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NURSE EDUCATORS' READINESS TO USE BLENDED LEARNING IN PUBLIC NURSING EDUCATION INSTITUTIONS IN GAUTENG PROVINCE, SOUTH AFRICA

by

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DECLARATION

I, SARAH NAMULONDO, student number: 18170367, declare that the dissertation/thesis titled:

"Nurse **Educators' readiness to use blended learning in public nursing education institutions in Gauteng Province, South Africa**",

is my original work and that it has not been submitted before for any degree at the University of Pretoria or at any other institution. All sources that have been used or quoted have been acknowledged by means of complete references in the text and in the list of sources.

_____ _____22/02/2021_____

Signature Date

Sarah Namulondo

DEDICATION

I hereby dedicate this study to the following people who significantly assisted, encouraged, and enthused me to persist till completion of my studies:

- The Almighty God, who acted as my teacher, counselor, guide, and soul giver of grace and wisdom, sustained me until completion.
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ABSTRACT

INTRODUCTION: Readiness for blended learning is described as the nurse educators' ability and preparedness to use Information Communication Technology. Blended Learning involves integrating both e-learning and face-to-face learning to complement the benefits of both designs. Blended learning has recently gained popularity as an effective instructional design in nursing education due to the advancement of information communication technology innovations. Even though it has become mandatory for all public nursing education institutions to use blended learning, nurse educators are still experiencing challenges related to adaptation to Blended learning, redesigning teaching activities and methods required to optimise positive learning experiences. Therefore, nurse educators are challenged to be competent in using information communication technology devices and designing blended learning-based programs as key performance areas for successful implementation of blended learning in public nursing education institutions in Gauteng Province.

AIM: The aim of this study was to investigate nurse educators' readiness to use blended learning in public nursing education institutions of Gauteng Province.

METHODOLOGY: This study applied a quantitative research methodology, and descriptive statistics was used to analyse the data. A sample of 217 participants was selected from a population of 500 nurse educators, using a simple random sampling. Data was collected using an adopted and modified survey questionnaire. Statistical Analysis System statistical software was used to analyse the data an alpha of 0,05 was used as the level of significance. The study consists of 87.5% female compared to 11,11% male participants with the average age of 46years from the minimum age of 32 to maximum of 62 years. Majority of participants were from black ethnicity employed as lecturers (68,5%) and 33,6% of the participants had a degree in nursing.

Abstract

RESULTS: There was no significance (p>0.05) identified between respondents' educational level and employment classification, with most of the questions associated with the three variables. Nonetheless, there was some significance (p=0.0075), between respondents' age group and willingness to use Blended Learning if introduced in the institution, Age group was associated with respondents' belief that it is a good intervention to use Blended Learning in the institution (p=0.0029). Employment classification was associated with respondents' possession of insufficient knowledge and skills to use Blended Learning (p=0.0493). Educational level was associated with respondents' anticipation that Blended Learning will be easy to use once introduced (p=0.0429). Thus, the null hypothesis of no association was rejected.

RECOMMENDATIONS: The study recommended that the management of nursing education institutions should consider utilisation of Chapnick's readiness model in terms of technical, psychological, equipment, infrastructure, among other aspects for prior assessment before the actual implementation of BL pedagogy to ensure sustainability

KEY WORDS: Blended learning, Gauteng province, information communication technology, nurse educators public nursing education institutions, readiness.

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LIST OF ABBREVIATIONS	
BL	Blended Learning
CHE	Council for Higher Education
CD-ROM	Compact Disc Read-Only Memory
CINAHL	Cumulative Index of Nursing and Allied Health Literature
COVID-19	Coronavirus disease of 2019
DOE	Department of Education
ERIC	Education Resources Information Center
GP	Gauteng Province
ICT	Information communication Technology
LMS	Learner management Systems
NEI	Nursing Education Institution
SANC	South African Nursing Council

CHAPTER ONE
OVERVIEW OF THE STUDY

1.1INTRODUCTION AND BACKGROUND

Blended Learning (BL) readiness is defined as nurse educators' ability and preparedness to successfully use Information Communication Technology (ICT) systems in educational institutions (Blayone,2018:429). According to Mosa et al., (2016:113), BL readiness's significance is in assisting relevant stakeholders such as nurse educators in designing positive virtual learning experiences for successful technological lesson delivery. Globally, technological innovations have recently transformed the face of tertiary nursing education curricular due to the integration of ICT into the existing traditional pedagogical designs (Oweis, 2018:1). These innovations are associated with increased access, utilisation, and flexibility in various nursing educational programs (Alexander, Barcellonaa, McLachlana & Sackleya 2019:2).

The instructional pedagogies commonly used in tertiary nursing education didactics are face-to-face and e-learning. According to Kavitha & Jaisingh (2018:183), face-to-face pedagogy involves student's and nurse educators' direct interaction in a classroom setting during the learning process. While e-learning pedagogy, according to Oweis, (2018:1) involves the use of ICT systems to facilitate learning. The e-learning systems utilises channels such as emails, virtual or flipped classrooms, videos, interactive TV, computers, messaging boards, and student portal systems to deliver the lesson (Garrison, 2016:2; Clark & Mayer 2016:8; Oweis 2018:1). Cassum, Allana & Dias (2016:221) established a unique hybrid paradigm called BL (BL) through ICT integration using traditional face-to-face pedagogy. The latter has resulted into improved and flexible teaching where learning activities can occur at any place regardless of geographical barriers. Blended Learning consists of two components, namely, synchronous and asynchronous interactions, as indicated in Clark & Meyer (2016:8). Synchronous interactions involve the interaction between a nurse educator to student or student to student interactions in real-time and place (Clark & Meyer, 2016:8). Synchronous interactions include face-to-face contact class sessions, instant messaging or chats, videoconferencing, and virtual classrooms (Clark & Mayer 2016:8). Asynchronous interactions involve the student-paced form of lesson

delivery using emails, webs, and message boards posted via online student portals outside time and place constraints (Clark & Mayer 2016:8).

Trayeket al., 2016:2; Adekola, Dale & Gardiner, (2017:13) indicated that ICT competencies for all lecturers and instructors are paramount to the successful adoption of BL in the delivery of lectures in nursing students. Thus nurse educators' readiness for BL is evaluated in terms of knowledge, attitudes, motivation, and technical competency skills (Adekola et al., 2017:13 & Namyssova, Tussupbekova, Helmer, Malone, Afzal & Jonbekova 2019:22). For this reason, in enhancing the success and sustainability of BL, Nurse educators' BL readiness in NEI must be evaluated before pedagogy implementation.

There are vatious Blended learning benefits according to Conole, (2016:18); Webb, Clough, O'Reilly, Wilmott & Witham (2017). The various benefits include increased accessibility, dialogue, motivation, flexibility, collaboration, and convenience during educational interactions Conole, 2016:18; Webb, Clough, O'Reilly, Wilmott & Witham, 2017). On the contrary, Jantjies & Joy, (2016:1); Oweis (2018:2) associated BL with challenges such as; non-readiness on part of nurse educators, time intensiveness, lack of motivation, lack of ICT usage skills, exposure, and lack of expertise in innovative BL training strategies by nurse educators.

Globally, nursing educational dynamics have led to newer methods of lecture delivery, and as a result, nurse educators must be prepared to use and implement BL pedagogy before its implementation. Nurse educators, in particular, must be knowledgeable and skillful in using ICT tools as well as designing meaningful virtual learning platforms to deliver the educational contents to students successfully (Alexander et al., 2018:2; Brown, 2016:1; Gonçalve, Chumbo, Silva, &Patrício, 2019:132; Adekolaet al., 2017:13).

Most studies that focused on BL previously concentrate on students' experiences, attitudes, and outcomes. On the other hand, less than 5% of studies explored the academic practice in terms of nurse educators' readiness to use BL (Brown 2016:1). Other studies have focused on barriers, enablers, attitudes, and educators' experiences in using BL. These studies focus areas indicate the limited literature on nurse educators' readiness for BL in South African Public nursing education (Porter & Graham 2016:748). Thus, any NEI intending to implement BL must determine nurse educators' readiness to use BL since these directly influence BL pedagogy implementation. Therefore, the NEI role in facilitating BL readiness is inevitable, hence the need for further studies (Coopasami, Knight & Pete al., 2017:301; Brown 2016:4).

A previous study on the use of BL in nursing education institutions in the United States revealed that 32% of the nurse educators lacked computer skills while the designed curriculum for nursing students excluded computer literacy packages (Button et al., 2014: 1320; Brown, 2016:4). Therefore, there is a need to further investigate nurse technical readiness abilities for BL in the South African context prior to implementing the BL pedagogy, promoting success and sustainability.

In many African countries, the use of BL continues to grow exponentially, yet some barriers for its adoption by nurse educators continue to exist in various NEIs (Jantjies& Joy, 2016:1). Although BL was implemented in many Libyan NEIs, nurse educators still deliver lectures using traditional face-to-face learning. It is still unclear whether nurse educators are ready to embrace and integrate BL in various nursing institutions in Libya. Based on this study (Elkaseh, Wong & Fung 2016:192; Contreras &Hilles 2015:54), it is crucial to assess nurse educators' readiness to use BL before its implementation for success operation (Elkaseh, Wong & Fung 2016:192; Contreras &Hilles 2015:54).

In South Africa, the department of health developed ICT integration policies into the nursing curricular and practice to enhance ICT skills and workplace competencies. This was intended to improve the effective integration of ICT into the NEIs; however, many nurse educators in public NEIs around GP were still reluctant to use BL in the few colleges with an established ICT infrastructure. Furthermore, it is unclear whether the educators in other NEIs intending to implement the BL pedagogy will be ready and willing to embrace the new educational innovation (National Department of Health, 2013: 50). Therefore, nurse educators in South Africa are challenged to use ICT tools to create positive learning experiences and improve social and economic development in all sectors, including the nursing profession (UNICEF, 2015:5).

Assessment of nurse educators' readiness for BL is crucial to determine any technical, psychological, infrastructure and equipment readiness required to successfully implement BL in the NEI in GP (Coopasamiet al., 2017:301). To this end, BL pedagody readiness assessment for nurse educators at public NEIs in GP is a crucial activity. The assessment depicts the impact of ICT on the NEI identifying areas that require immediate attention before implementation, for such as technical support and training of staff.

Although Ma'arop & Embi (2016:41) confirmed educational paradigm shift towards using BL, some nurse educators were reluctant yet they have a significant role embracing technology for their teaching activities (Risling, 2017:89; Chigona 2014:35). It remained a gap in Ma'arop and

Embi (2016:41) study whether public NEIs or nurse educators were ready to embrace and use BL technologies for the successful delivery of academic content to student nurses.

In South Africa, there is limited literature related to nurse educators' use of BL readiness (Gay 2016:3), hence the need to conduct this current study. This study aimed at determining nurse educators' readiness to use blended learning for public nursing education colleges in Gauteng Province.

1.2 PROBLEM STATEMENT

There has been a global shift towards the use of BL pedagogy in nursing education colleges due to technological innovations (Rizvi, Gulzar, Nicholas & Nkoroi,2017:1). In South Africa, changes have emerged to register with the council for higher education (CHE) establish a strong ICT infrastructure in re-aligning the nursing curriculum with the national qualification framework (National Department of Health, 2012/132016/17). The changes were due to the development of the new nursing curriculum, making it mandatory for all public NEIs to put in place these ICT infrastructure. Besides, the establishment of ICT integration policies into the nursing education institution curricular, as emphasised by the strategic plan for nurse education, training and practice 2012/13-2016/17, has challenged all public NEIs in Gauteng Province to re-think, restructure and establish an improved and efficient way of rendering nursing education activities to their students. This is because the policy demands that ICT must carefully be integrated into the nursing curricular and practice, thus prompting all nurse educators in NEIs to be competent in using ICT tools to render quality educational services effectively.

Although a few NEIs have an already established ICT infrastructure, including internet access, most of their educators are still struggling with the implementation of the BL pedagogy. There are also several NEIs that are in the process of establishing the BL pedagogy, yet it is still unclear if the pedagogy will effectively be implemented and sustained. Furthermore, it is not clear whether nurse educators in these public NEIs are ready and willing to use BL pedagogy due to digital literacy amongst nurse educators. Lack of readiness will imply failure of the pedagogy since it requires newer and different approaches to teaching and learning compared to the existing traditional face-to-face method of teaching.

There is limited evidence in the local literature to indicate whether the current nurse educators of public NEI in GP are ready and willing to use BL pedagogy. Thus, there is a need to

investigate nurse educators' readiness to use BL as a prerequisite for successful implementation and sustainability of the BL pedagogy of public NEI in GP, which is the aim of this study.

1.3 RESEARCH QUESTION (S), AIM AND OBJECTIVES OF THE STUDY

1.3.1 Aim

The aim of this study was to investigate nurse educators' readiness to use blended learning in public nursing education institutions in Gauteng Province.

1.3.2 Objectives

The objective of this study was:
To determine the nurse educators' readiness to use blended learning in Nursing education institutions in Gauteng Province by assessing the following dimensions areas:

- Describe the level of association between the nurse educators' demographic information and use of BL readiness.
- Assess nurse educators' Technological readiness.
- Assess nurse educators' Psychological readiness.
- Assess nurse educators' Infrastructure readiness.
- Assess nurse educators' Equipment readiness.

1.3.3 The research question

The study's research questions were:

- Is there an association between nurse educators' demographic information and use of BL readiness?
- Are the nurse educators ready to use blended learning at public nursing education colleges in Gauteng Province across the following four dimension areas:
  - Nurse educators' Technological readiness.
  - Nurse educators Psychological dimension.
  - Nurse educators Infrastructure readiness.
  - Nurse educators Equipment readiness.

1.4 DEFINITION OF KEY TERMS

1.4.1 Nurse educator

A nurse educator is a professional nurse with an additional qualification in Nursing Education and registered with the South African Nursing Council (Nursing Act 33 of 2005). In this study, a nurse educator is an individual who is employed at a nursing education institution to teach theory or modules. The nurse educators were used in this study as respondents who provided information regarding nurse educators' readiness to use BL at public NEI in Gauteng Province. Only individuals with additional qualifications in nursing education as a minimum tutorship requirement were considered for the study.

1.4.2 Readiness for blended learning

Readiness for blended learning is described as the nurse educators' ability and preparedness to competently integrate ICT into the existing traditional face-to-face pedagogy as they underwent various technological transformations (Trayeket al., 2016:2; Coopasami, et al.; 2017:301). In this study, readiness is described in terms of psychological, sociological, environmental, human resource, technological, equipment, and course content readiness dimensions (Coopasamiet al., 2017:301). In addition, readiness described the nurse educators' willingness to use ICT systems to implement BL at public NEI in Gauteng Province successfully.

1.4.3 Information and communication technology (ICT)

Information and communications technology (ICT) is a term used to describe all the digital devices used in transmission of educational content to support meaningful learning. Examples of ICT devices include blogs, emails, virtual or flipped classrooms, videos, interactive TV, computers, messaging boards and learner management systems (Garrison, 2016:2; Clark & Mayer 2016:8; Oweis 2018:1).

1.4.4 Blended Learning (BL.)

Blended learning is defined as a combination of traditional knowledge (face-to-face) learning and e-learning to complement each other (Buckley 2019:69; Cassum et al., 2016:221). In this study, blended learning described the synchronous and asynchronous instructional pedagogy used by nurse educators in public NEI to facilitate teaching and learning processes.

1.4.5 Public Nursing Education Institutions (NEIs)

Nursing Education Institution (NEI) is described as any nursing education institution, whether a school or college, public or private university, accredited to provide nursing courses in terms of nursing Act no 33 of 2005. In this study, public NEI was described as government-owned institutions or colleges in Gauteng Province that are accredited to provide nursing courses in nursing Act no 33 of 2005. This study was conducted on nurse educators employed by public NEIs in Gauteng Province.

1.5 THEORETICAL FRAMEWORK FOR THIS STUDY

The researcher adopted the Chapnick Readiness Model (2000) as cited by Coopasamiet al., (2017:301), to underpin this study. Nurse Educators' readiness for BL in NEIs was measured using the Chapnick Readiness Model (2000), which was described in terms of 8 dimensions, that is; psychological, sociological, environmental, human resource, technological, equipment, financial readiness, and course content readiness (Coopasami et al., 2017:301; Trayek et al.,2016:2).

The rationale for using the Chapnick readiness model was to plan the implementation of BL, by measuring nurse educators' readiness in NEIs (Rohayani, Kurniabudi & Sharipuddin, 2015:231). Chapnick's readiness model was also used to address questions such as; are we able to do this? If we are able, then how is it possible to achieve it? What will the results be, and how do we evaluate them?

The researcher selected four dimensions that were relevant to this study. For purposes of this study, Chapnick's readiness dimensions were subdivided into two sub-groups, human and system readiness aspects. The human readiness aspects included psychological, technological, sociological, and human resource readiness aspects. On the other hand, the systems readiness aspects had environmental, equipment, financial readiness, and course content readiness. Refer to chapter two for full details on the Theoretical Framework.

1.6 RESEARCH METHODS

A descriptive non-experimental survey design was applied to investigate nurse educators' readiness to use BL in public NEIs in Gauteng Province. The descriptive survey is a non-experimental design used when a researcher wants to describe characteristics of variables of interest in their everyday setting (Polit & Beck 2017:726). In this study, data was collected from five public NEIs across Gauteng Province in South Africa.

Gauteng Province has five (5) public nursing colleges, according to SANC database. This study's sample size was 217 nurse educators for all five (5) NEIs. Ethical clearance for the study was obtained from the University of Pretoria faculty of health sciences Ethics Committee and the public NEIs in GP. The researcher ensured that institutional, departmental heads and Gauteng National Department of Health gave their permission for the study. The respondents and questionnaires signed consent forms developed by the researcher and the statistician after intensive literature review. Aspects related to nurse educators' readiness to use BL were dealt with in the questionnaire. The nurse educators were given time to answer the questions in the questionnaire. Data was later analysed using descriptive non-experimental survey design. Refer to Chapter three for full details on research methods.

1.7 THE STUDY LAYOUT

This dissertation comprises of five chapters, listed as follows:

Chapter 1: Overview of the study. This chapter has introduced the topic under study, problem statement and described the specific problem addressed in the study as well as design components.

Chapter 2: Literature review. This chapter presented a comprehensive literature and relevant research associated with the problem addressed in this study.

Chapter 3: Research methodology. The methodology and procedures used for data collection and analysis were presented in this chapter.

Chapter 4: Results and interpretation. All the results and analysis of the data received and presentation of the results was presented in this chapter. Further presented was the literature control aligned to the results of the study.

Chapter 5: Discussion, recommendations and Conclusion. This chapter offered a summary and discussion of the research findings, recommendations, and limitations.

1.8 SUMMARY

This chapter has introduced the study and provided information on the orientation and theoretical framework of the study. The chapter further presented the problem statement, aim, objectives, research questions and definition of terms frequently used in this research report. A summary of the research methodology applied in this study was also presented. The next chapter presents a literature review related to the nurse educators' readiness to use blended learning in public NEIs.

CHAPTER TWO
LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter explored the study overview on various aspects such as the introduction and background to the research topic, problem statement, definition of key terms, the theoretical framework, the research methods, and study design. The respective aims and objectives of this study were:

- To investigate nurse educators' readiness to use BL in public nursing education institutions.
- To determine the nurse educators' readiness to use BL in Nursing education institutions in Gauteng province.

This chapter discusses a review of the assessment which is being conducted on the nursing educators' readiness to use blended learning in their pursuit to educate future nursing practitioners in Gauteng Province. This assessment is crucial to determine any technical, psychological, infrastructure, and equipment readiness that needs to be required to successfully implement BL in the NEIs in Gauteng province (Coopasami et al., 2017:301).
BL assessment readiness depicts the impact of ICT on the NEI thereby identifying areas that require immediate attention before implementation (Coopasami et al., 2017:301). The principles of a systematic review were followed to extract literature from 2016 to 2019 and both peer-reviewed and grey literature of readiness to use blended learning were reviewed. However, this was not a systematic review per se; but a robust literature review.

2.2 LITERATURE REVIEW

The researcher followed the principles of a systematic review approach and this was shown through a literature review. For the robustness of the reviews, systematic reviews collect and critically analyses multiple research studies or papers from a quantitative study through logical processes. The review provided an exhaustive summary of the available literature that is relevant to the study research question with the assimilation of statistical quantitative

deductions (Polit & Beck, 2017:647). The review was rigorously conducted to; determine what is already known about the proposed research topic or question, appraise the quality of the research evidence and synthesize the research evidence from studies of the highest quality. Furthermore, through the review, the researcher was able to identify the research gaps and priorities for generating new evidence to fill these gaps, avoid unnecessary duplication of research as well as shape future research project and plan (Polit, 2010:170). Therefore, the literature review gives an idea of established knowledge about similar studies, as well as what is unknown about the research problem (Brink, Van Der Walt & Rensburg, 2015:54).

A systematic search of primary literature was performed, using a selection of electronic search tools over one broad category: the nurse educators' readiness to use blended learning as well as Chapnick's readiness model (2000), which was described in eight dimensions. The obtained literature was practically integrated into the Chapnick's readiness model (2000) aspects.

2.3 METHODOLOGY FOR SEARCHING RESOURCES

2.3.1 Aim and question of the review

This literature review was conducted to record the available information on nurse educators' readiness to use blended learning. The guiding research review question was: how ready are the nurse educators to use blended learning? The review approach followed a thorough search for literature that discusses the research question. The following steps guided the search: search strategy as well as the screening of identified articles for quality purposes. This was followed by the extraction of relevant information from the articles, reports, and reporting of acquired results (Polit & Beck, 2017:649).

