

**EXAMINING THE READINESS OF NURSE EDUCATORS TO
ADOPT TECHNOLOGY-BASED EDUCATION IN A
COLLEGE OF NURSING WITHIN KWAZULU NATAL**

by

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Declaration

I declare that **EXAMINING THE READINESS OF NURSE EDUCATORS TO ADOPT TECHNOLOGY-BASED EDUCATION IN A COLLEGE OF NURSING WITHIN KWAZULULU NATAL** is my own work and that the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

Signature of student

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Dedication

I dedicate this dissertation to almighty God for granting me the opportunity, health and the enthusiasm to finish the study, and to KZNCN campuses for their contribution and information – they provided me with the opportunity to examine the readiness of nurse educators to adopt technology-based education.

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Abstract

Oketch (2013: 16) explains technology-centred training as the successful usage of computerised resources in training of student nurses, for example sound, pictures and computer graphics. Technology-centred training aims to create an interactive teaching and learning environment based on the use of computers and the internet (Mosa, Mahrin and Ibrahīm 2016: 113). Technology-centred training promotes workability of instructional processes and enables connections between academic staff and upcoming professional nurses. Preparedness for technology-centred training refers to an evaluation of how prepared a college is, to accept and apply technology in training of student nurses (Mosa, Mahrin and Ibrahīm 2016: 113). Academic staff has to be on the forefront with latest's fastly transforming technology, and institutions that have applied the practice of technology in education are observing many advantages such as cost effectiveness, adjustability, efficiency and improved usefulness (Hall 2015: 25).

The purpose of an investigation was to establish the preparedness of nurse educators to accept technology-centred training within a college of nursing in KZN.

A quantitative descriptive cross sectional survey research design was used. Data was collected via self-administered questionnaires from nurse educators and clinical facilitators on 10 KwaZulu-Natal College of Nursing KZNCN campuses using non-probability, purposive sampling.

The research study identified respondents who were all actively involved in teaching of student nurses. The majority of respondents in this study were Black females, working as lecturers in urban campuses who had a Bachelor's degree and more than 13 years of experience. Clinical facilitators intended to use technology more than lecturers. Respondents with between three and six years experience were more agreeable to using technology. All respondents were positively inclined to using technology although there was some regional variation. Nurse educators are ready to use technology in their teaching.

The findings of this study indicated that the nurse educators are ready to adopt technology-based education. However, the KZNCN needs to support this process by

improving the availability of resources and facilitating the conditions. The College has to be on par with other tertiary institutions with regard to the use of technology-based education as there is a transition from the status of a public nursing institution to a higher education and training institution.

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List of Acronyms

Acronym	Full name
BIU	Behavioural Intention to Use
EV	External variable
ICT	Information and Communication Technology
KZN	KwaZulu-Natal
KZNCN	KwaZulu-Natal College of Nursing
PEOU	Perceived Ease of use
PU	Perceived Usefulness
SANC	South African Nursing Council
TAM	Technology Acceptance Model

CHAPTER 1: INTRODUCTION

1.1 Background to the study

Technology-based education is learning of content through all types of computer-based instruction, such as online network, intra-network, email, television system, audible and audiovisual tapes, webcasting and web sites (Koller, Harvey and Magnotta 2012: 4). Oketch (2013: 16) explains technology-centred training as the successful usage of computerised resources in training of student nurses, for example sound, pictures and computer graphics. Technology-centred training aims to create an interactive teaching and learning environment based on the use of computers and the internet (Mosa, Mahrin and Ibrahīm 2016: 113). Technology-centred training promotes workability of instructional processes and enables connections between academic staff and upcoming professional nurses. Preparedness for technology-centred training refers to an evaluation of how prepared a college is, to accept and apply technology in training of student nurses (Mosa, Mahrin and Ibrahīm 2016: 113). Academic staff has to be on the forefront with latest's fastly transforming technology, and institutions that have applied the practice of technology in education are observing many advantages such as cost effectiveness, adjustability, efficiency and improved usefulness (Hall 2015: 25).

According to the South African Nursing Council (SANC) premeditated strategy for nurse preparation and practice (2012/13-2016/17) (South Africa, Department of Health 2013: 1), a core competence required of prospective nurse educators should include knowledge of technology in education. The SANC requires that nurse educators are competent in information technology so that they can support the teaching and learning processes. The innovation of technological devices has concluded in a recent model of instruction, studying and exploration. The Nursing Educational Institutions (NEI) have realised the demand to be appropriate and ambitious, consequently they have capitalized seriously in information and communication technology infrastructure (Selwyn 2015: 1). The academic staff not ever been anticipated to be the leaders of technology-based training. The old-fashioned nursing program formerly comprised of training staff centered on textbook

material. The lecturers are at the level where they have to impact knowledge through technology-based education with little or no training as some qualified as nurse educators when these advanced technologies did not exist (Kirkwood and Price 2014: 6).

Nowadays's nurses should have acquired expertise that permit them to render care at a technology-rich clinical setting and professional organisations have shouted for the combination of technology and proficiencies of a nurse-training programs (Thompson and Skiba 2008: 312). Simpson (2011: 1) attested to this and stated that nurses have a duty to be the leaders of technology-centred training, if not they are risking a return to the days of white-capped nurses. Nursing training has to display the growing technology requirements of current registered nurses and so train upcoming registered nurses to be the drivers of latest technology in nursing field. The challenge is for nurse educators to deliver an optimal learning experience that is effective and appropriate for students' learning needs. Gether-Eby (2014: 3) confirmed that nurse educators are in the position of a novice, as they have no experience of online and technology-centred teaching. Technology-centred training promotes freedom in provision of information and eradicates every physical or time restrictions related with an old-fashioned training methods (McColgan and Rice 2012: 35).

Globally, many people operate through social media to connect and to transfer their messages. Public communication channels act as a plan that can help nurse educators in assisting upcoming registered nurses to access better consideration of the significance of ICT competencies and clinical excellence (Merrill 2015b: 78).

"Net" generation learners, or "millennials", are not the people the educational system was designed to teach (Prensky 2009: 1). The students' character is challenging the traditional classroom teaching, as their characteristics include digital literacy, experiential and engaged learning, interactivity and collaboration as well as immediacy and connectivity (Skiba and Barton 2006: 3). Merrill (2015a: 72) confirms that nursing students of today have grown up in a media rich information environment and are referred to as the "net" generation. These "net" generation students pose the highest test to nurse educators who maintain to use old-fashioned instruction strategy which exclude the incorporation of technological expertise into

nursing. Nursing educators have to modify the instructional strategies to encounter the requirements of student nurses.

Rogers (2000: 20) identified that students can retain 20% of what is heard, 40% of what has seen and heard and 75% of what is heard, seen and done. Researchers concluded that more than half of American student nurses are graphic effective students, one third are hearing effective students, and less than a quarter are tangible effective students (Rogers 2000: 22). The communication of nurse educators with student nurses through technological methods, is observed by student nurses to be a real profitable and liberating (Ebersole and Vorndam 2003: 15, McCorkle 2001: 16). Technological expertise is significant in nurse-training, and higher training institutions are very optimistic in combination of technology into training. Many nursing schools are using high-tech mannequins to simulate real life patient situations. This allows for improved clinical competence in a safe environment before interacting with their clients. An introduction of technology-centred training in school of nursing is observed as a critical and significant compliment to practical hospital capabilities, and has built various chances to improve instructional methods in nurse-training (Merrill 2015b : 79). Huffington (2015: 7) argued that nursing colleges are behind in incorporating technological expertise into the training program. The increase in technology in health care settings as well as the increase in information available, and because of evidence-based practice, nurses need to be able to get information quickly to inform their practice and so they need to know how and where to find it quickly (Wolfson, Cavanagh, and Kraiger 2014: 26).

Technology-centred training offers for an asynchronous instruction, teaching at a personalised speed and at a lowest price rate. The statistic characteristics such as oldness, sexual category , and qualification category can delay preparedness of academic staff to embrace technology-centred training, and preparedness is not a one-time occasion, however, it should be a constant development (Oketch 2013: 1).

Hlagala (2015: 1) identified that, sub-Saharan African leadership is struggling to offer ICT-centred training. Sub-Saharan Africa is identified as one of the challenged continents in terms of ICT preparedness due to the underprivileged of ICT substructure and the shortage of an extensive expertise which facilitate citizen to

best operate through technological resources. Bothma and Cant (2010: 56) mentioned that South African training staff is electronically disadvantaged and reluctant to embrace technology-centred training. Bakioglu (2007: 1) described different categories of academic staff, such as; individuals who are proficient on technology-centred instruction, and who have willingness to shift to technology-centred training and those who are reluctant to technology-centred instruction. For the moment; Baltaci-Goktalay and Ocak (2006: 37) specified that certain training staff embraces latest technological strategies, even though others oppose. Selected techno- cultured lecturers embrace various technological platforms that are not backed by the nursing college, such as WhatsApp. Bothma and Cant (2011: 56) argued that, training institution may not support student nurses when they are unable to retrieve the training material, as they are not mandated and licenced by the private provider of that technological platform.

Chippis and Mars (2010: 1) discovered that, nurses from countryside regions have to pay for transportation costs to metropolitan areas to access training, particularly post-basic students, and therefore, University of KwaZulu-Natal' School of Nursing presented video-conferencing which was the latest in nurse-training. This technology-centred training improved education for countryside and faraway nurses within KwaZulu-Natal (KZN) and provided excellent training chances for post-basic students in their clinical setting, who, due to travelling limitations, would otherwise be difficult to pursue their career. However, some remote areas still have poor network reception which hinders this innovation.

1.2 Problem statement

Polit and Beck (2012: 73), define problem statement as an articulation of a question and explains the demand for an investigation because of an advancement of an argument.

Insufficient training of lecturers in application of computer-assisted instruction, even when it is available, remains an international challenge (Skiba 2015: 19). Nurse educators have to incorporate technology into nursing programs to ensure excellent provision of latest skills to nursing students (Edwards and O'Connor 2015: 1). Other studies have reported various barriers with regard to the adoption of technology in nurse-training programs (Hlagala, 2015: 1; Maharaj, 2014: 1). Despite the many

types of technologies accessible, lecturers at the KZN CN are not embracing technology-based education.

1.3 Purpose of the study

The purpose of this study was to determine the readiness of nurse educators to adopt technology-based education in a college of nursing in KZN.

1.4 Objectives of the study

The objectives of the study were:

- To identify the enabling and constraining factors influencing nurse educators' readiness to adopt technology-based education in a college of nursing in KZN.
- To describe nurse educators' attitudes towards technology-based education in a college of nursing in KZN.
- To identify and determine the availability of resources to facilitate technology-based education in a college of nursing in KZN.

1.5 Research questions

The study seeks to answer the following questions:

- How ready are nurse educators in a college of nursing in KZN to adopt technology-based education?
- What are the factors influencing nurse educators' readiness to adopt technology-based education?
- What are the attitudes of nurse educators towards technology-based education in a college of nursing in KZN?
- What resources are available for technology-based education in a college of nursing in KZN?

1.6 Significance of the study

The findings of the study will assist the KZNCN to identify knowledge gaps and nursing education resources required and factors that would enhance the introduction of technology-based education. The recommendations from this study will enable policy makers to initiate interventions that could improve readiness of nurse educators to introduce technology-based education and thus raise the teaching and learning standards as well as the competency level of the nursing students.

1.7 Structure of dissertation

Chapter 1: Introduction

This chapter described the background of an investigation and described the problem statement which channelled an investigation, and introduced the related research questions which were operated to determine the research problem.

Chapter 2: Literature review

This chapter reviews the obtainable form of distributed information in the field of preparedness of nurse educators to adopt technology-centred training. The gaps were recognised in the present literature that required extra reviews.

Chapter 3: Research methodology

This chapter describes the research methodology, research design, data collection process and the instrument that was used to collect the data.

Chapter 4: Presentation of results

This chapter presents the research findings and compares the findings with the literature review in Chapter 2.

Chapter 5: Discussion of results

This chapter concludes and summarises the intention of this research and presents recommendations for future study arising from the findings of this study.

1.8 Conclusion

This study explored the preparedness of nurse educators to accept technology-centred training within a college of nursing in KZN. The recommendations from this investigation can enable policy makers to initiate interventions that would improve readiness of the nurse educators to introduce technology-based education, and thus heighten the teaching and learning standards as well as the competency level of the nursing students.

1.9 Theoretical frame work

Theory refers to an abstract generalisation that offers a systematic explanation about how phenomena are interrelated (Polit and Beck, 2012: 126). Framework is a conceptual, rational construction of meaning (Burns and Grove, 2009: 126). According to LoBiondo-Wood and Haber (2013: 141), a theoretic outline guides the researcher in the interpretation of results and therefore directs the entire research process. Such framework assists in providing boundaries to the study and forms the foundation of the examinations, meaning of theories, study designs, clarifications and generalisations.

Engagement of the generational probabilities of upcoming groups of student nurses has pressed technology to the forefront of nurse-training. The researcher will use the Technology Acceptance Model (TAM) to critically assess issues that further or hinder acceptance of technological skills by lecturers. The TAM was developed by Dr Davis with the aim of assessing perceive usefulness, perceived ease of use, and attitude towards adoption of new technological skills. Davis, Bagozzi and Warshaw's (1989: 982) Technology Acceptance Model focuses on perceived usefulness, ease of use, attitude, behavioural intention, and systems operation as items that guess the receipt of a current technology (Figure 1.1).

Attitude towards the operation and behavioural intention to use technology affect how nurse educators react to technological practices. Attitudes and behaviour also touch the perceived ease of use and perceived usefulness of technology. The TAM proposes that if an individuals consider that technology is valuable, but concurrently consider that it is extremely demanding to operate with it, the efforts out-weigh the advantages and therefore weaken its operation (Tacy 2015: 36).

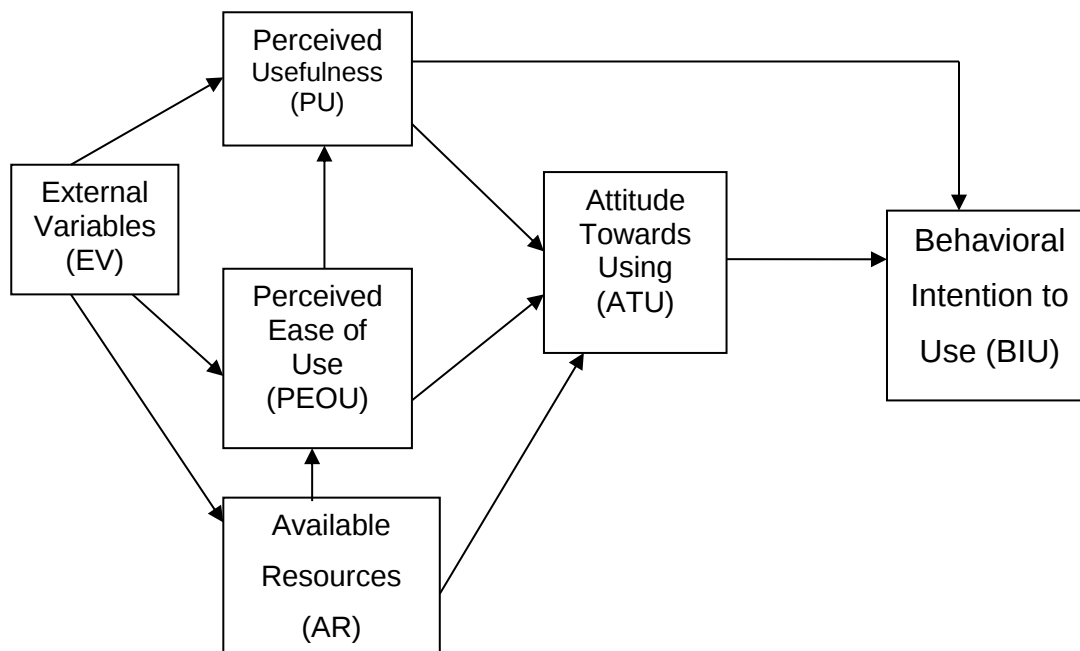


Figure 1.1: The Technology Acceptance Model

1.10 Definition of terms

- **Readiness:** State of being prepared for something (Oxford Advanced Learner's Dictionary 2015: 1220).
 - For this study readiness means preparedness of nurse educators of KZNCN to adopt technology-based education.
- **Nurse educator:** A professional nurse whose main part of importance, proficiency and specialized training is a training of student nurses at the College stage (Mosby Medical Dictionary 2009).
 - For the purpose of this study nurse educator means all KZNCN's professional nurses registered with the SANC and holding an additional qualification in nursing education.
- **Technology:** A body of knowledge devoted to creating tools, processing actions and extracting of materials (Hornby 2015: 1220).
 - In this research, technology means application of multimedia in teaching and learning.

- **Education:** The practice of instruction, guidance and studying particularly in a training institution to advance understanding and improve abilities (Hornby 2015: 468).
- **Teaching:** Imparting knowledge to or instructing someone as how to perform a task (Oxford Advanced Learner's Dictionary 2015: 1220).
- **Learning:** Acquisition of knowledge or skills through study, experience, or being taught (Oxford Advanced Learner's Dictionary 2015: 1220).
- **Innovation:** Introduction of new things, new ideas, way of doing something that has been introduced or discovered (Oxford Advanced Learner's Dictionary 2015: 775).
- **Multimedia :** Any combination of video, audio, text and graphics (Billings and Halstead 2009: 339).
- **Net generation:** students born from 1980 to the present, also known as millenials (Howe and Strauss 2000).

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

A literature review is a crucial review of research on a topic of interest, regularly organized to place a research problem into context (Polit and Beck 2012: 732). According to Brink, van der Walt and van Rensburg (2012: 71), the aim of a literature review is to achieve hints to the methodology and tools. This attribute offers the investigator with an evidence on what has and has not been tried, regarding the research styles and what kinds of data-collecting tools were employed and operate and do not operate. Okinda (2013: 1) describes technology-based education as the assessment of organisational and individual factors that should be considered if the organisation is to be successful with the introduction of technology in education. Graves and Corcoran (1989: 227) explain nursing informatics as the merging of information and communication science into nursing science with a plan to help in the administration and processing of nursing information to boost the nursing practice and provision of nursing care. In preparing this chapter, the researcher read and examined relevant electronic and published sources which included different research studies, journals, conference papers and textbooks. The researcher used English language to search, using search terms such as 'technology-based teaching in nursing', 'e-learning in nursing' from the following databases: South African Nursing Council (SANC) website, Durban University of Technology (DUT) online library, University of South Africa (UNISA) library repository, Nursing World, Nursing Times, and Google Scholar. Authors have written about the progressively significant part that technology shows in enabling learning in higher education which included among others learning management systems, email, digital video discs, mobile wireless technology, video-conferencing, social media, podcasting and instant messaging (Chetty, 2018: 1).

2.2 Evolution of technology in nursing education

The education system began to use computers as the means of teaching in 1950, and the first person to recognise the capability of visuals and sounds in teaching-

learning process was Bitzer (Hlagala 2015: 23). Since 1970, suggestions from nursing organisations have called on for the combination of information and communication technology into the nursing programs (Simpson 2011: 2). In 1990, nursing training commenced to fit in technology into the teaching activity as the powerpoint operations started replacing the transparencies, and an electronic mail was an anticipation (Axley 2008: 3). In 1997, more computing and nursing programs emerged, plainly stating the opportunity intended for nursing training, requiring technical articulacy and ability amongst nursing educators. An American Association of College of Nursing (Swan *et. Al.* 2012: 450) white paper referred to the impact of technology into the nursing occupation as an approval of a transformation, and involving this new technology-centred instruction leads to a compulsory operation of technology in health setting. In 2000, a non-profit association of more than 2000 colleges, universities, and educational organisations, was created to promote the intelligent use of information technology. This initiative provided mentoring and brought up to date resources and exploration for nurse educators and IT specialists. In 2006, the impact of technology on nursing training required unquestionably transition from chalkboard to powerpoint presentation. Integration of technology into nursing education requires an educator who is prepared to facilitate an effective learning experience. Nurse educators must step in and join in the revolution (Challa 2013: 8). Skiba (2015: 263) identified that, age is one of the contributory causes for nurse educators to be lagging behind in adoption of technology in nurse training. In 2012, the American Association of Colleges of Nursing noticed that the mean of grown up nursing professors was above sixty years, associate professors above fifty seven years, and deputy professors above fifty one years. Jamshidi *et al.* (2012: 1371) emphasised the importance of ensuring that, the nursing programmes have to meet the challenge of educating students to deal with advancing technology from clinical information systems to computerised medical equipment. McColgan and Rice (2012: 35), recommended that nursing informatics should be incorporated into the nursing education curricula and students' competencies. However, possibilities of rule and confidentiality infringement, price and misunderstanding of technology remain as an obstacle for the educators in the implementation of new technology into the nursing programs (Swan *et al.* 2012:449).

