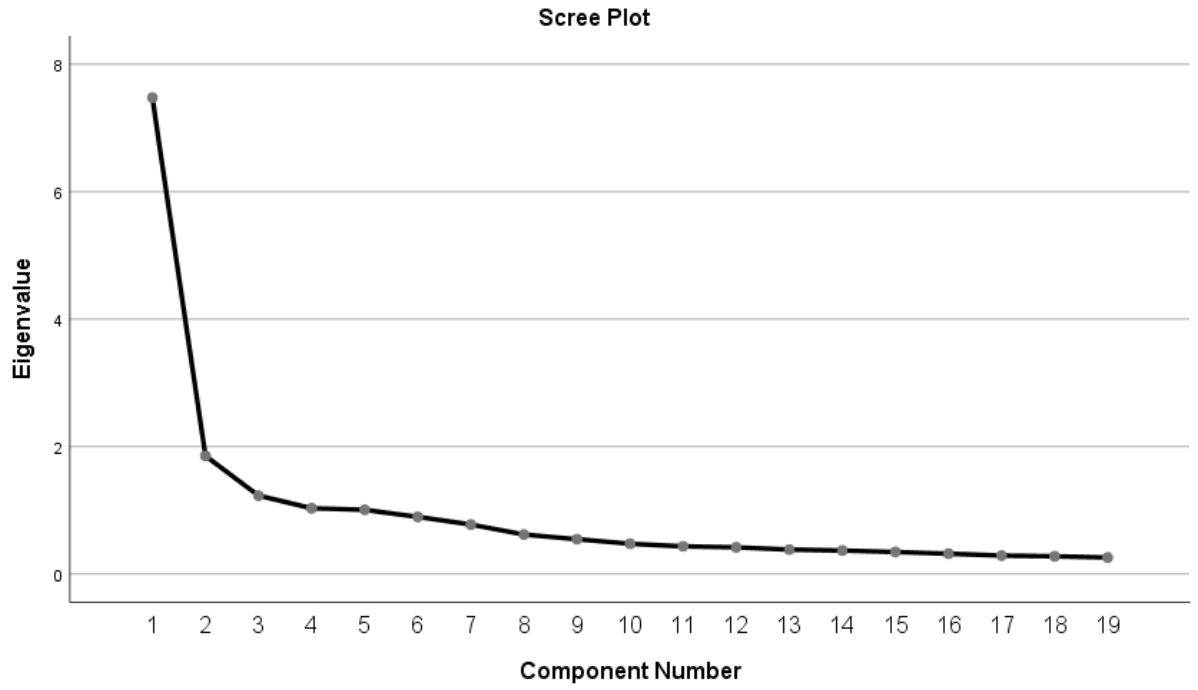

Figure 4.15. Scree Plot

The next stage of the analysis is the rotation, to simplify and clarify the data structure. Varimax rotation was used and based on the results for the Rotated Component Matrix in Table 4.46, 2 items were removed, and 17 components were categorized into components.

Table 4.46. Rotated Component Matrix

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
Performance Expectancy					
The use of e-learning improves flexibility, performance and productivity in education	.793				
The use of e-learning improves communication with educators and students	.790				
E-learning provides an opportunity to acquire new knowledge	.772				
E-learning is a very useful tool for education as the educational resources are easily available	.680				
Facilitating Conditions					
My institution has efficient infrastructure to support e-learning.		.777			
ICT Support staff are available for assistance with e-learning at my university		.733			
Training and support for e-learning are continuously available at my university		.696			
The required internet connectivity to use e-learning is available at my university		.624			
Effort Expectancy					
I have the necessary skills required to learn using e-learning			.815		
Learning how to use e-learning is easy			.759		
Interaction with e-learning is clear and understandable			.759		
Social Influence					
My educators/students and peers think I should use e-learning				.792	
Other people who also influence my behavior or whose opinions I value think that I should use e-learning				.574	
My educators/students encourage and support the use e-learning				.558	
Behavioral Intention					
In general, my institution encourages me to use e-learning					.685
I personally support the use of e-learning					.642
I believe that e-learning can be integrated with conventional learning to receive benefits of both learning methods					.603

4.5.1.2.Cronbach's Alpha

The 17 items under the four factors went through reliability testing by computing Cronbach's Alpha (Cronbach, 1951). According to Hinton, Brownlow, and McMurray (2004), there are four points of reliability which include: excellent (0.90 and above), high (0.70-0.90), high moderate (0.50-0.70) and low (0.50 and below). Table 4.47 presents the Cronbach's Alpha for the four factors that were extracted.

The four items under the performance expectancy factor have a Cronbach's Alpha value of 0.876 which is of high reliability. The four items under the facilitating conditions factor have a Cronbach's Alpha value of 0.798 which is of high reliability. The three items under the effort expectancy factor have a Cronbach's Alpha value of 0.832 which is of high reliability. The three items under the social influence factor have a Cronbach's Alpha value of 0.625 which is of high moderate reliability. Lastly, the three items under the behavioural intention factor have a Cronbach's Alpha value of 0.629 which is of high moderate reliability.

Table 4.47. Cronbach's Alpha

Reliability Statistics		
Factor	**Cronbach's Alpha**	**No of Items**
Performance Expectancy	0.876	4
Facilitating Conditions	0.798	4
Effort Expectancy	0.832	3
Social Influence	0.625	3
Behavioral Intention	0.680	3

4.5.1.3.Correlation Analysis

Correlation analysis determines the strength of the relationships between different constructs, in this case: facilitating conditions, performance expectancy, effort expectancy, and social influence. Table 4.48 shows the correlation analysis results using Pearson Correlation.

Table 4.48. Correlation Matrix

Correlations						
		Performance Expectancy	**Facilitating Conditions**	**Effort Expectancy**	**Social Influence**	**Behavioral Intention**
Performance Expectancy	Pearson Correlation	1				
	Sig. (2-tailed)					
Facilitating Conditions	Pearson Correlation	.474**	1			
	Sig. (2-tailed)	.000				
Effort Expectancy	Pearson Correlation	.589**	.467**	1		
	Sig. (2-tailed)	.000	.000			
Social Influence	Pearson Correlation	.453**	.509**	.352**	1	
	Sig. (2-tailed)	.000	.000	.000		
Behavioral Intention	Pearson Correlation	.566**	.521**	.505**	.438**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).						

The relationship between performance expectancy and facilitating conditions were investigated for the adoption of e-learning. The outcome revealed a moderate positive relationship

(r=.474** and p<0.01) between performance expectancy and facilitating conditions. The probability that this happened by chance is very low with the significant of (.000). Therefore, if the facilitating conditions are improved (infrastructure, training, and support), the performance expectancy will also improve at a moderate level, thus improving the perception of e-learning.

The relationship between performance expectancy and effort expectancy was investigated for the adoption of e-learning. The outcome revealed a strong positive relationship (r=.5.89** and p<0.01) between performance expectancy and effort expectancy. The probability that this happened by chance is very low with the significant of (.000). Therefore, if the performance expectancy is improved and respondents believe that the use of e-learning will improve their work performance, the effort expectancy associated with e-learning will also improve.

The relationship between performance expectancy and social influence was investigated for the adoption of e-learning. The outcome revealed a moderate positive relationship (r=.453** and p<0.01) between performance expectancy and social influence. The probability that this happened by chance is very low with the significant of (.000). Therefore, if the performance expectancy is improved, the social influence can also be improved moderately as it creates a positive perception.

The relationship between performance expectancy and behavioural intention was investigated for the adoption of e-learning. The outcome revealed a strong positive relationship (r=.566** and p<0.01) between performance expectancy and behavioural intention. The probability that this happened by chance is very low with the significant of (.000). Therefore, if the performance expectancy is improved, the behavioural intention to use e-learning can also be improved. This suggests that the respondents must acknowledge the benefits that e-learning provides. This strong relationship suggests that the institution is tending to focus on e-learning usefulness which will, in turn, cause the respondents to utilize the platform.