2.3.2 Search strategy

The following databases were searched: The Scopus, google scholar, ERIC, PubMed, research gate, science direct, and Cumulative Index to Nursing and Allied Health Literature (CINAHL). The purpose was to search for evidence and reference lists of the articles and various journals that reported about blended learning in NEIs as well as nurse educators' readiness for blended learning. The above databases were known to be comprehensive sources of the world's research output in numerous fields such as technology, nursing, medicine, social sciences, arts, and humanities. The rationale for the choices was based on

the need to extensively extract the most critical evidence from universal perspectives. The key search words that were used are listed in Table 2.1:

Table 2.1: Summary of keywords

Blended or hybrid learning in nursing education institutions.
E-learning in nursing education institutions.
E-learning readiness in nursing education institutions.
Willingness to use ICT in nursing education institutions.
Blended learning readiness in nursing education institutions.
Studies that have applied Chapnick's readiness framework.
Indicators of the nursing educator's readiness to use blended learning in NEIs

2.3.3 Inclusion and exclusion criteria

According to Polit & Beck, (2017:650), a researcher must ensure that they carefully indicate accurate study variables to conduct a quality literature search. In this study, inclusion, and exclusion of literature aimed to accurately record what is already available on aspects of nursing educator's readiness to use blended learning in Nursing Education Institutions. Therefore, universal philosophies of evidence literature search were used which followed a systematic review traditional pyramid of evidence search criteria (Polit & Beck, 2017:650). The literature searched needed:

- To be in English
- To be a recent publication for the period between 2015 to 2020.
- To point out the nursing educator's readiness to use BL in nursing education institutions.

Therefore, all literature that was written in any other language other than English or that discussed aspects not related to nursing educators' readiness to use E-learning or blended learning was excluded (Polit & Beck, 2017:650). Refer to Figure 2.1 for a comprehensive description of all the literature searches conducted in this study.

2.3.4 Search outcomes

The preliminary search generated (N=1341) hit counts on Scopus database, (N=20 200) hit counts on google scholar, (N=561) hit counts on ERIC, (N=56) hit counts on PubMed, (N=227

000) hit counts on research gate, (N=586) hit counts on science direct and (N=3,221) hit counts on CINAHL. Titles of the literature were selected.

2.3.5 Selection of articles

Given the fact that the search yielded vast several works of literature on BL, the researcher concentrated on the latest articles that were published from 2016 to date. This was due to dynamic technological advancement and the fact that ICT modes of learning have been introduced in learning institutions. It is therefore inevitable that the impact of such ICT advances is regularly reviewed. Furthermore, since authors are continuously getting loads of data about the influence of the ICT innovation in NEIs, regularly updated. Therefore, only the latest articles not older than 5 years formed the basis of this review.

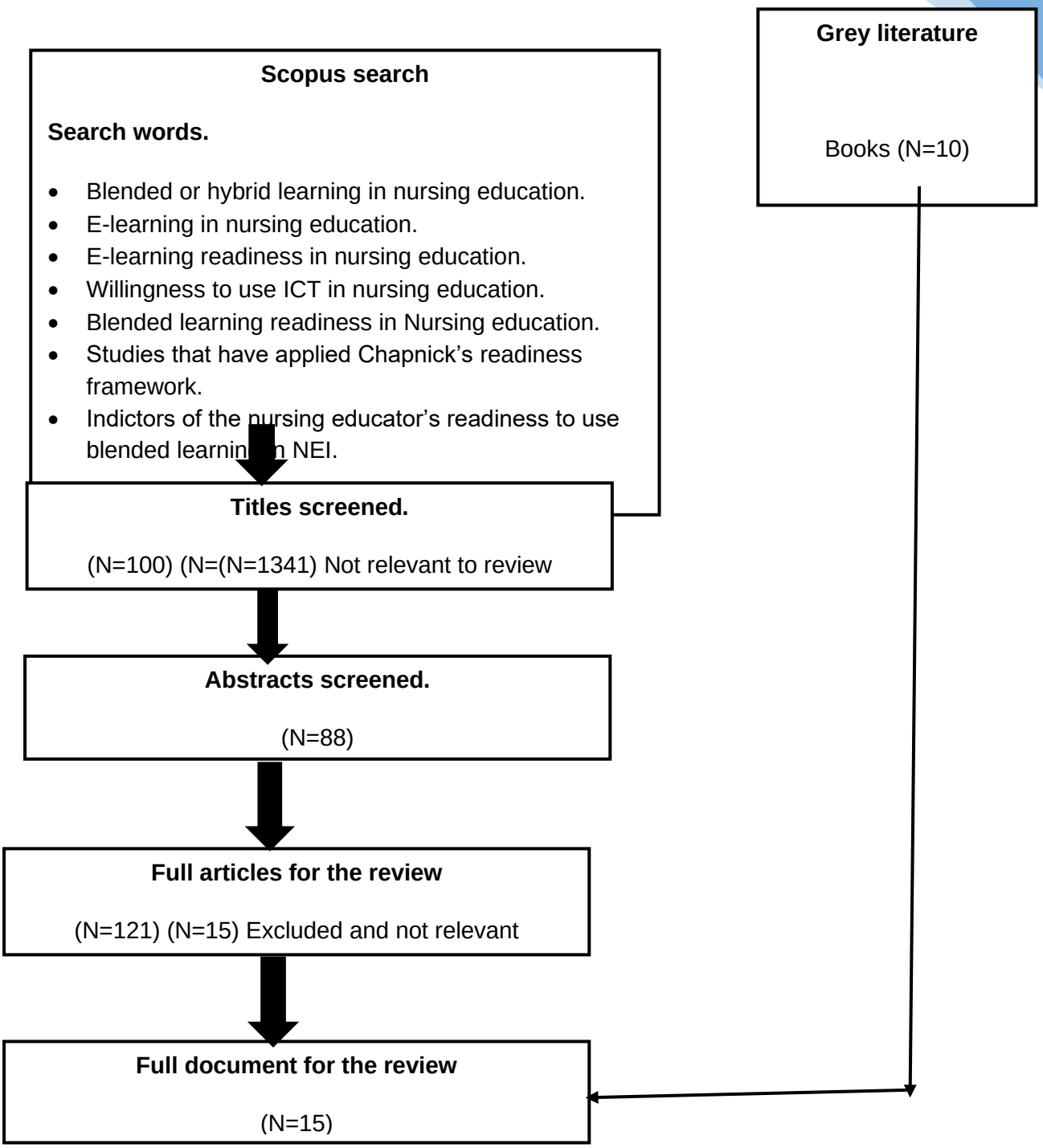

Figure 2.1: Literature searches

2.4 EXTRACTION OF DATA AND ANALYTICS APPROACH

The 16 articles and 16 grey literature that met the inclusion and exclusion criteria of the study were extracted and summarised into tables. Table 2.2 illustrates the summary of the literature or sources, presenting them under the following headings: author (s), year of publications,

country of publications, title, study aim or purpose, research paradigm as well as an indication of whether the educators were ready or not ready to use Blended Learning in each respective study.

Table 2.2: Summary of literature

AUTHOR (S) AND YEAR	COUNTRY	TITLE	AIM/PURPOSE	RESEARCH DESIGN	Blended learning readiness
Cassum, S.C., Hussein, S., Allana, S. & Dias, J.M., 2016.	Pakistan	Experiences of adopting blended pedagogies in health assessment course in post- RN baccalaureate program of nursing in Karachi, Pakistan. Journal of Education and Training Studies,	The study aimed to understand the experiences of faculty and students related to the adoption of BL pedagogies in health assessment courses.	Action research	There was a positive indication of blended learning integration
Coopasami, M., Knight, S. & Pete, M., 2017.	South Africa	e-learning readiness amongst nursing students at the Durban University of Technology	Assessment of students' readiness to make the shift from traditional learning to the technological culture of e-learning at a university in Durban.	A quasi-experimental Interrupted Time Series Analysis study design	Integration of face to face and ICT technologies
Trayek, F.A., Ahmad, T.B.T., Nordin, M.S., Dwikat, M.A., Abulibdeh, E.S.A., Asmar, M. & Sawari, S.S.M., 2016	Palestine	Underlying Structure of E-learning Readiness among Palestinian Secondary School Teachers	To identify the underlying factor structure that could explain the e-learning readiness of Palestinian secondary school teachers. -To validate the e-learning readiness measurement scale based on the data.	Cross-sectional survey	Evaluation of BL readiness using Chapnick's readiness model (2000)
Adekola, J., Dale, V.H. & Gardiner, K., 2017.	United Kingdom	Development of an institutional framework to guide transitions into enhanced blended learning in higher education. *Research in Learning Technology*	The study provided an opportunity to develop a holistic framework to guide institutional transitions into enhanced blended learning, in the context of UK higher education,	Semi-structured interviews	Evaluation of BL readiness using the A holistic framework to support effective institutional

			informed by the views and experiences of a range of stakeholders.		transitions into enhanced blended learning
Full document for the review (N=15)	South Africa	Lessons learned from teachers' perspectives on mobile learning in South Africa with cultural and linguistic constraints. *South African Journal of Education*	What are the teacher's perspectives concerning bilingual mobile technology use in classrooms?	semi-structured interview	No indication of ICT technology integration to support the teaching and learning process in the BL pedagogy
Rohani, A.H., 2015.	Indonesia	A literature review: readiness factors to measuring e-learning readiness in higher education. *Procedia Computer Science*.	-The Purpose of the study is to discuss the theory of E-learning Readiness Factors and investigate the readiness factors that have been found by previous researchers for measure e-readiness at higher education.	Meta-analysis as research design	To evaluate readiness for e-learning readiness in terms of technical, content, human and financial resources.
Brown, M.G., 2016.	United States	Blended instructional practice: A review of the empirical literature on instructors' adoption and use of online tools in face-to-face teaching. *The Internet and Higher Education*.	The purpose of this review was to identify peer-reviewed research that examined the factors shaping blended instructional practice in undergraduate education.	Not indicated	Evaluation of faculty member's adoption and use of online tools for face-to-face instruction
MNCUBE, V., OLAWALE, E. and HENDRICKS, W., 2019	South Africa	Exploring teachers' readiness for e-learning: On par with the Fourth Industrial Revolution?	The study investigated teachers' readiness on the use of e-learning in the Eastern Cape Department of Education	quantitative study design	Exploring teachers' readiness for e-learning using the e-readiness framework
Miglani, A. & Awadhiya,	India	Mobile Learning: Readiness and	The purpose of this study was to	Survey method	Indication of

A.K., 2017.		Perceptions of Teachers of Open Universities of Commonwealth Asia. *journal of learning for development*.	identify the readiness and perceptions of the teachers of the Open Universities of Commonwealth Asian countries towards m-learning.		Integration of 'Mobile Learning
Al Gamdi, M.A. & Samarji, A., 2016.	Saudi Arabia	Perceived barriers towards e-learning by faculty members at a recently established university in Saudi Arabia. *International Journal of Information and Education Technology*.	To investigate the potential barriers towards effective adoption and implementation of e-learning by faculty members.	Quantitative study design	Perceived barriers towards e-learning
Christensen, R. & Knezek, G., 2017.	USA	Readiness for integrating mobile learning in the classroom: Challenges, preferences, and possibilities. *Computers in Human Behavior*.	This study examines the challenges, preferences, and possibilities for integrating mobile learning into the classroom	Exploratory factor analysis	
Rohayani, A.H., 2015.	Indonesia	A literature review: readiness factors to measuring e-learning readiness in higher education. *Procedia Computer Science*.	The Purpose of the study is to discuss the theory of E-learning Readiness Factors and investigate the readiness factors that have been found by previous researchers for measure e-readiness at higher education.	Meta-analysis	Measurement of e-learning readiness is essential to support the success of E-learning implementation in higher education
Blayone, T., 2018.	Canada	Reexamining digital-learning readiness in higher education: Positioning digital competencies as key factors and a profile application as	This study, focused on higher education, reviews the readiness literature and positions digital competencies	Critical review	There was an indication of blended learning integration

		a readiness tool. *International Journal on E-learning*.	as factors within it.		
Mosa, A., Naz'ri bin Mahrin, M. & Ibrrahim, R., 2016.	Malaysia	Technological aspects of e-learning readiness in higher education: A review of the literature. *Computer and Information Science*.	This paper explores the gaps in the knowledge about the technical aspects of e-learning readiness through the conduct of a literature review	Not indicated	Evaluation of factors linked to technological aspects of e-learning readiness
Gay, G.H., 2016.	Barbados	An assessment of online instructor e-learning readiness before, during, and after course delivery. *Journal of Computing in Higher Education*.	To assess online instructors' levels of e-readiness and impact before, during and after course delivery	Web-based survey	The Impact of online instructor e-readiness before, during, and after course delivery
Aung, T.N. & Khaing, S.S., 2016.	Myanmar	Challenges of implementing e-learning in developing countries: A Review. In *International Conference on Genetic and Evolutionary Computing*	To investigate the Challenges of implementing e-learning in developing countries	Quantitative	No indication of ICT integration

2.5 FINDINGS

The section that follows will summarise the deductions of the 16 articles and all relevant information that were consulted, in pursuit of finding out how ready nursing educators are to use blended learning pedagogy, in imparting knowledge to future nursing practitioners in Gauteng Province. The objective of the study will be reported in this section using the four dimensions of Chapnick's Readiness Model (2000), as follows;

2.6 CHAPNICK'S READINESS MODEL

The researcher adopted the Chapnick Readiness Model (2000) as cited by Coopasami et al., (2017:301), to underpin this study. Nurse Educators' readiness for BL in NEIs was measured using the Chapnick Readiness Model (2000) which comprised of 8 dimensions, that is; psychological, sociological, environmental, human resource, technological, equipment, financial readiness, and course content readiness dimensions (Coopasami et al., 2017:301; Trayek et al., 2016:2; Adiyarta, et al., 2018:2). The rationale for use of the Chapnick readiness model was for effective implementation of BL in NEI (Coopasami et al., 2017:301; Rohayani et al., 2015:231).

For this study's purposes, Chapnick's readiness dimensions were sub-divided into two groups: human and system readiness aspects. The human readiness aspects included psychological, technological, sociological, and human resource readiness aspects. On the other hand, the systems readiness aspects will include environmental, equipment, financial readiness, and course content readiness. Although the model had eight dimensions, only 4 dimensions relevant to the study, namely, technological, psychological, infrastructure and equipment readiness dimensions were covered as the scope of this study. A brief description of the other four dimensions was described as follows.

The sociological readiness dimension recognized the collaborative and interpersonal factors within the NEIs where the BL programme was conducted (Coopasami et al., 2017:301). Nurse educators in public NEIs were previously challenged to explore newer pedagogies, such as BL, due to changes in students' demographics and ICT educational innovations which emerged from contemporary nursing educational changes (Rotellar, & Cain 2016:1).

The environmental readiness dimension considered the internal and external forces which impacted stakeholders of the nursing education institutions. The human resource readiness

dimension reflected the accessibility and structure that existed within the nursing education institutions (Coopasami et al., 2017:301). The human resource readiness dimension described all the nurse educators' professional characteristics in public NEI in terms of their educational levels, training, and skills. The dimension determined the impact of demographic factors on the BL readiness and evaluated if any support or training was required for nurse educators as they transitioned towards the use of BL systems (Coopasami et al., 2017:301).

Financial readiness is related to the monetary resources available concerning the available budget size for the nursing education institutions (Coopasami et al., 2017:301). The NEIs were required to prepare all the necessary resources needed for the implementation of BL pedagogy, to ensure the pedagogy's sustainability in the NEI's learning milieu. The content readiness mainly focused on the curriculum's substance developed for teaching students and the ICT integration process by nurse educators in the learning environment (Coopasami et al., 2017:301).

Chapnick's model was used to assess if blended learning content was available, congruent with the curriculum, and if nurse educators were skilled in the development of the BL content or were comfortable with the existing content (Njihia & Oketch 2014:34). Chapnick's model was therefore used to assess for any possible needs required by the nurse educators to develop BL materials and limit any discrepancies between technologies and the academic contents (Harerimana & Mtshali 2017:24; Topkaya & Kaya 2015: 142). The Figure 2.2 depicts the four dimensions utilised from Chapnick's readiness model to underpin this study (Coopasami et al., 2017:301; Trayek et al., 2016:2; Adiyarta, et al., 2018:2).

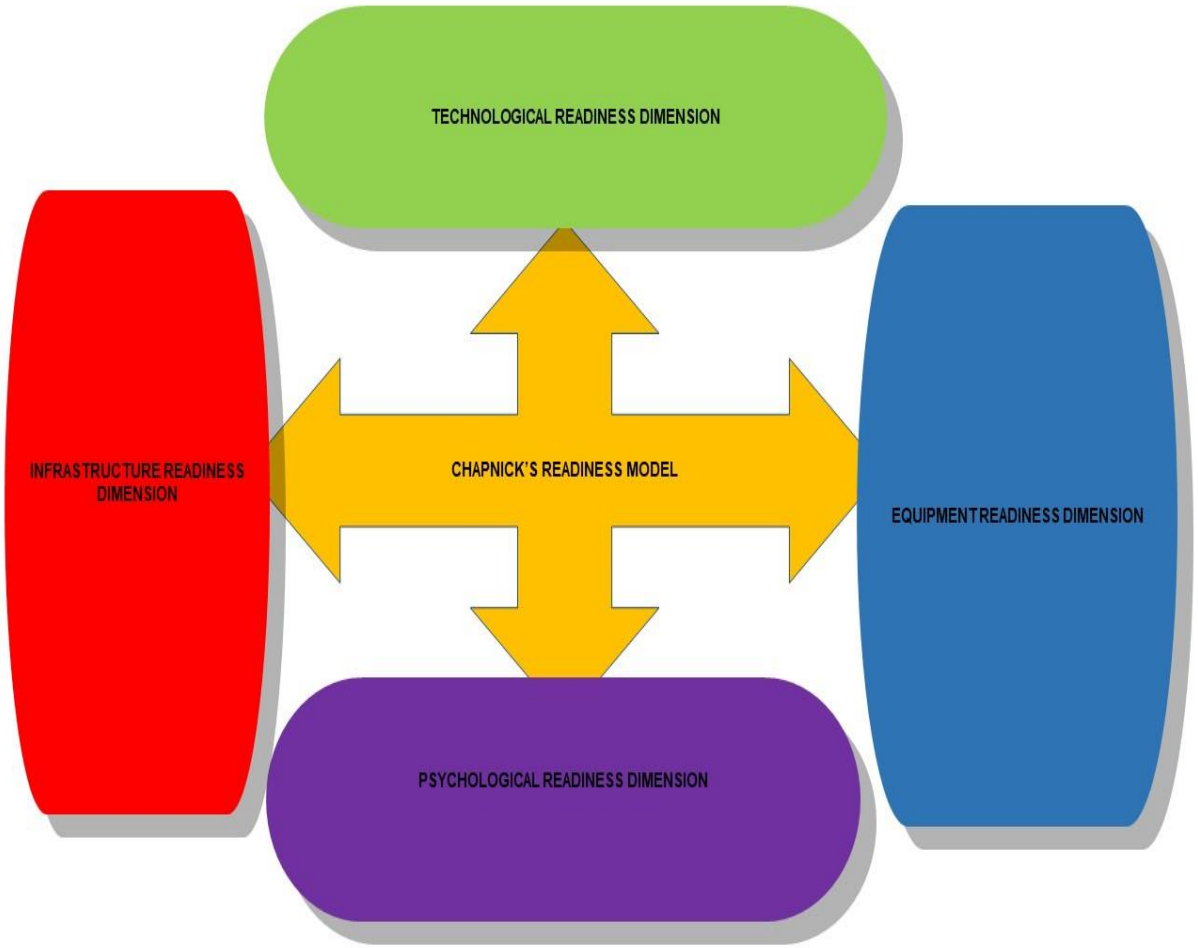

Figure 2-2: The Chapnick's readiness model

The full description of these four dimensions are as follows:

2.6.1 Technological readiness dimension

The technological readiness dimension described a technical support team's availability to support the nurse educators in NEI. Blended learning users were required to have technical skills needed to successfully use BL pedagogy (Coopasami et al., 2017:301). Additionally, nurse educators' knowledge, skills, and pedagogical approach to teaching either facilitated or hindered their readiness to use the BL pedagogy (Jantjies & Joy 2016:1; Christensen & Knezek, 2017). In this study, technological readiness was assessed in terms of attitudes, knowledge, skills, and resources required by nurse educators to use blended learning.

In a previous study in South Africa that aimed to evaluate nurse educators' technological readiness, no change was detected in the overall score on all ten components used to assess technological readiness (Coopasami et al., 2017:302).

A study by Trayek et al., (2016:2) that utilised Chapnick's readiness model to evaluate educators' readiness for Blended learning in Palestine revealed that educators' knowledge can be measured in terms of e-learning knowledge, computer skills, and positive beliefs about the benefits of e-learning. A conclusive finding was that successful uptake of Blended learning pedagogy, could be made possible through thoughtful consideration of institutional needs as well as overall readiness of the faculty personnel in the BL milieu.

Furthermore, Brown, (2016:4), confirmed that nurse educators experienced technological challenges, during the implementation of the BL programme which created a barrier for uptake of the pedagogy. Therefore, all NEIs must assess the preceding needs, in addition to nurse educator readiness to effectively implement the BL pedagogy. Another study by Miglani & Awadhiya, (2017:60) revealed that there is a critical need for all nurse educators to be ready for BL to deliver lectures using BL pedagogy successfully. The readiness for BL was subjective to the nurse educators' level of technical knowledge, awareness, and motivation.
Previously, there were ample studies that reported on why educators were not ready to use technologies. The authors indicated that lack of readiness to use technologies were the following challenges: competence, knowledge, autonomy, skills, access, time, resources, training, and technical support which represented almost all that is necessary to engage in e-learning (Mncube, Olawale & Hendricks, et al., 2019:7). However, there is still a gap in the Nursing education milieu since the study context differed resulting in a need to determine nurse educators' readiness to use BL pedagogy.