A investigation conducted in Iran by Jamshidi *et al.* (2012: 1372) found that 87% of students had access to computers and 64% had access to the internet, with 48% having undergone formal computer training and 52% with no training. The study further identified that computer possession and utilisation among students was low. Skiba (2014a: 267) identified the following benefits of technology: access to information, photographic information, access to digital resources, opportunity to participate in activities. Student nurses have great anticipations that in the modern days their gadgets such as computerised phones can be used either in the class room or outside the class room for the teaching and learning services. Dahlstrom *et al.* (2013: 1) noted that the relationship of students with technology-centred education is complicated; they acknowledge the usefulness of technology-centred education however, they require mentoring when it comes to an appropriate practice of technology for educational principles. Student nurses are prepared to apply their cellphones for more of their educational purposes and must be encouraged by educators and opportunities should be provided.

Skiba (2014b:1) recommended that nurse educators must become highly contented with technology application in the instruction environment, and get up to speed with mobile devices, social media and other tools used in the clinical environment. They should seek professional development opportunities to learn more about how to be an expert inside and outside the classroom environment, surveying their students to find out what devices they are using and what their expectations are of the boundaries between academic and personal connections. These technologies can be used to foster educational communication within the college to share ideas, and address issues and challenges. Educators should experiment with technology and work with administrators and IT personnel to ensure that the classroom environment can handle mobile devices and that the necessary IT infrastructure is available.

In KwaZulu-Natal (KZN), traditionally, professional post-graduate specialist nurse training has been centralised in urban areas. People wishing to pursue a career in nursing have to move to urban areas in order to receive university training or further specialisation. The University of KwaZulu-Natal's School of Nursing's mission is to increase retention of nurses in rural areas. The School of Nursing (SON) has been active in decentralised education for rural nurses since 1999, using part-time decentralised tutors and clinical facilitators to run courses directing them to be

registered with South African Nursing Council (SANC). The SON aims to expand the decentralised programme by using video-conferencing to deliver face-to-face education to nurses based in rural areas at their local hospitals with a further aim of creating and sustaining a virtual school of nursing (Chipps and Mars, 2010: 1). The advanced midwifery teaching programme via video-conferencing commenced in January 2009 at four sites and a fifth site commenced in August 2009. The use of video-conferencing teaching for nurses was not part of routine nurses education in South Africa and SON has not previously provided nursing education using this modality, however they have experience using this teaching modality at Nelson R. Mandela School of Medicine at the University of KwaZulu-Natal (Chipps and Mars, 2010: 2).

2.3 Benefits of technology-based education

Mosa, Mahrin and Ibrahīm (2016:113), state that technology-centred education helps student-nurses to approach sources and material from everywhere at any time. It helps successful teaching and learning encounter, and accessibility to instruction becomes simpler and general. Information communication technology (ICT) helps trainings, as well as promoting strategies at which nurse educators achieve individual goals. Information communication technology enhances accessibility to information mastery and promotes lifetime learning (Bonamo 2011: 438). Jung and Latchem (2011: 11) found that technology offers extended teaching space, and further identified three approaches to teaching, these being execution, facilitation, and liberation.

2.3.1 Execution

Lecturers can still provide students with information and proficiency, set assignments and determine results, but they are able to do so in a more diverse and individual manner. Powerpoint and other multimedia devices enable academic staff to display data and determine means of involving, encouraging and collaborative methods. Offline or online multimedia, learning management systems, and similar devices, offer materials that facilitate teaching and learning strategies. Students can work anywhere they want, and lecturers can evaluate, rate and then respond to students' work wherever at every time.

2.3.2 Facilitation

Learning objectives sometimes tend not to be specific. Self-managed technology-centred lectures may be utilised to help students' studying using ICT tools such as online helpdesks as well online tutoring. Interactive ICT tools allow lecturers to help students who need personal and affective support. Isolated students can be highly knowledgeable, user-friendly and passionately involved in studying through electronic-mail, conferences, as well as one-to-one and group-discussion boards are offering a crucial atmosphere of teaching (Kim, Chun and Song: 2009: 67). Technology assists lecturers to provide flexible student support, extending beyond conventional course boundaries, enabling more flexible learning, thereby improving communication and collaboration (Hartley 2011: 1).

2.3.3 Liberation

The presence of the internet and worldwide web (WWW) make most places, people, knowledge, and ideas instantly accessible. Everyone, everyplace and worldwide can acquire information from internet source, podcast and chatrooms. Technology-centred teaching doesn't substitute lecturers in a lengthy teaching place, since educators are still needed to design, organise and bring together all required resources, as well as teaching, facilitating and assessing students' development. Technology-centred education frees student nurse's brain and promotes information building.

The University of Nairobi (UoN) strategic plan (2008-2013) (Oketch 2013: 4), realised the importance of ICT, introducing it with the aim of maximising student nurses and lecturers' excellency and achieving great results, enhancing training then improving the standard of research. E-Learning has an ability to train anyone, anytime, anywhere but requires more than moving education online. To advance, offer and control electronic-learning programs and skilling of nurse educators to be more proficient in facilitation, a highest standard of investing in ICT substructure is needed (Sharoff 2011: 1). The benefits of technology-centred education involves training of students nurses at their own speed, instantly and with a lowest price within an organisation (Powell 2012: 52). The profit of operating through technology-centred education are lowest prices as compared to traditional methods, no limitation of time and place, improvement of results (Hall 2015: 1) as well as maintainence

of effectiveness (Goldstein and Ford 2002:74). The use of technology-centred education has been well-known as the transport that accelerate training to the best encounter and has the target of providing proficient labour (Rice 2015:35).

Brown and Mbatl (2015: 1) highlight the significance of portable training tools that is flexible and not limited by place. Student nurses may have accessibility to a variety of information (Viberg and Grönlund 2013: 169). Prensky (2009: 1) stated that it is hard for the human mind to recall a lot of information and currently the general mode is a storage of data via technological devices. Portable devices allow student nurses to communicate with their study mates and nurse educators at any time (Zayim and Ozel 2015: 456). Holmberg (1986: 25) highlighted the significance of discussion among the nurse educator and the nursing student, which makes the feeling of unity, stimulates learning desire and inspiration, especially when collaborative actions exist. (Kelsey and D'Souza 2004: 1; Simonson et al. 2012: 1). Van Rooyen and Wessels (2015: 184) suggests that technologies create a sense of emotional involvement in such a way that students are feeling an extra connection to the program than before, which unavoidably adds learning pressure and motivates student nurses to study. Student-nurses are not submissive recipients of instruction, but committed members who are stationed in a particular socio-demographic, and self-efficient situations which have a result on students' motivation (Prinsloo and Subotzky 2011: 1). Motivation is necessary for studying and implementation, especially in a technology-centred situation whereby student nurses are leading in the training process (Chetty 2018: 1).

The frequently exposure of student nurses to a variety of encouraging experiences creates more motivation (D'Souza et al. 2010:100). The effective digital communication with student nurses, is observed as an existent improvement (Ebersole and Vorndam 2003: 15; McCorkle 2001: 16). Portable devices helps individuals to connect irrespective of their whereabouts (Chetty 2018: 1). Since smartphone systems are spreading outside urban and peri-urban regions, especially in South Africa (Brown and Mbatl 2015: 2), people living there can not be limited to telephone calls, on the other hand can also gain smartphone packages, such as texting and internet browsing. Portable devices such as smartphones have the possibility to enhance student nurses' performance and the standard of learning activity, but study supports that student nurses discovered that portable devices are

enjoyable (Krau 2015: 379). Student nurses on mobile studying interviews have pointed out that, the subject matter is more interesting and praised the group effort that is brought into learning (Lin 2007: 817). Ghaith (2010: 489) points out that one of the major benefits of a technology-centred approach is that it equips graduates with proficiencies and expertise that allow them to be employed in an international field and highly infomative group, thus preparing them for the labour market. Ungerer (2012: 6) found that effective use of technology expands teaching-learning by creating innovative spaces, enhancing the standard of training and preparing student nurses for their position as an informative employee. The effective use of technology provides highest standard of training, then prepares student nurses for their questions of the twenty first era (Thomas 2011: 215). Trilling (2007: 11) identified the seven C's (21st Century lifelong skills) which have become a formula for success in the 21st century, namely: critical thinking and doing, creativity, collaboration, cross cultural understanding, communication, computing/ICT literacy, career and learning self-reliance. Thomas (2011: 216) believed that a worldwide change from inactive nurse educator-centred approach to student nurse-centred contructivist approach is essential in implementation of technology-centred education. Porcaro (2011: 39) described instructivism as a sound planned, nurse educator-centred focussed, instructive education, while constructivism means a student nurse-centred approach of education.

Quinn (2011: 3) compared face-to-face learning with mobile technology in learning (Table 2.1).

Table 2.1: Face-to-face learning compared to mobile technology learning

	Lecture method	Movable technology
Changes	The student nurses act as an inactive recipients of information from nurse educators and constrained in a lecture room	The learning process is liberated from being confined in a lecture room and student nurses are taking a lead in acquiring information
Sources	Student nurses are dependent on printed sources such as study guides and hard copies	Student nurses are dependent on technological sources such as soft copies
Student nurse's role	Student nurses are submissive participants and receive information	Student nurses are committed on information creation
Characters	Nurse educator-centred	Student nurse-centred
Position and point in time	Limited by geographical location and there is a specific allocated time	Training take part wherever and at anytime

Quinn 2011

2.4 Social media use in nursing education

Social media is an information network that uses some means of networking through shared and an individual-composed material, creating and upholding relationship among group (Tuominen, Stolt and Salminen 2014: 1). According to Schmitt, Sims-Giddens and Booth (2012: 1), Whatsapp, YouTube and Facebook are generally used public forms of communication in nursing training. Social media's existence is highly recognised, in such a way that one cannot predict that it is a developing technological means of communication which transforms the organisations worldwide and conveying information. Blogs assist in sharing of knowledge, thoughts and emotional state. They also display subject matter, thinking, encouragement and student improvement on writing expertise (Rice 2015: 36). Social media is cost-efficient, and develops shared studying and social skills relevant to nursing (Tuominen, Stolt and Salminen 2014: 3). Social media permits sharing of information among educators and students at anytime, and promotes students' interaction with their study mates from their place of residence (Nyangeni, Du Rand and Van Rooyen 2015: 1).

Social media enable nursing students to learn collaboratively and studying is always comfortable, pleasurable and the examples which are relevant to their culture are used. Learning improves with social collaboration and constructive learning situation

creates indepth learning (Merrill 2015a: 72). The audio visual method in Figure 2.1 displays how technology based education enhances teaching:

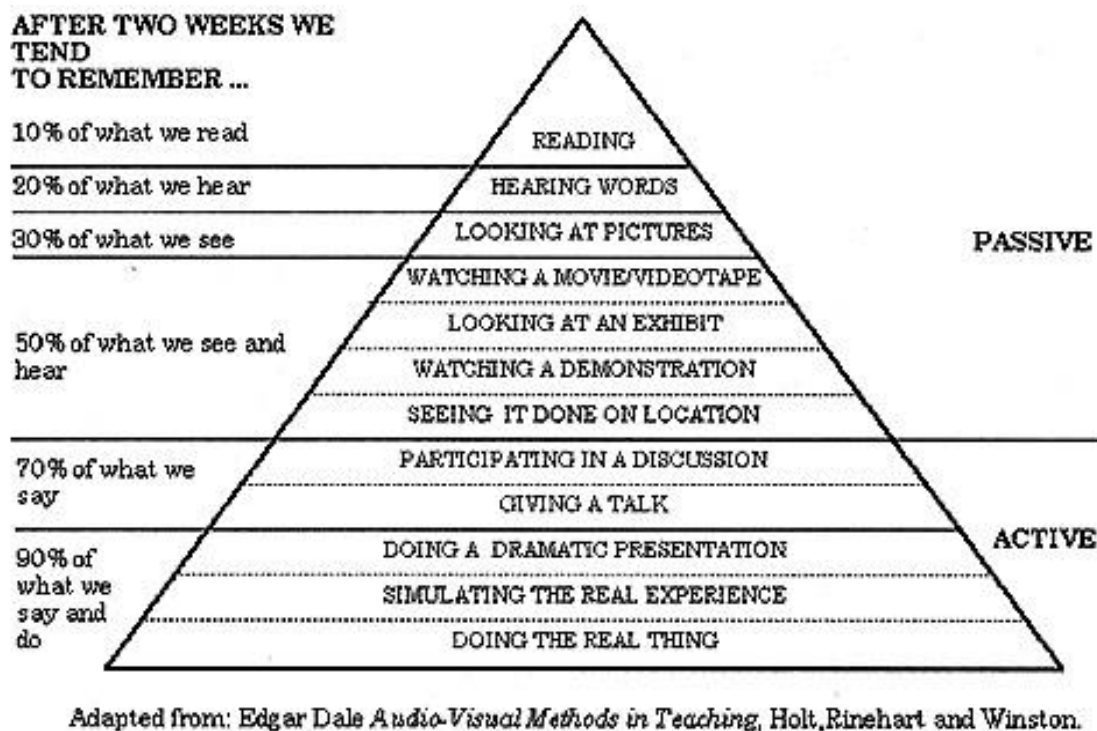


Figure 2.1: The audio visual method in teaching

2.5 Challenges of technology-based education

World Health Organisation (WHO) (2010: 1) reported that, the highest price of resources is a worldwide commonly mentioned problem on an adoption of technology and underprivileged infrastructure queries such as unsound electricity provisions, untrustworthy internet network and shortage of staff with the required technical skills. An investigation done by Challa (2013: 2) also proved that monetary limitations were one of the most troubling points regarding technology and only the highest income continents which are capable to dominate in operation through technology.

The perfect planning of work guarantee that employees have opportunity to acquire latest skills and manageable strategies to excel in technology-centred education (McNaughty and Kennedy 2000: 9). Nurse educators have to pay special attention on development of latest proficiencies in incorporating technology into learning, in order to change the training methods. The insufficient time to improve an individual

competencies with regard to technological skills is still a persistent problem (Jones 2004: 20).

An investigation performed at the University of Nairobi identified that some elements that determine electronic learning preparedness were supplying extra computers and internet accessibility, and preparation of lectures on e-learning (Muganda 2009: 1). Socio-demographic features such as age, sexual category and training rank are significant features to be mastered when evaluating the preparedness of lecturers for execution of e-learning (Hlagala 2015: 28). A study conducted in Tanzania by Lwoga (2012: 907) identified different problems associated with opting of developing technology-centred education:

- Insufficient money – the price of training technological tools is costly, and these economical difficulties lead to some student nurses to be unable to maintain internet connection price.
- Poor infrastructure and low internet bandwidth – this inhibits students from achieving valuable learning material such as video running, video pieces and copying or uploading huge documents.
- Shortage of technical experts–inadequate ICT skills to backup electronic learning approaches..

Post graduates nurses are still struggling with mastering of technological expertise; because most of student nurses are recruited into the nursing programmes lacking skills on ICT applications, colleges have to provide the strategy for the students to acquire the technological mastery expertise (Tacy 2015: 13). Brown and Mbatia (2015: 1) recommend that structured computer training courses should be implemented as part of the curriculum. Nurse educators' lack of information technology is a huge problem (Bonamo 2011: 439).

2.6 Attitude towards technology-based education

Attitude in relation to a behaviour is explained as a person's optimistic or pessimistic assessment of carrying out a behaviour (Kim, Chun and Song 2009: 7). Granberg (2016: 1) discovered that attitude is unrelated to perception and experience of the lecturers and institutional preparedness to render e-learning. Gakuu (2007: 1) determined that there is an insignificant change of attitude concerning the opting of distance e-learning. Omwenga, Waema and Wagacha (2004: 7) mentioned that

change of attitude and grasping of information are the main problems that hinders preparedness for e-learning. Contreras and Hilles (2015: 53) found that nursing students and nurse educators have positive attitudes towards technology-based education, but there is a need to improve the infrastructure. Fabry and Higgs (2000: 385) highlighted various hindrances to effectual-use of technology, such as nurse educators' attitudes, reluctant to change, financial support and lack of inservice training. Van Rooyen and Wessels (2015: 184) conducted an investigation at the University of South Africa and noted that technology changes the negative attitude towards study, backup systems are enhanced, ensures the actual caring of the lecturer and that the student is not just a number on the registration file, creates a sense of being in a correct place, since students are aware that there is an accessibility of information from an outside world, and creating of friends on the journey, provides an easy channel for feedback from the lecturer, all of which is motivating.

2.7 Perceived usefulness and perceived ease of use

According to Davis (1989: 320), perceived usefulness is a level at which an individual thinks that operating a specific technique would improve his professional functioning. Perceived ease of use is a level at which an individual thinks that operating a specific technique would be simple (freedom from difficulty). Kim, Chun and Song (2009: 67) define perceived usefulness as an operator's personal likelihood that operating a certain technological tools would boost the worker's performance in a training institution. Perceived ease of use is an operator's evaluation that the technological technique will be stress-free and less effort is needed. In the 1990s Kenya became aware of the growth of the internet, and their focus area was e-learning (Rosenfeld 2007: 6). Bonamo (2011: 439), found that nurse educators' self-perceived practical and academical ICT proficiency are optimistic, which is an important driving force towards implementation of technology-centred training in an identifiable teaching field. Learners and educators were not ready to implement e-learning, and the required outcomes were not met (Hu *et al.* 2012: 91). Blum (2014: 5), recommended that lecturers have to be skilled on how to incorporate ICT into the training programme, and should be trained and developed to maintain speed with fast revolutionising technological skills, as unskilled lecturer could dent the image of a training institution swiftly. In Sub-Saharan Africa,

smartphones are the technological instruments which are operating in peri-urban and countryside regions to interchange information (Ford and Batchelor 2007: 12), and are also operating for training goals (Johnson and Kritsonis 2007: 2).

2.8 Expected competency and development from nurse educators

Lecturers have to be modern, motivating, and participating as they groom potential registered professional nurses. Currently, lecturers are anticipated to operate through innovative ICT skills to deepen the students' training atmosphere (Koller, Harvey and Magnotta, 2012b: 14). Swan *et al.* (2012: 449), suggested that nurse educators have to be up to date with technology for them to be effective in a fast-paced, electronic-based society. Rosenfeld (2007: 6) suggested that current student nurses have to acquire a highest degree of computer proficiency, not specific in an outdated college programs, but also in a social world technological expertise which enable teamwork, self-driven information searching, interaction, improved intellectual capacity, and an independent decision making skills.

Hoskyns-Long (2009: 35) argued that, integrating ICT skills into lecture room and maintaining the traditional system, leads to the same traditional and unproductive training of students. The using of a combination of technology and traditional teaching methods was better than using either method alone (Johnson, Massa and Burne 2013: 40). An exclusive technology-centred training, even if it is highly exciting, is not involuntary developing the training strategy of student nurses. For successful technology-centred training, emphasis should be on the instructional objectives of training program, not only in technology. Hence, an approach should be designed to advance the excellence of student nurses' training objectives. The simply system of introducing technology-centred training into old system, is to ensure that training system is not affected by technology radical change in education, where students are mastering more of the technological skills than the nursing content. As the public advances in technological tools, then the health related matters are becoming highly complicated, as it is essential that the upcoming professional nurses be well prepared with the information and approaches to traverse the technological improvements that are happening in the clinical situation as well as the overall community avenues (Rosenfeld 2007: 6). According to Axley (2008: 1), technology-centred education have unlocked the gates to latest training

methods for training staff. The fast growth of electronic learning settings has improved the necessity to close the break among the age band of academic staff and current student nurses. Grandberg (2016:69) suggest that technology could yield a precious part in instructing the ICT proficiencies that will be required by upcoming professional nurses, and further clarified that public media are suitable significant training instruments for integrating and circulating information to student nurses, clients, and peers.

Roodt and Peier (2013: 478) noted that the presence of YouTube within training of nurses looks simpler and more welcoming to boost teamwork abilities and incorporates technological expertise into nurse training . Teaching with technology involves considerably more knowledge and skill than knowing how to use a computer. According to the American Association of Colleges in Nursing (2005: 1), most schools of nursing are suffering from a shortage of nurse educators, however, an extra responsibility of grasping current technological expertise and an increasing electronic development could accelerate the leaving of large number of more experienced academic staff from college of nursing. Programs should be implemented to maintain more experienced academic staff through financial assistance and training plans dedicated on building technological capacity.