The relationship between facilitating conditions and effort expectancy was investigated for the adoption of e-learning. The outcome revealed a moderate positive relationship (r=.467** and p<0.01) between facilitating conditions and effort expectancy. The probability that this happened by chance is very low with the significant of (.000). Therefore, if the facilitating conditions are improved (infrastructure, training, and support), the effort expectancy will also improve moderately as the respondents will find easiness associated with the use of e-learning.

The relationship between facilitating conditions and social influence was investigated for the adoption of e-learning. The outcome revealed a strong positive relationship (r=.509** and p<0.01) between facilitating conditions and social influence. The probability that this happened by chance is very low with the significant of (.000). Therefore, if the facilitating conditions are improved (infrastructure, training, and support), the social influence will also improve. This may be because, the availability of the facilitating conditions, may positively influence the respondents to use and recommend e-learning.

The relationship between facilitating conditions and behavioural intention was investigated for the adoption of e-learning. The outcome revealed a strong positive relationship (r=.521** and p<0.01) between facilitating conditions and behavioural intention. The probability that this happened by chance is very low with the significant of (.000). Therefore, if the facilitating conditions are improved (infrastructure, training, and support), the behavioural intention will also improve, thus leading to an increase in the adoption of e-learning.

The relationship between effort expectancy and social influence was investigated for the adoption of e-learning. The outcome revealed a moderate positive relationship (r=.352** and p<0.01) between effort expectancy and social influence. The probability that this happened by chance is very low with the significant of (.000). Therefore, if the effort expectancy is improved, the social influence can also be improved moderately. This, however, was the lowest coefficient, as compared to the rest of the construct relationships, which shows that this relationship may be less significant than the rest.

The relationship between effort expectancy and behavioural intention was investigated for the adoption of e-learning. The outcome revealed a strong positive relationship (r=.505** and p<0.01) between effort expectancy and behavioural intention. The probability that this happened by chance is very low with the significant of (.000). Therefore, if the effort expectancy is improved, the behavioural intention to use e-learning will also be improved. The strong relationship between these two constructs suggests that the respondents will adopt e-learning when there is more ease of use associated with the platform.

The relationship between social influence and behavioural intention was investigated for the adoption of e-learning. The outcome revealed a moderate positive relationship (r=.438** and p<0.01) between social influence and behavioural intention. The probability that this happened by chance is very low with the significant of (.000). Therefore, if the social influence is improved, the behavioural intention can also be improved moderately.

4.5.1.4.Regression Analysis

Regression analysis was used to determine up to which degree does performance expectancy, facilitating conditions, effort expectancy and social influence the adoption of e-learning. The results are presented in Table 4.49. Based on the results, the predictor variables accounted for at least up to 42.7% (Adjusted R Square=.427) of the variance under e-learning adoption. The results indicate that Performance Expectancy (Beta=.291, Sig=.000), Facilitating Conditions (Beta=.238, Sig=.000), Effort Expectancy (Beta=.178, Sig=.001) and Social Influence (Beta=.125, Sig=.011) are significant predictors of e-learning adoption. However, Performance Expectancy (.291) and Facilitating Conditions (.238) contributed the most positive changes and therefore should be prioritized in order to improve e-learning adoption in rural-based HEIs.

Table 4.49. Regression Analysis

Coefficients[a]					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	1.216	.164		7.426	.000
Performance Expectancy	.251	.046	.291	5.423	.000
Facilitating Conditions	.204	.044	.238	4.661	.000
Effort Expectancy	.152	.044	.178	3.425	.001
Social Influence	.119	.047	.125	2.543	.011
a. Dependent Variable: Behavioral Intention					
R Square	.433				
Adjusted R Square	.427				
F. Change	66.339				
Sig.	.000[b]				

4.6.Summary

This chapter presented the analysis of the data collected on e-learning adoption at Higher Educational Institutions. The chapter was divided into four parts, which included students, educators, institution and e-learning framework. The responses towards all the questions are presented in graphical or tabular form. The e-learning usage, perception, benefits, challenges and location challenges are identified. The results showed that performance expectancy, effort expectancy, facilitating conditions and social influence were all important constructs in the adoption of e-learning. The next chapter consists of the research summary, recommendation, and conclusions based on the analysis of the data collected obtained in chapter four.

CHAPTER FIVE: MAIN FINDINGS AND THE PROPOSED E-LEARNING ADOPTION FRAMEWORK

5.1.Introduction

The previous chapter provided the analysis, presentation, and interpretation of the data that was collected from the respondents. This chapter presents the main findings of this study and proposed e-learning adoption framework for rural-based HEIs.

5.2.Main findings of the study

The aim of this study was to propose an e-learning framework to provide guidelines for learning adoption considering all major components including technical, operational, organisational, cultural, and socio-economical domains, in the context of rural-based higher educational institutions. The discussions on the findings are based on the objectives of this study which are as follows:

- To determine the usage of e-learning at HEIs.
- To identify the perception of e-learning users and potential users towards the e-learning.
- To determine the level of promotion and support that HEIs provide towards e-learning.
- To identify up to what extent does the location of the HEIs influence the adoption of the e-learning program.
- To determine and bridge the gap between the maximum potential benefits and challenges of e-learning.

The subsection 5.2.1 presents the discussion of this study, which leads to the proposition of a framework for e-learning adoption in rural-based HEIs.

5.2.1. E-learning Usage

This subsection addresses the first research question of this study which is: *What is the current usage of e-learning?*

Prior to determining e-learning usage, the computer literacy and voluntariness of use were determined from the participants of this study. These two aspects impact the usage of e-learning as ICT skills and show that the participants engage in e-learning.

At the University of Venda, 92.9% of the students knew how to use ICT facilities. However, the institutional results depicted that students do not have good ICT skills and that the students require training before they can use the e-learning program. At Vhembe TVET College, 97.7%

of the students knew how to use ICT facilities. At Rosebank College, 99% of the students knew how to use the ICT facilities. These results show a high computer literacy rate in all the three institutions for students.

The e-learning usage as stated by students at the University of Venda was 51.8%. However, out of the rest of the students, 22.6% did not even know about the e-learning platform implemented by their institution. The preferred mode of study for majority of the students at the University of Venda is conventional learning. The institutional results depict that less than 18% of the students are active on the myUniven, which is very low usage. The results also depict that students cannot use the e-learning program efficiently and require regular and continuous training afterward for them to use the e-learning program efficiently. Students at Vhembe TVET College were asked if they engaged in e-learning via social platforms and 75.6% agreed that they do. This shows a positive use of technology in education and potential for adoption of an e-learning platform in the future. However, their preferred mode of study for majority of the students was also conventional learning. At Rosebank College, the e-learning usage was 87.1% which was the highest usage compared to the other institutions. The preferred mode of study for majority of the students at Rosebank College is e-learning, this may be due to a better perception towards e-learning.

The students at the University of Venda and Rosebank College mostly used their laptops and smartphones to access the Blackboard and to access study materials. Majority of the students at the University of Venda use Blackboard to access study material and to keep up to date with announcements, which is the general use of e-learning only. At Rosebank College, Blackboard is mostly used to access study material and to engage in group/discussion forums. The popular tools used to engage with Blackboard at both Univen and Rosebank College, were emails and social networking.

At the University of Venda and Rosebank College, majority of the students spend 1-5 hours per week on Blackboard whereas majority of the students spend 6-15 hours per week surfing on the internet. Overall, students spend more time on the internet than on the e-learning. Even tough majority of the students spend similar number of hours on Blackboard and surfing on the internet at both institutions, it is evident as per results in chapter four, that students at Rosebank College spend more time on Blackboard than students at the University of Venda.

73.1% of the educators at the University of Venda stated that they had adequate technology knowledge, 23.1% stated that they had expert knowledge in ICT whereas 3.8% stated that they

had inadequate knowledge. This shows that majority of the educators have the ability to implement and adopt e-learning, however, there is still need for training. 80.8% of the educators at the University of Venda indicated that they are familiar with the e-learning program implemented at their institution however only 50% of them have implemented it in their teaching process.