Contrary to the above, Mncube citing (Thaufeega, 2016) concluded that although ICT infrastructure was available, including ICT knowledge, skills, and support, evidence evidenced showed that these were not conditions that automatically resulted in the adoption and use of BL. He further added readiness for e-learning depended on access, technological skills, study habits, and skills, as well as self-directedness in learning (Mncube et al., 2019:8). Quoting (Gillwald, et al., 2018), Mncube points out that South African nursing colleges outstrip other African countries in terms of access to digital devices and resources. He adds that although South Africa performs well in this measure, there is evidence that ICT technologies are not affordable to the majority of South Africans. This contributes to one of the non-readiness of nurse educators to use BL in public nursing education institutions (Mncube et al., 2019:12). Moreover, most nurse educators do not use digital tools and devices for exploring curriculum content because they lack the understanding of the multifaceted relationships between content, pedagogy, and the technology to be incorporated into the curriculum delivery (Mncube et al., 2019:13).

Moreover, it was generally reported that the educators in many institutions in South Africa, lacked ICT technical support from their institutions, which contributed to the reduced uptake and readiness to use BL pedagogies successfully. Most educators emphasized the need for integration of ICT technical support in their institutions as a measure to support their readiness during their transition towards the use of BL and implementation thereof. More training in using ICT technologies and exposure to various virtual platforms is vital to enhance the readiness of educators for BL pedagogy across all disciplines. Additionally, the influence of educators in successful BL pedagogical integration should not be underestimated (Jantjies & Joy, 2016:8).

2.6.2 Psychological readiness dimension

This dimension mostly focuses on the nurse educator's mental status and implication on the nurse educators' Blended Learning initiative. This readiness dimension implies the implementation process (Coopasami et al., 2017:301). Individual perceptions and beliefs about ICT technologies have various implications on the uptake of blended learning and this could either positively or negatively influence nurse educators' readiness to use Blended Learning (Kaliisa, 2017:2). Therefore, nurse educators' psychological readiness goes hand in hand with Chapnick's psychological readiness in terms of facilitating the successful implementation of Blended Learning (Coopasami et al., 2017:304). Some nurse educators may be reluctant to use blended learning partly because of the uncertainty that may be experienced during interactions with students, or increased demand in terms of time for implementation and flexibility to use ICT tools (Rotellar & Cain 2016:4). Moreover, Auster (2016:39) explained that nurse educators often have a task to ensure that all their educational activities are positively and competently implemented to successfully transmit academic content to all students. Therefore, it is very vital to assess nurse educators' readiness for blended learning prior to implementation which will eventually increase students' psychological ability to learn as well as their enthusiasm and improved academic performance (Auster, 2016:40).

According to Brown, (2016:4), educators' and faculty's beliefs and attitudes about BL pedagogy, served as guidelines for effective planning for BL virtual platforms, thus promoting Nurse educators' readiness for BL. Educators and faculty transitioning towards the use of BL are reported to experience intense technological anxiety during the implementation of the BL pedagogy. The nurse educators' positive readiness for BL or the educators' support of student-centered learning is associated with increased motivation and uptake of the BL pedagogy by

nurse educators. Therefore, nurse educators with computer literacy skills and experience in designing the BL pedagogical strategies are often ready and willing to adopt BL technologies. Although a study by Coopasami et al., (2017:301) states that educators' uptake for blended learning is directly affected by psychological disposition, it was found in a study by Trayek et al., (2016:2), that no substantial affiliation between educators' overall readiness to use Blended learning and psychological disposition. The researchers further explained that psychological readiness might not be as relevant as technical, content, or infrastructure readiness. It is for this reason that educators' readiness for BL be further investigated to understand the psychological impact of BL on the part of the nurse educator.

In a study by Cassum et al., (2016:223), it was revealed that educators' relaxation, obligation, and capability directly impacted the uptake of blended tools, making it easier for the educators to move towards the use of the BL pedagogy smoothly. Although it was reported in a study by Cassum et al., (2016:223) that most educators were positive towards the introduction of the new BL pedagogy, the entire faculty members complained about time limitations associated with the new pedagogy. This supports the fact that the uptake of BL is associated with wastage of time for delivery and preparation of instructional designs.

Contrary to the above aspect, a similar study revealed that educators supposed that BL pedagogy in the form of Mobile learning saves time and is a feasible alternative to traditional face-to-face teaching as well as pure e-learning (Miglani & Awadhiya,2017:60). Likewise, gaps were identified in perceptions of BL among students and educators, in that some educators were reluctant to integrate ICT technologies efficiently and successfully in their BL course designs, leading to failure of successful implementation of BL pedagogy. Most of these rigid educators were against students using ICT devices during classroom interactions (Miglani & Awadhiya,2017:60). Furthermore, it was revealed that although educators actively distributed study content to their students and gave virtual references as a point of reference, they were still ignorant about the prospective role of ICT mobile technologies in enhancing the success of BL pedagogy (Jantjies & Joy, 2016:8).

2.6.3 Infrastructure readiness dimension

The infrastructure readiness dimension is associated with aspects to do with the availability of ICT technologies such as learner management systems (LMS), computers or laptops, computer laboratories as well as technical support staff and training for the staff and students. Institutions ought to assess the required necessities and prepare a well-organised plan before

the implementation of Blended learning pedagogy. The institutional must have proper planning in terms of funds required to enhance BL pedagogy's sustainability and regularly assess for effectiveness thereof. This will assist in measuring their readiness for BL pedagogy (Ahmad, Quadri, Qureshi & Alam, 2018: 5).

A study by Brown, (2016:3) revealed that inadequate access to ICT technology, consistency of technology, and the complexity of ICT technologies was among the factors that were recognised as prospective obstacles to the successful implementation of BL pedagogy. The inability to have access to suitable learner management systems intended to support learning is among the factors impeding the successful integration of BL pedagogy and BL readiness among nurse educators in Nursing education institutions worldwide. Defective or substandard technological infrastructure negatively impacts the pedagogy's success, especially when the nursing education institution does not have the ICT capacity.

Furthermore, the use of BL is both costly and time-intensive for nursing education institutions. Many educators testified that planning and arranging the educational content for the pedagogical design is time wasting. Therefore, all nurse educators and faculty must be well prepared before implementation of the BL to promote institutional and nurse educator readiness, thus making the pedagogy successful (Brown, 2016:3). Moreover, nursing education institutions should have adequate financial resources, well-established policies, and realistic procedures with the institutional context before the commencement of the BL programmes. If any NEI has a non-existence BL policy, deficient ICT support systems, resources, and internet connection challenges, the implementation of BL pedagogy and educator support will tremendously fail. As a result, the nurse educators' readiness for BL pedagogy becomes impeded (Al Gamdi & Samarji,2016:25).

According to Trayek et al., (2016:2), fundamental philosophers noted that training of nurse educators in computer literacy skills and establishment of an ICT infrastructure is vital in promoting their uptake for BL pedagogy and readiness thereof, for successful implementation and delivery of lectures using the BL platforms. Three readiness dimensions for BL pedagogy such as technological, psychological, and equipment, were recognized as important as they played a significant role in the implementation of the BL pedagogy.

In most South African institutions, information sharing among nurse educators and students is still paper-based, as the majority of the participants disagreed by stating that educators in these institutions of learning do not employ digital tools in information sharing. This was mainly

due to poor provision of ICT infrastructure, lack of electricity, shortage of educational resources, and poor or no internet connectivity, which harmed the use of e-learning. Therefore, the provision of internet access to schools and rural areas must be addressed to improve nurse educators' readiness to use blended learning (Mncube et al., 2019:14).

Although most South African Nurse educators at all levels have access to digital devices in NEI for teaching and learning, nurse educators do not integrate e-learning in their teaching methods. In addition, information sharing in learning institutions is still paper-based, since various findings have revealed that poor or unavailability of internet connectivity hinders nurse educators' readiness and uptake for the BL pedagogy thereof (Mncube et al., 2019:14).

2.6.4 Equipment readiness dimension

This dimension deals with the ownership and availability of proper and appropriate equipment needed for implementation of the Blended Learning within the NEI's such as laptops, tablets, and personal computers (Coopasami et al., 2017:301). Since proper equipment is necessary for the successful implementation of blended Learning, NEIs must have access to computers and all other ICT equipment required to facilitate the learning process, otherwise, lack of proper equipment may hinder the implementation of BL in Nursing education institutions (Coopasami et al., 2017:305).

On the contrary, a study by Jantjies & Joy, (2016:8) on educators' viewpoints on BL in South Africa revealed that although many nurse educators had access to different forms of ICT technologies, most did not opt to effectively use these technologies to support learning activities in the BL pedagogical environment. Further evaluation of other dimensions such as educators' technological and psychological readiness must be emphasized in this situation. Furthermore, assessment of BL in terms of equipment readiness prior to the implementation of BL pedagogy must be considered. It was evident that the students and faculty at the Durban University of Technology generally had a shortage of ICT technological equipment to support BL pedagogy. Therefore, it is very difficult for nurse educators under all circumstances to have access to ICT technological equipment and promote the success of BL pedagogy. Therefore, all NEIs must make provision for the purchase of ICT technologies, to ensure both nurse educators' and students' readiness for successful uptake of the programme (Coopasami et al., 2017:305).

Finally, a study by Trayek et al., (2016:4) that utilized Chapnick's readiness model to evaluate educators' readiness for BL confirmed that successful uptake for BL can be measured by the successful integration of the equipment readiness dimension. It should be deductively concluded that no BL programme can thrive in a resource-constrained environment. Therefore, faculty in NEIs must have the potential to effectively provide adequate ICT equipment for both the teachers and students to use during their academic interaction.

2.7 DISCUSSION AND CONCLUSION OF THE LITERATURE REVIEW

From the four areas of readiness dimensions presented in the previous section, blended learning is crucial amongst nurse educators. Globally, rapid changes in higher education institutions have resulted in Blended Learning, which involves a combination of traditional face-to-face and e-learning methods. This resulted from the development of ICT innovations, leading to the emergence of new pedagogy, Blended learning. Therefore, it is paramount for all nurse educators to keep up to date with such innovations for the successful delivery of lectures to the respective students (Oweis 2018:1).

Blended learning is associated with benefits such as delivery of quality educational services to a wider range of audience, enhanced students' autonomy and self-paced learning, easy access to educational materials by the students, cost-effectiveness, increased access, higher efficiency, and saveing of time among others (Coopasami et al., 2017:301; Cassum et al.,2016:221). On the other hand, several blended learning is associated with barriers such as deficiency skills in word clarification and inability to access information using the internet, restricted access to the internet, deficiency of ICT skills and infrastructure, deficiency of ICT support by faculty, uncertainty in terms of students', educators' expectations and lack of pedagogical ICT incorporation principles by nursing educational institutions among others (Cassum et al., 2016:222; Aung & Khaing:2016:406).

There are currently several nursing educational institutions from developing countries such as South Africa that still experience the above-mentioned challenges within within academic institutions, including congested classrooms. To resolve such challenges, there should be an effective use of BL by the nursing educational faculties, to bring about tremendous outcomes, through a convenient and improved transfer of nursing educational content to a large audience of students (Aung & Khaing:2016:406).

Evidence on the use of BL indicates that Nurse educators' readiness for BL impacted the implementation process and the successful use of BL in nursing education institutions. It is therefore evident that the evaluation of nurse educators' readiness, had a positive impact on the successful uptake and implementation of the BL pedagogy, making the delivery of educational content in NEI more efficient and effective. Therefore, nursing education institutions are encouraged to make careful assessments, using a feasible BL readiness framework (Chapnick's readiness model 2000), before the BL programmes (Coopasami et al., 2017:301).

Prior to implementation of BL pedagogy, it is crucial to design course goals, evaluate its benefits, obstacles, and, above all, evaluate nurse educators' readiness for effective implementation of the programme. Nurse educators' readiness for BL is defined as a measurement factor or tool for evaluation of nurse educators' level of flexibility for successful uptake and delivery of BL pedagogy in nursing education institutions (Blayone,2018:429). This will assist in identifying whether the Nurse educators, students or faculty are well prepared for the uptake of the new pedagogy (Coopasami et al., 2017:301). Nursing education institutions transitioning to the use of BL pedagogy may have some limitations such as failure of the programme if BL readiness isn't carefully measured in terms of Nurse educators' attitudes, knowledge, motivation, and technical competency skills (Blayone,2018:429; Rohayani et al.,2015:231; Aung & Khaing:2016:406). Therefore, the evaluation of BL readiness is vital in promoting the effective implementation of BL pedagogy in Nursing educational institutions. Careful planning on the part of the institution is crucial to save time, ensure cost-effectiveness and reduce frustration.

Prior literature supports that integrating digital technologies in South African institutions of learning is placed as a mechanism for educational reforms, via transformation of teacher practice and objectifying digital learning. Digital technologies are however placed as interactive tools which served to facilitate change in schools, improving standards and facilitating personalized learning (Mncube et al., 2019:7). They are also essential to satisfy curriculum expectations and facilitate Science-Technology-Engineering Mathematics education including nursing education courses. Identical to film, radio, and television, digital technologies are placed as important tools for restructuring teaching (Howard & Mozejko, 2015).

Although there are some studies conducted on the use of BL, it is still evident in the local literature that limited studies have been conducted to investigate nurse educators' level of

readiness to use BL in the Nursing education institutional context, thus the knowledge gap (Adekola et al., 2017:2). It is therefore imperative to investigate nurse educators' readiness for BL with a quest to bring about more efficient and effective educational delivery pedagogies in Nursing education institutions.

Furthermore, in South Africa, several ICT integration policies into the nursing education institution curricular and practice were among the key aspects outlined in the strategic plan for nurse education, training, and practice 2012/13-2016/17. There are objectives which were outlined in the strategic plan which strongly encourages the nursing profession to incorporate the ICT tools into both the educational and clinical sectors, as a way of equipping the nurses with competencies to keep up to date with current technological innovations and improve quality practice and teaching. It is for this reason that the readiness of nurse educators in public NEI in Gauteng province must be comprehensively investigated.

Therefore, it is worth noting that integration of digital technologies in South African nursing education institutions is placed, as a mechanism for educational reform via transformation of teacher practice and to objectify digital learning. Digital technologies are however placed as interactive tools to facilitate change in NEIs, improving standards and facilitating personalized learning (Mncube et al., 2019:7). They are also essential to satisfy curriculum expectations and facilitate Science-Technology-Engineering Mathematics education including nursing education courses. Identical to film, radio, and television, digital technologies are put as important tools for restructuring or teaching (Howard & Mozejko, 2015).

Findings from 16 articles and all relevant information that was consulted were summarised, in pursuit of finding out how ready nursing educators are to use BL pedagogy using the Chapnick's Readiness Model (2000) to underpin the study. Four dimensions relevant to the study, namely, technological, psychological, infrastructure and equipment readiness dimensions were utilised to underpin the study (Coopasami et al., 2017:301).

The technological readiness dimension explained the fact that nurse educators ought to possess technical skills, knowledge, skills, and a pedagogical approach to successfully use the pedagogy. (Jantjies & Joy 2016:1; Coopasami et al., 2017:302; Gay,2016). A study by Trayek et al., (2016:2) that utilized Chapnick's readiness model revealed that educators' knowledge, ICT skills, and positive beliefs about the benefits of e-learning have a positive impact on the successful uptake by the faculty personnel in the BL milieu.

Furthermore, Brown, (2016:4), confirmed that nurse educators had technological challenges, during the implementation of BL which hindered the uptake of the BL pedagogy, therefore, all NEI's must assess the required technical needs to enhance effective uptake of the BL pedagogy. Several factors such as; lack of competence, knowledge, autonomy, skills, access, time, resources, training, and technical support were highlighted as obstacles for the failure of the pedagogy. Thus, if such factors were resolved, there would be a prompt improvement in the readiness of nurse educators (Mncube, Olawale & Hendricks, et al., 2019:7; Jantjies & Joy, 2016:8). In addition, some South African institutions may lack access to relevant ICT infrastructure and this limits them from being ready to use such digital devices. A few who have access lack expertise in integrating digital devices into the nursing educational curricular (Mncube et al., 2019:12).

The psychological readiness dimension mostly focuses on the nurse educator's mental status as it implies the BL initiative of the nurse educators and the implementation process thereof (Coopasami et al., 2017:301). Prior studies confirmed that nurse educators' perceptions and beliefs about ICT technologies have an impact on the uptake of the pedagogy (Kaliisa, 2017:2). It was reported that some nurse educators were reluctant to use BL due to uncertainty, increased demand in terms of time as well as ability and flexibility to use ICT tools (Rotellar & Cain 2016:4). Furthermore, a similar study by Brown, (2016:4) confirmed that educators' and faculty's beliefs and attitudes about BL pedagogy, served as guidelines for effective planning for BL virtual platforms, thus promoting Nurse educators' readiness for BL. Therefore, positive readiness for BL by the nurse educators or faculty increases its uptake and negative readiness deters the implementation process.

Contrary to a study by Coopasami et al., (2017:301) which confirmed that educators' uptake for BL is directly affected by their psychological disposition, Trayek et al., (2016:2) on the other hand revealed that there was no substantial affiliation between educators' overall readiness to use BL and their psychological disposition towards it. Thus, psychological readiness might not be as relevant as technical, content, or infrastructure readiness. Moreover, it was reported in a study by Cassum et al., (2016:223) that even though most educators might be positive towards the introduction of the new BL pedagogy, the majority of faculty members complained about time limitations associated with BL pedagogy, thus hindering their readiness to use BL pedagogy. Contrary to Cassum et al., (2016:223), it was revealed that educators supported that BL pedagogy saved time and is a feasible alternative to traditional face-to-face teaching as well as pure e-learning (Miglani & Awadhiya,2017:60).

Some studies revealed that several perceptions and rigidity tendencies, among students and educators about BL, were some of the barriers to their reluctance to integrate ICT technologies efficiently and successfully (Miglani & Awadhiya,2017:60).

The infrastructure readiness dimension deals with the availability of ICT technologies such as learner management systems, computers, computer laboratories needed to support BL pedagogy. Thus, institutions ought to identify the required necessities for BL pedagogy before commencement and conduct prior planning for resources to ensure readiness (Ahmad et al., 2018: 5). A study by Brown, (2016:3) revealed that lack of access to ICT technology, LMS, consistency of technology complexity of ICT technologies, and defective ICT infrastructure were barriers for readiness to use BL pedagogy. In addition, the use of BL was confirmed to be both costly and time-intensive for NEIs thus hindering readiness to use. Furthermore, Trayek et al., (2016:2), confirmed that training of nurse educators in computer skills and setting up ICT infrastructure is vital in promoting their uptake for BL pedagogy and readiness thereof. Literature supports that most South African institutions are reluctant to use BL due to poor ICT infrastructure, lack of electricity, shortage of educational resources, and poor or no internet connectivity, which harmed the use of blended learning (Mncube et al., 2019:14).

The equipment readiness dimension was concerned with the ownership and availability of proper and appropriate equipment needed for successful implementation of the BL within the NEI's such as laptops, tablets, and personal computers (Coopasami et al., 2017:301). Once the NEIs lack such equipment, the implementation of BL pedagogy in NEIs is likely to fail, as it will negatively affect the readiness of nurse educators to use blended learning (Coopasami et al., 2017:305). However, a study by Jantjies & Joy, (2016:8) on educators' viewpoints on BL in South Africa revealed that access to different forms of ICT technologies doesn't necessarily guarantee usage as most of them did not opt to effectively use these technologies to support learning activities in the BL pedagogy.

Furthermore, equipment readiness of the NEIs for BL ought to be considered prior to the implementation of the BL pedagogy, to enhance the readiness of faculty staff and students. Otherwise, the absence of ICT equipment has a negative implication on the readiness of nurse educators to BL pedagogy successfully. Prior evidence by Trayek et al., (2016:4) confirmed that successful uptake for BL can be measured by the successful integration of equipment readiness dimension and no BL pedagogical programme can thrive in a resource-constrained environment. Therefore, faculty in NEIs must have adequate ICT equipment in place for both the teachers and students to use.

Although readily embracing BL pedagogy brings forth divergent opinions among nurse educators as well as challenges, it is worth noting that the use of BL pedagogy for the delivery of nursing education courses may improve the training of nurses. Further research is required to identify the factors which hinder BL implementation, strategies that can be utilized by institutions to successfully integrated the pedagogy into their everyday teaching, designing BL pedagogical content, and the feasibility of the existing ICT support in various NEIs in South Africa.

2.8 SUMMARY

This chapter presented the robust literature review on nurses' readiness to use BL technologies in the dispensation of their roles for educating nurses in NEIs in Gauteng Province. Furthermore, this chapter explained the procedures which were utilised to obtain existing information or literature on nurse educators' readiness to use BL in public NEIs in GP, as they strive to impart knowledge to the future nursing practitioners in the next generations. The subsequent chapter will discuss the research methodology and design used for this study.

CHAPTER THREE

RESEARCH DESIGNS AND METHODS

3.1 INTRODUCTION

The previous chapter discussed a review of literature on general aspects of readiness for nurse educators to use blended learning and ICT tools in nursing education institutions. The study was underpinned by Chapnick's readiness model with a focus on four dimensions, namely technological, psychological, infrastructure, and equipment readiness dimensions. The literature review involved an extensive search of articles from various databases.

This chapter will describe the research methods and designs used during the study. The chapter extensively describes aspects such as research design, paradigms, methods, data collection, analysis, data management, quality control, study setting, sample size as well as ethical considerations throughout the study.

3.2 RESEARCH QUESTION (S), AIM AND OBJECTIVES OF THE STUDY

3.2.1 Aim

This study aimed to investigate nurse educators' readiness to use blended learning in public nursing education institutions in Gauteng province.