Prospective professional nurses are extremely different culturally, oldness and familiarity with technological expertise. Technology-centred training is significant for upcoming professional nurses to acquire robust technological proficiencies in their readiness leading to professionalism (Skiba 2015: 264). D'Souza, Karkada and Castro (2014: 73), noted that training institutions are dragging to incorporate technology-centred training into the training program. McColgan and Rice (2012: 35), confirm that few training institutions need prospective nursing professionals to display technological capability on learning. Students want technological competency to be consistent, handy, and accessible, supporting productive use of time. Thompson and Skiba (2008: 312), suggested that academic staff requires to be at the forefront of technology-centred training, leading in moulding nursing training. It is supreme that nursing academic staff be capable in technology provision. D'Souza, Karkada and Castro (2014: 75) confirm that most of the training staff are still instructing like the way they were trained. Krau (2015: 379) states that nurse educators are ill prepared to teach technology to nursing students; training staff are

like a guide to provide student with chances to practice the sufficiency of their intelligence.

The Organisation of Medicine's statement on the potential of nursing profession alludes to the fact that more qualified professional nurses will further their training in private computer colleges to catch-up on technological skills (Blum 2014: 2). Technology turns into a channel whereby nurse educators impart knowledge to upcoming professional nurses and also assist them to gain more information during their own time. Public communication channels like FaceBook (FB), Twitter, and LinkedIn, weblogs and uploading academic articles via platforms such as Mendeley are the means at which prospective nurses could access information and enjoy these openings. Twittering permits student nurses to imitate, debate, network with group mates, appraise, construct judgments, then build up studying culture (Schmitt, Sims-Giddens and Booth 2012: 1). An Association of Nursing in Canada is concluding proficiencies for upcoming nursing training to make sure that student nurses on completion are able to apply technological experiences in their clinical setting (O'Connor and Andrews 2018: 172).

The Professional Nurses Association of Ontario (2012: 1) lately roll-out a Department of Health electronic instruments to assist academic staff to attach technological expertise into the undergraduate training. In USA, academic staff are starting to discover strategies of introducing social media into the nursing program; fast development of technological expertise has maintained nursing profession and other health-related setting crawling to maintain speed. The American Nurses Association social media toolkit, and an information technology based training comprises of public communication channels' material for example weblog or commitment via a mode like Facebook. Gether-Eby (2014: 3), recommends that experienced lecturers should pair with newly qualified or inexperienced lecturers to ensure competency with new technology, as more than half of the nurse educators have no experience in different technologies and find themselves in the position of novice and they are not adequately prepared to teach online. Gether-Eby (2014: 4), further suggested that the role of nurse educator changes from authority figure to facilitator, and for students who are reluctant to speak in class, web-based learning is a great benefit. Online learning forces the student to engage in critical thinking and participation at the highest level.

Contreras and Hilles (2015: 57) recommend that a training plan should be in place to improve nurse educators' competencies in content development and quality assurance. Nursing students should have basic literacy skills that can enable them to be comfortable to use information communication technology. Accessibility to reliable and fast internet connectivity should be improved (Okinda 2013: 3).

According to the Democratic Nurses Organisation of South Africa (Denosa) Nursing Update May/June (Delihlazo 2015: 37), technology use is a viable tool to enhance nursing education. Young nursing students are technologically savvy and are well versed in e-learning. An application of an individual and group communication channels such as voice-over internet service, video-chat, Twitting and online Google storage improves an acquiring of information by nursing trainees. The technological equipments and backing-up services are critical issues for technology-centred training and many training staff are underqualified to impart knowledge through blended strategies (Mapotse 2014:08). More workshops should be conducted on a regular basis and certificates of attendance must be offered, after completion of computer workshop for motivation purposes (Mapotse 2014:09).

Social media is a set of online tools which are designed for and centred around social interactions (Nyangeni, Du Rand and Van Rooyen 2015: 1). The public communication channel comprises of a combination of current technological packages such as weblogs, twittering, shared video facilities, texting, wikipedia, public interacting channels like Facebook and MySpace. Public networking permits nursing students to interact with each other and nurse educators exclusive of limitation of moment, status and space. Nursing students should not be in lecture rooms to acquire knowledge, however can network with group mates and educators from any place (Nyangeni, du Rand and van Rooyen 2015: 2).

Social media facilitates online learning, and allows flexibility which can accommodate andragogy, where student nurses can concurrently study and work part time (Akoh 2012: 9). It supports blended learning and encourages dynamic studying and information access via fellow-student nurses collaboration (Holden and Westfall 2010: 7). It also enhances sharing of clinical expertise in healthcare; nursing students from under resourced areas can exchange messages and pictures with

well-equipped regions in directive to get guidance so as to render highest quality client's service (Foronda, Kleinheksel and Samosky 2017: 15).

Inappropriate use of social media can damage personal integrity, nurse patient relationship, nurse-colleague relationship and current and future opportunities. The improper and irresponsible use of social media carries significant risks (Swan *et al.* 2012: 449). Nyangeni, du Rand and van Rooyen (2015: 8), made the following recommendations regarding the operation of public media in nurse training:

- Academic staff have to distribute knowledge with consideration of law, ethics and norms of upcoming professional nurses in relation to an application of the social media in nursing training.
- Nursing education institutions have to formulate the rules on social interaction which exactly belong to the ethos and professional practice of the nursing profession.
- Corrective measures have to be established in case of violation of such rules and supported to make sure that academic staff and upcoming professional nurses are complying with the policy.
- Nursing education institutions have to update the academic personnel by offering inservice sessions in relation to the suitable operation of social media, since public communication channels were not being utilised during their professional grooming period.
- An expected outcome of nurse educators in the organisation have to be unambiguously specified.

Blended learning or hybrid learning is an educational strategy that combines face-to-face classroom instruction with online learning (Orton *et al.* 2015: 7). Blended learning improves student competencies in reflective thinking, clinical skills, self-efficacy and clinical reasoning. Computer anxiety interferes with the use of e-learning (Orton *et al.* 2015: 8).

Mobile technologies are effective educational tools in resource limited settings. Mobile phones facilitate realistic independent decision making, insightful preparation, drilling, realisation of changeable training environment and lifelong acquiring of information (Chipps *et al.* 2015: 1398). Training staff need to skill student-nurses with technologically-proficiencies to render services in a sophisticated hospital

environment. Training staff is obliged by advancement of ICT and training technological skills to change from old-fashioned approaches of nurse training to blended or computer-centred training (Maboe and de Villiers 2011: 93).

Training staff is facing obstacles in making prospective professional nurses to excel in an ICT steered domain, embodied by endless revolutions and radical transformations like digital technology (Maboe and de Villiers 2011: 93). Technology-centred training alters the methods at which prospective professionals acquire knowledge and trainee-trainer relationships. Educators and hard copies are now not the only basis of knowledge material and acquiring of information is not bound to a specific region or period (Lin 2007: 817).

The student nurses have to be proficient to operate in a high technology setting and they have to apply technological skills into their daily lifestyles (Maboe and de Villiers 2011: 94). It remains the academic staff's duty to plan and design the training activities to meet the training objectives of the training program according to the South African Nursing Council's regulations. (Mapotse 2014: 9).

2.9 Conclusion

The literature reviewed in this chapter indicates that cost is the highest repeatedly mentioned obstacle to technology-centred education along with an underprivileged substructure such as unpredictable electricity provisions and an untrustworthy internet network, and shortage of staff with the required technological skills.

CHAPTER 3: METHODOLOGY

3.1 Introduction

Polit and Beck (2012: 741), describe research methodology as the methods used to structure, collect and analyse information in a logical manner. This study used a quantitative approach which emphasises objective measurements and statistical and numerical analysis of data collected through questionnaires using computational techniques (Babbie 2010: 1). This approach provides strong evidence with regard to the research problem investigated (Brink, van der Walt and van Rensburg 2012: 97). A descriptive design was used to gain information through gaining an understanding of the phenomenon as it occurred naturally (Brink, van der Walt and van Rensburg 2012: 112). The research methodology followed the four elements laid out in Figure 3.1.

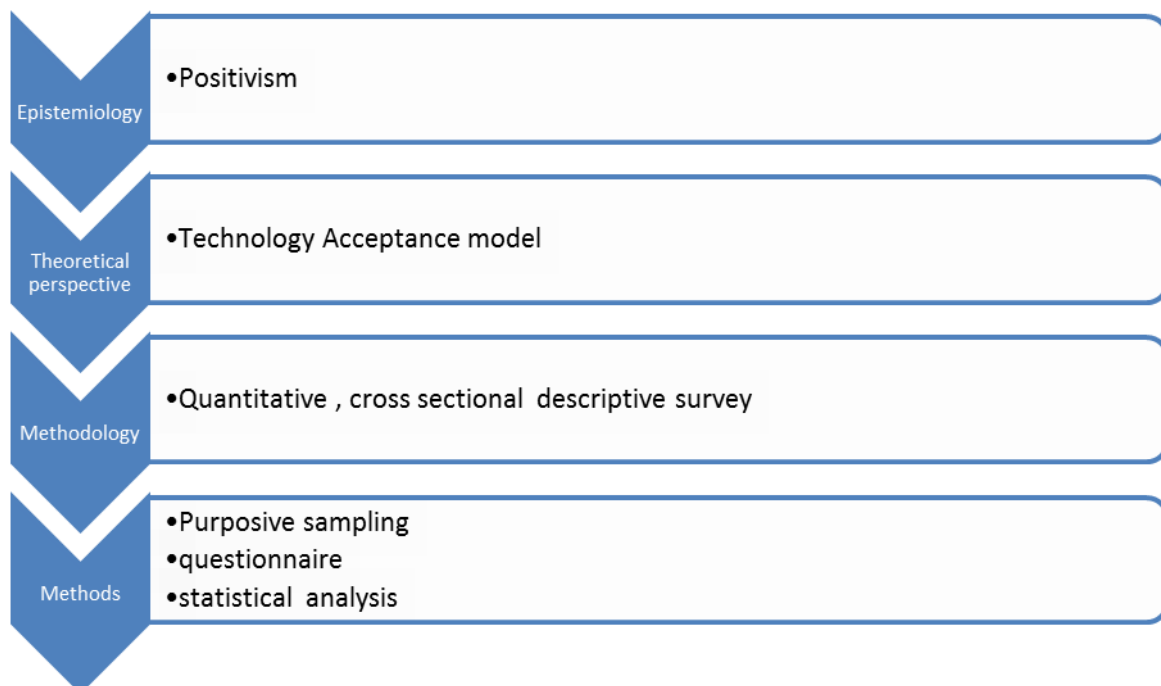


Figure 3.1: The four elements of the study

3.2 Research design

Research design is the overall plan for gathering data in a research investigation (Brink, van der Walt and van Rensburg 2012: 217). According to Polit and Beck (2012: 741), research design is a general design for tackling the research query including requirements for improving the study's reliability. In this investigation the investigator utilised a quantitative approach since there was no influence on the individual variables and no involvement. A descriptive design was used because this study was about the description of the phenomenon.

3.3 Setting

Research setting indicates the exact location or sites where information was gathered (Brink, van der Walt and van Rensburg 2012: 59). A natural site was used by the researcher because it was an unrestrained, actual state or situation. The investigator did not influence or alter the setting for this investigation. The investigation was performed in a college of nursing in KwaZulu-Natal. KwaZulu-Natal College Nursing (KZNCN) campuses are situated within 11 public hospitals in KZN province. Ten campuses were used in the study which excluded the campus where the researcher was a lecturer. Of the ten KZNCN campuses used in this study; nine offered the R425 Diploma in Nursing (General, Psychiatric, Community) and Midwifery, which leads to a qualification as a professional nurse and the eleventh college offered a one year post basic Diploma in Ophthalmology Nursing Science, Critical care Nursing Science, Operating theatre Nursing Science, Orthopaedic Nursing Science, Midwifery and Neonatal Nursing Science and Child Nursing Science. There were five campuses in urban areas namely Addington, King Edward and RK Khan Campuses in eThekweni Municipality, and Edendale and Greys campus in uMgungundlovu Municipality. The other five campuses are situated in rural areas namely Benedictine in Zululand District, Charles Johnson Memorial and Madadeni in Amajuba District, Port Shepstone in Ugu District and Prince Mshiyeni in eThekweni District.

3.4 Population

Polit and Beck (2012: 273) defined population as the total number of individuals in which an investigator is fascinated. The population in this investigation included

nurse educators who were working at the ten nursing campuses of the KZN CN selected for this study. The nurse educators were all professional nurses employed by the KwaZulu-Natal Department of Health and working at KZN CN campuses. They were involved in nurses' training and all had an additional qualification in nursing education. Vice principals and heads of department were included in this study; although they are involved in administrative duties they also teach. Tutorial room educators plus clinical facilitators were included because they were all involved in the training of nursing students. The sum of nurse educators from the ten campuses was 278.

3.5 Sampling

A sample is a subset of population elements, which is the basic unit about which data are collected (Brink, van der Walt and van Rensburg 2012: 133). Sampling is the procedure of choosing individuals to stand for the total group of people so that interpretations about the people can be created (Polit and Beck 2012: 275).

A purposive, non-probability sampling was therefore used as the nurse educators and clinical facilitators were expert about the matter under investigation (Polit and Beck 2012: 279). A minimum sample size of 162 was required; a confidence interval of 95% was set with a 5% margin of error. The researcher included all nurse educators who were keen to take part in the investigation and in order to evaluate their readiness to adopt technology-based education.

3.6 Inclusion criteria

The study included lecturers who were actively participating in training of nursing students either in lecture room or clinical situation such as campus vice principals, heads of departments and clinical facilitators. All had an extra qualification in health services education and were registered with the South African Nursing Council.

3.7 Exclusion criteria

Lecturers who were not actively participating in training of nursing students such as campus principals were excluded from the study.

3.8 Data collection instrument

Data collection instruments are study instruments or tools used to collect data from respondents in a study (Brink, van der Walt and van Rensburg 2012: 165). In this study the investigator formally requested permission to use the Technology Acceptance Model (TAM) scales Perceived Usefulness, Perceived Ease of Use developed by Dr Fred Davis in 1989, and the attitude scale developed by Davis, Mishra and Panda in 2007 (Appendix 17). The instrument had already been tested and validated by a statistician. The questionnaire has seven sections:

1. Section A – demographic details,
2. Section B – Perceived Usefulness,
3. Section C – Perceived Ease of Use,
4. Section D – Attitude Towards e-Learning
5. Section E – Behavioural Intention to Use,
6. Section F – Availability of Resources,
7. Section G – Facilitating Conditions.

Section B to G used closed-ended questions measured by a seven-point Likert scale with statements which were rated by participants as follows: strongly disagree, moderate disagree, slightly disagree, neutral, slightly agree, moderately agree, strongly agree.

Davis (1989: 320) defined perceived usefulness as the level at which an individual is convinced that working with a specific system would develop his or her job execution. Perceived ease of use is the level at which an individual is convinced that working with a specific system would need less effort (freedom from difficulty). Kim, Chun and Song (2009: 4) define perceived usefulness as the operator's personal likelihood that working with a particular technology would develop his or her job execution inside an institution. Perceived ease of use is an operator's judgement that the system would be unproblematic to work with since it needs less energy. Attitude towards a behaviour is explained as a person's optimistic or pessimistic assessment of execution the behaviour, and it can be either bad or good (Kim, Chung and Song 2009: 7).

3.9 Validity and reliability

Instrument validity seeks to ascertain whether an instrument accurately measures what it is supposed to measure (Brink, van der Walt and van Rensburg 2012: 167). Reliability is a level of regularity or trustworthiness at which a tool rates a quality (Polit and Beck 2012: 741). The usefulness and ease of use tool was discovered to be valid. Convergent validity indicates that each item included in a tool performed as if they are rating a general fundamental concept. For perceived usefulness 90% monotrait-heteromethod correlations were all significant at the 0.05 level and 96% of the monotrait-heteromethod associations were significant for ease of use (Davis 2010: 327). Discriminant validity is about the capability of an instrumental item to distinguish among things being weighed. The usefulness and ease of use instruments maintained a great presentation of excellent alteration and were not obviously designed by methodological descriptions. Factorial validity was interested on the usefulness and ease of use items from diverse concepts. The multitrait-multimethod analysis and factor analysis both support the construct validity (Davis 2010: 328). In respect of reliability it was found to have a Cronbach Alpha reliability of 0.97 for usefulness and 0.91 for ease of use which show good reliability (Davis 2010: 327). Faculty attitude towards electronic learning measure has a consistency measurement of 0.88 which is excellent (Davis, Mishra and Panda 2007: 31). The outcome of the dependability assessments suggested a great standard of tool validity (Kim, Chun and Song 2009: 16). The other aspects of instrument validity are discussed below.

3.10 Construct validity

Construct validity denotes either the tool really determines the theoretic concept it implies to gauge or scrutinizes the connection among theoretical and functional meaning of items (Grove et al. 2013: 200). An investigator adopted construct validity by making sure that the population and sample were nurse educators working at a college of nursing within KZN. A validated instrument was used which the researcher had permission to use and there was no need to test the construct validity.

3.11 Data collection

Data collection is the gathering of information to address the research problem (Polit and Beck 2012: 725). A research design is a prearrangement of reasonable stages chosen by an investigator to respond to an investigation question (Brink, van der Walt and van Rensburg 2012: 96). The research design denotes to the general plan that the researcher will select to incorporate the diverse parts of an investigation in a clear and an orderly style, and to ensure that the study will successfully deal with the research problem (Brink, van der Walt and van Rensburg 2012: 13). The questionnaires were hand delivered to all respondents at the selected campuses by the researcher. The researcher made appointments with the campus principals. The researcher was presented to the participants by the head of an institution. The letter of an information (Appendix 16) was distributed to all participants by an investigator asking for their contribution to the study. The aim and the significance of the study was clarified to all participants and the means in which confidentiality would be safeguarded. Contribution to the study was according to the participant's will, and those who had eagerness to contribute put their signatures on the consent forms. The questionnaires (Appendix 18) were circulated by an investigator during tea breaks and lunch time to ensure that there was no disruption of office hours. The finished questionnaires were placed in an entitled closed container reserved in the office of the head of an institution. An investigator collected finished questionnaires before an end of fourteen days. The data was collected from the natural (a staff board room) during tea breaks and lunch time to avoid disturbance of duties.

3.12 Pre-testing of the instrument

A pilot study is a preliminary version or experimental run aimed to check the procedures to be applied in a bigger investigation would be successful (Polit and Beck 2012: 195). The purpose of the pilot study was to identify potential errors in the methodology of the planned study. Challenges with the instrument could be recognized and corrected (Brink, van der Walt and van Rensburg 2012: 174)

The researcher piloted the questionnaire on 10 nurse educators from the excluded campus where the researcher is working (Ngwelezana). Questionnaires were given to them to respond with the aim of assessing the strength of an instrument. Readability test were performed and the Flesch reading ease score was 45.1 and

the Flesch-Kincaid Grade level was 9.4. These scores indicated that the target respondents easily understood the questionnaire so there was no need to change the questions. The researcher identified the period spent to finish the questionnaire and any reasons to change or rephrase the questions. The pre-testing of the instrument evaluated the appropriateness and quality of the instrument and identified the confounding variables that needed to be controlled (Polit and Beck 2012: 195). There were no changes made to the questionnaire according to the feedback from the pilot study. The participants who participated in the pilot study were excluded from the main study.

3.13 Data analysis

Data analysis involves categorising, gathering, controlling and summarising information and relating them in communicative terminologies (Brink, van der Walt and van Rensburg 2012: 177). Descriptive statistics organised and summarised the numerical data obtained from respondents (Brink, van der Walt and van Rensburg 2012: 211). Inferential statistics were involved with the features of the population and used sample statistics to generate an inference about the population (Brink, van der Walt and van Rensburg 2012: 213). Once the researcher had succeeded in getting the respondents to answer the questionnaires, the researcher analysed and interpreted the collected data from the respondents. This information was analysed by means of the latest version of SPSS. In this study both descriptive and inferential statistics were used to provide meaning to the information gathered. The statistical analysis included but was not limited to frequencies, measures of central tendency and variability and measures of association, t-test and/ or ANOVA, Pearson's correlation analysis as well as regression analysis. The significance was $p = 0.005$.

3.14 Limitations of the study

- The study concentrated on the readiness of nurse trainers to adopt technology-based education and the readiness of student nurses was not examined.
- The lack of current literature from South Africa especially in nursing profession was among limitation of this study. Most of the literature extracted was from high income countries.

- The study used a quantitative approach and the qualitative approach was not explored which could have strengthened the findings.

3.15 Ethical issues

The researcher obtained prior approval from the Durban University of Technology (DUT) and succeeded to get an ethical-clearance from the Institutional Research Ethics Committee (IREC) before beginning with the research (Appendix 1). Permission was requested from the Principal of the KZNCN (Appendix 3) and campus principals (Appendices 6 to 15). The basic ethical standards that influence investigators throughout an investigation procedure are respect for an individual, prevention of harm and fairness. The basic ethical principles were followed to ensure safety practices throughout the research process. These basic ethical principles were the right to free will, secrecy, namelessness and privacy, impartial conduct and being safe (Brink, van der Walt and van Rensburg 2012: 34).