Lack of familiarity depicts poor communication from the institution to its students and educators. Based on the institutional results, the respondent was uncertain if the educators have good ICT skills and disagreed that the educators use the e-learning program efficiently. The results also stated that the educators require training prior to use e-learning and regular training after implementation for them to use e-learning efficiently

The results show that e-learning usage at the University of Venda is higher in educators than students. However, the overall usage is low which shows that e-learning has not yet been fully adopted. Vhembe TVET College shows a positive review towards the future implementation of e-learning. Based on the results, Rosebank College has the highest usage of e-learning.

5.2.2. Perception of e-learning

This subsection addresses the second research question of this study which is: *What is the perception of e-learning users towards e-learning?*

The e-learning perception was divided into four categories based on the indicators in the UTAUT Model. This included performance expectancy, effort expectancy, facilitating conditions and social influence which determine behavioural intention to adopt e-learning.

Performance expectancy at the University of Venda was positive and majority of the students agreed to the statements which make them believe that the use of technology serves in achieving improvements in their work performance. Performance expectancy at Vhembe TVET College was also positive, however, they were neutral about e-learning productivity compared to conventional learning and this may be because they haven't experienced the use of an e-learning platform i.e. Blackboard and this perception may change afterward. Performance Expectancy was also positive at Rosebank College and stronger than University of Venda and Vhembe TVET College.

The results for **effort expectancy** at the University of Venda were also positive, as majority of the students agreed to most of the statements under this section. However, most of the students at the University of Venda were uncertain if learning how to use e-learning was easy or not.

This shows that there is a need for training for students as they might find difficulties when introduced to e-learning. Effort expectancy at Vhembe TVET College and Rosebank College was positive and majority of the students agreed to the all statements which make them believe that there is a degree of easiness associated with the use of technology.

Social Influence at the University of Venda and Rosebank College was positive as most students agreed that their educators and other people who influence their behavior, encourage them to use e-learning. However, at Vhembe TVET College, educators do not encourage the students to use e-learning.

The results for **facilitating conditions** at the University of Venda were on average. The required internet connectivity and ICT infrastructure is available. However, there is lack of training and ICT support staff. The students are uncertain if educators have the skills to teach using e-learning or if the university encourages the use of e-learning. The facilitating conditions at Vhembe TVET College was weak, as the students disagree or are uncertain on majority of the statements, but majority of the students believe that their institution encourages the use of e-learning. If the institution lacks effective internet connectivity, the quality of learning may be compromised through online learning. At Rosebank College, the results for facilitating conditions were positive as majority of the students agreed to the statements.

The **behavioural intention** at all three institutions was positive as majority of the students agreed to all the statements in this section. This shows the willingness of students to adopt e-learning.

Looking at the results for educator's perception at the University of Venda, the performance expectancy was mostly positive. However, the educators were uncertain about e-learning productivity compared to conventional learning. This may be due to experience while using e-learning in their teaching process or poor perception. The effort expectancy was very positive as majority of the educators agreed or strongly to most of the statements. Social influence was however neutral, which means that the educators are not influenced much by peers, students or other people to use e-learning. The facilitating conditions for educators at the University of Venda was more positive than the students as they agreed on majority of the statements. However, they were uncertain that the students have the necessary skills to learn using e-learning. Students at the University of Venda were also uncertain if learning how to use e-learning is easy or not. This shows an alignment of views towards this section. Lastly, the behavioural intention of educators at the University of Venda was very strong as the educators

strongly agreed on both statements which shows that if e-learning is implemented correctly, educators are willing to engage with the platform.

5.2.3. Level of Institutional promotion and support towards e-learning

This subsection addresses the third research question of this study which is: *What is the degree of promotion and support for e-learning being allocated by HEIs in these rural-based institutions?*

At the University of Venda, e-learning was implemented in 2014 and officially introduced in 2015. The facilitating conditions under e-learning perception show weak institutional promotion and support provided to the students. Even though there is efficient infrastructural support for ICT, there is no regular training provided nor are there is ICT support staff available as per student views. The students are also uncertain to whether or not the educators have the necessary skills to teach using e-learning and if the university encourages them to use e-learning. The institutional results depict that students do not have good ICT skills, nor do they use the e-learning program efficiently. There are less than 18% of students active on Blackboard. This confirms the need for training and support for students to motivate the students to adopt e-learning, which is currently not being provided efficiently at the institution.

There is a positive level of promotion and support provided towards educators at the University of Venda, as training and support is continuously available. It is however evident that the training is weak as 50% of the educators have not yet implemented e-learning, thus being trained. Based on the institutional results, the educators may not have good ICT skills as the results were neutral. The educators do not use the e-learning program efficiently and require training and support.

From the institutional results, it is clearly evident that there is a documented vision, mission and strategic plan for e-learning at the University of Venda. Nonetheless, it is not well known and understood across the organization. There are also goals, objectives, and policies for e-learning, but again they are not well known and understood across the organization. Top management support for smooth running and funding for the e-learning program is available. However, they may not be proper mechanisms to make decisions, resolve disputes and challenges; and recruit qualified employees in the field of e-learning.

There may be inadequate hardware infrastructure to support e-learning at the University of Venda but there is adequate software, application, and network infrastructure to support e-

learning. The security is also maintained as the program protects institutional information. Looking at the results for support staff, there is no e-learning department dedicated to supporting the program as there is only one staff member employed. There is lack of communication, ICT management, and team building skills. The results were also neutral on the existence of support and collaboration, learning and development and; knowledge creation and sharing culture. These factors raise an issue of the availability of a supportive culture for students and educators.

There is progress in the e-learning department as helpdesk and support was introduced in the year 2016, and training was provided to majority of the educators, tutors and student assistants around the institution. If technology is used efficiently in the teaching process, it creates a technology-based society which is more cost-effective and gives a competitive edge locally, regionally and globally. There is a need for investing in institutional promotion and support as this is the major reason for drawback in the adoption of e-learning at the University of Venda.

5.2.4. Influence of location of the Higher Educational Institution to e-learning adoption

This subsection addresses the fourth research question of this study which is: *How does the location of the HEIs affect the adoption of the e-learning program?*

A comparative study between rural-based HEIs and urban-based HEIs was conducted to address this objective of the study. E-learning for students at Rosebank College (urban-based HEI) was compared to University of Venda and Vhembe TVET College (rural-based HEIs). A question based on locational challenges of e-learning was also asked to students and educators who formed part of the sample.

Computer literacy rates were higher at Rosebank College compared to University of Venda and Vhembe TVET College. However, the use of ICT facilities at campus was more at the University of Venda compared to Rosebank College but the difference was relatively low. These results show that there is a high computer literacy rates in urban-based HEIs compared to rural-based HEIs.

E-learning usage through the platform Blackboard was highest at Rosebank College as 87.1% of the students engage in online learning. At the University of Venda, only 51.8% of the students engage in online learning and 22.6% of the students do not even know about Blackboard. This depicts poor usage of e-learning and communication between the institution and the students. Vhembe TVET College does not have an official e-learning platform

implemented yet, and therefore the students were asked if they engaged in e-learning via social media and 75.6% agreed that they do. This shows the willingness of students to engage in online learning and a potential for an official e-learning program being implemented at their institution.

The preferred mode of study at Rosebank College was e-learning, whereas, at the University of Venda and Vhembe TVET College, the preferred mode of study was conventional learning. The students at rural-based HEIs still prefer traditional learning methods over online learning which shows resistance towards technology and change.

The most popular device used to access e-learning at Rosebank College was smartphones whereas at the University of Venda, the popular device were laptops. Majority of the students at Rosebank College used e-learning to access study material and engage with other students in groups or discussion forums whereas at the University of Venda, majority of the students used e-learning to access study material and to keep up to date with announcements. The popular tools used to engage in e-learning at both Rosebank College and the University of Venda were social networking and e-mail. Looking at the time spent on the e-learning and the internet, it was evident that students at Rosebank College ranked higher than the University of Venda in both aspects. Despite the similarities that both institutions showed, majority of the students did not use the e-learning platform at the University of Venda.