3.2.2 Objectives

The objective of this study was:

To determine the nurse educators' readiness to use blended learning in Nursing education institutions in Gauteng province by assessing the following dimensions areas:

- Describe nurse educators' demographic data
- Assess nurse educators' technological readiness
- Assess nurse educators psychological dimension

- Assess nurse educators Infrastructure readiness
- Assess nurse educators Equipment readiness

3.2.3 The research question

The study's research questions were:

- Nurse educators' demographic data
- How ready are the nurse educators to use blended learning in public nursing education institutions in Gauteng province across the four dimension areas:
  - Nurse educators' technological readiness?
  - Nurse educators' psychological readiness?
  - Nurse educators infrastructure readiness?
  - Nurse educators equipment readiness?

3.3 RESEARCH PARADIGM

A paradigm is a generalised global view that identifies a set of philosophical assumptions which guide the researcher's approach to inquiry (Polit & Beck, 2017:738). The study followed a positivist research paradigm approach as it is quantitative. Polit & Beck (2017:9) define philosophical assumptions as basic principles which are believed to be true without proof or verification of a phenomenon. The assumptions are used in nursing research to guide and position the nature of research. The following assumptions, that is to say; ontological, epistemological, and methodological were applied in this study.

3.3.1 Positivism paradigm

Positivism is a scientific and logical method of doing a research study that stresses the significance of facts that can be noticed (Polit & Beck, 2017:9). Positivism broadly describes hypothesis-testing-research and how we respond to basic philosophical questions (Botma et al., 2010:42). The positivism paradigm involves the use of data collection instruments such as questionnaires to gather facts in a given study (Creswell, 2014:7). Positivism described the logical plan of researching while focusing on principles of ontology, epistemology, and methodological accuracy and reliability, hence the researcher did not influence the study (Polit and Beck, 2017:10).

3.4 ASSUMPTIONS

Assumptions of the study are fundamental explanations that are believed to be true without any scientific verification (Polit & Beck, 2017:720). The philosophical assumptions such as ontology, epistemology, and methodology are discussed.

3.4.1 Ontological assumptions

Ontology is defined as the branch of philosophy that deals with the study of reality (Polit and Beck 2017:10). In this study, the reality was that the nurse educators' readiness or non-readiness for blended learning pedagogy either promoted or hindered technological innovations associated with BL pedagogy. This would either positively or negatively have implications on the quality of learning in the BL environment.

3.4.2 Epistemological assumptions

Epistemology is a philosophy section that deals with the nature of knowledge, for example; focusing on how knowledge is structured, how we understand or explain something, and social phenomena (Polit and Beck, 2017: 10). In a positivist worldview, knowledge is explained logically and the researcher doesn't have any close connection with the study participants (Polit and Beck, 2017: 9). In this study, the researcher used a questionnaire to investigate the nurse educators' readiness to use blended learning.

3.4.3 Methodological assumptions

The methodological assumptions describe the guidelines that a researcher must utilise to investigate the research aims and objectives for the study. Positivist methodology describes deductive processes, objective quantities, relationships, specific concepts, and statistical analysis of findings (Polit & Beck 2017:10). This study used a descriptive survey design to investigate nurse educators' readiness to use BL in public NEIs in GP.

3.5 RESEARCH METHODS AND DESIGNS

3.5.1 Research design

A research design is an overall plan for addressing a research question, including specifications for enhancing the study's integrity. The research designs form a basis of a research study through determining the study purpose, questions, hypothesis, concepts as well as variables (Polit & Beck, 2017: 743). In this study, a descriptive non-experimental survey design was followed to investigate nurse educators' readiness to use BL in public NEIs in Gauteng province.

3.5.2 Quantitative research approach and design

A quantitative research approach is a statistical approach that involves investigating relationships among variables (Creswell 2014:4). This approach was used to collect the same information from all respondents in the sample using a questionnaire (Polit & Beck, 2017:741). The study used a descriptive non-experimental survey design to investigate nurse educators' readiness to use BL in public NEIs in Gauteng province. A descriptive survey is a non-experimental design used when a researcher wants to describe characteristics of interest variables in their everyday setting. A descriptive survey design was used as it clearly described the relationships between two or more variables in the natural setting and it is a simple and cost-effective method (Polit & Beck 2017:356).

3.5.3 Quantitative research setting

The research setting described the geographical location where the data was collected. In this study, data were collected from public NEIs across the Gauteng province of South Africa. Gauteng province has five (5) general nursing colleges, according to the SANC database. These public NEIs offer a variety of nursing qualifications, which are either undergraduate or post-basic courses. All these courses are presented on a full-time basis. Therefore, students must travel daily to attend face-to-face contact lectures and practical health facilities for clinical experience. The student numbers are high, and therefore, nurse educators often divide the students into different groups to comply with SANC prescribed nurse educator to students' ratio of 1:30. Since the students are many, nurse educators often have to repeat lessons as different groups must be seen at specific times by different educators.

3.6 STUDY POPULATION AND SAMPLING

The study population is described as the target research participants of a given study (Polit & Beck,2017: 47). Sampling is defined as the procedure used to identify a section of the population as a representation of the whole population (Polit & Beck,2017: 250). In this study, study population and sampling procedures were described as follows;

3.6.1 Study population/unit of analysis

The study population in this study were nurse educators from five (5) public nursing education institutions in Gauteng province. According to information obtained from each of the five NEIs in GP, there were approximately Five hundred (500) nurse educators in the 5 NEIs of Gauteng Province as summarised in Table 3.1.

Table 3- 1: Number of nurse educators in the 5 NEIs

Institution	Number of nurse educators per institution
1	109
2	93
3	98
4	100
5	100
Total	**500**

3.6.2 Sample size

The sample size is defined as the number of individuals who are participants from the accessible population in a research study (Polit & Beck, 2012:257). The size of the population under investigation must be determined as (N). The population (N) were the 500 nursing educators reported by the relevant principals from these 5 NEIs in GP. According to Gill, Johnson & Clark (2010) in Taherdoost (2017:238), a sample of 217 nurse educators out of a total population of 500 were used for this study **(Refer to Table 3- 2 & Annexure E).**

3.6.3 Sampling method

Sampling refers to a process in which the subgroup of the total population of the study is obtained during selection (Botma, et al., 2010:124). This study used a two-stage sampling method. The first stage to apply stratified sampling method that selected five public nursing

education institutions in Gauteng province called the stratums. From within the stratum, a simple random sampling was then applied to select a representative sample from each NEIs. The stratified random sampling method examined the characteristics of a population group and broke down the population into strata. Dividing out the population by strata helped a researcher to easily choose the appropriate number of individuals from each stratum based on the proportions of the population (Lawrence, 2014:262). The method proposed by Barreiro & Albandoz (2001) which is based on the formula below will be used for this study,

$$n_i = n.\frac{N_i}{N} \quad \text{.....(1)}$$

Where,

n_i = *sample size for each stratum*

n = *required sample size*

N_i = *population size for each stratum*

N= *size of the population*

Table 3.2 illustrates the proportional sample size for each stratum to be used in this study.

Table 3- 2: Population of nurse educators

Variable	NEI 1	NEI 2	NEI 3	NEI 4	NEI 5	Total
N_i	109	93	98	100	100	**500**
n_i	47	40	43	43	43	**217**

Furthermore, a simple random sampling without replacement method (SRSWOR) was used as the last stage of sampling to select nurse educators in each stratum. The SRSWOR method ensured that each nurse educator in the population had a known and equal probability to be selected and be part of the survey. The SRSWOR method was done for each stratum. The process started by writing each nurse educator's name on a piece of paper and putting it in a box. The names were randomly selected from the box. The selected name was recorded and would not be placed back in the box. This process ensured that the name was not set more than once and would continue until all n_i was reached. SRSWOR method was suitable because it provided a deliberate choice to nurse educators to participate in the study. The researcher used this method because it was relatively efficient, accurate, and gave more reliable results (Polit & Beck, 2012:257).

3.7 DATA COLLECTION

This is a process in which information is gathered (Cresswell, 2014:189). Data collection is done to address an existing problem (Polit and Beck 2017:725). Data collection for the proposed study was conducted upon approval from the University of Pretoria health sciences ethics committee. This was followed by approval from the National Department of Health (NDoH) and finally from the relevant stakeholders of public NEIs in Gauteng province.

3.7.1 Measurement tool

The study adopted and customised the data collection tool designed to assess BL readiness in a similar study (Trayek et al., 2016:3). A structured survey questionnaire was used to obtain data from the respondents. Refer to Annexure C. The survey questionnaire consisted of two sections as a single document. Annexure A consisted of questions of the demographical data of the respondents. Likert scale was used in Section B to determine the readiness of nurse educators to use BL and it was subdivided into four themes which were described as dimensions. The dimensions included; technological readiness, psychological readiness, infrastructure readiness, and equipment readiness of nurse educators to use BL in NEIs. A Likert scale is defined as a scaling technique that describes people's viewpoints about a certain topic or aspect. The views were graded as positive or negative. (Polit & Beck, 2017:273). The rating on the scale consisted of five parts or continuums, with 5 being the most positive, followed by four, three, two, and then one. One and two are described as the most negative responses on the Likert scale as follows; 5 was rated as strongly agree, 4-agree, 3-uncertain, 2-disagree& 1-strongly disagree (Polit and Beck 2017:274). The tool consisted of the following sections:

- **Section A**

  This section gathered the respondents' demographic data in terms of age, gender, ethnicity, employment status, and educational level.

- **Section B**

  This section gathered information about nurse educators' readiness to use BL in terms of 4 dimensions, that is to say, technological, psychological, infrastructure, and equipment readiness dimensions.

3.7.2 Measurement method/technique

3.7.2.1 Pilot study

A pilot study is a trial that is carried out to test planed methods and procedures. It aims to modify and make decisions regarding the research methodology chosen (Polit & Beck, 2017:177). Although the questionnaire was intended to be tested on 10% (n=20) of the sample size (217) of nurse educators (not the respondents of the study), the researcher only used 15 respondents from this particular NEI, who were willing to participate in the pilot study. Feedback about the overall experience with the questionnaire was welcomed and aspects such as; challenges with interpretation of the questionnaire's instructions, any acronyms, or any ambiguous words. The respondents stated that they interpreted and understood the instructions, except for a few acronyms and missing words explained before answering the questions. Lessons learned in the pilot study process were used to modify the questionnaire to be used for the final study.

The pilot study results did not form part of the final data collection for the final study. The results were simply used to test the data collection instrument and it is time to complete the questionnaire. The purpose of the pilot study was to test the suitability and usability of the tool.
The information leaflet with study aims and objectives was explained to the respondents before administering the informed consent forms. The questionnaires were given to the respondents to complete just before the covid-19 pandemic. Upon completion, the questionnaires were handed over to the researcher. The respondents answered all the questionnaire questions without experiencing any problems, hence making the pilot study success and the instrument was then used for the main study. The pilot study results were not included in the main study and the fifteen respondents used for the pilot study were also excluded from the main study as they had already seen the questionnaire. The pilot study results were used to improve the research questionnaire upon discovery of gaps or errors.

3.7.2.2 Pretesting the questionnaire

A pre-test of the data collection instrument was conducted at a private Nursing education institution before data collection. Pre-testing the instrument permitted the identification of mistakes that would distort the standard of the study. Fifteen questionnaires were distributed to 15 educators by the researcher. The pre-test offered the researcher an opportunity to assess the study's viability, evaluate if the sample size and sampling method were suitable and current,

and test the appropriateness of the research tools. The pre-test discovered that some questions were either unclear or incomplete, with a few repetitions, which allowed the researcher to refine some questions and add more useful questions. Some questions which were unclear or incomplete included the following; "*I think it's a good intervention to use Blended Learning in my institution", sounded vague, whilst the repeated ones included; "I feel more comfortable when using traditional face to face learning",* and*, "my institution has the potential to support Blended Learning* ", which were then removed by the researcher to prevent duplication. More useful questions were added, such as; Is your institution having online systems to deliver Blended learning classes?

A few questions were repeated, and the researcher got rid of those specific questions. The time for completing the tool was reduced upon correction of the above errors and eliminating unclear question questions. After the pre-test, the data collection tool was finalised and administered to nurse educators at public nursing education institutions in Gauteng province.

3.7.2.3 Data collection process

The researcher asked for permission to present the study's aims and objectives to the nurse educators of public nursing education institutions in GP (See Annexure C) after obtaining approval from the health sciences ethics committee and permission from the department of health Gauteng province and principals of different NEIs. The respondents were then given the informed consent documents to sign, before completing off the questionnaires. The researcher then proceeded to collect data during the second contact or during the respondents' convenient time. Both soft copy and paper-based survey questionnaires written in English were used. In institutions where the researcher was granted an appointment, the researcher delivered the questionnaires to the NEI's research chairpersons who distributed them to all the available respondents to complete while the researcher waited at the NEI premises. The questionnaires were together attached with consent forms which the respondents signed before completion of the questionnaire. This enabled the respondents to understand the questions and the purpose of the study and yielded reliable and valid information. The session took approximately 15 minutes and upon completing the questionnaire by each respondent, the researcher collected the questionnaire and safely stored it in a fastened storage plastic boxes. In other instances, when the respondents were not available before lockdown, the researcher dropped off the questionnaires to research chairpersons in some institutions who issued them to relevant educators to complete and handed back after completion. The questionnaires were then fetched by the researcher at an agreed date upon completion.

On the other hand, the researcher shared the soft copy of the questionnaire, using a survey link generated by the University of Pretoria Qualtrics software system for online surveys, due to the COVID-19 pandemic, during the lockdown period, as the researcher couldn't access some of the public NEIs to physically gather data. The researcher sent a survey link with the soft copy of the questionnaire, consent form, and relevant instructions via email to the relevant institutional research committee chairpersons, who eventually distributed the link to the relevant respondents to complete the questionnaires. Before the filing of the online survey questionnaire, the respondents were given options to indicate if they needed to proceed with the survey or terminate if they did not want to do so. Upon completion of the online survey, results were stored and analysed by the qualities online system and later extracted as excel sheets. The online survey data collection took approximately 4 weeks to be finalised and the data collection process took approximately 5 weeks to be finalised.

A total of 217 documents of the questionnaire were distributed to nurse educators in the five public NEIs in GP. Nevertheless, only 158 (72.8%) questionnaires were returned. There were 81 online responses and 77 responses on hard copy questionnaires. Among these, one copy had a lot of missing information in both sections A & B whilst the remaining 13 documents were blank. In addition, some respondents who answered online and hard copy questionnaires did not reveal some of their demographic data while others never answered some of the research questions in various sections of the data collection tool, meaning that the sample for this missing information will be less than the total sample of 144.

3.8 QUALITY CONTROL

Quality control in a quantitative study uses validity and reliability. Validity and reliability are two major components in evaluating a measurement tool while the reliability of an instrument is closely associated with its validity (Mohajan,2017:1).

3.8.1 Validity

This is the degree to which an instrument accurately measures what it is intended for (Polit & Beck, 2017:161). For instance, to ensure face validity, the researcher ensured that distributed a sample of 217 questionnaires to the educators in the five public NEIs in GP as a representative of the target population, and results were generalized to that specific group (Polit & Beck 2017:230). The study was conducted in real public NEIs setting and nurse educators' readiness was assessed therein. In addition, the validity and reliability of the data

collection instrument were ensured through pre-testing of the questionnaire before final use. To realize content validity, the questionnaire comprised of an assortment of questions regarding nurse educators' readiness to use BL under technological, psychological, equipment, and infrastructure aspects of readiness assessment using Chapnick's theoretical framework. Comprehensive literature searches and reviews were sought to ensure the standard of validity. In this study, the softcopy survey questionnaire in form of a link, and the questionnaire was submitted to specialists in quantitative research statistician to ensure content validity.

3.8.2 Reliability

This refers to the extent to which a measuring tool is free from any form of errors, in other words, similar results should be obtained for different studies (Polit & Beck 2017:160). In this study, the researcher ensured that the instrument used for data collection was consistent among all the respondents. Reliability was ensured through stability and internal reliability. In this study, a pilot study was conducted as a standard, to ensure the stability of results (Brink et al., 2015:170). In addition, the researcher ensured the consistency of the findings. Conbrach's alpha coefficient (Cronbach, 1951), was used to test the reliability of the questionnaire. This test was used because it would be determined in a single session, can be flexibly utilized in some circumstances which ensured reliable results (Diedenhofen & Musch, 2016:51).

Cronbach's alpha reliability coefficient was used to determine the internal consistency of the measuring tool. Cronbach's alpha reliability coefficient ranges typically between 0 and 1 and the closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale (Wessa, 2017). Taber, (2018:1278) described the rules of thumb for Cronbach alpha as illustrated by Table 3.3:

Table 3- 3: The rules of thumb for Cronbach alpha

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

The Cronbach's alpha for this study is greater than 0.8, which implies that the measuring tool's reliability is good and the measuring tool is valid. The Cronbach for each item in the questionnaire had an alpha Coefficient of more than 0.8, similarly, the Cronbach's alpha for this study is 0.8316.

3.8.3 Bias

According to Polit & Beck, (2017:161), bias is defined as any tendency or nonconformity from the reality in data collection, sampling, data analysis, interpretation, and publication, leading to the formulation of incorrect deductions. If not carefully controlled, bias may impend validity and trustworthiness during the study. Data collection bias was reduced by ensuring that only the researcher administers the questionnaire or survey link, and by ensuring that the tool is administered to the target audience without displaying any form of prejudice or preference. In addition, sampling bias could result from variance amongst the population described by the researcher and the definite population under investigation during the sampling process (Simundic, 2013:13; Polit & Beck, 2017:162).

Bias in the sampling method was reduced through adherence to prior piloting of the data collection tool, followed by modification of the tool to ensure user-friendliness, such that the study respondents would easily take part in the study (Simundic, 2013:13). When non–response rate was high, efforts were made to determine how this impacted the overall results. Data analysis bias is the form of bias that occurs when raw data are changed into incorrect research judgments. It may result from the use of unsuiTable statistical methods, leading to misinterpretation of the survey results (Simundic, 2013:13; Polit & Beck, 2017:162). Data analysis bias was reduced through careful interpretation of all the statistical procedures that the researcher scheduled to use on the raw research data before construction of the research instrument (Simundic, 2013:14; Polit & Beck, 2017:162).

3.9 DATA MANAGEMENT AND ANALYSIS

Data collected was captured on Microsoft Excel spreadsheets and did not involve editing and coding of the collected data (De Vos et al., 2011:252). Coding is described as the accurate arrangement of raw data thoroughly (Polit and Beck 2017:426; De Vos et al., 2011:252). During this process, any errors or data that is missing was identified and rectified and data was stored on the spreadsheet. (Polit and Beck 2017:428). In this study, data was captured by the researcher in excel sheets and later sent to the statistician for data cleaning and

analysis. The data were analysed using SAS statistical software. Chi-square test (χ^2) for equal proportion technique was used to analyse the data to describe the data in terms of frequencies and percentages. In addition, the chi-square test (χ^2) for independence in a two-way contingency table was used to determine if there is an association between the nominal categorical variables and continuous numerical variables (Polit and Beck 2017:392). Cramer's V tests were also performed as post-test to determine strengths of the association after chi-square has determined significance. Statistical tests of choice were run to address the objectives of the study with the assistance of a statistician.

3.10 DATA ANALYSIS

Descriptive statistics describe variables in terms of their characteristics, relationships, or measures of central tendency and variability or distribution (Brink et al., 2015:179). In this study, descriptive statistics are utilised to deliver information about the respondents concerning their demographic characteristics and distinctive responses to the questionnaire.
Inferential statistics Chi-square test was used to determine the level of association between demographic variables and nurse readiness in using blended learning (Bonett & Wright,2015:2; Bujang, Omar, Baharum, 2018: 85).
The Chi-square test is described as a non-parametric that is utilised to evaluate variances amongst groups during the measurement of dependent variables at a nominal level. The Chi-square is vigorous in terms of data distribution and seldom necessitates differences among study variables (Bujang et al., 2018: 85).

3.11 ETHICAL CONSIDERATIONS

Ethical clearance for the study was obtained from the health sciences Ethics Committee and the public NEIs in GP. The researcher ensured that institutional, departmental heads, and the National Department of Health gave their permission for the study. Principles of ethics followed in this study included the following;

3.11.1 Informed consent

Written informed consent was obtained after due explanation to the respondent of their ability to choose to either participate or withdraw at any time (Creswell, 2014:96). The researcher gave respondents complete and truthful information in the simplest language so that could fully understand any possible implications of the research study (West, 2020:6). The

respondents voluntarily decided to either agree or disagree to participate in the study. The consent process involved respondents signing a written consent document (Heale & Shorten, 2017:7).

3.11.2 Respect for person's confidentiality

Regardless of any known or immediate risks related to the study, the researchers ensured that anonymity was provided by ensuring that no personal information was included in the questionnaires and provision of the researchers' contact addresses. Data obtained in this study were stored safely. Respondents' information was coded and kept anonymous (West, 2020:8; SANC 2013).

3.11.3 Autonomy and self-determination

According to Heale & Shorten, (2017:7), autonomy is an ethical principle that entails allowing a mentally competent individual to make an informed decision. Self-determination is an ethical principle that involves giving individuals the freedom to make their own decisions once sufficient information has been provided. In this study, the researcher ensured that all necessary information about this study was given to prospective respondents. They would decide to either participate or refuse to participate in the study.

3.11.4 Justice

The principle of justice entails that the participant should be fairly treated. This means adherence to the research protocol and information given in the instructions before the research is conducted (Heale & Shorten, 2017:7; SANC 2013:4). In respect of this study, all nurse educators from public NEIs were treated equally throughout the study and equal opportunity was given to participate.

3.11.5 Beneficence

The beneficence explains that a person has the right to be protected from harm and discomfort and should do good above all and no harm (West, 2020:10; SANC 2013:4). In this study, no harm befell the participants in the course of data collection and the study contributed to the investigation of nurse educators' readiness for BL.