The researcher used a letter of information to clarify the research procedure to the participants and their signatures were endorsed on the consent form. Contribution to the study was according to their will and participants had a right to discontinue with research process at any stage without any punishment. The participants' names were not written on the questionnaires to guarantee their privacy and anonymity. Hard copies were stored under locked-up container for five years and then be cut into shreds. Soft copies will be saved in a password secured computer and will afterward be erased after a period of five years agreeing to a DUT policy.

3.16 Conclusion

This descriptive survey was conducted among nurse educators on 10 of the KZNCN campuses. Data was collected using validated questionnaires and was analysed using the latest version of SPSS. The descriptive and inferential data were computed and reported in order to understand KZNCN lecturers' preparedness to implement technology-centred training.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 Introduction

The former chapter summarised the methodology used in the study. This chapter presents the findings of the study. The aim of this study was to examine the preparedness of lecturers to embrace technology-centred training in a college of nursing within KwaZulu-Natal. Data was collected using a questionnaire (see Appendix 18).

4.2 The questionnaire

The questionnaire used in this study consisted of seven sections:

- Section A collected the demographic data.
- Section B addressed the perceived usefulness of technology-based education.
- Section C addressed the perceived ease of use of technology in technology-based training
- Section D dealt with attitude towards learning.
- Section E addressed behavioural intention.
- Section F addressed availability of resources.
- Section G described facilitating conditions.

4.3 Statistical tests

The following statistical tests were used to analyse data:

- Descriptive statistics including means and standard deviations, where applicable. Frequencies are represented in tables or graphs.
- Regression analysis: Linear regression estimates the coefficients of the linear equation, involving one or more independent variables that best predict the value of the dependent variable.

- ANOVA. A test for several independent samples that compares two or more groups of cases in terms of one variable. Where conditions are not met, Welch is applied.
- Pearson's correlation: Correlations measure how variables or rank orders are related. Pearson's correlation coefficient is a measure of linear association.
- One sample t-test: Tests whether a mean score is significantly different from a scalar value.
- Independent samples t-test: A test that compares two independent groups of cases.

4.4 Sample realisation

The total number of nurse educators was 278, the minimum sample size required was 159 and an additional number of 24 was calculated to make 183 in case of non-response. A sample size of 174 was realised.

4.5 Results

4.5.1 Section A – demographics

4.5.1.1 Gender

Female nurse educators comprised the majority (95.4% $n = 166$) of the respondents in this study while the male nurse educators comprised 4.6% ($n = 8$) of those sampled. There was 100% response rate and the gender comparison is illustrated in Figure 4.1.

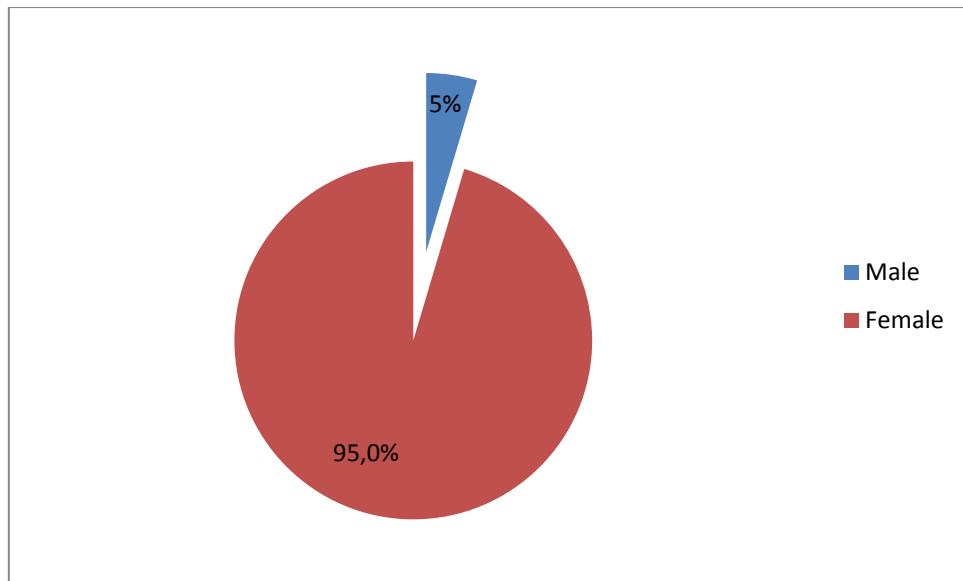


Figure 4.1: Gender

4.5.1.2 Race

Figure 4.2 shows that the sample consisted of different race groups. The majority of respondents were Black (67.2% n = 117), Indians comprised 23% (n = 40), Coloureds 6.3% (n = 11) and Whites 1.7% (n = 3). Two respondents (1%) categorised themselves as other and one was missing (0.6%). See Figure 4.2.

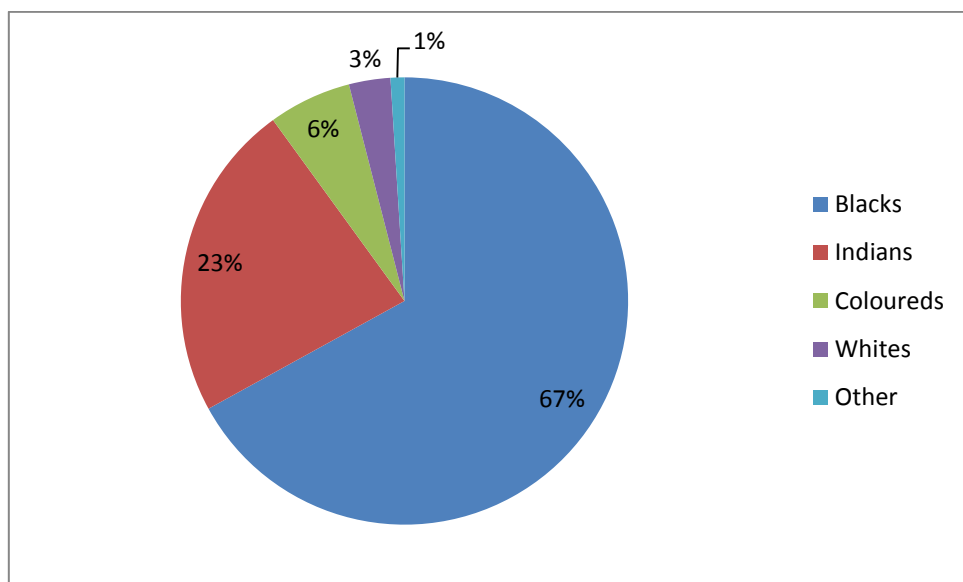


Figure 4.2: Race

4.5.1.3 Job title

Just over three quarters (77.6% n = 135) of the respondents were lecturers, 14.4% (n = 25) Heads of Department, 5.7% (n = 10) Clinical Facilitators and 2.3% (n = 4) Vice Principals. Figure 4.4 illustrates the results.

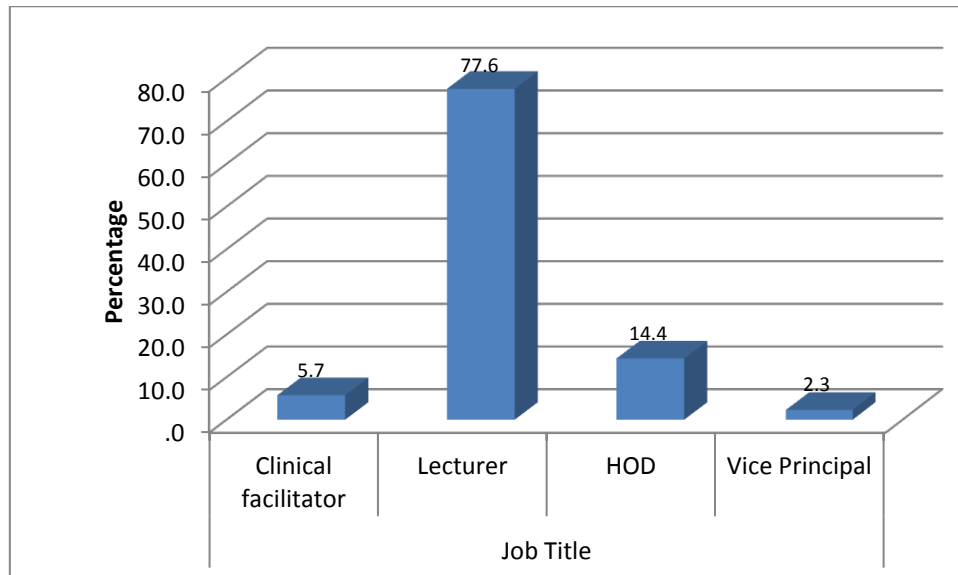


Figure 4.3: Job title

4.5.1.4 Education

Respondents were generally educated at a bachelor's degree level or above with only two (1.1%) reporting having a diploma and one (0.6%) did not answer (Figure 4.4).

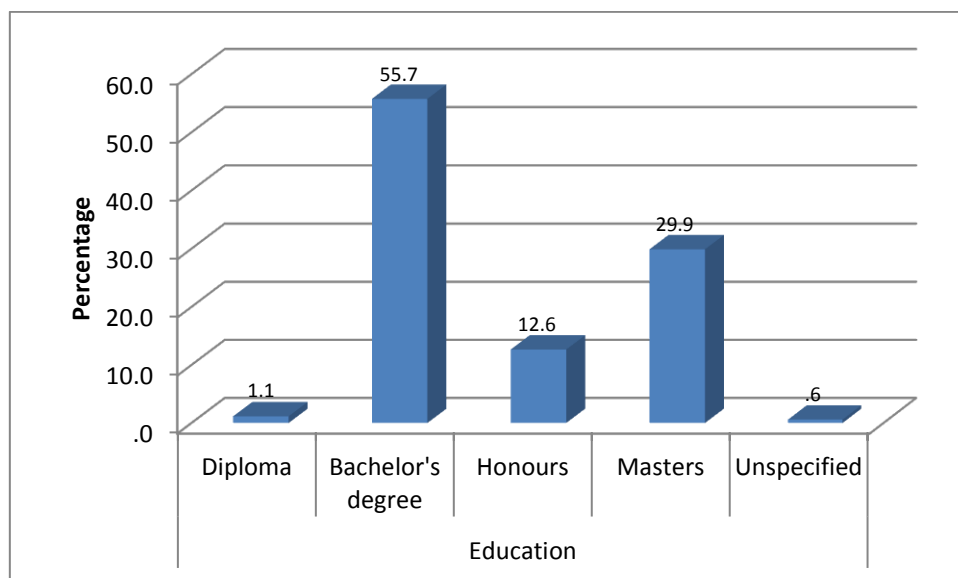


Figure 4.4: Education

4.5.1.5 Experience

The majority of respondents (43.7% n = 76) had more than 13 years of experience, 28.7% (n = 50) had 10 to 13 years, 14.9% (n = 26) 6 to 10 years, 7.5% (n = 13) 3 to 6 years and 4.6% (n = 8) had less than 3 years of experience and 0.6% (n = 1) were missing.

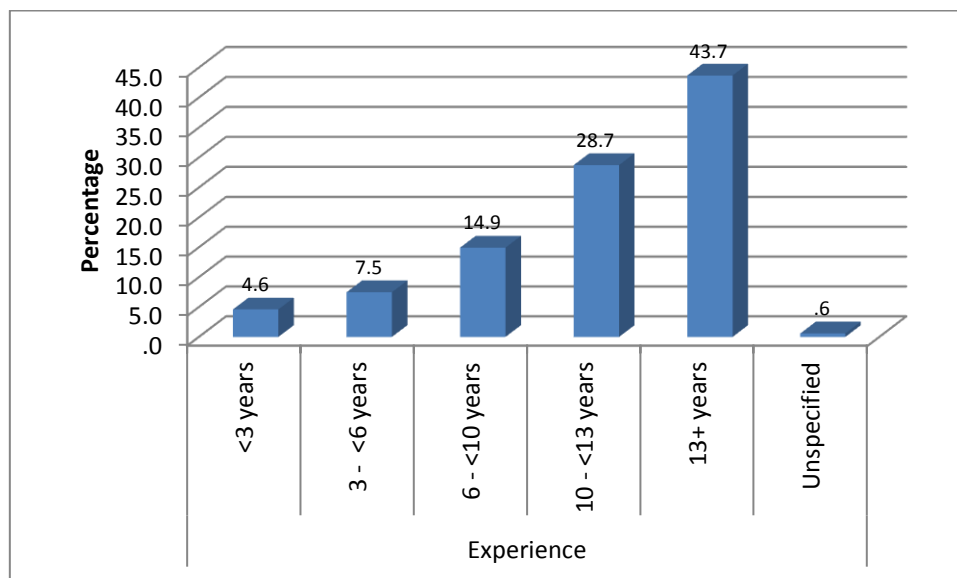


Figure 4.5: Experience

4.5.1.6 Campus

The respondents were from 10 campuses in KwaZulu-Natal, and their distributions were as indicated in Figure 4.6.

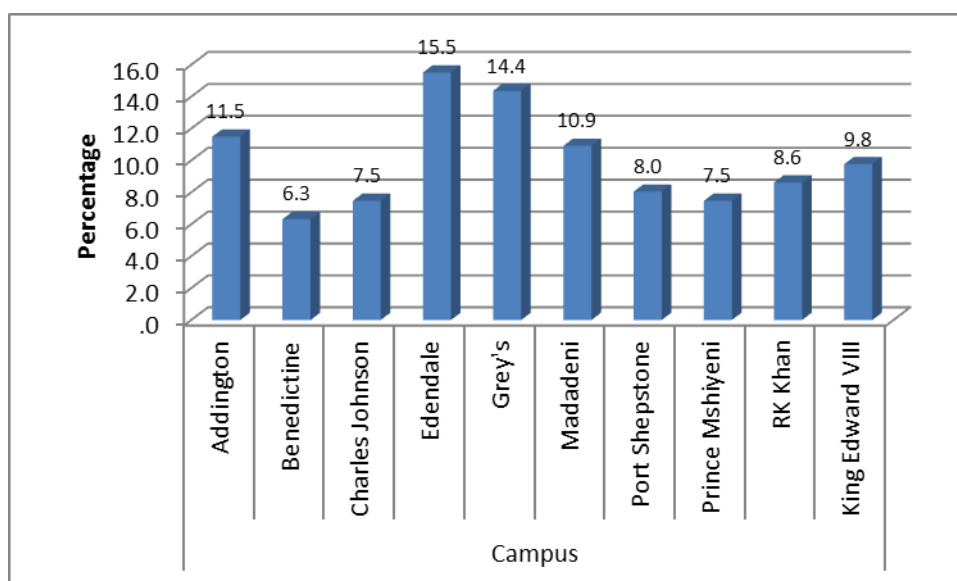


Figure 4.6: Campus

Hereafter the results will be reported as per the research objectives, which were:

1. To identify the enabling and constraining factors influencing nurse educators' readiness to adopt technology-based education in a college of nursing in KZN.
2. To describe nurse educators' attitudes towards technology-based education in a college of nursing in KZN.
3. To identify and determine the availability of resources to facilitate technology-based education in a college of nursing in KZN.

4.5.2 Objective 1: To identify the enabling and constraining factors influencing nurse educators' readiness to adopt technology-based education in a college of nursing in KZN.

In this study, readiness to adopt technology-based education was elicited through the perceived usefulness, perceived ease of use and facilitating conditions sections of the questionnaire.

Table 4.1 shows response frequencies with regard to the perceived usefulness of technology.

Table 4.1: Perceived usefulness of technology

Question	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Total
Using technology in my job enables me to accomplish tasks more quickly	5.2% n=9	0	0	3.4% n=6	4.0% n=7	21.3% n=37	66.1% n=115	100% N=174
Using technology improves my job performance	4.0% n=7	1.7% n=3	1.1% n=2	1.1% n=2	5.2% n=9	16.1% n=28	70.7% n=123	100% N=174
Using technology makes it easier to do my job	3.4% n=6	1.1% n=2	0	0.6% n=1	6.3% n=11	19.0% n=33	69.5% n=121	100% N=174
Using technology enhances my effectiveness on the job	4.0% n=7	0	0.6% n=1	2.3% n=4	4.6% n=8	24.1% n=42	63.8% n=111	100% N=174
Using technology makes it easier to do my job	3.4% n=6	0.6% n=1	1.1% n=2	1.1% n=2	4.0% n=7	22.4% n=39	66.7% N=116	100% N=174
I find technology useful in my job	5.2% n=9	0.6% n=1	1.1% n=2	0.6% n=1	4.0% n=7	13.8% n=24	74.7% n=130	100% N=174

Referring to Figure 4.7, it is evident that there is significant agreement that using technology in a job enables tasks to be accomplished more quickly ($M = 6.29$, $SD = 1.435$), $t(173) = 21.085$, $p < 0.005$; using technology improves job performance ($M = 6.33$, $SD = 1.447$), $t(173) = 21.215$, $p < 0.005$; using technology in my job increases my productivity ($M = 6.40$, $SD = 1.294$), $t(173) = 24.482$, $p < 0.005$; using technology enhances my effectiveness on the job ($M = 6.33$, $SD = 1.321$), $t(172) = 23.191$, $p < 0.005$; using technology makes it easier to do my job ($M = 6.38$, $SD = 1.300$), $t(172) = 24.041$, $p < 0.005$; I find technology useful in my job ($M = 6.38$, $SD = 1.472$), $t(173) = 21.318$, $p < 0.005$.

There is a moderate positive relationship between perceived usefulness and perceived ease of use ($r = 0.427$, $p < 0.005$). This result is in the expected direction.

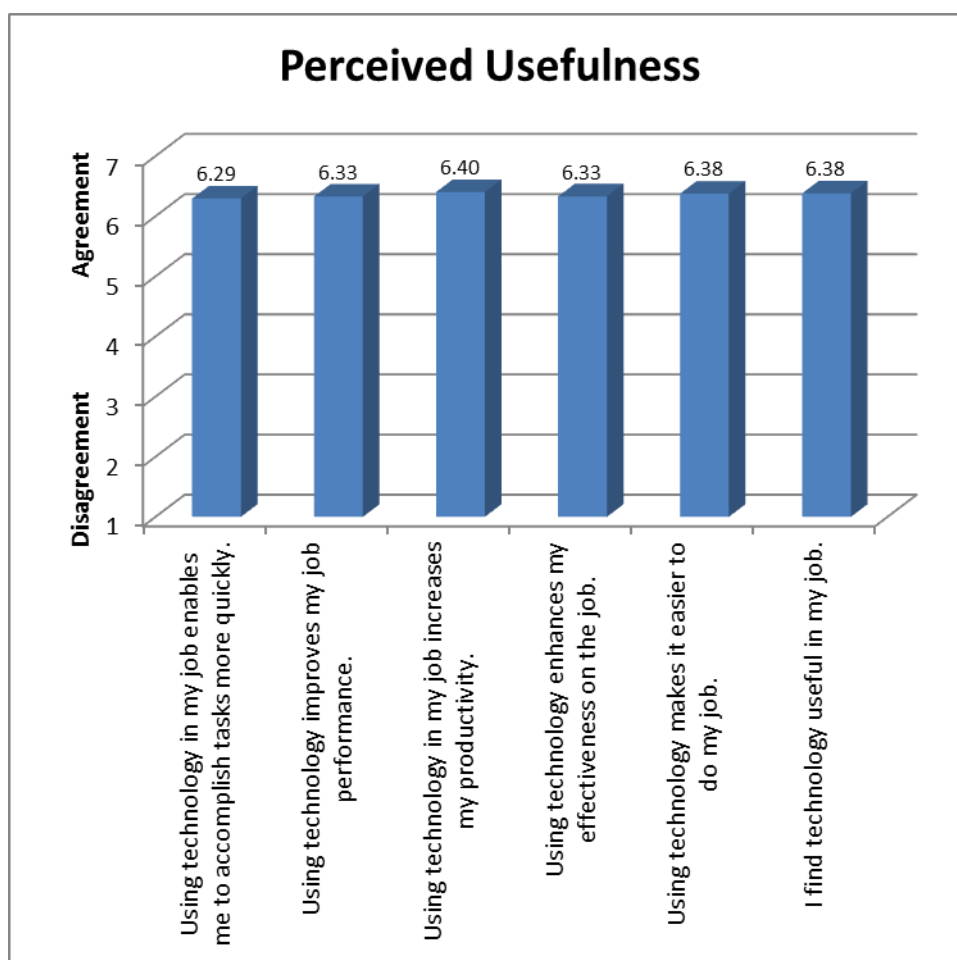


Figure 4.7: Perceived usefulness of technology in my job

Perceived ease of use refers to how easily people are able to use the technology, without any effort (Davis 1989: 320). Table 4.2 displays the frequency with which respondents agreed with various statements about perceived ease of use.