E-learning Perception based on performance expectancy, effort expectancy, social influence, facilitating conditions and behavioural intentions; was more positive at Rosebank College as compared to University of Venda and Vhembe TVET College.

Students at all three institutions were aware of the benefits of e-learning and perceived them in a similar way irrespective of the location of the HEI. However, the students at the University of Venda and Vhembe TVET College faced more challenges as compared to Rosebank College with majority of the students who believed that they did not face any challenges at all.

These results show that there lies a gap between e-learning adoption between urban-based HEIs and rural-based HEIs. These gap needs to be bridged in order to achieve a competitive edge towards education.

5.2.5. Benefits and Challenges of e-learning

This subsection addresses the two research questions of this study which include: *What are the potential benefits of the adoption of e-learning?* and *What are the major challenges faced when implementing e-learning in rural-based HEIs?*

5.2.5.1.Benefits of e-learning for students

The benefits in order of importance for students include:

- Flexibility of time, place and delivery of education
- Self-paced learning
- Delivery of effective and personalized learning
- Increased collaboration and interactivity with educators and students
- Access to updated learning material and advanced information
- Increase in level of confidence and motivation towards online learning
- Reduced commute time to campus
- Rapid and continuous feedback

5.2.5.2.Challenges of e-learning for students

The challenges in order of importance for students include:

- Poor/No Wi-Fi connection
- Lack of motivation
- Lack of awareness
- Lack of assistance and technical support
- Lack of computer literacy and training
- Lack of assistance/expertise from educators
- Long distance to travel to access the computer/internet facility
- No access to computers
- No access to the internet
- Resistance towards use of e-learning
- Low levels of English competency

5.2.5.3.Benefits of e-learning for educators

The benefits in order of importance for educators include:

- Flexibility of time, place and delivery of education
- Access to updated learning material and advanced information

- Delivery of effective and personalized learning
- Increased collaboration and interactivity with educators and students
- Rapid and continuous feedback
- Efficient records management
- Increase in level of confidence and motivation towards online learning

5.2.5.4.Challenges of e-learning for educators

The challenges in order of importance for educators include:

- Poor/No Wi-Fi connection
- Resistance towards use of e-learning
- Lack of computer literacy and training
- No access to computers
- Lack of assistance and technical support
- No access to the internet
- Lack of awareness
- Lack of motivation
- Long distance to travel to access the computer/internet facility
- Low levels of English competency

5.2.5.5.Location Challenges

The location challenges in order of importance for educators include:

- Lack of computer literacy and training
- Lack of economic development in the area
- Social and cultural differences
- Lack of awareness and perception towards technology and change
- Lack of effective Information technology infrastructure i.e. internet access, computer availability etc.
- Lack of research and development in education

Looking at the challenges at rural-based HEIs, the stakeholders at the institution lack awareness of e-learning and the capabilities it provides. There can be a lack of computer literacy and training which creates a resistance towards the use of e-learning. Social and cultural differences may also affect how students perceive innovative methods of learning. There is a lack of technical and support staff available to assist with the integration with the existing e-learning

program. Students may not have access to computers or the internet. The institutions may require costly upgrades if the required technology to accommodate e-learning may not currently be available.

If e-learning is implemented and adopted optimally in rural-based HEIs, it could bring students closer to knowledge and they do not have to physically attend lectures. It could create the ability to work and study at their own pace, anytime and anywhere. It could intensify the social construction of knowledge through group discussions/forums. Resources can be shared easily through the platform and online libraries. Learning strategies which involve multimedia technologies may enhance the attitude and perception of students and educators towards e-learning and promote better learning outcomes. These benefits can be maximized if the challenges are well understood and eliminated.

5.3.E-learning adoption framework in Rural-Based HEIs

From the above discussions and analysis of results in chapter four, it is evident that there is need for a systematic approach towards e-learning adoption in rural-based HEIs. The framework could be used as a reference by educational institutions which seek to implement e-learning successfully. Figure 5.1 shows the proposed e-learning framework based on the results obtained in this study. All the constructs remained as they were all influential factors towards e-learning adoption. However, certain factors were eliminated based on the exploratory factor analysis.

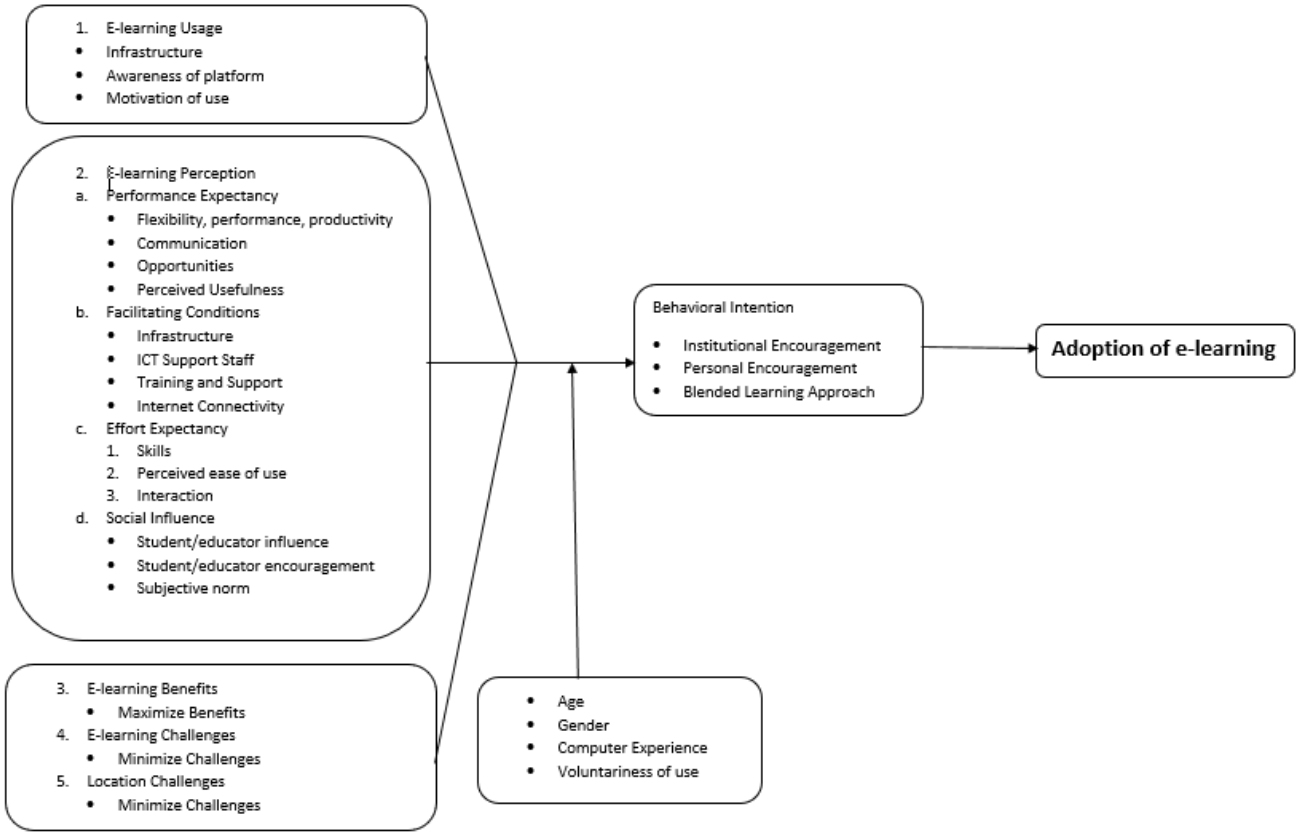

Figure 5.1. E-learning adoption Framework

5.3.1. E-learning Usage

E-learning usage is affected by the availability of ICT infrastructure, the awareness of the e-learning platform at the institution and the motivation of use by the students and educators. If these three factors are considered before the e-learning implementation it will increase the usage of e-learning.