3.12 SUMMARY

In this chapter, research methods that were employed by this study were extensively discussed. These included research designs, study setting, sampling techniques used, data collection, analysis, measurement tool, technique, quality control in terms of reliability and validity, and ethical considerations. The next chapter presents the results and interpretation.

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF RESULTS

4.1 INTRODUCTION

The previous chapter presented the research methodology and provided details of how data was collected. This chapter shows the results of the analysed data that was collected from an adopted and modified questionnaire. The results are based on the research methodology presented in the previous chapter.

The main objective of the study was to:

- Determine the nurse educators' readiness to use blended learning at Nursing education colleges in Gauteng Province by assessing the following dimensions areas:
  - Describe nurse educators' demographic data
  - Assess nurse educators' technological readiness
  - Assess nurse educators' psychological dimension
  - Assess nurse educators' infrastructure readiness
  - Assess nurse educators' equipment readiness

4.2 DESCRIPTIVE STATISTICS

Descriptive statistics describe variables in terms of their characteristics, relationships, or measures of central tendency and variability or distribution (Brink et al., 2015:179). In this study, descriptive statistics were utilised to deliver information about the respondents' demographic characteristics and distinctive responses to the questionnaire.

4.3 A BRIEF DESCRIPTION OF THE DATA COLLECTION METHODS

The total number of questionnaires distributed to nurse educators was 217 in the five public NEIs in Gauteng Province. Among these,158 (72.8%) of questionnaires were received. One copy had a lot of missing information, while the remaining 13 documents were blank. Thus, the study's total response rate was 144 (66.4%), from which the study results were based. In this investigation, the p-value of $\alpha < 0.05$ (less) was regarded as significant, while the p-value of $\alpha > 0.05$ (greater) is considered not to be significant.

4.4 THE RESEARCH QUESTIONNAIRE

The questionnaire consisted of the following:

SECTION A: DEMOGRAPHIC DATA

- The respondents' demographic profile comprised five items investigated, i.e., gender, age, ethnicity, educational level, and employment classification.

SECTION B: NURSE EDUCATORS' READINESS USE OF BL IN PUBLIC NEIs;

- This section was answered through closed-ended questions designed to answer: How ready are the nurse educators to use BL in public NEI in GP? This section consisted of sub-questions that were divided into four readiness dimensions, namely technological, psychological, infrastructure, and equipment readiness dimensions.

4.5 RELIABILITY OF THE DATA COLLECTION TOOL

The Cronbach alpha coefficient was used to determine the internal consistency of the questionnaire. The tool's internal consistency yielded 0.83 or 83,16%, as indicated in Table 4.1 implying that the tool is reliable and that the results analysed using data collected by this questionnaire would be valid.

Table 4- 1: Cronbach alpha coefficient results

Items	Cronbach Alpha
All items	**0.8316**

4.6 SECTION A: DESCRIBING DEMOGRAPHIC CHARACTERICTICS OF RESPONDENTS

4.6.1 Gender of the respondents

In this study, female respondents constituted a greater number of respondents (n=126), contributing 87.5% of total respondents compared to 11.11% (n=16) male counterparts. Only 142 responded to this question, and the remaining two respondents did not reveal their gender.

Table 4.2 indicates that the majority of respondents from public NEIs in Gauteng Province were females compared to males. Therefore, the results revealed that nursing is a female gender-dominated profession. According to Statistics South Africa, (2020), females constitute approximately 51.1% of the total population in South Africa. Furthermore, a study conducted by Rasweswe & Peu (2018:43) confirmed similar results from a conducted study on nurses' opinions about occupational HIV PEP services at the selected hospital in Tshwane district, South Africa. Therefore, strategies might be required to attract more males into the nursing profession to fill this gap. Results show that there is a significant difference between gender of the participants since the p-value (<0,0001<0,05) of the Chi-square value (85,2) is less than the significant value of alpha 0,05 in line with the literature presented.

Table 4- 2: Respondents' gender (n=142)

Variables		Frequency	Percentage	X^2 value	Probability value (p-value)
Gender	Female	126	87.5	85.2113	<0.0001
	Male	16	11.11		

4.6.2 Age of the respondents

This variable is summarized in Table 4.3 and Table 4.4. Table 4.3 indicates the age gap between the participants. Results revealed that the youngest participant was 32 years old while the oldest participant was 62 years old. The average age of participants for this study was 46 years, closer to its median of 46 years. Most participants were 58 years old.

This finding is comparable with the South African Nursing Council 2019 statistics on age analysis of registered nurses and midwives where more than half of the total number of professionals were between 40 to 59 years of age (SANC, 2019). A study conducted in South Africa on developing a competency profile for newly graduated registered nurses in South Africa revealed older nurse educators in nursing education institutions than the younger ones (Rabie et al., 2020:3). Therefore, there is a need to put strategies in place to attract younger nurse educators.

Table 4- 3: Respondents' average, minimum and maximum age gap

Description	Age
Mean	46.20
Median	46.00
Mode	58.00
Maximum	62.00
Minimum	32.00

Table 4- 4: Respondents' age group (n=144)

Variables		Frequency	Percentage	X^2 value	P-value
Age group	<=35	30	20.83	9.5556	0.0227
	36-45	46	31.94		
	46-55	44	30.56		
	>55	24	16.67		

In Table 4.4, results show that most participants 31,94% (n=46) were between the age group 36-45 followed by participants 30,65% (n=44) within 46-55 years of age. Results further show 20.83% (n=30) of participants younger than 35 years of age while 16,67% (n=24) were above 55 years of age. Results show a significant difference between the

participants' age groups since the p-value (0,0227) of the Chi-square (9,55) is less that α = 0,05. These results imply that the frequency of the age groups significantly differ.

4.6.3 Ethnicity of the respondents

Results in Table 4.5 indicate respondents' ethnicity. 4 respondents did not reveal their ethnicity. However, majority of respondents were Blacks (80%; n=112), followed by coloureds (8,57%; n=12), whites (8,57%; n=12), and black Indians (2,86%; n=4). These values are supported by the current mid-year population estimates of the Republic of South Africa, which indicated that the black race population is higher than other races (Statistics South Africa,2020). These results are supported by a previous study on *Nurses' views on promotion and the influence of race, class and gender in relation to the Employment Equity Act*, by Van Der Heever, Van Der Merwe & Crowley, (2019:5), which revealed that the nursing profession was dominated by blacks, who represented over 47.2% of the nurses' population in Western Cape and Gauteng Provinces. There is a significant difference between participants' ethnicity since the p-value (<0,0001) of the Chi-square of 227 is less than α = 0,05. The majority of the participants were blacks compared to other races.

Table 4- 5: Ethnicity of the respondents (n=140)

Variables		Frequency	Percentage	X^2 value	p-value
Ethnicity	Black	112	80.00	227.0857	<.0001
	Black Indian	4	2.86		
	Coloureds	12	8.57		
	Whites	12	8.57		
	Not specified	4	2.77		

4.6.4 Educational Level of the respondents

The education level is depicted in Figure 4.1 below. Results indicated that most of the participants (33.6%; n=48) had a bachelor's degree in nursing, followed by 25,9% (n=37) of the participants with Masters in Nursing while 20,3% (n=29) had a post-doctoral degree in nursing. Results further show that 7% (n=10) of participants has a post-diploma in public health while 2,8% (n=4) had a diploma in general nursing. Participants with specialised clinical training were 10,5% (n=15). Results reflected that most respondents held a

bachelor's degree in Nursing qualification, which was too high compared to those who had a diploma in general nursing. Furthermore, the researcher assessed the impact of respondents' educational levels on their readiness to use blended learning, with specific emphasis on educators in public NEIs in Gauteng Province. Results shows a significant difference between respondents' educational level since the p value (<0,0001) of the Chi-square value of 91,9 is less than the alpha 0,05. Most respondents had a degree in nursing, while fewer had a diploma in general nursing.

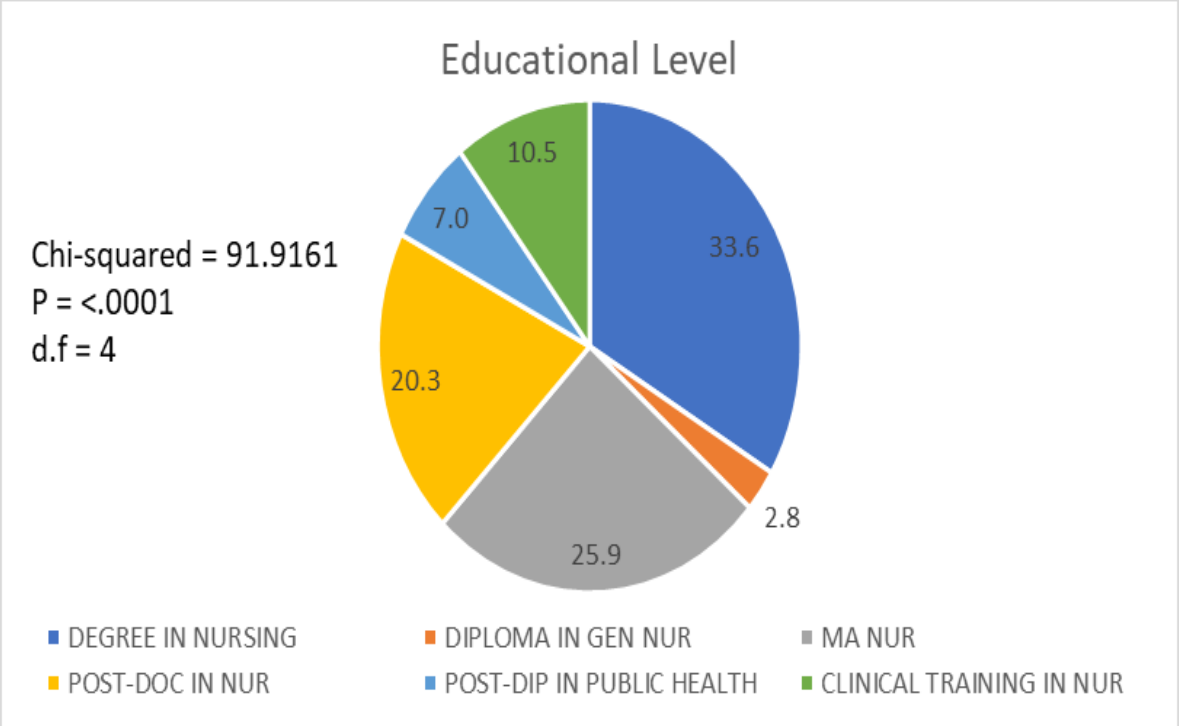

Figure 4- 1: Respondents' educational Level (n=142)

4.6.5 Employment classification of the respondents

Results in table 4.6 depict the employment classification of the respondents. The majority of the respondents, 68%(n=98), work as lecturers, followed by n=26 (18.3%) who work as clinical facilitators and a small percentage less than 10% who work as Heads of department (4.2%), nurse administrators (2.1%) and 7% who worked as preceptors. There was a significant difference between respondents' employment classification. The p-value (<0,001) is less than the alpha 0,05. The majority are lectures compared to other employment classification counterparts.

Table 4- 6: Employment classification of respondents (n=143)

Variables		Frequency	Percentage	X^2 value	P-value
Employment classification	Clinical facilitators	26	18.18	221.5105	<.0001
	Head of Department	6	4.20		
	Lecturers	98	68.53		
	Nurse administrators	3	2.10		
	Preceptors	10	6.99		

4.7 SECTION B: NURSE EDUCATORS' READINESS USE BL IN PUBLIC NURSING COLLEGES

This section consisted of one broad research question to obtain information on educators' readiness state to use BL prior to the implementation of the blended learning pedagogy: The research question was: How ready are the nurse educators to use Blended Learning? This question was split into several closed-ended sub-questions using a Likert scale with the rating of 1-5 was used, where the rating was described as follows; 1= Strongly disagree (S.D), 2=Disagree (D), 3=uncertain (U), 4=Agree (A), 5=Strongly agree (SA). The respondents were required to answer by ticking the most applicable option in terms of their readiness to use BL under various dimensions.

The questions were divided into four readiness dimensions, using the Chapnick's readiness theoretical framework. For convenience of this study, the Chapnick's readiness framework comprises the following dimensions: technological, psychological, infrastructure, and equipment readiness dimensions. The data from the research question were descriptively analyzed using frequencies, percentages and graphs. At the same time readiness to use BL was associated with the respondent's demographics.

4.7.1 TECHNOLOGICAL READINESS DIMENSION

Question 1: Do you have an idea of what blended learning is?

When data were analysed on respondents' having an idea of what blended learning is, results revealed that 25% and 27% of the respondents strongly agreed and agreed

respectively on having knowledge about BL concept while 12% were uncertain. There were 17% and 19% of the respondents who disagreed and strongly disagreed, respectively about having knowledge of BL concept. There was only 1 respondent who did not answer this question.

Based on the results in this study as summarised in Figure 4.2, it is evident that more than 50% of the respondents had an idea about blended learning, which might be a positive aspect on readiness for educators to implement the pedagogy. There might be a need for these institutions to organize in-service training, such that all educators can have an opportunity to acquire knowledge and skills use of BL pedagogy. According to Harerimana & Mtshali, (2017:1), it was revealed that nurse educators' ICT knowledge and skills were pertinent in enhancing their readiness for BL pedagogy so as to effectively render meaningful virtual learning activities and accomplish the intended educational goals. Results further revealed a significant difference between participants' responses between those who agreed and disagreed with having an idea of what BL is since p-value is 0,036 less than 0,05.

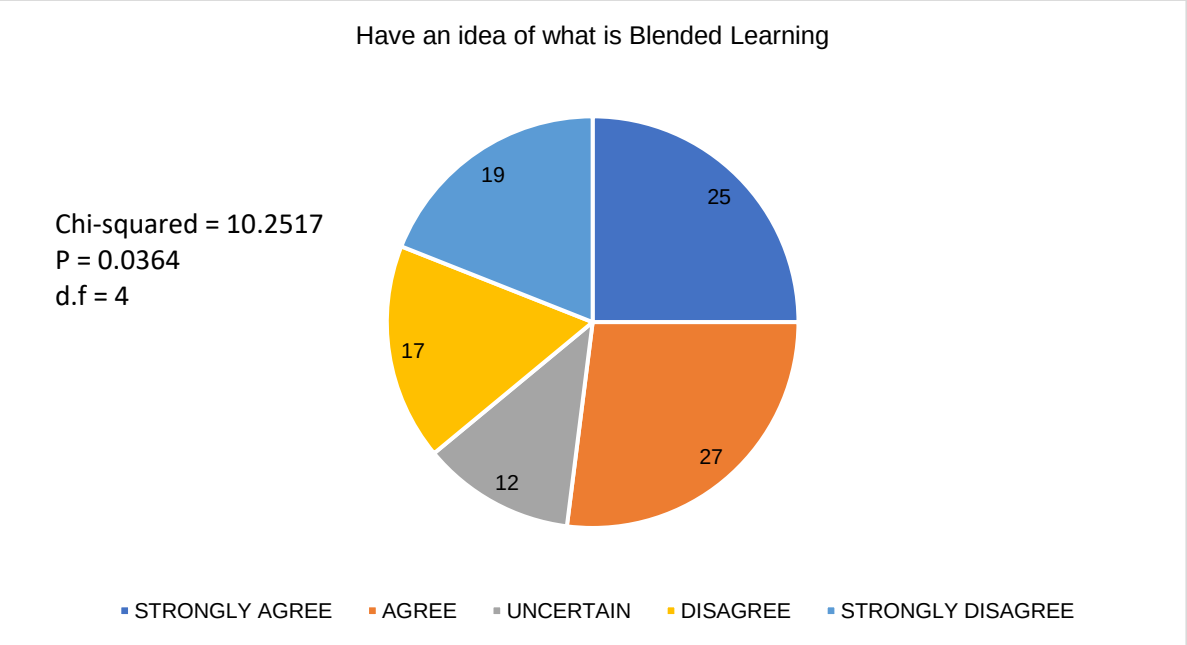

Figure 4- 2: **Respondents having an idea about BL**

Question 2: Do you know the components of blended learning very well?

Results show that 5% strongly agreed and 19% agreed to know all the BL components very well. Results further show that 36% of respondents were uncertain about the components while 29% disagreed and 11% strongly disagreed about BL's components. Two respondents never answered this question out of the sample size of 144 respondents as indicated by Figure 4.3. These results indicate that although less than 50% of the respondents might have heard about blended, many are still lacking information about its components, yet readiness for BL must be coupled with respondents' expertise in understanding and using the different ICT tools used for successful implementation (Trayek et al., 2016:2). More awareness might be paramount for these educators to be well acquainted with BL components to make learning more successful.

There is a significant difference between participants that agreed and disagree that they know the components of BL very well since p-value is less than 0,05 level of significance.

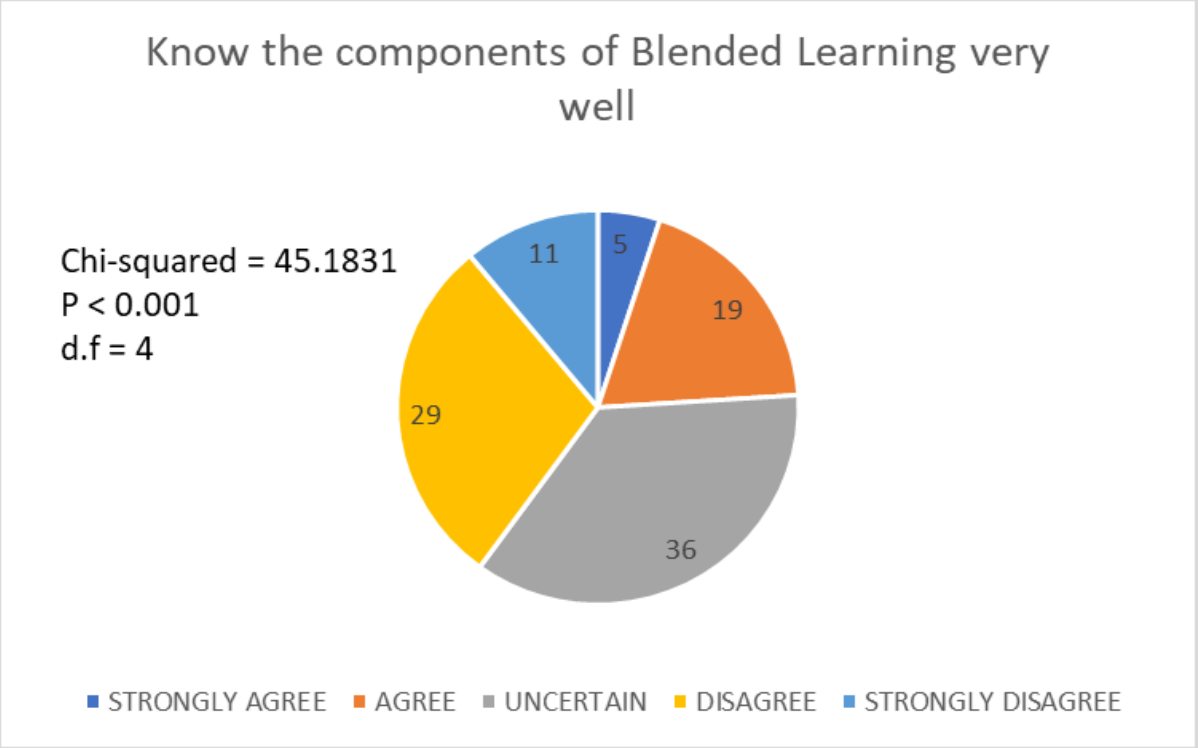

Figure 4- 3: Respondents' knowledge of BL components

Question 3: Have you received previous training in using BL?

Data revealed that only 7.1% of the respondents and 35.5% strongly agreed and agreed to have received previous training in using BL, respectively, compared to 32.6% who disagreed and 12.8% strongly disagreed with having received such training. Results further show 12% of respondents who were uncertain about receiving such training. Out of the sample size of 144, only 3 respondents did not answer this question (Refer to Figure 4- 4). This data indicates that more than 40% of the respondents have received prior training in using blended learning. However, many respondents are still unsure or have never received training, yet this component might enhance their successful uptake and implementation readiness. These results are supported by literature in the South African context, that most institutions have limited ICT technical support and training for their staff, even where the BL pedagogy is already implemented, leading to reduced uptake and educators' readiness for successful implementation. Therefore, it would be vital to render more training and support to educators to enhance their readiness for BL pedagogy before its successful implementation or use where it's already in operation (Jantjies & Joy, 2016:8). Although institutions may have adequate ICT infrastructure, there is a high possibility of BL pedagogy failure if educators' regular training is not prioritised by institutional management (Mirzajani, Mahmud, Ayub & Wong,2016:27).

There is a significant difference between participants that agreed and disagree that they have some previous training in using BL since the p-value (<0,0001) is less than 0,05 level of significance.