Table 4.2: Perceived ease of use

Question	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Total
Managing technology is easy for me	4.0% n = 7	3.4% n = 6	9.2% N = 16	3.4% n = 6	16.1% n = 28	38.5% n = 67	24.7% n = 43	100% N = 174
I find it easy to get technology to do what I want it to do	8.0% n = 14	8.0% n = 14	6.3% n = 11	16.1% n = 28	34.5% n = 60	23.6% n = 41	98.9% n = 172	100% N = 174
My interaction with electronic learning technology is clear and understandable	7.5% n = 13	7.5% n = 13	5.2% n = 9	4.6% n = 8	17.8% n = 31	33.3% n = 58	23.6% n = 41	100% N = 174

I find technology to be flexible to interact with	4.0% n = 7	6.3% n = 11	2.9% n = 5	2.9% n = 5	16.7% n = 29	33.3% n = 58	32.8% n = 57	100% N = 174
It easy for me to become skilful at using technology	2.3% n = 4	3.4% N = 6	7.5% n = 13	2.3% n = 4	14.9% n = 26	39.7% n = 69	28.2% n = 49	100% N = 174
I find technology easy to use	4.6% N = 8	2.9% n = 5	8.0% n = 14	4.0% n = 7	20.7% n = 36	34.5% n = 60	24.1% n = 42	100% N = 174

Figure 4.8 displays respondents' agreement with the questions related to perceived ease of use. A significant majority of respondents indicated agreement with perceived ease of use. The significance level was set at $p = < 0.005$.

There is significant agreement that managing technology is easy for me ($M = 5.40$, $SD = 1.613$), $t(172) = 11.407$, $p = < 0.005$; I find it easy to get technology to do what I want it to do ($M = 5.17$, $SD = 1.827$), $t(171) = 8.431$, $p = < 0.005$; my interaction with electronic learning technology is clear and understandable ($M = 5.13$, $SD = 1.849$), $t(172) = 8.060$, $p = < 0.005$; I find technology to be flexible to interact with ($M = 5.56$, $SD = 1.655$), $t(171) = 12.347$, $p = < 0.005$; it is easy for me to become skilful at using technology ($M = 5.60$, $SD = 1.489$), $t(170) = 14.071$, $p = < 0.005$; I find technology easy to use ($M = 5.36$, $SD = 1.607$), $t(171) = 11.102$, $p = < 0.005$.

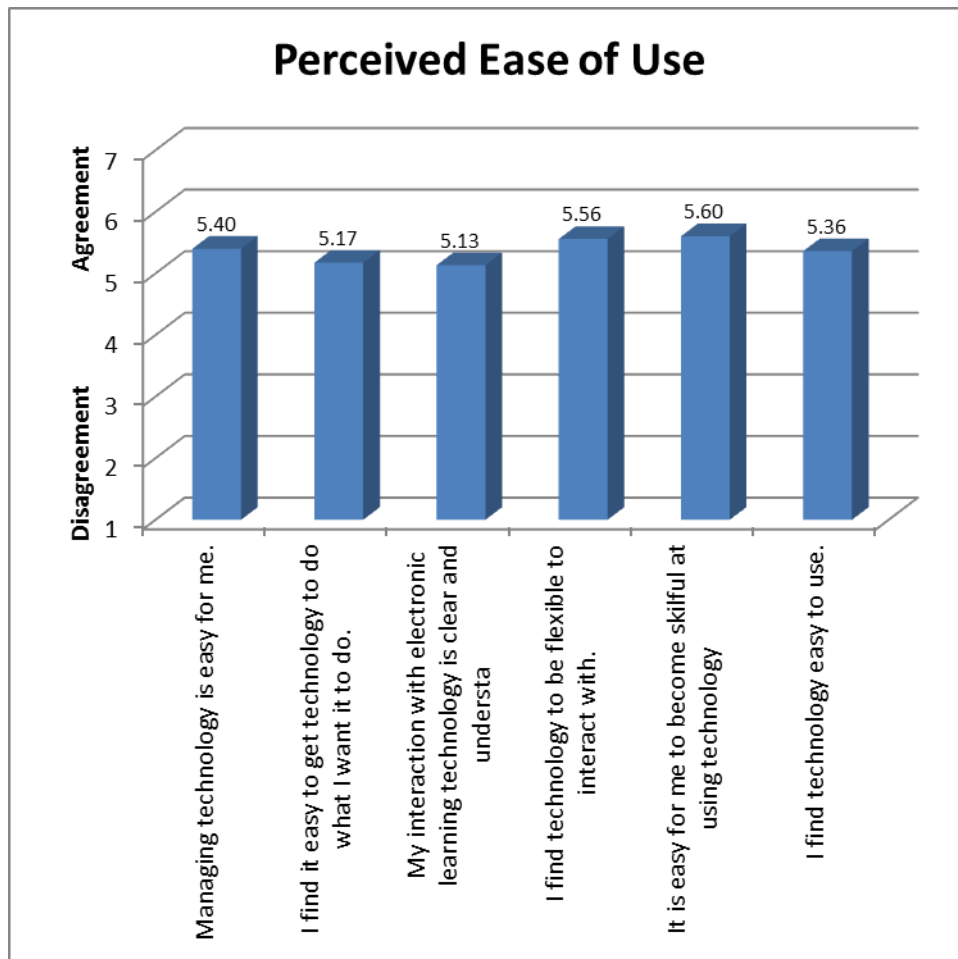


Figure 4.8: Perceived ease of use

There was a moderate positive relationship between perceived usefulness and perceived ease of use ($r = 0.427$, $p = < 0.005$). This result was in the expected direction.

Facilitating conditions were measured with six statements as reflected in Table 4.3.

Table 4.3: Facilitating conditions

Question	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Total
Power outages occur frequently on campus	29.9% n = 52	9.2% n = 16	6.9% n = 12	8.0% n = 14	21.3% n = 37	12.1% n = 21	12.6% n = 22	100% N = 174
In case of power outage, there is a backup system available	43.1% n = 75	7.5% n = 13	7.5% n = 13	6.3% n = 11	8.0% n = 14	10.3% n = 18	16.7% n = 29	100% N = 174
The internet speed is good	32.2% n = 56	9.8% n = 17	11.5% n = 20	4.6% n = 8	7.5% n = 13	19.0% n = 33	15.5% n = 27	100% N = 174
There is an uninterrupted internet connection	42.5% n = 74	8.0% N = 14	10.9% n = 19	5.2% n = 9	6.9% n = 12	16.7% N = 29	9.8% n = 17	100% N = 174

The wireless mobile network is trustworthy.	43.7% n = 76	9.2% n = 16	4.6% n = 8	16.7% n = 29	6.3% n = 11	9.2% n = 16	8.0% N = 14	100% N = 174
The equipment is well maintained and repaired quickly if it breaks down	46.0% n = 80	13.8% n = 24	6.9% n = 12	6.9% n = 12	11.5% n = 20	6.3% n = 11	8.6% n = 15	100% N = 174

Referring to Figure 4.9, it is evident that there was significant disagreement with the statements: in case of power outage, there is a backup system available ($M = 3.27$, $SD = 2.404$), $t(172) = -4.017$, $p = < 0.005$; the internet speed is good ($M = 3.64$, $SD = 2.353$), $t(173) = -1.997$, $p = 0.047$; there is an uninterrupted internet connection ($M = 3.15$, $SD = 2.276$), $t(173) = -4.930$, $p = < 0.005$; the wireless mobile network is trustworthy ($M = 2.92$, $SD = 2.121$), $t(169) = -6.619$, $p = < 0.005$; equipment is well maintained and repaired quickly if it breaks down ($M = 2.78$, $SD = 2.105$), $t(173) = -7.673$, $p = < 0.005$.

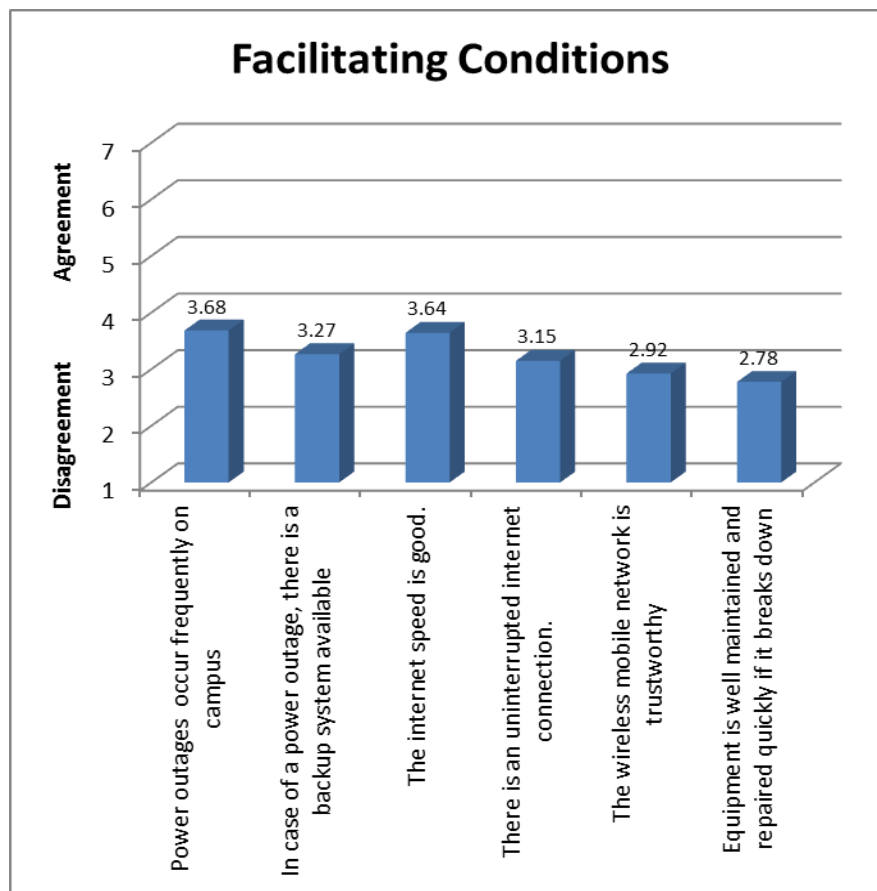


Figure 4.9: Facilitating conditions

Facilitating conditions had a weak positive relationship with perceived usefulness ($r = 0.160$) and perceived ease of use ($r = 0.274$).

4.5.3 Objective 2 To describe nurse educator's attitude towards technology-based education in a college of nursing in KZN

Attitude and intention to use.

Section D addresses attitude and Section E addresses behavioural intention to use. Regarding attitude, there was significant agreement among respondents on statements 1 to 12 and significant disagreement with statements 14 to 16 (Table 4.4).

Table 4.4: Attitude

Question	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Total
1. e-Learning can solve many of our educational problems	1.7% n = 3	0.6% n = 1	1.1% N = 2	8.0% n = 14	12.1% n = 21	29.9% n = 52	46.6% n = 81	100% N = 174
2. e-Learning will bring new opportunities for organising teaching and learning	1.1% n = 2	0.6% n = 1	0.6% n = 1	5.7% n = 10	9.8% n = 17	26.4% n = 46	55.7% n = 97	100% N = 174
3. e-Learning saves time and effort for both teachers and students	2.9% n = 5	0.6% n = 1	0	6.9% n = 12	8.0% n = 14	24.1% n = 42	57.5% n = 100	100% N = 174
4. e-Learning increases access to education and training	1.1% n = 2	1.1% n = 2	0	5.2% n = 9	4.6% n = 8	20.7% n = 36	67.2% n = 117	100% N = 174
5. e-Learning will increase my efficiency in teaching	0.6% n = 1	1.7% n = 3	0	6.9% n = 12	11.5% n = 20	23.6% n = 41	55.7% n = 97	100% N = 174
6. e-Learning enables collaborative learning	1.1% n = 2	0.6% n = 1	1.7% n = 3	8.0% n = 14	7.5% n = 13	25.9% n = 45	54.6% n = 95	100% N = 174
7. e-Learning can engage learners more than other forms of learning	0.6% n = 1	1.1% n = 2	1.7% n = 3	8.0% n = 14	9.8% n = 17	31.0% n = 54	47.7% n = 83	100% N = 174

Question	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Total
8. e-Learning increases the quality of teaching and learning because it integrates all forms of media, print, audio, video, and animation	1.1% n = 2	0.6% n = 1	1.1% n = 2	5.2% n = 9	6.3% n = 11	23.6% n = 41	62.1% n = 108	100% N = 174
9. e-Learning increases the flexibility of teaching and learning	1.1% n = 2	1.1% n = 2	1.1% n = 2	6.9% n = 12	5.7% n = 10	26.4% n = 46	57.5% n = 100	100% N = 174
10. e-Learning improves communication between students and teachers	1.7% n = 3	1.1% n = 2	4.0% n = 7	6.3% n = 11	10.3% n = 18	25.9% n = 45	50.6% n = 88	100% N = 174
11. e-Learning enhances the pedagogic value of a course	1.1% n = 2	1.1% n = 2	2.3% n = 4	11.5% n = 20	9.8% n = 17	31.6% n = 55	42.0% n = 73	100% N = 174
12. Universities should adopt more and more e-learning for their students	1.7% n = 3	1.1% n = 2	0.6% n = 1	7.5% n = 13	7.5% n = 13	19.5% n = 34	61.5% n = 107	100% N = 174
13. e-Learning makes me uncomfortable because I do not understand it	30.5% n = 53	5.7% n = 10	5.7% n = 10	8.6% n = 15	18.4% n = 32	16.7% n = 29	14.4% n = 25	100% N = 174
14. e-Learning is a dehumanising process of learning; I feel intimidated by e-learning	43.1% n = 75	8.0% n = 14	8.0% n = 14	11.5% n = 20	12.1% n = 21	9.2% n = 16	8.0% n = 14	100% N = 174
15. I get a sinking feeling when I think of trying to use e-learning	39.7% n = 69	8.6% n = 15	6.9% n = 12	10.9% n = 19	13.2% n = 23	12.6% n = 22	8.0% n = 14	100% N = 174
16. e-Learning is not effective for student learning	48.9% n = 85	8.0% n = 14	8.0% n = 14	13.2% n = 23	6.3% n = 11	6.3% n = 11	9.2% n = 16	100% N = 174

There was a significant agreement among respondents that e-learning can solve many of their educational problems ($M = 6.04$, $SD = 1.242$), $t(173) = 21.675$, $p < 0.0005$; e-learning will bring new opportunities for organising teaching and learning ($M = 6.25$, $SD = 1.124$), $t(173) = 26.383$, $p < 0.0005$; e-learning saves time and effort for both teachers and students ($M = 6.19$, $SD = 1.310$), $t(173) = 22.054$, $p < 0.0005$; e-learning increases access to education and training ($M = 6.42$, $SD =$

1.108), $t(173) = 28.806$, $p < 0.0005$; e-learning will increase my efficiency in teaching ($M = 6.21$, $SD = 1.154$), $t(173) = 25.217$, $p < 0.0005$; e-learning enables collaborative learning ($M = 6.18$, $SD = 1.209$), $t(172) = 23.706$, $p < 0.0005$; e-learning can engage learners more than other forms of learning ($M = 6.09$, $SD = 1.174$), $t(173) = 23.501$, $p < 0.0005$; e-learning increases the quality of teaching and learning because it integrates all forms of media; print, audio, video and animation ($M = 6.34$, $SD = 1.125$), $t(173) = 27.424$, $p < 0.0005$; e-learning increases the flexibility of teaching and learning ($M = 6.24$, $SD = 1.197$), $t(173) = 24.701$, $p < 0.0005$; e-learning improves communication between students and teachers ($M = 6.02$, $SD = 1.360$), $t(173) = 19.624$, $p < 0.0005$; e-learning enhances the pedagogic value of a course ($M = 5.92$, $SD = 1.291$), $t(172) = 19.545$, $p < 0.0005$; universities should adopt more and more e-learning for their students ($M = 6.24$, $SD = 1.271$), $t(172) = 23.212$, $p < 0.0005$.

The respondents significantly disagreed with the following statements: e-learning is a dehumanising process of learning; I feel intimidated by e-learning ($M = 3.01$, $SD = 2.131$), $t(173) = -6.117$, $p < 0.0005$; I get a sinking feeling when I think of trying to use e-learning for my course ($M = 3.20$, $SD = 2.174$), $t(173) = -4.883$, $p < 0.0005$ and e-learning is not effective for student learning ($M = 2.76$, $SD = 2.104$), $t(173) = -7.783$, $p < 0.0005$.

An independent samples t-test was conducted to test for any significant difference between gender and attitude. There were no significant differences found between gender and attitude, and gender and behavioural intention to use technology-based education.

Respondents with 3,6 years' experience show significant more agreement to use technology-based education than all other years of experience categories ($M = 6.9167$, $SD = 0.15076$). Respondents from Port Shepstone campus reported a more positive attitude towards the use of technology-based education, Welch (9, 57.674) = 2.733, $p = 0.010$.

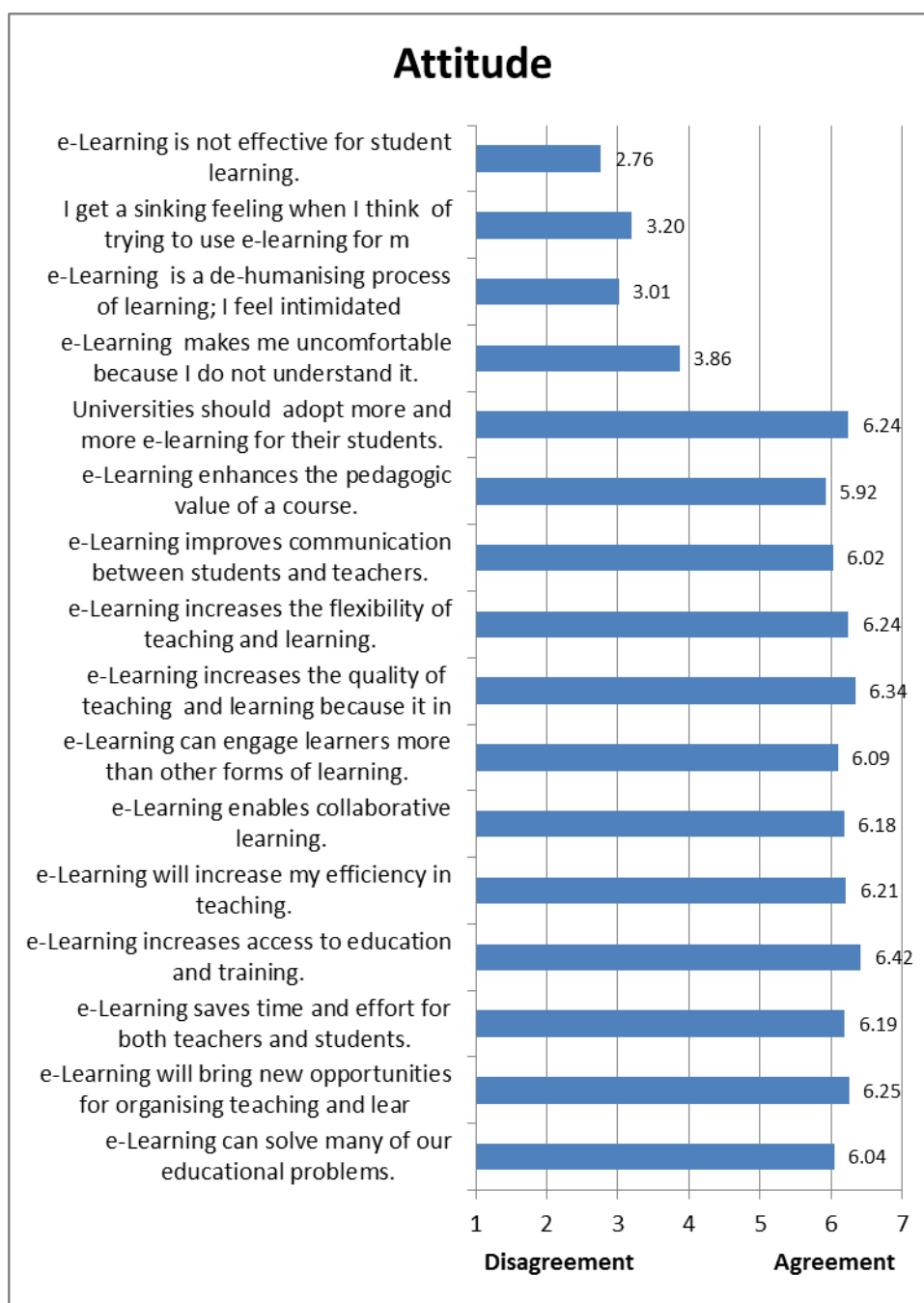


Figure 4.10: Attitude

The respondents generally displayed a positive attitude towards the use of technology-based education in a college of nursing within KwaZulu-Natal.