5.3.2. E-learning Perception

An exploratory factor analysis, correlation analysis, and regression analysis were conducted in order to identify the most influential factors for e-learning adoption in rural-based HEIs. An e-learning adoption framework was proposed based on a case study research and the UTAUT Model. The basis of this model was to identify influential factors which affect the adoption of e-learning and minimize the challenges. These factors are presented in order of importance below.

5.3.2.1.Performance Expectancy

The results that were acquired from this subsection show that performance expectancy is an important factor in the adoption of e-learning. These results correlate with previous studies

(Maina & Nzuki, 2015; Nicholas, Olanike, Chiazor, Azeta, & George, 2016; Attuquayefio, 2014). The results were positive as majority of the respondents agreed to all the statements based on improvement in skills, communication, acquiring new knowledge and usefulness of the tool in education. There was a strong positive relationship (r=.566**, p<0.01, Beta=.291, Sig=.000) between performance expectancy and behavioural intention. This shows that if performance expectancy increases, e-learning adoption will also increase. These results correlate with other studies.

5.3.2.2.Facilitating conditions

The results obtained from the analysis show that facilitating conditions are an influential factor in the adoption of e-learning. These results correlate with previous studies (Maina & Nzuki, 2015; Nicholas, Olanike, Chiazor, Azeta, & George, 2016; Attuquayefio, 2014; Uğur & Turan, 2018). These results combined with the institutional results show that facilitating conditions were one of the core issues to the adoption of e-learning. The results showed a strong positive relationship (r=.521**, p<0.01, Beta=.238, Sig=.000) between facilitating conditions and behavioural intention. According to Venkatesh, Morris, and Davis, (2003), institutional policies, training and support and leadership are some of the key indicators for the adoption of technology. From the results, there was a lack of facilitating conditions, this included infrastructure, ICT support staff, training and support, and internet connectivity. This shows poor perception towards the institution and the support it can provide for e-learning. In conclusion, it can be said that if the facilitating conditions are enabled or improved, e-learning adoption will also improve significantly.

5.3.2.3.Effort Expectancy

According to the results derived in chapter four, there was also a strong relationship between effort expectancy and behavioural intention (r=.505**, p<0.01, Beta=.178, Sig=.001). These results correlate with previous studies (Maina & Nzuki, 2015; Nicholas, Olanike, Chiazor, Azeta, & George, 2016; Attuquayefio, 2014). The statements under effort expectancy include required skills, interaction, and easiness associated with learning how to use e-learning. There was uncertainty involved in whether learning how to use e-learning is easy or not at the University of Venda. If continuous training and support is provided to students, these conditions may be improved. Overall, if the effort expectancy increases, the adoption of e-learning will also increase.

5.3.2.4.Social Influence

Based on the analysis, there was a moderate-strong relationship between social influence and behavioural intention (r=.438**, p<0.01, Beta=.125, Sig=.011). These results correlate with previous studies (Maina & Nzuki, 2015; Nicholas, Olanike, Chiazor, Azeta, & George, 2016; Thomas, Singh, & Gaffar, 2013). These factors included social influence and support from educators, students, and other people. This was, however, the least strong relationship compared to the rest of the factors.

5.3.3. E-learning benefits and challenges

The e-learning benefits, challenges and location challenges were identified and discussed in this chapter. The e-learning benefits need to be maximized, and the e-learning challenges and location challenges need to be minimized in order to increase the adoption of e-learning at rural-based HEIs.

5.3.4. Behavioural Intention

The behavioural intention is affected by institutional encouragement, personal encouragement, and the blended learning approach. If there is an increase in behavioural intention, the e-learning adoption will also increase.

5.4.Summary

This chapter presented the main findings of this study by addressing the research objectives. The chapter effectively answered the research question achieving the research objectives of this study. The aim of this chapter was to propose an e-learning adoption framework for rural-based HEIs based on the findings of the study through which e-learning can be adopted more efficiently in other rural-based Higher Education Institutions.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1.Introduction

The previous chapter provided the main findings of this study and proposed the e-learning adoption framework for rural-based HEIs. This chapter presents research findings, conclusion and recommendations of this study. This chapter also represents the knowledge contribution, limitations and future suggestions for e-learning adoption at rural-based HEIs.

6.2.Research Findings

The research objectives of this study were achieved, and the research questions were answered. The study identified the factors which influence the adoption of e-learning in rural-based HEIs. The central focus of this study was to propose an e-learning adoption framework. The e-learning usage, perception, benefits, and challenges were sought from respondents at the University of Venda, Vhembe TVET College and were compared to Rosebank College.

The study identified that e-learning usage at the University of Venda for students was up to 51.7% whereas the actual active accounts were less than 18%. At Vhembe TVET College, 75.6% of students engaged in e-learning via social media, but they do not have an official platform at their institutions which limits them from many opportunities that e-learning can provide. At Rosebank College, 87.1% of the students engaged in e-learning which was the highest usage compared to the rural-based HEIs. The study also concluded that students spend more time on the internet than on e-learning.

The study concluded that e-learning perception was positive at the University of Venda, Vhembe TVET College, and Rosebank College. However, at the University of Venda, under effort expectancy, students may have faced challenges when learning how to use e-learning. There was also a poor perception in terms of facilitating conditions at the University of Venda. Even though the ICT infrastructure is available, there is a lack of training and support and ICT support staff available for assistance. Overall, the University does not encourage the students to use e-learning as there is lack of promotion and support. It is also evident that there is more support in terms of e-learning towards educators than students. At Vhembe TVET College, there was a lack of social influence and ICT infrastructure was identified. If Vhembe TVET College wants to implement e-learning, these factors should be well considered. At Rosebank College, the perception was more positive than the other institutions which is another factor which shows that location plays a role in the adoption of e-learning.

The results also conclude that performance expectancy, effort expectancy, social influence and facilitating conditions are all major factors which influence the adoption of e-learning. They were all taken into effect when proposing the e-learning adoption framework.

The results conclude that students and educators are aware of the benefits that e-learning provides. Looking at the challenges, it is evident that respondents at rural-based HEIs face more challenges compared to respondents at urban-based HEIs such as lack of poor/no Wi-Fi connectivity, lack of motivation and lack of promotion and institutional support. There were also challenges specific to rural-based HEIs such as lack of computer literacy and training, social and cultural differences and lack of economic development in education.

6.3.Knowledge Contribution

The study contributed to the literature on e-learning adoption frameworks at rural-based HEIs in South Africa combined with a comparative study with urban-based HEIs. There is limited literature published on e-learning adoption frameworks in the Limpopo Province therefore, it contributed to the knowledge base in this area.

This study was a student, educator, technology, course and institution-centered and combined all the influential factors to provide a context-based framework specific to South African rural-based HEIs based on the UTAUT Model. The study also provided a difference between students' and educators' perception towards e-learning adoption.

The e-learning adoption framework can be used by rural-based Higher Educational Institutions when implementing or developing an e-learning program at their institutions by maximizing its success and eliminating challenges. It can be used to form and devise robust decisions suitable to specific rural-based HEIs.

The research findings have provided empirical investigations and validations to the factors that influence the adoption of e-learning. These include both positive and negative factors. Although this study looked at rural-based HEIs in the Limpopo Province, the results can still be generalized to other rural-based HEIs with a similar context.

6.4.Limitations to the study

The researcher could only reach out to educators and e-learning practitioners at the University of Venda and not the other institutions due to time constraints, this limited the results of this study. Approval for data collection was also denied by many institutions, therefore the study was limited to three HEIs only.

Data collected from educators at the University of Venda was limited due to lack of response through the online surveys. There was also limited data collected from e-learning practitioners at the University of Venda, as there was only one staff member responsible for the e-learning program at the institution. The study used questionnaires, organizational contact and observations for data collection and majority of the data collected was quantitative. The use of interviews would have provided more insight into the area of study in form of qualitative data which was not employed.

One limitation of this study was the difficulty in accessing private and sensitive information from the institution regarding policies and strategies. There was reluctance in providing such information and therefore lack of in-depth analysis of e-learning through the institutional perspective due to limited data collection. The e-learning framework could not be tested and validated, therefore, the researcher could not address one of the gaps which was to provide a practical solution rather than a theoretical solution.