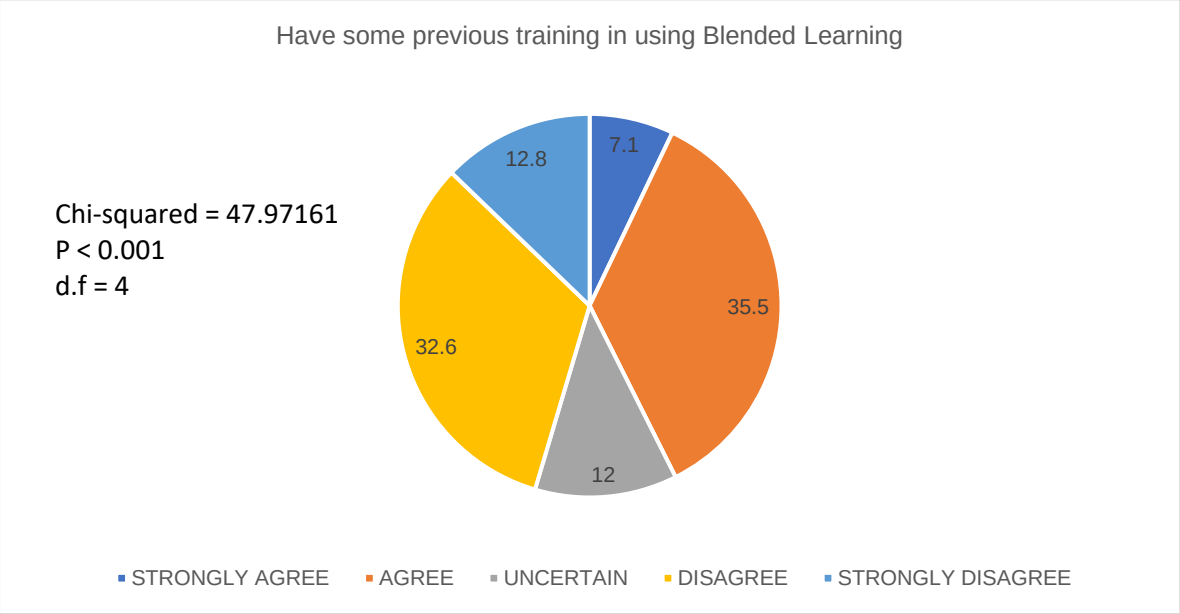

Figure 4- 4: Respondents' possession of previous training in using BL

Question 4: Do you anticipate that BL will be easy to use once introduced?

Results on respondents' anticipation that BL will be easy to use once introduced indicated that, 24.7% of the respondents strongly agreed that it would be easy to use BL while 25.4% of them similarly agreed in that regard. About 11.3% of the respondents were uncertain about the easy use of BL, 10.6% disagreed, whereas 28% of them strongly disagreed that BL would be easy to use. Out of the sample size of 144, 2 respondents did not answer this question.

Although the previous studies results revealed that over half of the respondents indicated positive anticipation for its future implementation, many are still reluctant or uncertain about its use once implemented. According to Naim, Corebima, and Susilo (2019:122), enthusiasm for ICT technology enhances an individuals' predisposition towards the BL platforms' readiness and successful use. It is therefore imperative for educators to be flexible and positive towards use of ICT tools.

The Chi-square results in Figure 4.5 shows that there is a significant difference between participants that agreed and disagree in their anticipation that BL will be easy for them to

use once introduced since the p-value (0,0005) is less than 0,05 significance level. In confirmation, Table 4.7 shows that there is an association between educational level of respondents and respondents' anticipation that BL will be easy to use once introduced since p value (0,04) is less than 0,05 significance level. The majority of respondents who agree that BL will be easy to use are those with master's and PhD degrees in Nursing

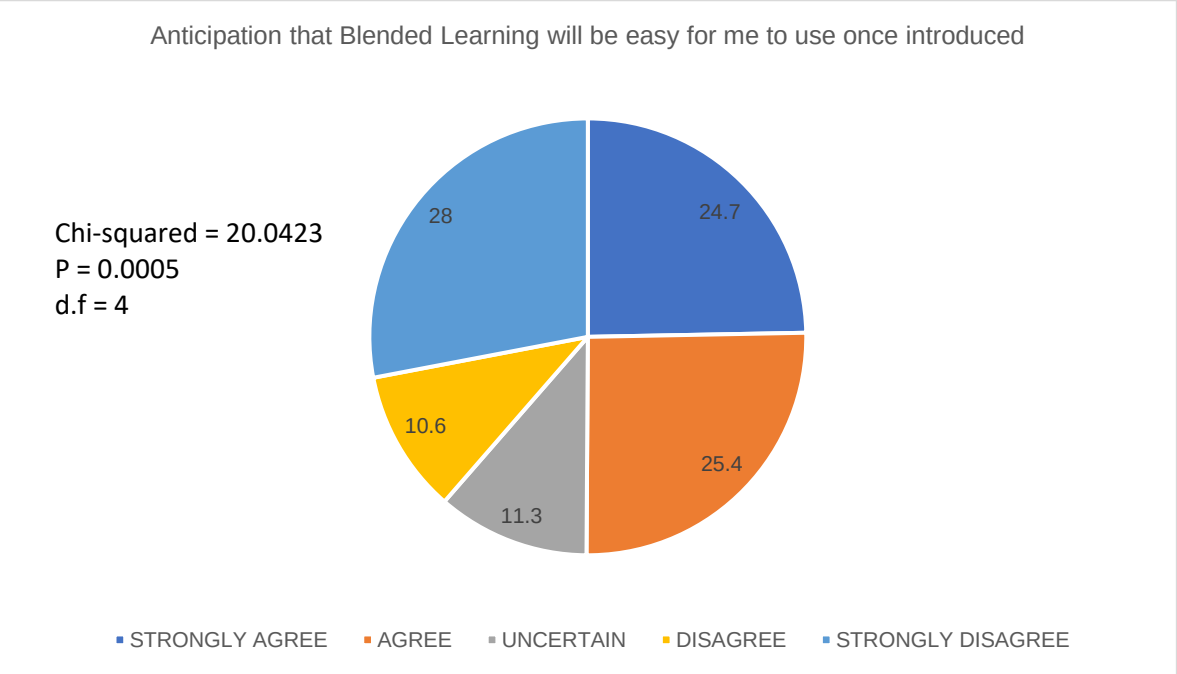

Figure 4- 5: Respondents' anticipation that BL will be easy to use once introduced.

Table 4- 7: Association of respondents' educational level and respondents' anticipation that BL will be easy to use once introduced.

Anticipate that Blended Learning will be easy for me to use once introduced								
	SA	**A**	**U**	**D**	**SD**	**X^2 value**	**P-value**	**Φ coefficient**
B Nur	8	29	33	19	11	32.0335	0.0429	0.4166
Diploma Nur	0	0	100	0	0			
Masters Nur	22	17	28	22	11			
PhD in Nur	11	25	18	25	21			
PGDip P/health	0	30	30	40	0			
Clinical related Nur specialty	7	27	13	53	0			

The data in Table 4.7 above is supported by results of Bobtayo, Essel and Mohammed, (2020:10), who asserted a significant association between nurse educators' level of education and ease to use ICT tools during their regular interactions with the learners. The results revealed that many educators with masters' degrees or higher educational levels were very likely to adopt ICT tools for teaching than those with lower educational level qualifications such as diplomas.

Question 5: Are you ready and willing to integrate ICT learner systems into your teaching activities?

The data indicated that 26% of the respondents strongly agreed being ready and willing to integrate ICT learner management systems into their teaching. Similarly, 22% of the respondents agreed to be ready and willing to integrate ICT learner management systems, 19% of the respondents were uncertain, 20% disagreed whereas 13% strongly disagreed that ICT learner systems should not be integrated into their learning. One (1) of the respondents did not answer this question out of 144 respondents. (Refer to Figure 4-6 below).

These results revealed that nearly half of the respondents were open-minded and willing to use BL. A few were not sure, while the rest showed reluctance, perhaps because their institutions did not provide such systems. According to Jowsey, Foster, Cooper-Ioelu and Jacobs, (2020:8), educators must be flexible, open-minded and skilful in using virtual ICT learner management systems such as discussion forums to be ready in effectively using and supporting BL pedagogy to support meaningful learning activities. Therefore, educators must always help their learners who may experience challenges using such systems to achieve their academic goals effectively. Association between age group, educational level and employment classification, readiness, and willingness to integrate ICT learner systems in teaching activities were not significant.

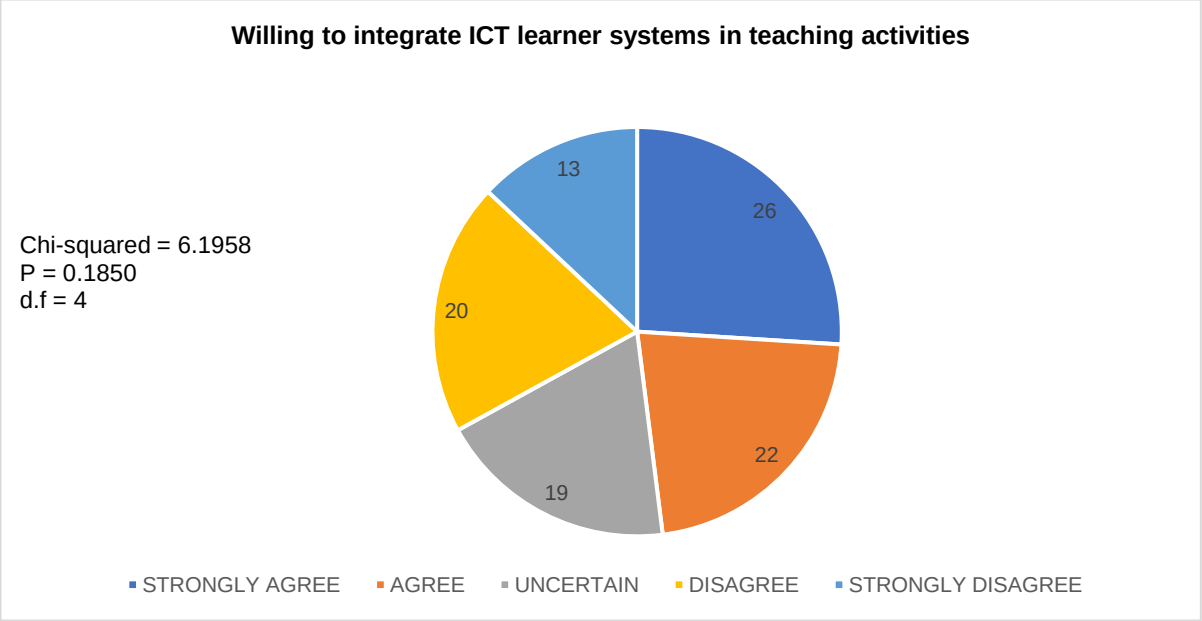

Figure 4- 6: Respondents' willingness to integrate ICT learner systems in teaching.

Question 6 to 11: Skills possessed for technical readiness for Blended Learning.

Question 6 to 11 was on the skills that nurse educators possessed to prove technical readiness for BL. Results indicated that approximately 8% and 22% of the respondents strongly agreed and agreed, respectively having enough ICT skills to use BL while 27% were uncertain. These results are compared with 29% of the respondents who disagreed and 14% who strongly disagreed, having enough ICT skills required to BL. From the sample size of 144, five (5) respondents left this question blank. There was a significant difference

between respondents that agreed and disagreed that they have enough ICT skills to use Blended Learning (p-value=0,0002); have some experience in using Blended Learning (P<0,0001); Have challenges with internet access (p-value <0,0001); Have an idea on how to fix ICT media tools, e.g., emails, intranet, learner management systems etc. (p-value <0,0001); have ability to monitor virtual platforms and making learning more meaningful (p-value <0,0001) and Competent in integrating ICT media for teaching (p-value<0,0001). (Refer to Table 4- 8 above). Based on the data, it is evident that less than half of the respondents had ICT skills needed for them to use BL. More than half of the respondents lacked ICT skills required to integrate BL educational components, which is a vital component for readiness to use in blended learning pedagogy.

A study by Brown (2016:4) revealed that nurse educators might have technical challenges such as; inadequate ICT skills, which may hinder their readiness to use BL thus creating a barrier for successful pedagogy. It was noted that inadequate ICT skills among educators deters the effective utilization and implementation of BL (Ibrahim & Nat, 2019:4). Trayek et al., (2016:2) asserted that training of nurse educators in ICT skills and launching an excellent ICT infrastructure in any institution is mandatory for enhancing educator readiness and successful uptake of the BL pedagogy. In addition, 5% of the respondents strongly agreed as compared to 29% who agreed having some experience in using BL whilst 19% uncertain. Approximately 35% of the respondents disagreed while 12% strongly disagreed having prior experience in using BL. Out of the total sample size of 144, one (1) respondent did not respond to this question. No association was found significant between the respondents' age, educational level and employment classification when compared with their level of experience. (Refer to Table 4- 8 above).

This data also shows that over 30% of the respondents had experience in using BL whilst nearly half had no previous experience and the rest were not sure. Having prior knowledge on the part of the respondent might increase their level of readiness for uptake of BL pedagogy. In their study on the *Blended learning motivation model for instructors in higher education institutions*, Ibrahim and Nat, (2019:2) indicated that possession of prior experience in using of ICT tools on part of the students and educators might improve their approaches and skills to effective use of the pedagogy. This is a positive factor of readiness for nurse educators' readiness to use BL as they would have existing knowledge and skills needed for effective implementation of the pedagogy.

Furthermore, it was revealed that 15% and 29% of respondents strongly agreed and disagreed respectively having internet access challenges, while 9% were uncertain. About 32% of respondents disagreed having internet access challenges while 15% of them strongly disagreed in this aspect. The rest of the 2 members never gave any response to this particular question. When the respondents' age, educational level and employment classification, associated with the challenges experienced with internet access, no significant was found. (Refer to Table 4- 8 above). This data reveals that close to half of the respondents had internet access challenges which might be a barrier for respondents' readiness to use BL. Relevant NEI may be required to provide internet access for all respondents prior to the commencement of BL. Although several NEIs are increasingly transitioning towards use of ICT tools to improve their teaching activities, there are several barriers that are hindering such innovations, such as internet access challenges, which consequently negatively affects nurse educators' readiness to effectively use the pedagogy (Harerimana & Mtshali,2017:2; Ma'arop & Embi,2016:45).

In addition, 9% of nurse educators strongly agreed being able to fix ICT media tools, 20% agreed with the assertion while 25% of them were uncertain. 27% of the responds disagreed knowing how to fix ICT media tools while strongly disagreed having any clue in that regard. Out of 144 respondents, 3 did not give any input to this question. The data indicated that less than 30% of the respondents had basic skills in fixing ICT media tools while more than half had no clue. Therefore, institutions might need to place more emphasis in this aspect, through provision of regular technical support and training. Association was not significant between the respondents' age, educational level and employment classification compared with having an idea of how to fix ICT media tools. According to Miglani and Awadhiya, (2017:60), all nurse educators must be ready for successful uptake and implementation of BL through expression of a high level of technical skills, cognizance and enthusiasm.

When asked if they can monitor virtual platforms to make learning more meaningful, 27% agreed whereas 10% of them strongly agreed having ability in that regard. Approximately 30% of the respondents were uncertain, 10% of them strongly disagreed while 23% disagreed being able to monitor students' learning virtual systems thus effectively utilizing the pedagogy to deliver positive learning experiences. Two (2) respondents had no answer to this question. No association was found significant when respondents' age, educational level and employment classification were associated with their ability to monitor virtual

platforms, to make learning more meaningful. This study revealed that less than 50% of the respondents had ability to monitor virtual platforms and make learning more meaningful while more than half of these respondents were either unsure or had no clue perhaps because their institutions do not have such systems, which might possibly hinder their readiness for successful implementation of the pedagogy once their institutions decide to set BL systems up. This is supported by literature that confirmed that nurse educators have a significant role required for successful BL pedagogical integration, monitoring BL virtual platforms to make learning more meaningful (Jantjies & Joy, 2016:8). However, Harerimana and Mtshali, (2017:2) reported that many nurse educators still experience challenges such as inadequate ICT skills and creativity required for effective incorporation of ICT tools into the BL pedagogy, thus hindering their readiness to use BL.

When asked about their competence in integrating ICT media for teaching, 7% strongly agreed as compared to 24% who strongly who agreed to this assertion, while 28% of them were uncertain. About 34% of the respondents disagreed and 7% strongly disagreed in having competence in integrating ICT media for teaching. Approximately 4 members didn't give their view to this question. (Refer to Table 4- 8 above). This particular data revealed that no association existed between the respondents' age, educational level and employment classification compared to their competency in integrating ICT media for teaching. Generally, these results indicate that more than 30% of respondents indicated being competent in carefully integrating ICT media during their teaching activities, however, more than 50% indicated lacking competency in that aspect while the rest were not sure. This might be a possible hindrance for BL readiness and successful uptake.

Although many NEIs are reviewing their pedagogical approaches by integrating ICT infrastructure, various challenges still exist because most nurse educators lack the knowledge and expertise required for designing and creating BL pedagogical activities, e-resources, and use of creative teaching strategies. This is because BL pedagogy requires a more technical approach in terms of redesigning the students' academic content, learning objectives and assessments (Brown, 2016:3). In addition, the pedagogy maybe challenging in terms of balancing the virtual and face to face activities appropriately. Therefore, it would be more time consuming for the educator and costly for the NEIs to render expertise training to all its educators, such that they can be ready to successfully blend and implement the programme (Ma'arop & Embi,2016:42). Table 4.8 summarises question 6 to 11 results.

Table 4 8: Respondents skills on technological readiness for blended learning

Questions		Frequency	Percentage	X^2 value	P-value
Question 6. Have enough ICT skills to use Blended Learning?	Strongly agree	11	8	22.4029	0.0002
	Agree	31	22		
	Uncertain	38	27		
	Disagree	40	29		
	Strongly disagree	19	14		
Question 7. Have some experience in using Blended Learning?	Strongly agree	7	5	43.3986	<0.0001
	Agree	42	29		
	Uncertain	27	19		
	Disagree	50	35		
	Strongly disagree	17	12		
Question 8. Have challenges with internet access?	Strongly agree	21	15	27.0141	<0.0001
	Agree	41	29		
	Uncertain	13	9		
	Disagree	45	32		
	Strongly disagree	22	15		
Question 9. Have an idea on how to fix ICT media tools e.g. emails, intranet, learner management systems etc?	Strongly agree	13	9	13.2908	0.0099
	Agree	28	20		
	Uncertain	35	25		
	Disagree	38	27		
	Strongly disagree	27	19		
Question 10. Have ability to monitor virtual platforms and making learning more meaningful?	Strongly agree	14	10	26.0986	<0.0001
	Agree	38	27		
	Uncertain	43	30		
	Disagree	33	23		
	Strongly disagree	14	10		
Question 11. Competent in integrating ICT media for teaching?	Strongly agree	10	7	42.2857	<0.0001
	Agree	34	24		
	Uncertain	38	28		
	Disagree	48	34		
	Strongly disagree	10	7		

Question 12: Do I have sufficient knowledge and skills to use BL?

When data were gathered on knowledge and skills levels in using BL, 15% of the respondents strongly agreed to lacking sufficient knowledge, 31% of them agreed to lacking such skills whilst 19% were uncertain. 26% of the respondents disagreed having insufficient knowledge and skills as compared with 9% who strongly disagreed with having insufficient knowledge and skill required to use BL. These results indicated that although 35% of the respondents indicated having knowledge and ICT skills to use BL, more than 45% of them still mentioned having insufficient knowledge and skills to use Blended Learning, perhaps because their institutions have not implemented the pedagogy or they did not receive any formal training in use of ICT tools. This might be a negative implication for any institution intending to use the BL pedagogy, as it might not be easily implemented and sustained in the teaching milieu.

Prior literature supports that educator readiness for BL can only be guaranteed through ensuring that all stakeholders such as educators or students have the necessary ICT skills required to render teaching activities. It is therefore imperative to carefully measure educators' BL readiness in terms of Nurse educators' attitudes, knowledge, motivation and technical competency skills This will ensure the effective implementation of BL pedagogy in Nursing educational institutions (Blayone,2018:429; Rohayani et al.,2015:231; Aung & Khaing,2016:406). Furthermore, related studies have reported various reasons for non-readiness of educators for BL, such as; lack of competence, knowledge, autonomy, skills, access, time, resources, training, and technical support which subsequently hinder the implementation process of the pedagogy by various nursing education institutions (Mncube et al., 2019:7).

Table 4.9 indicates that there is no significant association between the respondents' age and educational level when compared with having insufficient knowledge and skills to use BL, however, respondents' employment classification showed significance, Chi-square=26.3492, degrees of freedom = 16, p-value=0.0493 with strength of association being moderate ($\phi = 0.4323$). This implied that employment classification had an impact on the respondents' possession of insufficient knowledge and skills to use Blended Learning.

These above results indicated that although some few respondents indicated having knowledge and ICT skills to use BL, a high number of them still mentioned that they had insufficient knowledge and skills to use Blended Learning, perhaps because their institutions have not implemented the pedagogy or they did not receive any formal training in use of ICT tools.

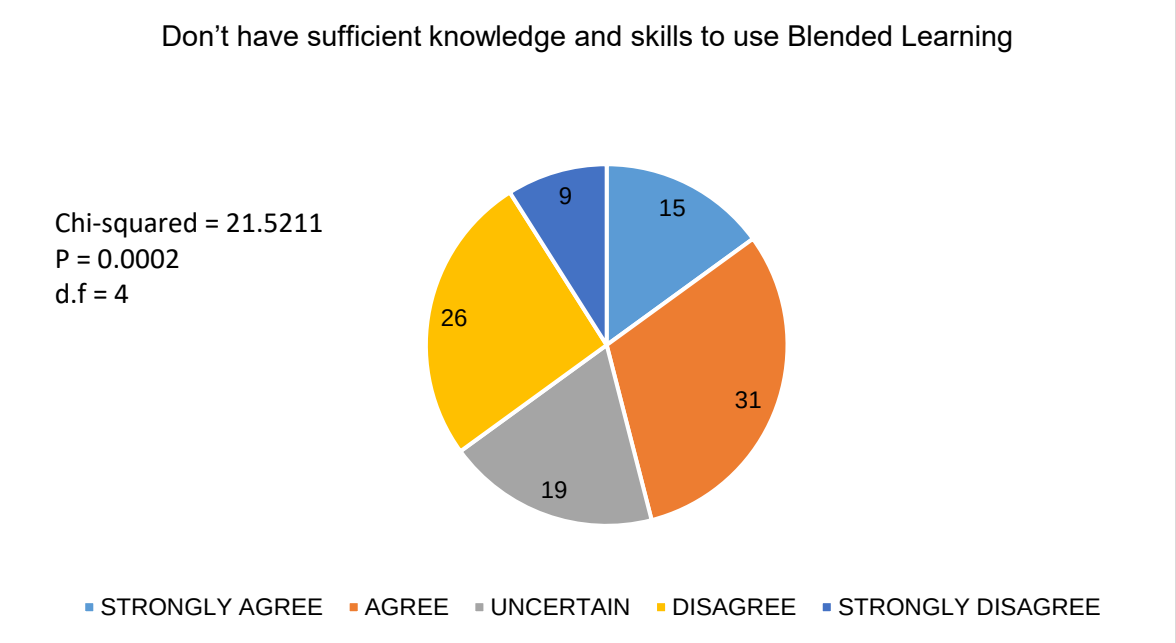

Figure 4- 7: Respondents' possession of insufficient knowledge and skills to use BL

Table 4- 9: Association of respondents' employment classification and do not have sufficient knowledge and skills to use Blended Learning

Don't have sufficient knowledge and skills to use Blended Learning								
	SA	**A**	**U**	**D**	**SD**	**X^2 value**	**P-value**	**Φ Coefficient**
Clinical facilitator	25	42	4	29	0	26.3492	0.0493	0.4323
Head HOD	0	17	33	50	0			
Lecturer	11	33	19	25	12			
Nurse admin	0	0	67	33	0			
Preceptor	40	10	30	20	0			

4.7.2 PSYCHOLOGICAL READINESS DIMENSION

Question 1: Is it a good intervention to use BL in my institution?