Respondents indicated a strong behavioural intention to use technology-based education see (Table 4.5).

Table 4.5: Behavioural intention to use

Question	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Total
Providing I have access to electronic learning I INTEND to use it	6.3% n = 11	0	1.1% n = 2	2.9% n = 5	6.3% n = 11	11.5% n = 20	71.8% n = 125	100% N = 174
Providing I have access to electronic learning I PREDICT I will use it	6.3% n = 11	0.6% n = 1	0.6% n = 1	4.6% n = 8	4.6% n = 8	13.8% n = 24	69.5% n = 121	100% N = 174
In future, I plan to use electronic learning MORE often	1.7% n = 3	0.6% n = 1	0	5.2% n = 9	4.0% n = 7	18.4% n = 32	70.1% n = 122	100% N = 174

There was a significant agreement among respondents to the statements *providing I have access to electronic learning I INTEND to use it* ($M = 6.25$, $SD = 1.592$), $t(173) = 18.621$, $p < 0.0005$; *providing I have access to electronic learning I PREDICT I will use it* ($M = 6.20$, $SD = 1.620$), $t(173) = 17.924$, $p < 0.0005$; and to the statement *in the future I plan to use electronic learning MORE often* ($M = 6.45$, $SD = 1.130$), $t(173) = 28.571$, $p < 0.005$.

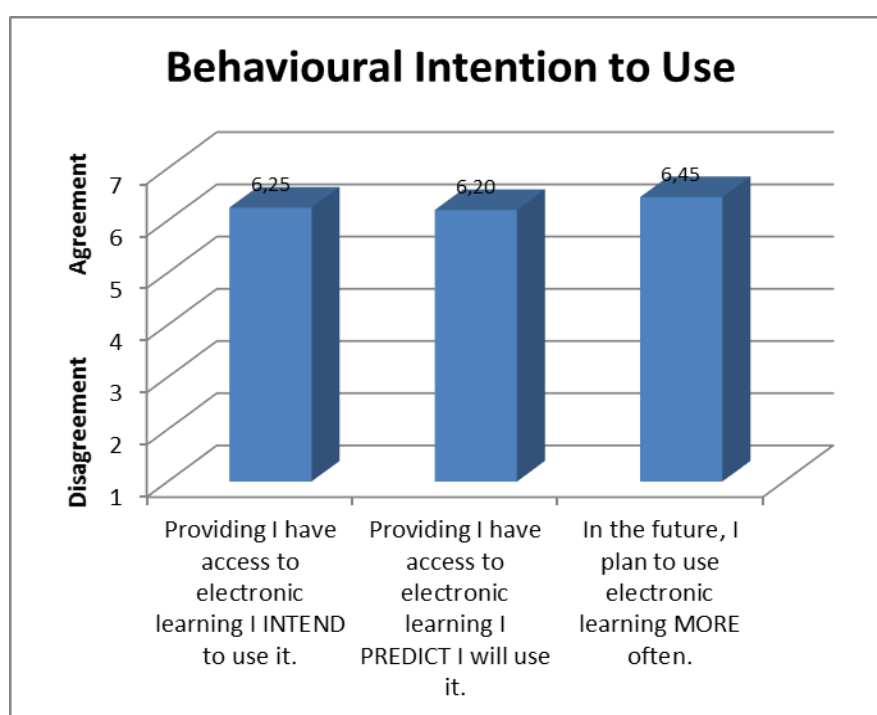


Figure 4.11: Behavioural intention to use

An Anova was conducted to test for any significant differences across various demographic variables and attitudes and behavioural intention to use, no significant

differences were measured across race. However, there was a significant difference in behavioural intention to use technology-based education across categories of job, Welch (3, 13.361) = 6.034, $p = 0.008$. Clinical facilitators ($M = 6.875$) agree significantly more than lecturers ($M = 6.394$) that they intend to use technology-based education.

There was a weak positive relationship ($r = 0.272$, $p = < 0.005$) between attitude and behavioural intention to use.

Perceived usefulness, perceived ease of use and available resources accounted for 19.9% ($R^2 = 0.199$) of the variation in attitude, $F(3, 166) = 13.735$, $p = < 0.005$.

4.5.4 Objective 3 To identify and determine the availability of resources to facilitate technology-based education in a college of nursing in KZN

Section F of the questionnaire addressed the availability of resources, and the analysis shown in Table 4.6 and Figure 4.12.

Table 4.6: Availability of resources

Question	Strongly disagree	Moderately disagree	Slightly disagree	Neutral	Slightly agree	Moderately agree	Strongly agree	Total
I have access to reliable computer technology	20.7% n = 36	4.0% n = 7	3.4% n = 6	4.0% n = 7	16.1% n = 28	17.2% n = 30	33.9% n = 59	100% N = 174
Technical support is available if I need it	25.3% n = 44	4.6% n = 8	7.5% n = 13	4.6% n = 8	17.2% n = 30	19.0% n = 33	21.3% n = 37	100% N = 174
I have adequate knowledge of computer technology	9.8% n = 17	6.3% n = 11	9.8% n = 17	5.2% n = 9	17.8% n = 31	30.5% n = 53	20.1% n = 35	100% N = 174
Access to internet is readily available	31.6% n = 55	4.6% n = 8	5.2% n = 9	4.0% n = 7	8.6% n = 15	12.1% n = 21	33.9% N = 59	100% N = 174
I have adequate knowledge of how to set up computer technology in classroom	16.7% n = 29	4.6% n = 8	5.7% n = 10	4.6% n = 8	23.0% n = 40	20.7% n = 36	24.7% n = 43	100% N = 174
Computer technology skills development training is available	44.8% n = 78	6.3% n = 11	6.3% n = 11	8.0% N = 14	14.9% n = 26	9.8% n = 17	9.8% n = 17	100% N = 174

There was significant agreement among respondents to the statements: *I have access to reliable computer technology* ($M = 4.79$, $SD = 2.323$), $t(172) = 4.483$, $p < 0.0005$; *I have adequate knowledge of computer technology* ($M = 4.88$, $SD = 1.927$), $t(172) = 5.998$, $p < 0.0005$; *I have adequate knowledge on how to set up computer technology in the classroom* ($M = 4.74$, $SD = 2.123$), $t(173) = 4.570$, $p < 0.0005$; *computer technology skills development training is available* ($M = 3.10$, $SD = 2.235$), $t(173) = -5.292$, $p < 0.0005$.

Nearly 45% of respondents (44.8% $n = 78$) strongly disagreed with the statement *computer technology skills development training is available* and 25.3% ($n = 44$) strongly disagreed with the statement *technical support is available if I need it*.

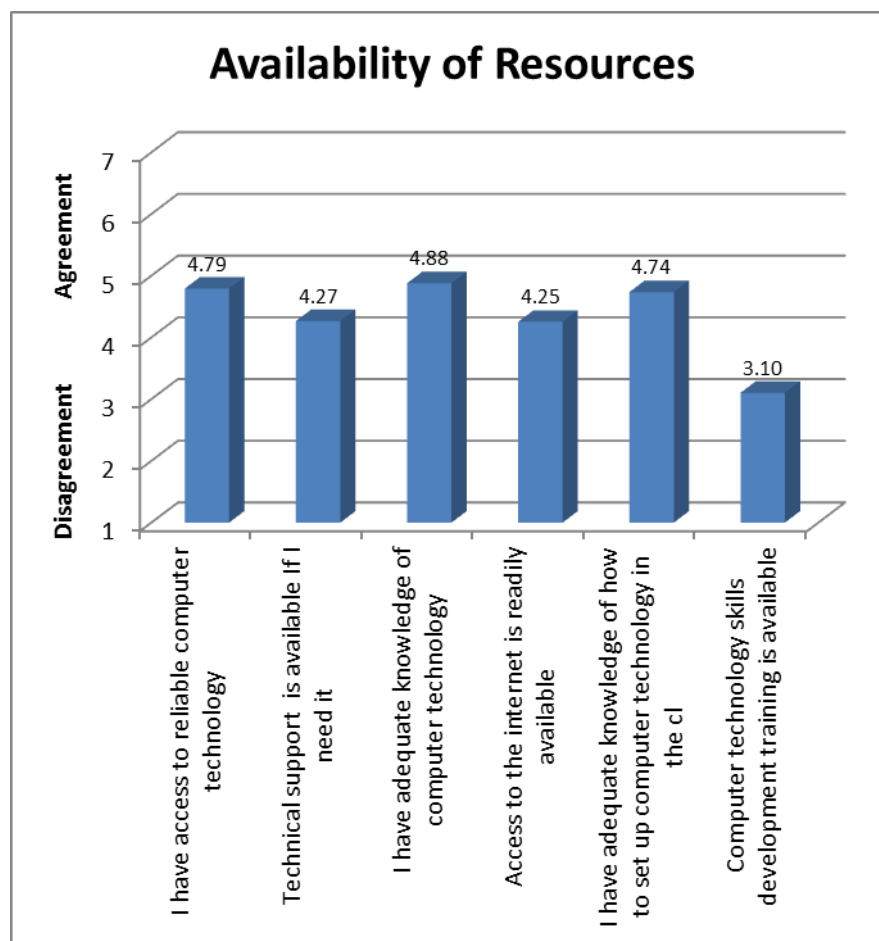


Figure 4.12: Availability of resources

There was a strong positive relationship between facilitating conditions and availability of resources ($r = 0.637$). Higher scores on facilitating conditions were significantly associated with higher scores on availability of resources, which one

would expect, if resources are available then respondents would agree that conditions facilitate the use of technology-based education.

There is a moderate positive relationship between the availability of resources and perceived ease of use.

Availability of resources has no relationship with attitude ($r = 0.041$) and this is supported in the ANOVA results ($b = 0.085$).

4.5.5 Summary of reliability statistics

The reliability of an instrument is the consistency and accuracy with which it measures the target attributes (Polit and Beck, 2012: 331). The agreement or disagreement to the constructs as a whole were as follows:

- Perceived usefulness ($M = 6.3492$, SD Deviation = 1.26539, SD error of mean = 0.09593), $t = 174$;
- Perceived ease of use ($M = 5.3671$, SD Deviation = 1.45714, SD error of mean = 0.11078), $t = 173$;
- Attitude ($M = 6.1794$, SD Deviation = 1.05251, SD Error of mean = 0.07979), $t = 174$;
- Behavioural intention ($M = 6.2989$, SD deviation = 1.22648, SD error of mean = 0.09298), $t = 174$;
- Availability of resources ($M = 4.3331$, SD deviation = 1.65311, SD error of mean = 0.12532), $t = 174$;
- Facilitating conditions ($M = 3.1575$, SD Deviation = 1.67525, SD error of mean = 0.12700), $t = 174$.
- One sample t-test was applied to test for significant agreement or disagreement to the construct as a whole (Table 4.7).

Table 4.7: Agreement or disagreement with the constructs as a whole

	N	Mean	Std Deviation	Std Error of the Mean
Perceived usefulness	174	6.3492	1.26539	.09593
Perceived ease of use	173	5.3671	1.45714	.11078
Attitude	174	6.1794	1.05251	.07979
Behavioural intention to use	174	6.2989	1.22648	.09298

Availability of resources	174	4.3331	1.65311	.12532
Facilitating conditions	174	3.1575	1.67525	.12700

As can be seen from Table 4.7, there was a significant agreement on the perceived usefulness, perceived ease of use, attitude, behavioural intention to use and availability of resources. There was a significant disagreement on facilitating conditions.

4.6 Conclusion

This study shows that nurse educators are ready to adopt technology-based education, and that they displayed eagerness to use technology. The majority of respondents strongly agreed with all the items in the perceived usefulness, perceived ease of use, attitude and behavioural intention to use. However, KZNCN has to embrace their readiness by improving the facilitating conditions and availability of resources.

CHAPTER 5: DISCUSSION

5.1 Introduction

The preceding chapter was presenting and discussing the results of the findings. The purposefulness of this study was to determine the readiness of nurse educators to adopt technology-based education within a college of nursing in KwaZulu-Natal. In this chapter, discussion, conclusion and recommendations based on the findings will be presented. In this chapter the findings of the study will be discussed in relation to the Technology Acceptance Model.

5.2 Demographics

The researcher identified participants who were all actively involved in teaching of student nurses. The majority of respondents in this study were Black females, working as lecturers in urban campuses who had a Bachelor's degree and more than thirteen years of experience. Clinical facilitators intend to use technology more than lecturers. Respondents with between 3 and 6 years' experience had more agreement to use technology. All respondents were positively inclined to using technology although there was some regional variation. Nurse educators are ready to use technology in their teaching.

5.3 Interpretation of the research findings

The TAM model comprised the following six constructs: External Variables (EV), Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude towards using (ATU), Behavioural Intention to Use (BIU) and Available Resources (AR) Figure 5.1.

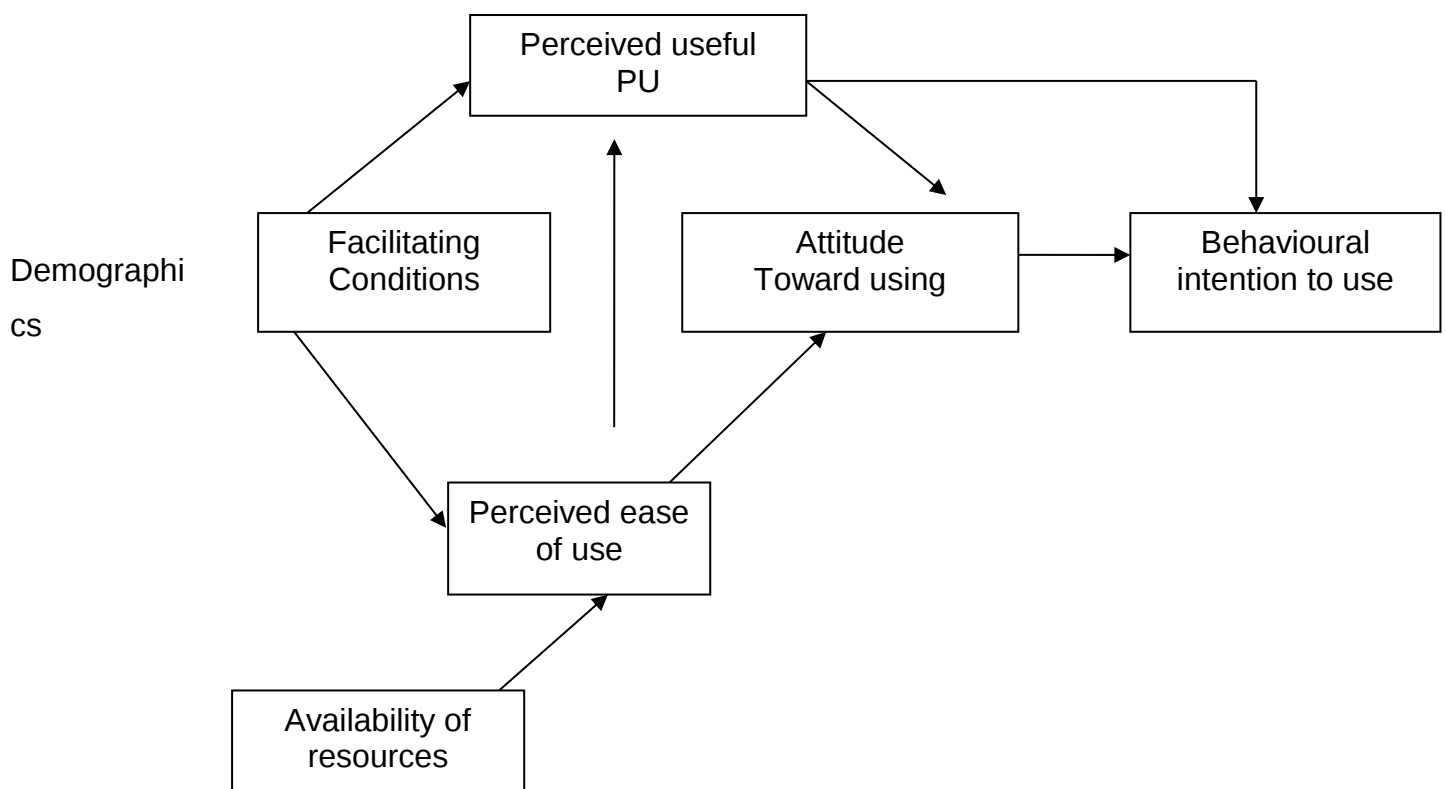


Figure 5.1: The Technology Acceptance Model

5.3.1 External variables (EV)

In this study, the external variables refer to the facilitating conditions of technology-based education. There was significant disagreement from respondents across the six facilitating conditions. These facilitating conditions are: availability of back-up system in case of power outages, good internet speed, uninterrupted internet connection, trustworthiness of wireless mobile network, and maintenance and quickly repairing of equipment if it breaks down.

Respondents did not experience frequent power outages on campus which is a positive finding as the WHO (2010: 1) reported that the poor infrastructure such as unstable power supplies contribute to the readiness of technology-based education. High income countries have better infrastructure compared to lower income countries (Wallace 2015: 361). However, respondents generally reported no back-up system in case of a power outage. The respondents generally agreed that the wireless network was not trustworthy, that the internet connection was interrupted and that the speed was not good. Hlagala (2015: 36) confirmed that unstable power

supplies, lack of technical support, poor electric power back-up system, untrustworthy wireless network and interrupted internet connection are the major factors that obstruct readiness for technology-based education.

The majority of respondents strongly disagreed regarding the availability of backup systems, in case of power outage. Lack of support service is the major concern for the technology-based education (Mapotse 2014:8). Perceived usefulness and perceived ease of use are influenced by external variables. Technical support to student and nurse educators should be facilitated and college information and electronic content should be secured at all times (Contreras and Hilles, 2015: 58). Gunther and Stephens (2016: 23) emphasised that efforts should be made to enhance accessibility to reliable and fast internet connectivity and other information communication technologies for learning and research purposes.

Most respondents indicated that internet speed was not good. The deprived wireless technology base, leads to little internet bandwidth and restriction to achieve the resource rich learning content such as YouTube videos, copying or uploading of huge documents (Challa, 2013: 5).

Most respondents mentioned that there was interrupted internet connection. Tuominen, Stolt and Salminen (2014: 1) state that provision of computers and internet availability determine readiness for technology-based education and access to computer and internet should be facilitated in the college to ensure convenient and reliability of resources. The wireless mobile network was not trustworthy according to the majority of respondents. If there is no access or inadequate access to technology, this will affect the rate of usage or ability to use technology (Maharaj 2014:16).

5.3.2 Perceived usefulness

Perceived usefulness is a point at which an individual trusts that using a specific technology would improve his work performance (Tacy, 2015: 37). According to Kim, Chun and Song (2009: 4), perceived usefulness is an individual's personal likelihood that utilizing a particular technology will praise his job performance in an organization. This section had the following six items: using technology in my job enables me to accomplish tasks more quickly, using technology improves my job

performance, using technology in my job increases my productivity, using technology enhances my effectiveness on the job, using technology makes it easier to do my job and I find technology useful in my job.

Respondents agreed that making use of technology in their occupation enabled them to complete responsibilities more fast. Richardson (2013: 69) said nurse educators need more preparation time for integration of technology into their traditional teaching to accomplish more tasks quickly. Oluwanifesimi (2016: 70) argues that only competent nurse educators can accomplish tasks more quickly than unskilled nurse educators.

Most respondents indicated that using technology improves their job performance. Nurse educators are the driving force behind technology-based education; if they are not well equipped to integrate technology into teaching, there will be a decline in their job performance and college will continue to bear poor results unless major interventions are implemented (Richardson, 2013: 68).

Respondents agreed moderately to strongly with the perceived usefulness of technology. If they do not see the usefulness they will not use it. Respondents agreed with the perceived usefulness of technology and there was a significant relationship with attitude towards technology.

Respondents confirmed that using technology in their job increases their productivity. Hall (2015: 1), confirmed that, the application of technology in education results in an improved performance with low cost and better output. Hall (2015: 72), reported that technology sharpens and improves skills by being exposed to high-tech mannequins to simulate real life patient situations.

The majority of respondents agreed that using technology enhances their effectiveness on their job. Selwyn (2014: 69), confirmed that technology use enhances the effectiveness of nurse educators to do their job and Grandberg (2016: 1), stated that effective use of technology has the potential to transform teaching and produce excellent results.

Respondents indicated that through technology it was more simpler to perform their tasks. It is difficult for the human mind to recall everything and these days the familiar system is to pile information via digital technologies (Prensky, 2009: 1).

The lecturers sampled in this study found technology useful in their job. Nurse educators including those at KZNCN need to be up to date in terms of the latest technology and computer techniques to incorporate technology into their teaching and make computer literacy a vital skill and must be at the forefront of development in technology-based education (Maharaj, 2014: 73).