6.5.Suggestions for future work

A study can be conducted to implement, test and validate the e-learning adoption framework. An institutional-centered study for the adoption of e-learning can be conducted as it is one of the crucial most crucial elements in rural-based HEIs. A study on e-learning adoption can be conducted with more than three cases to widen the scope and enhance the results can be conducted.

6.6.Recommendations

The following are the recommendations based on the findings of the study:

6.6.1. Technology infrastructure and cost

There must be enough ICT infrastructure available prior to implementation of e-learning. Availability of hardware, software and network infrastructure should be provided to the students and educators. This can be done by seeking funding from the government and other entities to procure the required infrastructure. The institution must invest heavily in the use of technology and its availability to increase the adoption of -learning.

6.6.2. Computer literacy Course

Rural-based HEIs face challenges such as lack of computer literacy and training. Inadequate ICT skills limit the adoption of e-learning; therefore, a computer literacy course should be introduced as a pre-requisite for all students before they can use the e-learning platform. This

also allows them to have adequate knowledge in using education for learning and improve the perception of technology based on effort expectancy.

6.6.3. E-learning Department

There should be a well-established e-learning department with sufficient staff members to support the implementation and adoption of e-learning. Policies and strategies should also be identified at the top management level. The study identified that despite the presence of the e-learning policies, they were not well-known around the institution. This works against the adoption of e-learning, and an e-learning policy should be in place and well communicated with the staff members as it would create incentives for the use of new forthcoming technologies.

6.6.4. Training and Support

The skills required for students and educators to engage in e-learning should be prioritized by the institution. Continuous training and support for students and educators should be provided on a regular basis. The study showed minimal and poor training and support is provided to the students and educators. It is recommended to establish effective training and support methods to ensure sustainable use of e-learning. Students should be trained in the use of e-learning for their education and educators should be trained on course development and execution. ICT support staff should be available to provide assistance with technical aspects of the e-learning platform.

6.6.5. E-learning Awareness

There is a need for creating e-learning awareness once e-learning is implemented. If communication is not clear, many students and educators won't even be aware of the available e-learning platform as evident at the University of Venda. The institution should promote the use of technological tools such as video conferencing, discussion forums and social interactions to increase the level of interest in the platform.

6.6.6. Online course for Blackboard

Students must be trained. An online course for the e-learning platform would serve as a support system for students who struggle with the use of e-learning. This course should be introduced for both students and educators. They should be made familiar with the tools available for use, navigation through the system, learn how to use the content etc.

6.6.7. Motivation from educators

The educators should play a major role in influencing the perception of the students. Students will engage in e-learning if the educators offer it to its students. Therefore, the motivation for educators to use, develop, upload content for e-learning is very crucial. If the institution motivates the educators to adopt e-learning, the students shall follow.

6.6.8. Use of technology for educational purposes

Based on the results, it was evident that students spend minimum time on education through internet technologies and spend more time surfing through the internet for other purposes. Students have a high and long experience in using internet services, they should be driven to using the internet for educative purposes and exploit resources available to them. The institution and educators should build student confidence into the system, so they are willing to engage in the platform. The educators must always be available on the e-learning platform to improve the reliability of the system.

6.6.9. Engaging users

The study found that majority of the students and educators do not use e-learning despite the positive perception. There were user accounts created for most of the students and educators at the University of Venda, however, there are few active users. The educators should encourage the students to use e-learning. The educators themselves need to commit to the e-learning platform and be more active and engage in using this technology efficiently.

6.7.Concluding Remarks

This chapter explored e-learning adoption in rural-based HEIs, it analyzed the use of e-learning by students and lecturers at Univen and Vhembe TVET College. It also analyzed the use of e-learning at Rosebank College and compared it with the rural-based HEIs. The chapter effectively revisted the research objectives followed by the knowledge contribution, limitations of the study and future suggestions. The recommendations were also presented from the research findings.

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Annexure A-Ethical Clearance

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Ms NM Patel

Student No:
11631848

PROJECT TITLE: Towards an E-learning adoption framework for rural-based higher education institutions in South Africa.

PROJECT NO: SMS/18/BIS/02/0304

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Prof A Kadyamatimba	University of Venda	Supervisor
Mr S Madzvamuse	University of Venda	Co - Supervisor
Ms NM Patel	University of Venda	Investigator – Student

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: April 2018
Decision by Ethical Clearance Committee Granted
Signature of Chairperson of the Committee: .....
Name of the Chairperson of the Committee: Senior Prof. G.E. Ekosse

UNIVERSITY OF VENDA
DIRECTOR
RESEARCH AND INNOVATION
2018 -04- 04
Private Bag X5050
Thohoyandou 0950

University of Venda
PRIVATE BAG X5050, THOHOYANDOU, 0950λ LIMPOPO PROVINCEλ SOUTH AFRICA
TELEPHONE (015) 962 8504/8313 FAX (015) 962 9060
"A quality driven financially sustainable, rural-based Comprehensive University"

Annexure B-Consent Form

Research and Innovation
Office of the Director

RESEARCH ETHICS COMMITTEE

UNIVEN Informed Consent

LETTER OF INFORMATION

Title of the Research Study : *Towards an E-Learning Adoption Framework for Rural-Based Higher Education Institutions in South Africa*

Principal Investigator/s/ researcher : *Naziyabanu Mohmedsalim Patel*
Bcom Honours- Business Information Systems

Co-Investigator/s/supervisor/s : *Prof A. Kadyamatimba, PhD*
S. Madzvamuse, Masters

Brief Introduction and Purpose of the Study:

Outline of the Procedures: *The enclosed questionnaire has been designed to collect information on factors influencing the E-learning adoption at rural based Higher Education Institutions. The purpose of this study is to propose an e-learning framework to provide guidelines for the adoption of e-learning considering all major factors such as technical, operational, organisational, cultural, socio-economical and contextual domains, in the context of rural based higher educational institutions. The participant is required to answer the research questions on the questionnaire. The completion of the questionnaire will take approximately 20 minutes. The participation in this research is completely voluntary and the participant may withdraw from the research at any time if they wish to do so. Data collected from this questionnaire will contribute towards the final research report.*

Risks or Discomforts to the Participant: *If the participant feels any discomfort, he/she may withdraw from the research at any time.*

Benefits: *Upon the completion of the study, the researcher would like to publish the findings of this study in Information Technology Journals.*

Reason/s why the Participant May Be Withdrawn from the Study: *The participant maybe withdrawn from the study if the questionnaire is incomplete or answered in an incorrect format.*

Remuneration : *No Remuneration*

Costs of the Study : *The participant will not be required to cover any costs towards the study.*

Confidentiality	:	*The confidentiality of the participant is maintained as no personal details which may lead directly to a participant are collected and anonymity is maintained.*
Research-related Injury	:	*The researcher does not take responsibility of any research-related injury*

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher 076 531 0809, my supervisor 082 803 9015 or the University Research Ethics Committee Secretariat on 015 962 9058. Complaints can be reported to the Director: Research and Innovation, Prof GE Ekosse on 015 962 8313 or Georges Ivo.Ekosse@univen.ac.za

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Naziyabanu Mohmedsalim Patel, about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: ,
- I have also received, read and understood the above written information (*Participant Letter of Information*) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerized system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant	Date	Time	Signature
I, ...	.....	.....	.....

Naziyabanu Mohmedsalim Patel herewith confirm that the above participant has been fully

Informed about the nature, conduct and risks of the above study.

Full Name of Researcher

Naziyabanu Mohmedsalim Patel Date..... Signature.....

Annexure C- Student Survey for University of Venda

E-learning at University of Venda

Section A: Background Information

For each item below, please show your best response applicable by making a clear cross (X) on the circle provided next to your response (Please choose only one).