In this study, results indicated that 18% of the respondents strongly agreed that use of BL would be a good intervention to use once introduced in their NEIs, 25% of them agreed in that regard. About 3% were uncertain, 27% disagreed while 17% strongly disagreed with the assertion that BL would be a good intervention once introduced in their institutions. Results shows that 4 respondents did not give their opinion towards this question. These results specify that over 40% of the respondents contemplate that use of BL is a good intervention in their institution. However, the other remaining portion disagrees with the intervention because they lack information about the pedagogy. When respondents have a positive expectation towards the use of BL, their general approach to using BL might improve, thus enhancing their readiness. See Figure 4.8.

It should be noted that both the faculty and individual nurse educators often have their institutional philosophies that direct their decision-making before implementing any academic activities related to ICT integration. Therefore, many educators often use such beliefs, which often influence their personal attitudes in either positively embracing or negatively rejecting new technological inventions. Respondents with positive attributes towards use of ICT tools often have a high sense of enthusiasm and will positively embrace it, thus enhancing their readiness to use BL (Brown,2016:4; Ibrahim & Nat:2019:7).

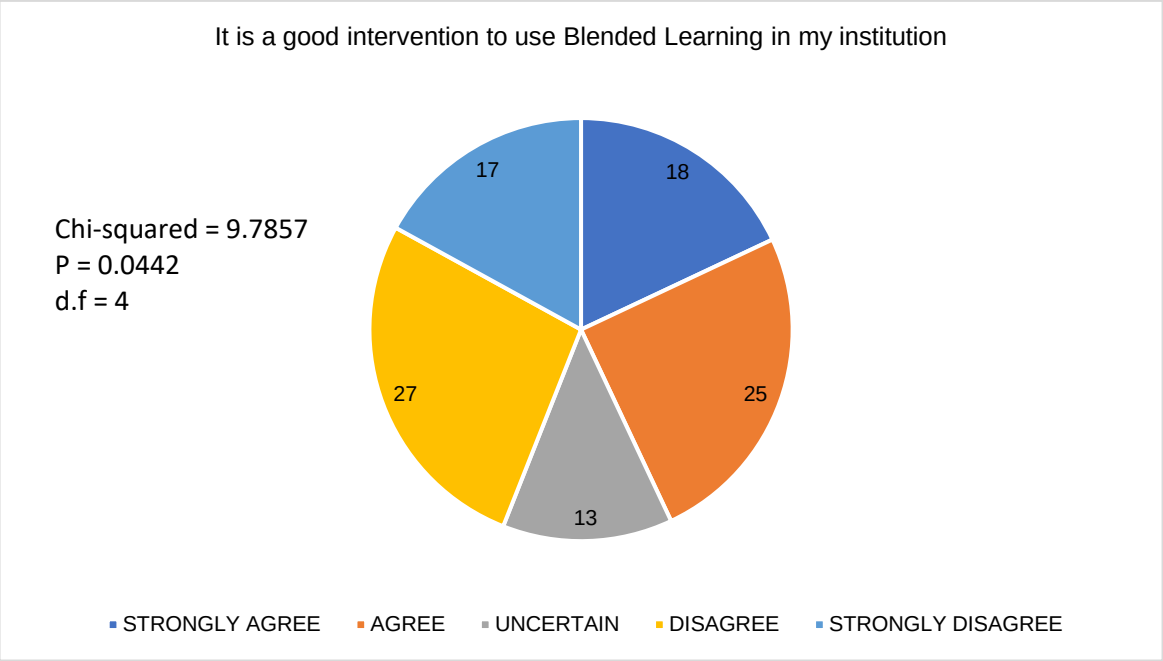

Figure 4- 8: Respondents' anticipation that BL is a good intervention to use

Furthermore, when the respondents' educational level and employment category were associated with respondents' anticipation that BL is a good intervention to use, it was found insignificant ($p>0.05$). However, association was significant ($p=0.0029$) between the respondents' age and belief that it is a good intervention to use BL in my institution. These results could be because the general impression of the data gathered reflected that most nurse educators are at their age periphery of retirement. Thus, fewer nurse educators are available in the institutional systems. (Refer to table 4.10 above).

Table 4- 10: Association of respondents' age and it's a good intervention to use Blended Learning in my institution

It's a good intervention to use Blended Learning in my institution								
	SA	**A**	**U**	**D**	**SD**	**X^2 value**	**P-value**	**Φ coefficient**
<=35	10	33	0	24	33	29.9349	0.0029	0.4624
36-45	10	14	21	43	12			
46-55	20	32	7	21	20			
>55	21	21	25	4	29			

Question 2: Am I eagerly willing to use BL if introduced in my institution?

The results related to nurse educators' eagerness and willingness to use BL once introduced in their NEIs shows that 21% of the respondents strongly agreed and 28% agreed in that regard. These results are compared to 17% of the respondents who were uncertain while 18% disagreed and 16% strongly disagreed being eager and willing to use BL once introduced. Results further showed that three respondents from the sample of 144 did not give their responses in that regard (Refer to Figure 4.9 below).

Based on the results, nearly half of the respondents are enthusiastic and therefore ready to use Blended Learning once their institutions decided to implement it. The other half of the educators were reluctant due to lack of interest, fear of change, and being comfortable with the current traditional face-to-face pedagogical design. Since Blended learning is a very flexible pedagogy of delivering educational content, many NEIs are increasingly adopting it. However, some nurse educators in such institutions may have negative attitudes towards BL use, which eventually affects their readiness, uptake, and successful implementation. Therefore, for BL pedagogy to be successfully implemented, individual nurse educators must have a high sense of eagerness to enhance their readiness to use it (Ibrahim & Nat, 2019:2; Rizvi et al., 2017:2).

Likewise, nurse educators' readiness to use BL may be promoted through institutional, technical training and support to increase their knowledge, skills, motivation, and confidence in using ICT tools prior to implementing the pedagogy (Ibrahim & Nat, 2019:7).

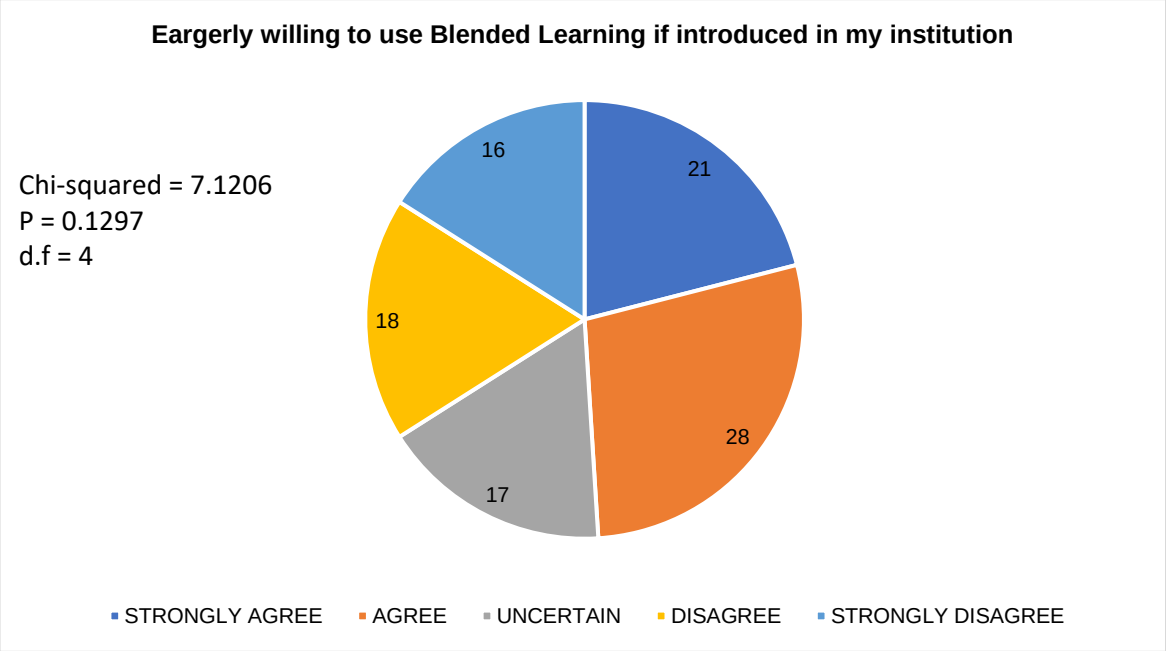

Figure 4- 9: Respondents' eagerness and willingness to use BL

Table 4- 11: Association of respondents' age and willingness to use BL once introduced

	Eagerly willing to use Blended Learning if introduced in my institution							
	SA	**A**	**U**	**D**	**SD**	**X^2 value**	**p-value**	**Φ coefficient**
<=35	27	23	13	30	7	**27.1034**	**0.0075**	**0.4384**
36-45	14	19	30	28	9			
46-55	18	39	9	9	25			
>55	29	33	13	4	21			

Table 4-11 depicts the Chi-Square results to test the association between age group and willingness to use BL once introduced. Results show that there is an association between age group and eagerly willing to use Blended learning if introduced in my institution since the p value of 0,0075 is less than 0,05 level of significance, (X^2 =27.1034; p. v=0.0075; with a power of association being moderate (ϕ = 0.4166). (Refer to table 4-11).

These findings might have resulted from the significantly greater number of educators in the institutions at their age peripheries and, therefore, constituted the respondents' biggest percentage. There might be a need to attract younger registered nurses into this sector of the profession. Contrary to these findings, other studies revealed that age impacted the users' willingness to use and was significantly higher with lower age categories such as middle age or 30 years or lesser due to exposure to ICT tools (Singh & Masango, 2020:20).

Question 3: Will blended learning make teaching more effective?

This study results revealed that respondents did not differ significantly between those who agreed and disagreed with the statement that blended learning will make teaching more effective. Results indicated that 22% strongly agreed that BL will make teaching more effective, 18% agreed in that regard, while 21% were uncertain about this issue. However, 19% disagreed with 20% who strongly disagreed that BL will make teaching more effective once introduced. Out of the sample of 144, 19 respondents did not reveal their opinion in this regard. These results indicate that about 40% of respondents envisage that BL learning will make teaching more effective; however, the rest are either not sure or do not think otherwise, which might negatively impact their readiness level in using BL to make teaching more effective.

Literature supports that educational transformations such as BL have become inescapable and are associated with improved effectiveness in teaching and learning activities in various NEIs. Therefore, it is evident that nurse educators' readiness for BL will be heightened during the pedagogy's implementation (Mahmud et al., 2016:26).

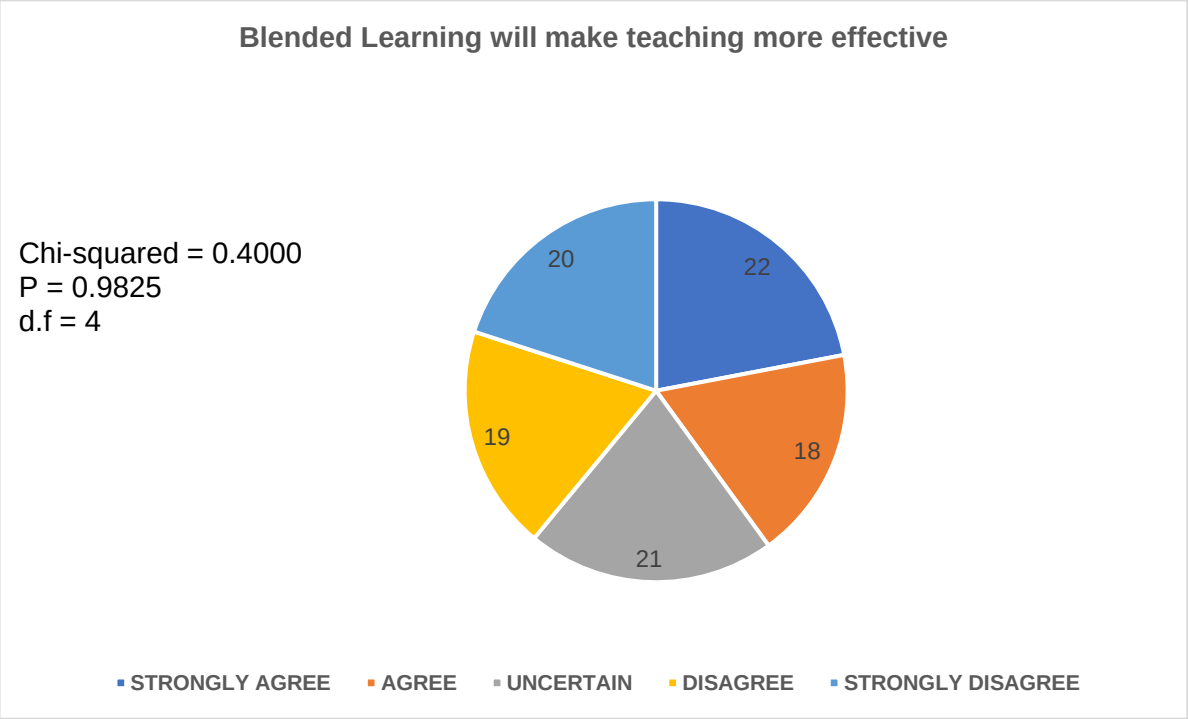

Figure 4- 10: Respondents' belief that BL will make teaching more effective

Question 4: Will use of BL may assist in saving time once implemented in my institution?

From the results obtained, 19% and 26% of respondents either strongly agreed or agreed that BL saves time while 16% were uncertain. Approximately 23% of the respondents disagreed, and 16% who strongly disagreed that BL saves time. This data reflects that nearly half of the respondents indicated that using BL will save time once implemented in their institutions. Out of 144 respondents, 4 members left this question blank. See summary in Figure 4.11. Although the results suggest that more than 40% of the respondents expressed that BL may help save time, more than half opposed the view.

However, Brown, (2016:3), noted that the use of BL is costly and time and wastes a lot of time if institutions wish to implement it due to intense planning and arrangement of the educational content required to be integrated into the virtual pedagogy. Therefore, all nurse educators and faculty must be well equipped prior to commencement by enhancing educator readiness for successful uptake and implementation of the pedagogy.

A study done in South Africa on students' readiness for e-learning confirmed that although many educators were positive towards the incorporation of the BL pedagogy, all faculty members had concerns about wastage of time during preparation of online study materials which could hinder their readiness to effectively render the pedagogy (Cassum et al., 2016:223).

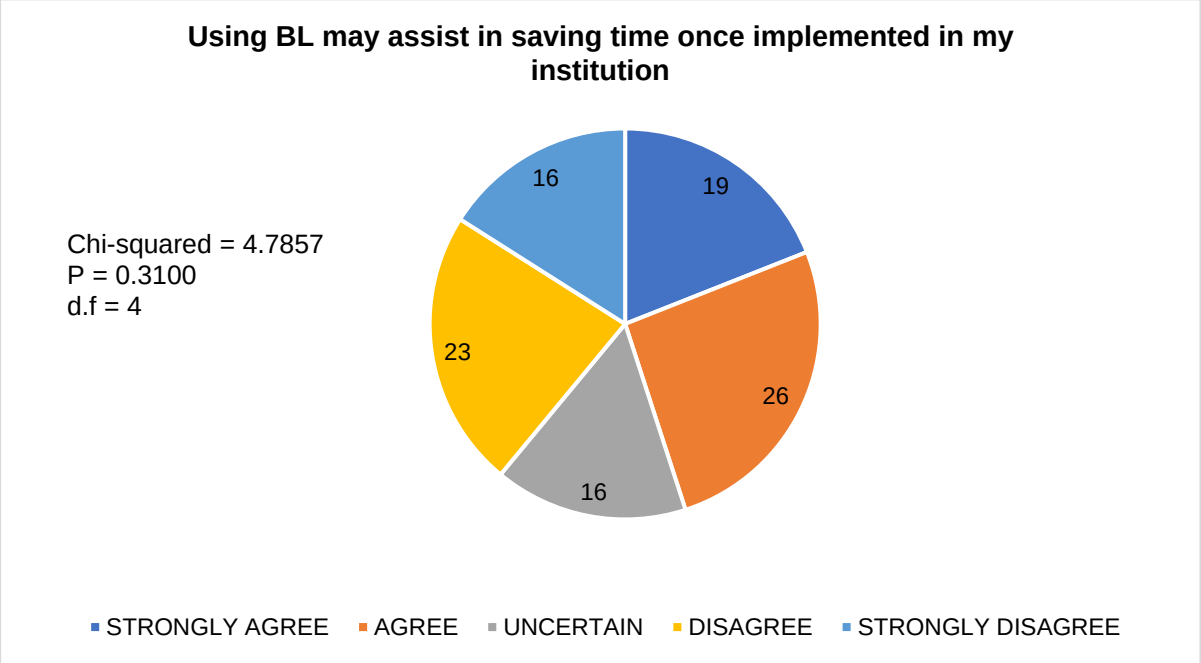

Figure 4- 11: Respondents' anticipation that BL will save time

Question 5: Do I strongly feel that implementation of BL will promote independence and autonomy?

The results indicated that over 18% of the respondents strongly felt that BL would promote independence, 27% agreed while 20% were uncertain about the assertion. There were 15% and 20% of respondents who disagreed and strongly disagreed respectively, that BL would promote independence and autonomy. Results show that 5 respondents did not indicate any response. Figure 4.12 summarises these results. The results suggest that nearly half of the total respondents are optimistic that BL will promote autonomy amongst educators and students once implemented. This might enhance their competence, satisfaction levels and readiness to use BL.

According to Li, He, Yuan, Chen and Sun, (2019:51), blended learning is associated with benefits such as increased flexibility and autonomy for both nurse educators and students as the teaching learning process can occur asynchronously. This is crucial as it gives the nurse educators to carefully pace their teaching activities regardless of time and geographical constraints, thus enhancing their readiness.

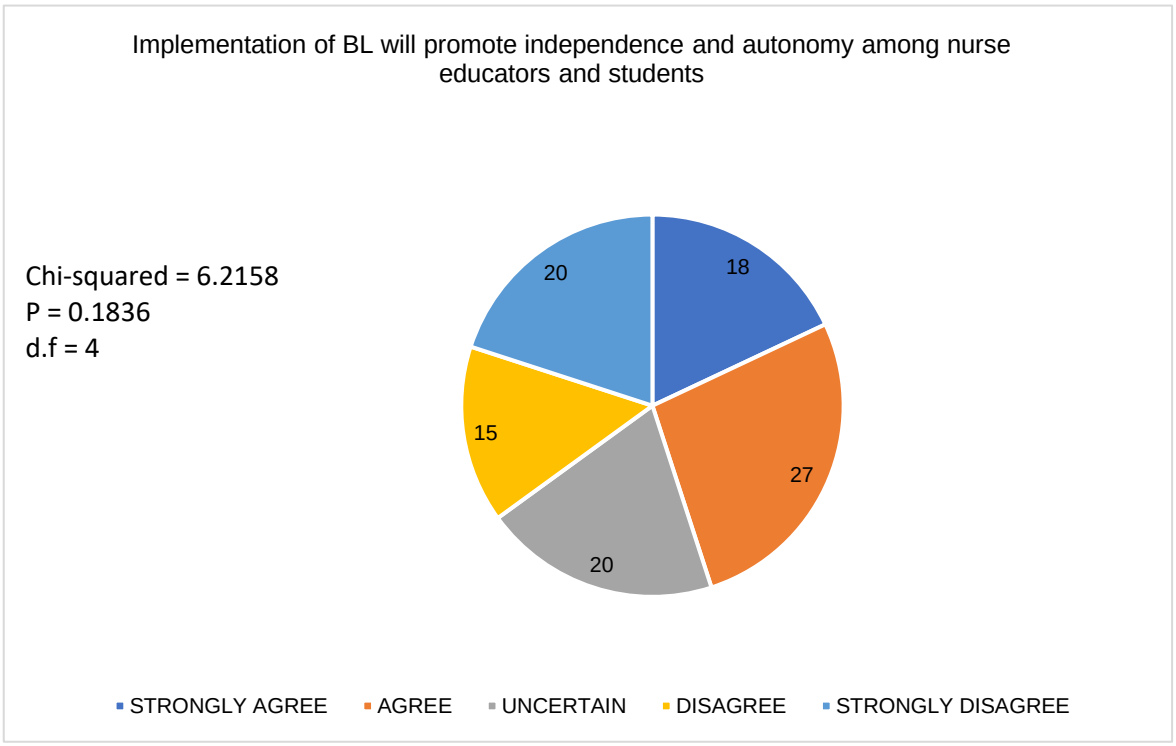

Figure 4- 12: Respondents' belief that BL promotes independence

Question 6: Will you have motivation to use BL once introduced in my institution?