5.3.3 Perceived ease of use (PEOU)

Perceived ease of use is the point at which an individual trusts that making use of a specific technology will be simple without any struggle or energy (Tacy, 2015: 37). Kim, Chun and Song (2009: 4) defined PEOU as the user's assessment that the system will be easy to use and require little effort.

The findings of this study indicated that nurse educators found managing technology easy. This is in contrast to the findings of Bothma and Cant (2011: 56), who reported that nurse educators are technologically challenged and that limits their use of technology solutions in their teaching activities. The respondents in this study found it easy to get technology to do what they want it to do. According to Oketch (2013: 1), nurse educators are challenged to teach using technology, especially in developing countries due to demographical aspects like advance in years, sexual category, and educational level which can delay keenness of nurse educators to embrace technology-based education. He further suggested that more workshops should be conducted on a regular basis and a certificate of attendance should be issued after training in order to inspire nurse educators to be present at all short course. Skiba (2015: 1), said if nurse educators are using technology which they are already familiar with, such as smart phones, that will make technology more likely to do what they want and that will make it more likely for them to use technology-based education.

Most respondents' interaction with electronic learning technology was clear and understandable. Technology is not substituting the role of nurse educators, but it is an additional tool, as nurse educators have to design and gather all teaching equipments, impart knowledge, help and evaluate students' development. Technology set free the nurse educators' minds and motivates production of information (Jung and Latchem, 2011: 11).

Respondents found technology to be flexible to interact with. Nurse educators who are competent in the use of technology are eager to shift from traditional teaching strategies and those who are not skilled are sturdy to teach using technology (Axley, 2008: 1). Technology is here to stay, therefore nurse educators must embrace and master it and become more flexible to interact with it (Chipps *et al.* 2015: 2)

Respondents confirmed that it was easy for them to become skillful at using technology. The presence of the internet and worldwide web (www) exposes nurse educators to various new information and other forms of learning experiences. The availability of technical and expert support make the nurse educators more skillful at using technology-based education, and have instant access to anyone, anywhere in the world (Jung and Latchem 2011: 11). Akimanimpaye (2012: 55), argued that prior experience with computers creates a positive attitude and enhances skills in using technology-based education and a low level of computer skills leads to demotivation and technology anxiety and remaining unskilled on technology-based education.

Respondents indicated that they found technology easy to use. Student nurses can work anywhere they want, and nurse educators can evaluate, score and provide comment on students effort, everywhere and at all time. PowerPoint and other multimedia devices enable nurse educators to present information and develop methods that attract and stimulate cooperation in an electronic learning.

5.3.4 Attitude

Attitude is an individual's positive or negative evaluation of performing the behaviour, and it can be either bad or good (Kim, Chung and Song 2009: 7).

The majority of respondents stated that electronic learning can resolve many of their educational challenges. However, Tacy (2015: 4), found that embracing and becoming proficient in technology in nursing education can be challenging and stressful. Nyangeni, du Rand and van Rooyen (2015: 1), confirmed that technology is ubiquitous and can create the feeling of frustration, overload and stress.

Most respondents in the current study indicated that electronic learning will provide chances for planning strategies of imparting information in teaching. Technology

helps teaching and learning practices and also promotes ways in which nurse educators fulfil human development goals (Mosa, Mahrin and Ibbrahim 2016: 113).

Respondents confirmed that electronic learning needs less time to do the task for both educators and student nurses. E-Learning promotes accessibility in education and training. Students have access to feedback and information at any time and everywhere (Hall 2015:25). Gether-Eby (2012: 7), reported that e-learning preparation is time consuming and it takes more time to teach online. Technology in education promotes access to resources and information anywhere anytime (Mosa, Mahrin and Ibbrahim 2016:113). Electronic learning is an innovative approach for delivery of well-designed interactive, facilitated learning environment, and creates critical thinking ability (D'Souza, Karkada and Castro 2014: 73). E-Learning will increase efficiency in teaching. Mosa, Mahrin and Ibbrahim (2016: 115), indicated that technology-based education such as blogs, electronic mail, video streaming enhance efficiency in teaching and enhance lifelong learning.

Two thirds of respondents agreed that e-learning enables collaborative learning, Merrill (2015a: 72), reported that social media platforms can assist nurse educators to promote collaborative learning as electronic learning engages students more than other forms of learning. Technology-mediated environments engage students to take an active role in their learning. Mobile technologies allow students to communicate regardless of their location (Jung and Latchem 2011: 11). Van Rooyen (2015: 184), highlighted that e-learning creates passionate and more involvement to the teaching process than previously, which forces unavoidably a rise in study pressure and inspires student to acquire more information.

E-Learning boosts the excellence of teaching and learning for the reason that it incorporates different media such as print, audiovisual, and simulation. E-Learning presents an exciting learning opportunity to train students with little previous access to computer-based training. E-learning is the use of electronic media, educational technology, using different media such as text, audio, images, animation and streaming of video (Contreras and Hilles 2015: 53).

The majority of respondents agreed that, e-learning stimulates the tractability of education. According to Mahesh (2013: 1), technology- centered training boosts the tractability of education and also enables means of communication among nurse

educators and student nurses. The schoolbooks are not the only source of information and learning is not limited to one specific station or period (Lin 2007: 817).

The majority of respondents indicated that e-learning stimulates interaction among student nurses and nurse educators. Zayim and Ozel (2015: 456) confirmed that students prefer electronic learning because of on demand learning and not being restricted by means of place, period, or convenience of perfect and current information, inspiration aimed at self-focused dynamic learning and good interaction among student nurses and teachers.

More respondents indicated that e-learning develops the pedagogical rating of a program. Maharaj (2014: 75) emphasised the importance of developing nurse educators to keep up with the trend in higher education pedagogies. Ungerer (2012: 5) further explained that advancement of recent instructions controls the shift from nurse educators to extra self-guided student nurses. Some nurse educators are resisting their loss control over students and feel uncomfortable in the facilitator role which is required by the constructivist approach.

The KwaZulu-Natal College of Nursing have to accept more e-learning for their student nurses. Globally, nurse educators are embracing the practice of technology in their training environments then integrating various technologies on an increasing basis to promote learning. Some students with old-fashioned methods of learning might come across challenges toward adjustment of technology-based education (Ungerer 2012: 8). Contreras and Hilles (2015: 54) highlighted that some nursing institutions are still embracing traditional methods of teaching such chalkboard, while other institutions are now using current technologies.

Almost half of the respondents in this study admitting to feeling uncomfortable because they do not understand e-learning, but they also reported not being intimidated by it and felt it was effective for student learning. Despite a strong behavioural intention to use technology, the incompetence of technology practice continues as a barrier to nursing education in adopting technology in the curricula. Nurse educators need to be thoroughly trained or have a fully trained resource at hand to assist them in using technology-based education (Jamshidi *et al.* 2012: 1371).

Two thirds of respondents disagreed with the statement *e-Learning is a dehumanising method of learning; I feel frightened by e-learning*. The American Association of College of Nursing reporting that nurses are the late adopters of technology, with increasing age being an important contributing factor for this delay. Orton, Nokes, Scott and Hickey (2015: 8), reported that computer anxiety in nurses interferes with the adoption of electronic learning.

Over half of the respondents in the current study disagreed with *I get a sinking feeling when I think of trying to use e-learning*. Skiba (2014b:1), recommended that, nurse educators must become more comfortable in using technology in classroom, and get up to speed with mobile devices, social media and other tools used in clinical environment. Nurse educators need to seek professional development opportunities to learn more about how to be an expert inside and outside the classroom environment.

Over two thirds of respondents disagreed with the statement; *e-Learning is not applicable for student learning*. Mosa, Mahrin and Ibbrahim (2016:113), confirmed that electronic learning stimulates operative instructional proficiency and access to education. It also expands the accessibility to knowledge and information mastery and enhances lifetime learning

5.3.5 Behavioural intention

Behavioural intention to use refers to a level at which an individual has articulated a mindful strategies to either accomplish or not to accomplish a stated upcoming behaviour (Tacy, 2015: 38).

The majority of participants indicated that, provided they have access to electronic learning, they INTEND to use it. Nurses have positive attitudes in wanting to use technology, but they have challenges which hinder their ability to use technology. Some of these challenges are access, absence of computer expertise, shortage of time, absence of support, budgetary constraints. These challenges must be taken into consideration because they can change positive attitudes into negative attitudes and also develop resistance to the use of technology (Maharaj 2014: 18).

Over two thirds of respondents agreed that if provided with access to electronic learning they PREDICT they will use it. O'Connor and Andrews (2018: 172),

highlighted that access to technology-based education is a valuable element, however sharing of limited computer resources is one of the barriers to using technology. Krau (2015: 379) reported that frustration with slow internet speed and technical issues cause reluctance to opt for technology.

Almost all respondents confirmed that, in future, they plan to use electronic learning MORE often. Nurse educators who are competent in technology are eager to change to technology-centred instruction and the non-competent educators are resilient to technology- centred instruction (Bakioglu 2007: 1). Mosa, Mahrin and Ibrbrahim (2016: 113) highlighted that nurse educators are required to be advanced with today's fast transforming technology, especially as nursing training institutions are operating through technology-centred education.

5.3.6 Availability of resources

Just over two thirds of respondents agreed with the statement *I have access to reliable computer technology*. Foronda, Kleinheksel and Samosky (2017: 14), reported that nurse educators must be skilled on how to incorporate technology into the training programmes then, the educators should be enabled to be on par with fast transforming technology. Gregory and Lodge (2015: 1), emphasised the importance of training nurse educators as a lack of technological abilities delays readiness of technology-based education.

Two thirds of respondents disagreed that technical support was available if they needed it. The shortage of technological backing was found as an impediment; in the nursing college there is a shortage of resident ICT technological experts to help electronic teaching creativities. Milham (2013: 1), highlighted that sub-Saharan Africa suffers from unhappy levels of information computer technology (ICT) preparedness due to lowest levels of ICT base and shortage of extensive skills that would permit people to make best use of technology. Skiba (2014a: 267), recommends that nurse educators should work with administrators and information technology (IT) personnel to ensure the classroom environment can handle mobile devices and necessary IT infrastructure is available. Forbes (2015: 5), reported that technology is not viewed as a problem but is seen as a solution to the problem and it should therefore unquestionably be accepted into teaching. Therefore, urgent technical support should be available to ensure technology enhanced teaching and learning.

More than half of respondents agreed with having adequate knowledge of computer technology. In order for academic staff of KwaZulu-Natal College of Nursing (KZNCN) to be on par with academics in the other higher education institutions with regards to the usage of technology-centred education, it is crucial for them to receive training that will enhance their skills and knowledge (Maharaj, 2014: 75).

Just over half the respondents agreed that access to the internet was readily available. However, Hlagala (2015: 35) reported that developing countries are struggling to sustain uninterrupted internet connectivity due to their financially constrained background; this is a great challenge as the pricing of educational technologies are expensive. Over two thirds of respondents had adequate knowledge of how to set up computer technology in a classroom. The basic tools necessary for teaching, learning and administration in nursing educational institutions are lacking and there is a need to strengthen them (South Africa Department of Health, 2012: 8). Training institutions should give their staff in-service education with regard to the appropriate use of current technologies such as public avenues which were never utilised during their training (Nyangeni, du Rand and van Rooyen 2015: 8).

The majority of respondents strongly disagreed regarding the availability of computer technology skills development training in KZNCN. The majority of African educational institutions have not invested in the training of their staff and delivering of teaching by electronic means (Hlagala, 2015: 7). Computer literacy allows for perceived ease of use, if one does not have knowledge of computer usage then it would affect ones attitude (Maharaj, 2014: 16).

5.4 Contribution of the study

The findings of the inquiry give some insight into the readiness of the nurse educators at the KZNCN to adopt technology-based education.

This knowledge can enable the management of KZNCN to implement programmes to facilitate the educator`s adoption of technology-based education.

The study identified the gaps and strengths that could assist KZNCN to make corrections and some improvements.

The study can assist other researchers as a source of information or reference. The study determined the extent of nurse educators' readiness and made recommendations based on the findings.

The nurse educators were ready to accept technology-based education but were hampered to some extent by the availability of infrastructure, information technology (IT) support and training.

5.5 Recommendations

5.5.1 Human resources

It is suggested that the Management of the KZNCN formulate policies which enforce the inclusion of computer training in all nursing campuses to increase skills for accessibility to reliable and up to date scientific sources.

Technical support and continual expert support should be provided to facilitate and mentor nurse educators to adopt technology-based education.

5.5.2 Infrastructure resources

Technology-based education needs adequate information and ICT infrastructure such as good internet speed, Wi-Fi, and computers with internet throughout the province to facilitate teaching and learning. Enhance the back-up system so that there is power during a power outage to ensure that accessibility to technology is not compromised.

5.5.3 Training

Upskill nurse educators on technology-based education to ensure adequate knowledge of how to set up computer technology in the classroom setting.

The KZNCN to organise the benchmarking of nurse educators to higher educational institutions they are affiliated with, to ensure that nurse educators are on a par with others in higher education nursing institutions.

5.5.4 Recommendations for further research

- Further studies should focus on the readiness of student nurses to adopt technology-based education in KZNCN.

- Clinical area readiness to adopt technology-based education in KwaZulu-Natal hospitals where student nurses are placed, especially human resources and material resources such as electronic health records.
- Explore regional differences and why clinical instructors are more inclined to use technology than lecturers.
- Explore the possibility of using smart technology such as smartphones during lectures to facilitate portability and easy access to online content.

5.6 Limitations of the study

- The study was focusing on the readiness of nurse-educators to accept technology-centred education and the readiness of student nurses was not examined.
- The lack of current literature from South Africa on technology-based education especially in the nursing profession was a limitation in this study. Most of the literature was extracted from high income countries.
- The investigation was carried out through a quantitative approach then a qualitative approach was not explored, which might strengthen the findings.

5.7 Conclusion

The findings of this study indicated that the nurse educators in the KZN CN are ready to adopt technology-based education. However, the KZN CN needs to give support to facilitate this process by improving the availability of resources and facilitating conditions. The College has to be on a par with other higher education institutions regarding the usage of technology-based education since there is a transition from the status of a public nursing institution to a higher education and training institution.

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APPENDICES

Appendix 1: IREC approval



9 October 2017

IREC Reference Number: **REC 74/17**

Mr S Ziqubu
Box 9802
Eshowe
3815

Dear Mr Ziqubu,

Examining the readiness of nurse educators to adopt a technology based education in a College of Nursing within KwaZulu-Natal.

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tool.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letters.

Please note that **FULL APPROVAL** is granted to your research proposal. You may proceed with data collection.

Yours Sincerely,

Professor J K Adam
Chairperson: IREC



Appendix 2: Request letter to IREC

Mbongolwane Reserve

P. O Box 9802

Eshowe

3815

13 September 2017

Chairperson: IREC

Professor J.K. Adam

Durban University of Technology

Dear Professor

RE: Gate Keepers permission to conduct research at the KwaZulu-Natal College of Nursing. Ref: REC 74/17

TITLE: EXAMINING THE READINESS OF NURSE EDUCATORS TO ADOPT TECHNOLOGY BASED EDUCATION IN A COLLEGE OF NURSING WITHIN KWAZULU NATAL.

Kindly receive the attached documents:

1. KwaZulu Natal Department of Health
2. KwaZulu-Natal College of Nursing
3. Piloting of the data collection tool report

Thank you for your attention.

Yours sincerely

Siyabonga Ziqubu

Student Number: 20053275

Email address: siyabonga.ziqubu@yahoo.com

Cell Number: 072 583 0190

Appendix 3: KZNCN gatekeeper permission letter



health

Department:
Health
PROVINCE OF KWAZULU-NATAL

Physical Address: 211 Pietermaritzburg Street, Pietermaritzburg 3200
Postal Address: Private Bag X 11080, Pietermaritzburg 3200
Tel: 033 264 7300 Fax: 033 394 7226 Email: enquiries@mthembu@kznhealth.gov.za
www.kznhealth.gov.za

DIRECTORATE:

KwaZulu-Natal College of Nursing

Reference: Dr. S.Z. Mthembu

Date: 29 August 2017

Principal Investigator: Ms S Ziqubu
Student No: 20053275
Durban University of Technology

RE: Gate Keeper Permission to conduct research at the KZN College of Nursing.

TITLE: Examining the readiness of nurse educators to adopt a technology based education in a College of Nursing within KwaZulu-Natal

Dear Madam

I have the pleasure in informing you that Gate Keeper permission has been granted to you as per the above request by the Principal of the KZN College of Nursing.

Data Collection site(s): Campuses- Addington, Benedictine, Charles Johnson Memorial, Edendale, Greys, King Edward, Madadeni, Ngwelezane, Prince Mshiyeni Memorial, Port Shepstone, RKKhan.

Please note the following:

1. Please ensure that you adhere to all policies, procedures, protocols and guidelines of the Department of Health with regards to this research.
2. This research can only commence once you have received approval from the Provincial Health Research Committee in the KZN Department of Health.
3. Gate keeper permission is therefore granted for you to conduct this research at the above identified campuses after consultation with the Campus Principals.
4. The KwaZulu-Natal College and its NEI's will not be providing you with any resources for this research.
5. You will be expected to provide feedback on your findings to the Principal of the KwaZulu-Natal College of Nursing.

Thank You

Dr. S.Z Mthembu
Principal: KZN College of Nursing

Fighting Disease, Fighting Poverty, Giving Hope

Appendix 4: Request gatekeepers permission letter

Ngwelezana Nursing Campus
Private Bag X 20016
Empangeni
3880

The Principal
KwaZulu Natal College of Nursing
Pietermaritzburg
3200

Dear Madam

Request for permission to conduct the research study

I am a registered student for Master of Health Sciences in Nursing degree at Durban University of Technology. I am doing my research on the readiness of nurse educators at KZNCN to adopt technology based education. I request permission to approach the nurse educators and clinical instructors at all Campuses to answer my questionnaire. The purpose of this study is to assess the readiness of nurse educators in the KZNCN to adopt technology based education in the nursing programmes.

The researcher will use a quantitative cross-sectional, descriptive, survey design. The questionnaires will be used to collect data from nurse educators, and there will be no interruption of work during the data collection process.

Your support and permission will be appreciated.

Yours faithfully

.....

Siyabonga Ziqubu (Mr.)

Master of Health Sciences: Nursing student

Email: siyabonga.ziqubu@kznhealth.gov.za

Tel (W):035 901 7102 Cell: 060 923 3541 Fax: 086 686 2875

Supervisor: Dr Penny Orton

Email: penny@dut.ac.za

Appendix 5: KZN DoH approval letter



health

Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE:

Physical Address: 330 Langalaba Street, Pietermaritzburg
Postal Address: Private Bag X9051
Tel: 033 395 2805; 3394 3123 Fax: 033 394 3782
Email: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

Health Research & Knowledge
Management

HRKM Ref: 341/17
NHRD Ref: KZ_201708_031

Date: 13 September 2017
Dear Mr S. Ziqubu
DUT

Approval of research

1. The research proposal titled '**Examining the readiness of nurse educators to adopt a technology based education in a College of Nursing within KwaZulu Natal**' was reviewed by the KwaZulu-Natal Department of Health.

The proposal is hereby **approved** for research to be undertaken at the following KZN College of Nursing campuses: Addington, Benedictine, Charles Johnson Memorial, Edendale, Greys, King Edward, Madadoni, Ngwelezane, PMMH, Port Shepstone, RK Khan

2. You are requested to take note of the following:
 - a. Make the necessary arrangement with the identified facility before commencing with your research project.
 - b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.
3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mr X. Xaba on 033-395 2805.

Yours Sincerely

Dr E Lutge

Chairperson, Health Research Committee

Date: 14/09/17

Fighting Disease, Fighting Poverty, Giving Hope

Appendix 6: Permission letter from Addington Campus

17/10/2017

Mr Ziqubu

PERMISSION TO CONDUCT RESEARCH AT ADDINGTON CAMPUS

Dear Mr Ziqubu

Permission is hereby granted for you to conduct your research on:

“Examining the readiness of nurse educators to adopt technology based education in a College of nursing within KwaZulu Natal

Please take cognizance of the following:

- You must adhere to all policies, procedures, protocols and guidelines of the Department regarding research
- Please inform our institution before research is commenced
- Please provide a copy of your research report to the Campus, on completion of the study

Wishing you all the best for your studies

Ms.T.P. Skakane-Masango
Campus Principal

Appendix 7: Permission letter from Benedictine Campus



health

Department:
Health
PROVINCE OF KWAZULU-NATAL

Private Bag 1002, Nongoma
P.O. Box 1002, Nongoma 3950
Tel: 035 931 1100 Fax: 035 931 0750 Email: health@kzn.gov.za
www.khhe.kzn.gov.za

NURSING EDUCATION

KWAZULU NATAL COLLEGE OF NURSING
BENEDICTINE CAMPUS

Enquiries: Research permission
Date: 2017.10.25

Mr. S. Ziqubu
P.O. Box 9802
Eshowe
33815

PERMISSION TO CONDUCT RESEARCH 2017

The above matter has this reference:

You are advised that the permission has been granted to utilize Benedictine Campus lecturers for your research in 2017.