1. What is your gender?

   ○ Male

   ○ Female

2. What is your age group?

   ○ 15-19

   ○ 20-29

   ○ 30-39

   ○ 40 and above

3. What is your current level of education?

   ○ 1st Year ○ Honours

   ○ 2nd Year ○ Masters

   ○ 3rd Year ○ PhD

   ○ 4th Year

Section B: Computer Literacy and Voluntariness of Use

4. Do you know how to use computer and internet facilities?

   ○ Yes

   ○ No

5. Do you use the ICT facilities provided on campus?

○ Yes

○ No

6. Do you use the e-learning platform, implemented by your institution?

○ Yes

○ No

○ I do not know about it

(If your answer in No.7 is not "Yes" please go to question 13)

7. What is your preferred mode of study?

○ Conventional Learning

○ E-learning

○ Blended Learning

Section C: E-learning Usage

8. Through which device do you access the e-learning?

☐ Desktop
☐ Laptop
☐ Smartphone
☐ Tablet
☐ All the above
☐ None

9. For which purposes do you use the e-learning?

☐ Access study material
☐ Online Tests/Assignments
☐ To keep up to date with announcements from the educator
☐ To engage with other learners in group/discussion forums
☐ All the above

☐ None of the above

10. Which tools do you use when you engage with e-learning?

☐ E-mail
☐ Search Engines
☐ Virtual Classroom
☐ Social Networking
☐ Video conferencing
☐ Discussion forums
☐ Audio/Video content
☐ CD-ROM
☐ All the above
☐ None of the above

11. What is the average time you spend on the e-learning? *(Please choose only one)*

○ 0 hrs/week
○ 1-5 hrs/week
○ 6-15 hrs/week
○ 16-20 hrs/week
○ 21 or more hrs/week

12. What is the average time you spend surfing on the internet? *(Please choose only one)*

○ 0 hrs/week
○ 1-5 hrs/week
○ 6-15 hrs/week
○ 16-20 hrs/week
○ 21 or more hrs/week?

Section D- E-learning Perception

Please indicate your level of agreement based on the statements below by making a clear cross(X) next to your response:

SD-Strongly Disagree, D-Disagree, N-Neutral, A-Agree, SA-Strongly Agree.

13.

Comment	SD	D	N	A	SA
Performance Expectancy					
1. The use of e-learning improves flexibility, performance, and productivity in education.					
2. The use of e-learning improves communication with educators and students.					
3. E-learning provides an opportunity to acquire new knowledge.					
4. E-learning is more productive and engaging in learning activities than conventional learning.					
Effort Expectancy					
5. E-learning is a very useful tool for education as the educational resources are easily available.					
6. Interaction with e-learning is clear and understandable.					
7. Learning how to use e-learning is easy.					
8. I have the necessary skills required to learn using e-learning.					
Social Influence					
9. My educators and peers think I should use e-learning.					
10. People who influence my behavior or whose opinions I value think that I should use e-learning.					

Facilitating conditions					
11. The required internet connectivity to use e-learning is available at my institution.					
12. The required ICT resources to use e-learning are available at my institution.					
13. Training and support for e-learning are continuously available at my institution.					
14. ICT Support staff are available for assistance with e-learning at my university.					
15. My educators have the necessary skills to teach using e-learning.					
16. My educators encourage and support the use of e-learning.					
17. In general, my institution encourages me to use e-learning.					
Behavioural Intention					
18. I personally support the use of e-learning.					
19. I believe that e-learning can be integrated with conventional learning to receive benefits of both learning methods.					

Section E – E-learning benefits and challenges

14. What benefits do you think you will achieve or have achieved using e-learning? *(You may choose more than one response)*

○ Flexibility of time, place and delivery of education

○ Increased collaboration and interactivity with educators and students

○ Delivery of effective and personalized learning

○ Self-paced learning

- ○ Rapid and continuous feedback
- ○ Access to updated learning material and advanced information
- ○ Increase in level of confidence and motivation towards online learning
- ○ Reduced commute time to campus
- ○ All the above
- ○ None of the above

15. What challenges do you think you will experience or have experienced when using e-learning? *(You may choose more than one response)*
    - ☐ Lack of awareness
    - ☐ Lack of motivation
    - ☐ Resistance towards use of e-learning
    - ☐ Lack of computer literacy and training
    - ☐ Low levels of English competency
    - ☐ No access to computers
    - ☐ No access to the internet
    - ☐ Poor Wi-Fi connection
    - ☐ Long distance to travel to access the computer/internet facility
    - ☐ Lack of assistance and technical support
    - ☐ Lack of assistance/expertise from the educators
    - ☐ All the above
    - ☐ None of the above

16. What role do you think location (rural vs. urban) plays in the adoption of e-learning?
    - ☐ Social and cultural differences
    - ☐ Lack of awareness and perception towards technology and change
    - ☐ Lack of computer literacy and training
    - ☐ Lack of economic development in the area
    - ☐ Lack of research and development in education

- ☐ Lack of effective Information technology infrastructure i.e. internet access, computer availability etc.
- ☐ All the above
- ☐ None of the above

Thank you very much for your participation.

Annexure D-Student Survey for Vhembe TVET College

E-learning at Vhembe TVET College

Section A: Background Information

For each item below, please show your best response applicable by making a clear cross (X) on the circle provided next to your response (Please choose only one).

1. What is your gender?

   ○ Male

   ○ Female

2. What is your age group?

   ○ 15-19

   ○ 20-29

   ○ 30-39

   ○ 40 and above

3. What is your current level of education?

   ○ 1st Year

   ○ 2nd Year

   ○ 3rd Year

Section B: Computer Literacy and Voluntariness of Use

4. Do you know how to use computer and internet facilities?

   ○ Yes

   ○ No

5. Do you use the ICT facilities provided on campus?

○ Yes

○ No

6. Do you engage in e-learning via social media for your education (Facebook, WhatsApp, etc.)?

○ Yes

○ No

Section C- E-learning Perception

7. If provided, your institution implements an e-learning program, what are your views on the statements below

Please indicate your level of agreement based on the statements below by making a clear cross(X) next to your response:

SD-Strongly Disagree, D-Disagree, N-Neutral, A-Agree, SA-Strongly Agree.

Comment	SD	D	N	A	SA
Performance Expectancy					
1. The use of e-learning improves flexibility, performance, and productivity in education.					
2. The use of e-learning improves communication with educators and students.					
3. E-learning provides an opportunity to acquire new knowledge.					
4. E-learning is more productive and engaging in learning activities than conventional learning.					
Effort Expectancy					
5. E-learning is a very useful tool for education as the educational resources are easily available.					
6. Interaction with e-learning is clear and understandable.					

7. Learning how to use e-learning is easy.					
8. I have the necessary skills required to learn using e-learning.					
Social Influence					
9. My educators and peers think I should use e-learning.					
10. People who influence my behavior or whose opinions I value think that I should use e-learning.					
Facilitating conditions					
11. The required internet connectivity to use e-learning is available at my institution.					
12. The required ICT resources to use e-learning are available at my institution.					
13. Training and support for e-learning would be available at my institution.					
14. ICT Support staff would be available for assistance with e-learning at my institution.					
15. My educators have the necessary skills to teach using e-learning.					
16. My educators encourage and support the use of e-learning.					
17. In general, my institution encourages me to use e-learning.					
Behavioural Intention					
18. I personally support the use of e-learning.					
19. I believe that e-learning can be integrated with conventional learning to receive benefits of both learning methods.					

Section D – E-learning benefits and challenges

8. What benefits do you think you will achieve or have achieved using e-learning? *(You may choose more than one response)*
   - ☐ Flexibility of time, place and delivery of education
   - ☐ Increased collaboration and interactivity with educators and students
   - ☐ Delivery of effective and personalized learning
   - ☐ Self-paced learning
   - ☐ Rapid and continuous feedback
   - ☐ Access to updated learning material and advanced information
   - ☐ Increase in level of confidence and motivation towards online learning
   - ☐ Reduced commute time to campus
   - ☐ All the above
   - ☐ None of the above

9. What challenges do you think you will experience or have experienced when using e-learning? *(You may choose more than one response)*
   - ☐ Lack of awareness
   - ☐ Lack of motivation
   - ☐ Resistance towards use of e-learning
   - ☐ Lack of computer literacy and training
   - ☐ Low levels of English competency
   - ☐ No access to computers
   - ☐ No access to the internet
   - ☐ No Wi-Fi connection
   - ☐ Long distance to travel to access the computer/internet facility
   - ☐ Lack of assistance and technical support
   - ☐ Lack of assistance/expertise from the educators
   - ☐ All the above
   - ☐ None of the above

10. What role do you think location (rural vs. urban) plays in the adoption of e-learning?
    - ☐ Social and cultural differences

- ☐ Lack of awareness and perception towards technology and change
- ☐ Lack of computer literacy and training
- ☐ Lack of economic development in the area
- ☐ Lack of research and development in education
- ☐ Lack of effective Information technology infrastructure i.e. internet access, computer availability etc.
- ☐ All the above
- ☐ None of the above

Thank you very much for your participation.