Kind Regards

MN Zibani
Principal
Benedictine Campus

DEPARTMENT OF HEALTH
THE PRINCIPAL
BENEDICTINE CAMPUS

2017 -10- 2 5

PRIVATE BAG 1002
NONGOMA 3950

Appendix 8: Permission letter from CJM Campus



health

Department:

Health

PROVINCE OF KWAZULU-NATAL

DIRECTORATE:

KWAZULU NATAL COLLEGE OF NURSING
CHARLES JOHNSON MEMORIAL NURSING CAMPUS

Private Bag x 5555, Nguthu, 3135
Lot 92, Hlubi Street, Nguthu, 3135
Tel : (034) 271 0529, Fax: (034) 271 0584

www.knhealth.gov.za

Enquiries: B.S. Simeane

27 October 2017

Mr. S. Ziqubu
Ngwelezane Nursing Campus
Private Bag x 20016
Empangeni
3880

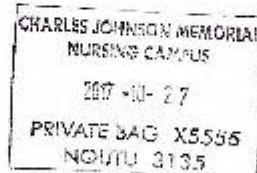
Dear Sir,

PERMISSION TO CONDUCT THE STUDY

You are hereby granted permission to conduct a study on the readiness of Nurse Educators at KZNCN on adoption of Technology Based Education.
You are expected to comply with the Ethical Principles whilst conducting the study.

I thank you,

B.S. Simeane
C.J.M Campus Principal



Appendix 9: Permission letter from Edendale Nursing Campus

Kamanga Rodney

From: Ziqubu Siyabonga
Sent: 30 May 2018 12:35 PM
To: Kamanga Rodney
Cc: Hlongwana Dudu
Subject: FW: Permission to conduct a research study

From: Majola Ntombizakhona
Sent: 16 February 2018 10:16 AM
To: Ziqubu Siyabonga
Subject: RE: Permission to conduct a research study

Good Day S. Ziqubu

This serves to acknowledge receipt of the correspondence with appreciation.

I have informed colleagues about your coming on Tuesday. I am out at Grays in a meeting.

You are wished well in your research.

Thank You
Mrs N.C. Majola
Edendale Nursing Campus principal



health
Department:
Health
PROVINCE OF KWAZULU-NATAL

EDENDALE NURSING CAMPUS

Ntombizakhona, Clementine Majola
CAMPUS PRINCIPAL
EDENDALE NURSING CAMPUS
031 3954781 / 033 3453122
033 3424883 / 033 3954892
Ntombizakhona.majola@kznhealth.gov.za
ntombizakhona@kznhealth.gov.za

Appendix 10: Permission letter from Greys Hospital Campus



health

Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE:

Postal Address: Private Bag X 9001, Pietermaritzburg, 3200
Physical Address: 201 Townush Road, Northern Park, Pietermaritzburg, 3200
Tel: 033 897 3503 Fax: 033 897 3500 Email: busi.shezi@kznhealth.gov.za
www.kznhealth.gov.za

KwaZulu-Natal College of
Nursing
Grey's Campus

Reference: Mrs BE. Shezi
Date: 10 October 2017

Principal Investigator: Mr S Ziqubu
Student No: 20053275
Durban University of Technology

RE: Greys Campus permission to conduct research study.

TITLE: Examining the readiness of nurse educators to adopt a technology based education in a College of Nursing within KwaZulu-Natal.

Dear Madam

I have a pleasure to inform you that permission has been granted to conduct your research study: Data collection.

We request to forward us a feedback of your research study findings once you have completed.

Thank you

MRS BE SHEZI
CAMPUS PRINCIPAL

Appendix 11: Permission letter from King Edward VIII Campus



health

Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE:

Physical Address: 330 Langalaba Street, Pietermaritzburg
Postal Address: Private Bag X9051
Tel: 033 395 2805; 3394 3123 Fax: 033 394 3782
Email: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

Health Research & Knowledge
Management

HRKM Ref: 341/17
NHRD Ref: KZ_201708_031

Date: 13 September 2017
Dear Mr S. Ziqubu
DUT

Approval of research

1. The research proposal titled '**Examining the readiness of nurse educators to adopt a technology based education in a College of Nursing within KwaZulu Natal**' was reviewed by the KwaZulu-Natal Department of Health.

The proposal is hereby **approved** for research to be undertaken at the following KZN College of Nursing campuses: Addington, Benedictine, Charles Johnson Memorial, Edendale, Greys, King Edward, Madadoni, Ngwelezane, PMMH, Port Shepstone, RK Khan

2. You are requested to take note of the following:
 - a. Make the necessary arrangement with the identified facility before commencing with your research project.
 - b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.
3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mr X. Xaba on 033-395 2805.

Yours Sincerely

Dr E Lutge

Chairperson, Health Research Committee

Date: 14/09/17

Fighting Disease, Fighting Poverty, Giving Hope

Appendix 12: Permission letter from Madadeni Campus

Mr Ziqubu

I hope you are well

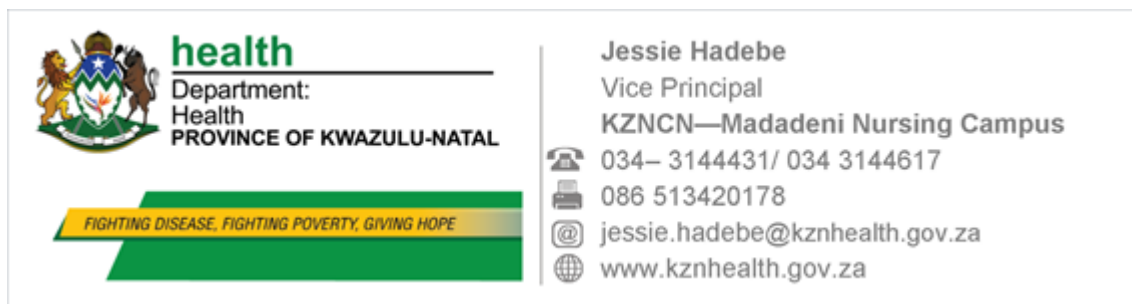
I have pleasure in informing you that permission is hereby granted to you to conduct the research study at

Madadeni Campus as per the stated objectives.

The provisions on the request letter stand – that there will be no disruption of teaching and learning process for

Students and Lecturers. Assistance will be provided as required.

Thank you.



“ Anyone who stops learning is old, whether at twenty or eighty...”

From: Ziqubu
Sent: 27 October 2017 03:53
To: Hadebe
Subject: FW: Permission to conduct research study
Siyabonga PM
Jessie

Good afternoon Madam

Kindly receive the attached supporting documents for the request to collect data from Lecturers on Friday (03.11.2017). My sample size is nineteen(19).

Regards

Siyabonga Ziqubu

Ngwelezana

Appendix 13: Permission letter from Port Shepston Campus



health

Department:
Health
PROVINCE OF KWAZULU-NATAL

101 Marine Drive, Shelly Beach, 4305
P.O. Box 4240, Port Shepstone, 4240
Tel: 033-3155322 Fax: 033-3155325 Email: Normantlane_cole@kznhealth.gov.za

KWAZULU-NATAL COLLEGE OF NURSING
PORT SHEPSTONE NURSING CAMPUS

Enquiries :NG Cole
Date: 11 October 2017

Attention: Mr Ziqubu

RE: REQUEST FOR PERMISSION TO CONDUCT STUDY

Your letter requesting permission to conduct a research study at Port Shepstone Campus is hereby acknowledged.

Permission is hereby granted for you to conduct your study at this Campus. Please take note of the conditions as stated by the Kwa-Zulu Natal College of Nursing.

It may not be always be possible for you to see all the lecturers at the time you projected as some may be at the clinical facilities conducting clinical accompaniment and or comprehensive clinical examinations.

Please specify your dates and times so that the campus can assist you in this regard.

Best wishes

Mrs. N.G Cole
(ACTING CAMPUS PRINCIPAL)

Appendix 14: Permission letter from Prince Mshiyeni Memorial Campus



health
Department:
Health
PROVINCE OF KWAZULU-NATAL

KWAZULU-NATAL COLLEGE OF NURSING
PRINCE MSHIYENI MEMORIAL CAMPUS
Physical Address: Mangosuthu Highway, Durban, 4000
Physical Address: Private Bag X10, Moseni, 4060
Tel: +27(031) 907 8813/ 8314 Fax: +27(031) 906 7772 Email: Rozana.Bridgemohan@kznhealth.gov.za
www.kznhealth.gov.za

Directorate: PRINCIPAL OFFICE

Date: 18/10/2017

Mr. Siyabonga Ziqubu
Ngwelozana Nursing Campus
Private Bag X 20016
Empangeni
3880

Dear Mr. S Ziqubu

Re: Permission to conduct a research study at Prince Mshiyeni Memorial Campus

Title of the study: Examining the readiness of nurse educators to adopt technology based education in a College of nursing within KwaZulu Natal

In response to your request dated 28 July 2017, I am pleased to inform you that your application to conduct your study at Prince Mshiyeni Nursing Campus has been granted.

I note with appreciation that you have full approval from the Institutional Research Ethics Committee, DUT.

Please abide by the stipulations of Kwa – Zulu Natal College of Nursing and KZN Department of Health. Kindly communicate the outcome of your study by submitting a written report to the Prince Mshiyeni Memorial Campus Principal

Thank you

Mrs. R. Bridgemohan
Campus Principal

Appendix 15: Permission letter from R. K. Khan Campus



health

Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE:

Postal Address: Private Bag X 9001, Pietermaritzburg, 3200
Physical Address: 201 Townush Road, Northern Park, Pietermaritzburg, 3200
Tel: 033 897 3503 Fax: 033 897 3500 Email: busi.shezi@kznhealth.gov.za
www.kznhealth.gov.za

KwaZulu-Natal College of
Nursing
Grey's Campus

Reference: Mrs BE. Shezi
Date: 10 October 2017

Principal Investigator: Mr S Ziqubu
Student No: 20053275
Durban University of Technology

RE: Greys Campus permission to conduct research study.

TITLE: Examining the readiness of nurse educators to adopt a technology based education in a College of Nursing within KwaZulu-Natal.

Dear Madam

I have a pleasure to inform you that permission has been granted to conduct your research study:
Data collection.

We request to forward us a feedback of your research study findings once you have completed.

Thank you

MRS BE SHEZI
CAMPUS PRINCIPAL

Appendix 16: Letter of information and consent form



LETTER OF INFORMATION

Title of the Research Study: Examining the readiness of nurse educators to adopt technology based education in a College of nursing within KwaZulu Natal

Dear Colleague

You are being invited to take part in a research study. The purpose of this study is to assess the readiness of nurse educators in the KZNCN to adopt technology based education in the nursing programmes. Please take time to read through this information sheet that contains all the pertinent information relating to this study.

Principal Investigator/s/researcher: Mr. Siyabonga Ziqubu (B Cur)

Co-Investigator/s/supervisor/s: Dr. Penny Orton (PhD) and Co-Supervisor: Ms. Babusisiwe Khumalo (M Tech Nursing).

Brief introduction and purpose of the study: Technology based education readiness means mental or physical preparedness of an organization for some e-Learning or technology experience or action. Nurse educator needs to be up to date with today's rapidly changing technology, and institutions that have implemented the use of technology in education are witnessing a number of benefits such as savings, increased flexibility, productivity and maintained competitiveness (Hall 2015).

The South African Nursing Council (SANC) strategic plan for nurse education, training and practice (2012/13-2016/17) states that, the core competence required for prospective nurse educators should include knowledge of technology in education. The researcher wishes to assess the nurse educator's readiness to adopt technology based learning, as the KwaZulu-Natal College of Nursing (KZNCN) transitions to higher education and training where advanced technology is used in teaching and learning.

Outline of the Procedures: You are kindly requested to answer the questions in the questionnaire. The questionnaire should take approximately 30-35 minutes to complete.

Risks or discomforts to the participant: I do not expect you to experience any risk or discomfort when participating in this study.

Benefits: The findings of the study will give some insight into the readiness of the nurse educators at the KZNCN to adopt technology based education. This knowledge might enable the management of KZNCN to implement programs to facilitate the educator's adoption of technology based

education. The study will help identify the gaps and strengths that will assist KZNCN to make corrections and some improvements. The study might assist other researchers as a source of information or reference. The study will determine the extent of nurse educators' readiness and make recommendations based on the findings.

Reasons why the participant may be withdrawn from the study: You can withdraw from the study at any point in time if you wish to do so. There will be no penalty for withdrawing from the study.

Remuneration: You will not receive any money for participating in this study.

Costs of the Study: You will not be expected to pay any money to be involved in the study.

Confidentiality: There will be no mention of your name on the questionnaire that will be used for the study. The consent form with your name will be kept separately from the questionnaire by the researcher.

Research-related Injury: The nature of the study does not have the risk of you being injured.

Persons to Contact in the Event of Any Problems or Queries: Please contact the researcher: Mr. Siyabonga Ziqubu on 060 923 3541, Dr. Penny Orton (Supervisor) on 031-373 2537, email: penny@dut.ac.za or the Institutional Research Ethics administrator on 031-373 2375. Complaints can be reported to the DVC: Research, Innovation and Engagement Prof S Moyo on 031 373 2577 or moyos@dut.ac.za.

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, _____ (name of researcher), 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 computerised 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 Thumbprint	Date	Time	Signature / Right

I, _____ (name of researcher) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

_____	_____	_____
Full Name of Researcher	Date	Signature

_____	_____	_____
Full Name of Witness (If applicable)	Date	Signature

_____	_____	_____
Full Name of Legal Guardian (If applicable)	Date	Signature

Appendix 17: Permission to use Technology Acceptance Model

From: Davis, Fred [mailto:fred.davis@ttu.edu]
Sent: 01 December 2016 07:21 PM
To: Ziqubu Siyabonga
Subject: RE: Permission to use Technology acceptance model

You have my permission to adapt and use the Perceived Usefulness and Perceived Ease of Use, behavioural intention to use and attitude towards e-learning scales associated with Technology Acceptance Model for your research. I only ask that you cite the articles from which you adapted the scales (e.g., MIS Quarterly 1989; Management Science 1989) in your dissertation and any papers reporting your findings.

Best wishes

Fred Davis

From: Ziqubu Siyabonga [mailto:Siyabonga.Ziqubu@kznhealth.gov.za]
Sent: Thursday, December 01, 2016 4:06 AM
To: Davis, Fred <fred.davis@ttu.edu>
Subject: Permission to use Technology acceptance model

Dr. Davis

I formally request the permission to use your Perceived Usefulness and Perceived Ease of Use, behavioural intention to use and attitude towards e-learning scales associated with Technology Acceptance Model. I am currently doing Master of Health Sciences in Nursing at Durban University Of Technology (DUT). I am so interested to use your TAM scales to study the Readiness of Nurse educators to adopt technology based education in KwaZulu Natal College of Nursing. Should you need more information please let me know. Thank you for your consideration.

Respectfully

Siyabonga Ziqubu

siyabonga.ziqubu@yahoo.com

Appendix 18: QUESTIONNAIRE

SECTION A DEMOGRAPHIC DATA

Please answer all questions

Select ONE option only for each question

1 GENDER

Male	Female

2 RACE

Black	White	Coloured	Indian	Other

3 MARITAL STATUS

Married	Single	Divorced/ Separated	Widowed	Cohabiting

4 JOB TITLE

Clinical facilitator	Lecturer	Head of department	Vice Principal

5 HIGHEST EDUCATIONAL QUALIFICATION

Diploma	Bachelor's degree	Honours	Masters	Doctorate

6 YEARS OF TEACHING EXPERIENCE

<3 years	From 3 - <6 years	From 6 - <10 years	From 10 - <13 years	13+ years

7 NAME OF CAMPUS

ADDINGTON	BENEDICTINE	CHARLES JOHNSON	EDENDALE	GREY'S
MADADENI	PORT SHEPSTONE	PRINCE MSHIYENI	RK KHAN	KING EDWARD VIII

SECTION B Perceived usefulness of technology based education

Indicate your level of agreement with the following statements

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
1 Using technology in my job enables me to accomplish tasks more quickly.							
2 Using technology improves my job performance.							
3 Using technology in my job increases my productivity.							
4 Using technology enhances my effectiveness on the job.							
5 Using technology makes it easier to do my job.							
6 I find technology useful in my job.							

SECTION C Perceived ease of use of technology in technology based education

Indicate your level of agreement with the following statements

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
1 Managing technology is easy for me.							
2 I find it easy to get technology to do what I want it to do.							
3 My interaction with electronic learning technology is clear and understandable.							
4 I find technology to be flexible to interact with.							
5 It is easy for me to become skilful at using technology							
6 I find technology easy to use.							

SECTION D Attitude toward E-learning

Indicate your level of agreement with the following statements

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
1 e-Learning can solve many of our educational problems.							
2 e-Learning will bring new opportunities for organising teaching and learning.							
3 e-Learning saves time and effort for both teachers and students.							
4 e-Learning increases access to education and training.							
5 e-Learning will increase my efficiency in teaching.							
6 e-Learning enables collaborative learning.							
7 e-Learning can engage learners more than other forms of learning.							
8 e-Learning increases the quality of teaching and learning because it integrates all forms of media; print, audio, video, and animation.							
9 e-Learning increases the flexibility of teaching and learning.							
10 e-Learning improves communication between students and teachers.							
11 e-Learning enhances the pedagogic value of a course.							
12 Universities should adopt more and more e-learning for their students.							
13 e-Learning makes me uncomfortable because I do not understand it.							
14 e-Learning is a de-humanising process of learning I feel intimidated by e-learning.							
15 I get a sinking feeling when I think of trying to use e-learning for my courses.							
16 e-Learning is not effective for student learning.							

Section E Behavioural intention to use

Indicate your level of agreement with the following statements

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
1 Providing I have access to electronic learning I INTEND to use it.							
2 Providing I have access to electronic learning I PREDICT I will use it.							
3 In the future, I plan to use electronic learning MORE often.							

Section F Availability of resources

Indicate your level of agreement with the following statements regarding the availability of resources

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
1 I have access to reliable computer technology							
2 Technical support is available If I need it							
3 I have adequate knowledge of computer technology							
4 Access to the internet is readily available							
5 I have adequate knowledge of how to set up computer technology in the classroom.							
6 Computer technology skills development training is available							

Section G Facilitating conditions

Indicate your level of agreement with regard to the following statements with regard to the technology you use

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
1 Power outages occur frequently on campus							
2 In case of a power outage, there is a backup system available							
3 The internet speed is good.							
4 There is an uninterrupted internet connection.							
5 The wireless mobile network is trustworthy							
6 Equipment is well maintained and repaired quickly if it breaks down							

Appendix 19: EDITOR'S CERTIFICATE

DR RICHARD STEELE BA, HDE, MTech(Hom) HOMEOPATH Registration No. A07309 HM Practice No. 0807524 Freelance academic editor Associate member: Professional Editors' Guild, South Africa

110 Cato Road Glenwood, Durban 4001 031-201-6508/082-928-6208 Fax 031-201-4989 Postal: P.O. Box 30043, Mayville 4058 Email: rsteele@telkomsa.net

EDITING CERTIFICATE

Re: Siyabonga Ziqubu Master's dissertation: EXAMINING THE READINESS OF NURSE EDUCATORS TO ADOPT TECHNOLOGY BASED EDUCATION IN A COLLEGE OF NURSING WITHIN KWAZULU NATAL

I confirm that I have edited this dissertation and the references for clarity, language and layout. I am a freelance editor specialising in proofreading and editing academic documents. I returned the document to the author with track changes so correct implementation of the changes in the text and references is the responsibility of the author. My original tertiary degree which I obtained at the University of Cape Town was a B.A. with English as a major and I went on to complete an H.D.E. (P.G.) Sec. with English as my teaching subject. I obtained a distinction for my M.Tech. dissertation in the Department of Homeopathy at Technikon Natal in 1999 (now the Durban University of Technology). During my 13 years as a part-time lecturer in the Department of Homoeopathy at the Durban University of Technology I supervised numerous Master's degree dissertations.

Dr Richard Steele 14 December 2018 per email

Appendix 20: LETTER FROM STATISTICIAN

Gill Hendry B.Sc. (Hons), M.Sc. (Wits), PhD (UKZN) Mathematical and Statistical Services Cell: 083 300 9896 email : hendryfam@telkomsa.net

22 July 2019

Re: Assistance with statistical aspects of the study

Please be advised that I have assisted Siyabonga Ziqubu (Student number 20053275), who is presently studying for an MHSci: Nursing at DUT, with the sampling, questionnaire validation and data analysis for his study.

Yours sincerely

Gill Hendry (Dr)