Annexure E-Educator Survey for University of Venda

University of Venda

E-learning at Rural Based Higher Education Institutions

Section A: Background Information

For each item below, please show your best response applicable by making a clear cross (X) on the circle provided next to your response (Please choose only one).

1. What is your gender?

   ○ Male

   ○ Female

2. What is your age group?

   ○ 20-29

   ○ 30-39

   ○ 40-49

   ○ 50 and above

3. Under which school/faculty do you teach?

……

4. How many years have you spent in this occupation?

   ○ 0-5

   ○ 6-10

   ○ 11-19

- ○ 20 and above

5. What is the average size of students in your class?

   - ○ 0-19
   - ○ 20-39
   - ○ 40-59
   - ○ 60 and above

Section B: Computer Experience and Voluntariness of Use

6. Do you have access to the required ICT infrastructure to support e-learning at your institution?

   - ○ Yes
   - ○ No

7. What level of technology knowledge do you think you have?

   - ○ Expert Knowledge
   - ○ Adequate Knowledge
   - ○ Inadequate Knowledge (Require Training)

8. Are you familiar with the e-learning program used at your institution?

   - ○ Yes
   - ○ No

Section C: E-learning Usage

9. For how long have you implemented e-learning in your teaching process?

○ Not yet implemented

○ 0-6 months

○ 6-12 months

○ 1-2 years

○ 2 years and above

Section D: E-learning Perception

Please indicate your level of agreement based on the statements below by making a clear cross(X) next to your response:

SD-Strongly Disagree, D-Disagree, N-Neutral, A-Agree, SA-Strongly Agree

10.

Comment	SD	D	N	A	SA
Performance Expectancy					
1. The use of e-learning improves flexibility, performance, and productivity in education.					
2. The use of e-learning improves communication with my colleagues and students.					
3. E-learning provides an opportunity to acquire new knowledge.					
4. E-learning is more productive and engaging in learning activities than conventional learning.					
Effort Expectancy					
5. E-learning is a very useful tool for sharing educational resources easily.					
6. Interaction with e-learning is clear and understandable.					
7. Learning how to use e-learning is easy.					

8. I have the necessary skills required to teach using e-learning.					
Social Interaction					
9. My peers/ students think that I should use e-learning.					
10. People who influence my behavior or who opinions I value think that I should use e-learning.					
Facilitating conditions					
11. The required internet connectivity to use and support e-learning is available at my university.					
12. The required ICT resources to use and support e-learning are available at my university.					
13. Training and support for e-learning are continuously available at the university.					
14. ICT Support staff are available for assistance with e-learning at my university.					
15. I believe my students have the necessary skills to learn using e-learning.					
16. My students encourage and support the use e-learning					
17. In general, I believe the university encourages me to use the e-learning program.					
Behavioural Intention					
18. I personally support the use of e-learning.					
19. I believe that e-learning can be integrated with conventional learning to receive benefits of both learning methods.					

Section D – E-learning benefits and challenges

11. What benefits do you think you will achieve or have achieved using e-learning? *(You may choose more than one response)*
    - ☐ Flexibility of time, place and delivery of education
    - ☐ Increased collaboration and interactivity with educators and students
    - ☐ Delivery of effective and personalized teaching and learning
    - ☐ Rapid and continuous feedback
    - ☐ Access to updated learning material and advanced information
    - ☐ Increase in level of confidence and motivation towards online learning
    - ☐ Efficient records management
    - ☐ All the above
    - ☐ None of the above

12. What challenges do you think you will experience or have experienced when using e-learning? *(You may choose more than one response)*
    - ☐ Lack of awareness
    - ☐ Lack of motivation
    - ☐ Resistance towards use of e-learning
    - ☐ Lack of computer literacy and training
    - ☐ Low levels of English competency
    - ☐ No access to computers
    - ☐ No access to the internet
    - ☐ Poor Wi-Fi connection
    - ☐ Long distance to travel to access the computer/internet facility
    - ☐ Lack of assistance and technical support
    - ☐ All the above
    - ☐ None of the above

13. What role do you think location (rural vs. urban) plays in the adoption of e-learning?
    - ☐ Social and cultural differences
    - ☐ Lack of awareness and perception towards technology and change
    - ☐ Lack of computer literacy and training

- ☐ Lack of economic development in the area
- ☐ Lack of research and development in education
- ☐ Lack of effective Information technology infrastructure i.e. internet access, computer availability etc.
- ☐ All the above
- ☐ None of the above

Thank you very much for your participation.

Annexure F-E-learning Staff Survey

University of Venda

E-learning at Rural Based Higher Education Institutions

Please indicate your level of agreement based on the statements below by making a clear cross(X) next to your response:

SD-Strongly Disagree, D-Disagree, N-Neutral, A-Agree, SA-Strongly Agree

1.

Comment	SD	D	N	A	SA
Vision, Mission, and Strategic Plan					
1. There is a documented vision, mission and strategic plan for the e-learning program at the institution.					
2. The e-learning program vision, mission, and strategic plan are well known and understood across the organization					
Goals/Objectives/Policies					
3. There are well-defined goals, objectives, and policies for the e-learning program at the institution					
4. The goals, objectives, and policies for the e-learning program are well known and understood across the organization					
Top Management Support					
5. There is top management support for the smooth running of the e-learning program.					

6. There is funding support from the top management for the e-learning program.					
7. Proper mechanisms in place to recruit qualified employees in the field of e-learning.					
8. The decisions regarding e-learning are executed from top management					
9. Top management resolves all disputes and challenges faced throughout the implementation and use of the e-learning program.					
Technology					
10. There is adequate hardware infrastructure at the institution to support e-learning.					
11. There is adequate software and application infrastructure at the institution to support e-learning.					
12. There is adequate network infrastructure at the institution to support e-learning.					
13. The e-learning program protects the institution's information and content.					
Support Staff					
14. There is an e-learning department dedicated to support the e-learning program.					
15. There is an adequate number of staff members for a smooth running of the e-learning program.					
16. Staff members have personal, communication, ICT management, and team building skills.					
17. Educators are continuously being trained for using the e-learning program.					
18. Students are continuously being trained for using the e-learning program.					
Culture					

19. There is an existence of a support and collaboration culture					
20. There is an existence of a learning and development culture					
21. There is an existence of knowledge creation and sharing culture					
Students					
22. Students have good ICT Skills.					
23. Students use the e-learning program efficiently.					
24. Students require training before they can use the program.					
25. Students require regular and continuous training.					
Educators					
26. Educators have good ICT Skills					
27. Educators use the e-learning program efficiently					
28. Educators require training before they can use the e-learning program.					
29. Educators require regular and continuous training.					

Thank you very much for your participation.

Annexure G-Language Editing Report

Office No. C7-4
Department of English
University of Venda
P/Bag X 5050
Thohoyandou
0950
17 January 2019

Dear Sir/Madam

This serves to confirm that I proof-read dissertation entitled "Towards An E-Learning Adoption Framework for Rural-Based Higher Education Institutions in South Africa" by Naziyabanu Mohmedsalim Patel, Student Number: 11631848.

I have suggested a few amendments, provided the changes I recommended are effected to the text, the language is of an acceptable standard.

Please don't hesitate to contact me for any enquiry.

Regards

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