When respondents' anticipation of motivation was assessed, it was revealed that 15% of them strongly agreed being motivated to use while 27% of them merely agreed having such anticipation. About 20% of the respondents were uncertain, 25% disagreed whilst 13% strongly disagreed with positive anticipation to use the BL pedagogy. In addition, 4 of the respondents did not answer this question (Refer to figure 4-13).

These results indicate that over 40% of the respondents indicated positive motivation towards the introduction of BL while the rest of the members expressed negative attitudes or were uncertain about the pedagogy. Expression of motivation towards use of BL among

respondents might enhance their readiness to use the BL pedagogy. This is so, provided the ICT infrastructure is implemented successfully and technical support components are present. This is supported by literature in a study conducted by Brown, (2016:4), which indicated that when a lot of educators and faculty who are in their initial stages of implementing BL, intense experiences of technological anxiety results, thus lowering their motivation. On the hand, positive readiness for BL by the nurse educators is associated with increased motivation and uptake of the pedagogy.

In addition, Mirzajani et al., (2016:28) explained that although educators may have computer literacy skills and knowledge required to use BL pedagogy, many are still reluctant due to their individual philosophies which may be positive or negative. For instance, some people may generally have a negative attitude that BL pedagogy consumes a lot of time and might decide not to use it. The educators' philosophies will therefore have a direct impact on their motivation, thus positively or negatively affecting their readiness to use BL. Furthermore, challenges associated with use of BL such as increased workload, costs, time factor, technical challenge may have a direct impact on the educators' motivation to use BL (Ibrahim & Nat,2019:2).

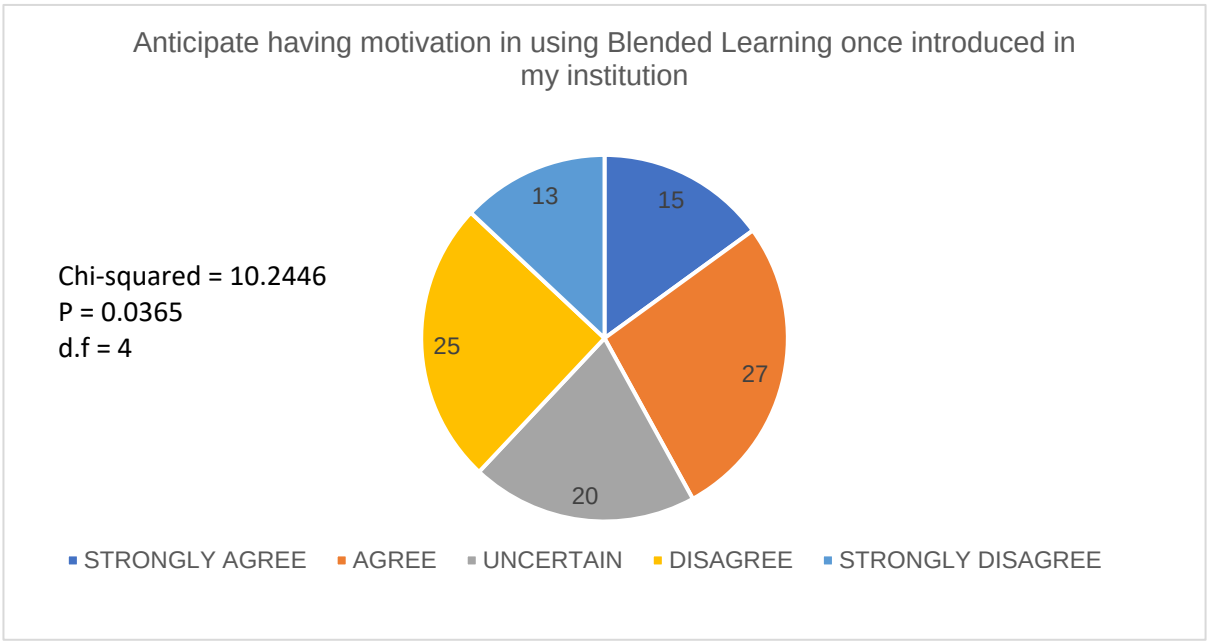

Figure 4- 13: Respondents' anticipation that they will be motivated when BL is introduced.

Question 7: Do I have confidence when using BL for teaching?

Results show that 14% of respondents strongly agreed they anticipated having confidence when using BL teaching, similarly, 26% of them agreed in that regard while 25% were uncertain. Results show that 21% and 14% of the respondents disagreed and strongly disagreed respectively in having positive anticipation to use BL for teaching. Out of 144 questionnaires, only 139 answered; 5 respondents left this question unanswered, as indicated in Figure 4.14. These results indicate that approximately 40% of the respondents anticipate having confidence in using BL for teaching while over 30% indicated negative anticipation and the remaining portion were unsure in terms of their confidence. The respondents' possession of confidence might enhance their readiness whilst their lack of confidence might indicate non-readiness for the pedagogy. Coopasami et al., (2017:301) and Cassum et al., (2016:223) explained that nurse educators' uptake for blended learning is directly influenced by their psychological temperament of confidence levels, commitment and aptitude. When educators are generally well acquainted with ICT technical skills, their confidence and commitment to use BL pedagogy increase their positive readiness. On the other hand, if they lack skills, their confidence and commitment levels will drop, thus hindering BL pedagogy use.

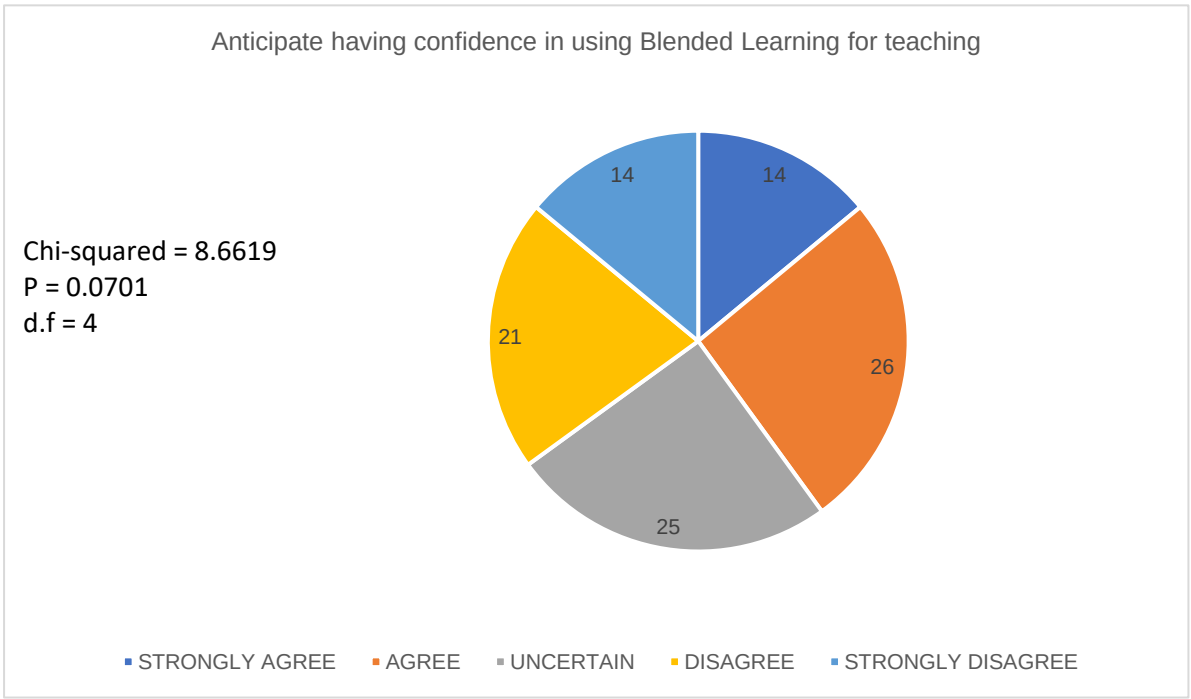

Figure 4- 14: Respondents' anticipation of having confidence when using BL.

Question 8: Will knowledge acquisition be easier and flexible with implementation of BL?

The results revealed that 14% and 31% of the respondents strongly agreed and agreed that knowledge acquisition will be easier and flexible with the implementation of BL whereas 18% were uncertain. The remaining 23% and 14% agreed and strongly agreed that knowledge acquisition will be easier and flexible with BL implementation. Out of the total sample size (n=144), seven respondents did not answer this question. See summary in Figure 4.15. Concerning these results, nearly half of the respondents hope that knowledge acquisition will be easier and flexible once BL pedagogy is introduced whilst over 30% disagree and the remaining respondents have no idea at all. Blended learning allows both the nurse educators and the students to effectively interact with each other or with a wide range of educational content during the learning process. The pedagogy is very flexible because information can be easily and efficiently accessed synchronously and asynchronously, thus enhancing lifelong knowledge and skills with utmost independence. This will encourage the nurse educators' readiness in flexibly using BL pedagogy to create meaningful learning experiences for their students (Alexander et al.,2019:2; Rizvi et al., 2017:1).

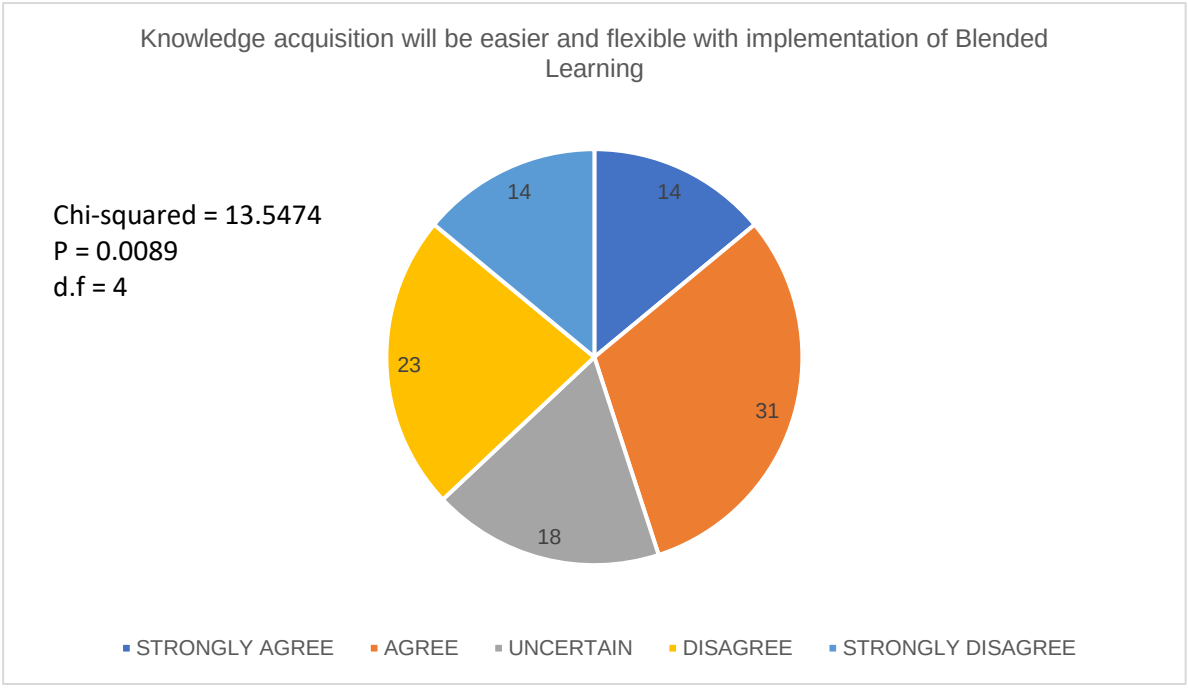

Figure 4 15: Respondents' belief that knowledge acquisition will be easier & flexible

Question 9: Do Nurse educators prefer traditional teaching method?

From the results as summarised by Figure 4.16, 17% strongly agreed with a strong preference for face-to-face method, and 9% of them are uncertain about their preference. Results further show that 27% of the respondents strongly disagreed with traditional face-to-face learning, while 25% disagreed. There were 6 respondents who did not answer. Respondents 18% strongly agreed that traditional face-to-face is the best teaching method, 21% agreed while 9% were uncertain about the statement. A remarkable 32% disagreed and 20% strongly disagreed that the traditional face-to-face method is not the best method to teach. Five of the respondents did not choose any answer to this question.

Results reflect that over half of the respondents are negative towards traditional face-to-face learning, thus feeling uncomfortable because they feel it is the best teaching method. Although traditional face-to-face teaching has prevailed for decades in all NEIs, technology has changed this. Various NEIs are now switching to different virtual platforms for teaching. Therefore, most educators have resorted to use of ICT aided pedagogies such as BL. A South African study on nurse educators' lived experiences on teaching in a large class, revealed similar challenges. In line with the results of this current study, Ndawo (2016) study also found that traditional face to face learning is associated with several benefits such as shared learning, acquisition of skills among others, educators experienced challenges such as failure in addressing students' unique needs, use of flexible strategies and inability to manage a large crowd of students which made their facilitation very difficult (Ndawo,2016:2).

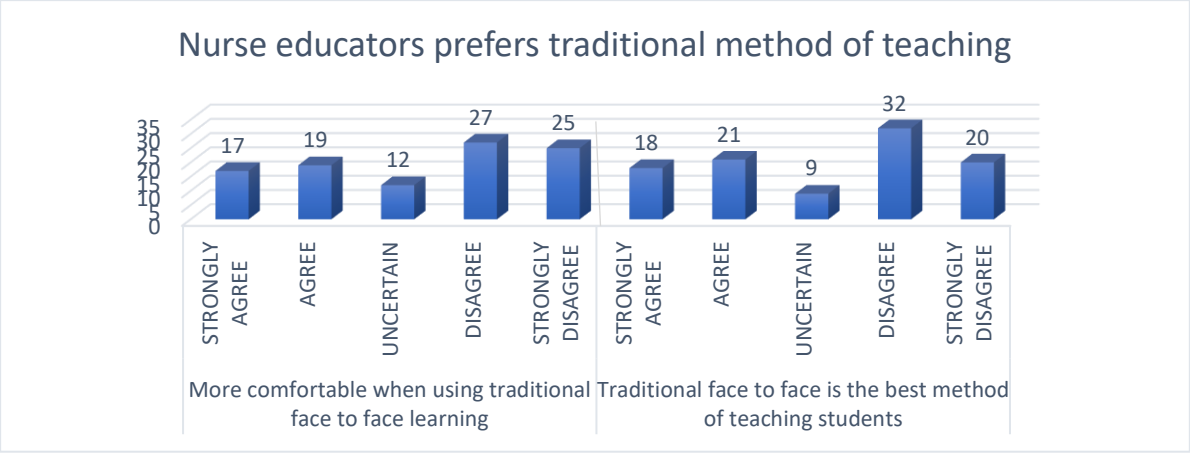

Figure 4- 16: Respondents' preference for the traditional method of teaching

Question 10: Do I anticipate wasting a lot of time if BL is introduced in my institution?

The results indicated a similar percentage of 16% of respondents who strongly agreed, agreed or uncertain that BL wastes a lot of time, respectively. A similar percent (26%) of the respondents were uncertain and disagreed that BL wastes time respectively, while 5 respondents had no answers for this particular question. (Refer to figure 4-17 below). The study results reveal that over 30% of respondents expect BL to be time-wasting and demanding once introduced, while more than 40% disagreed in that regard, and the rest are unsure.

Ibrahim and Nat, (2019:5) revealed that the blended learning pedagogy is associated with an augmented amount of work in terms of designing the e-learning educational objectives, e-assessments, supervision of virtual spaces during both synchronous and asynchronous learner interactions as well as assessing students and giving feedback. All these activities are known to be time intensive on the part of the nurse educator which eventually causes negative attitude and frustration towards the pedagogy, undermining their readiness, degree of uptake and implementation process.

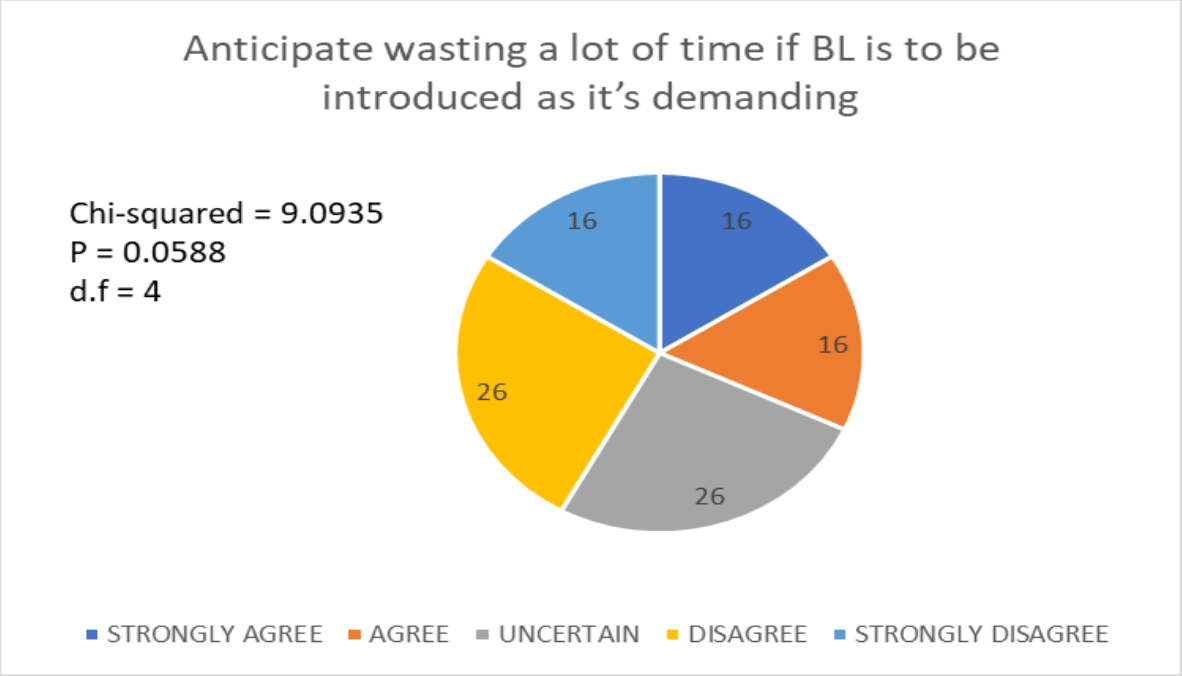

Figure 4- 17: Respondents' anticipation that BL will waste a lot of time.

4.7.3 INFRASTRUCTURE READINESS DIMENSION

From the results, it was revealed that approximately 13% of the respondents strongly agreed to having ICT resources to facilitate BL in their classrooms, 28% agreed having the ICT resources, 22% were uncertain, 29% disagreed whilst 8% strongly indicated that there no ICT resources available at all (Refer to table 4-12). Furthermore, over 40% of the respondents strongly agreed that they had enough ICT infrastructure to facilitate BL in their classrooms, however, more than 50% of the respondents were either uncertain, disagreed or strongly disagreed that their institutions had such ICT infrastructures at all. (Refer to table 4-12).

The results were supported by literature which reveals that most institutions still lack adequate access to ICT infrastructure, unreliability of ICT as well as complexity of ICT technologies were some of the identified hindrances for successful uptake and implementation of the BL pedagogy (Brown, 2016:3).

When the levels of BL technical training offered by the respective institutions were assessed, data revealed that 8% of the respondents strongly agreed to have training in using BL and 32% who agreed to have such training. There were 23% of the respondents who were uncertain if they ever had such training, 21% of the respondents disagreed while 16% strongly disagreed that no training was offered. One respondent left this question with no answer. (Refer to table 4-12 above).

Results from institutions that had initiated BL pedagogy indicated that only 40% of respondents indicated receiving technical training in using of BL and the rest of the 60% were either unsure or confirmed receiving no training at all, perhaps because their institutions have not implemented the BL pedagogy or lack the policies that support this move. This implies that these instructions might need to design some challenges to improve the readiness of educators and enhance uptake and implementation of the BL thereof. A prior study by Porter and Graham (2019:5) revealed that only 4.1% of educators were offered training opportunities required for ICT usage prior to implementation of online learning programs. This had a tremendously negative impact on educators' readiness and successful uptake of the BL pedagogy since educators' training was seldom done (Mirzajani et al.,2016:36).

Furthermore, from the data obtained on technical staff availability, required by the NEIs to monitor and support the BL program, results revealed that only 5% and 31% of the respondents strongly agreed and agreed that their institutions had technical staff whilst 22% were uncertain. There were 32% and 10% of respondents who disagreed and strongly disagreed respectively, having such technical support staff (Refer to table 4-12 above).

The results in this study revealed that less than 40% of the respondents indicated having ICT technical support staff to smoothly facilitate successful of BL in their respective institutions where BL might have commenced, however, more than 40% of them indicated lack of technical staff, perhaps because the pedagogy hadn't been introduced yet. According to a study on acceptance of ICT, it was evident that many educators seldom received adequate ICT training to empower them with the competence required to successfully and effectively rendering BL programmes (Mirzajani et al., 2016:36).

When the potential of institutions to support BL was assessed, it was revealed that only 8% strongly agreed that their institutions had full potential, followed by 21% who merely agreed while 30% of the respondents were uncertain. In addition, 32% of them disagreed that their institutions lacked potential as compared to 9% who strongly disagreed that their institutions had potential to support BL pedagogy. Out of 144, two of the questionnaires had this question blank. The results indicate that less than 30% of respondents indicated that their institutions might potentially support BL programmes, while the rest of the respondents were totally in doubt if their institutions could do so. It should be noted that all NEIs must examine their ICT requirements and convey a logical approach prior to implementing their BL virtual platforms. The NEIs ought to have a logical plan for financial support, appropriate response, and strategies for comprehensive evaluation. This will help establish their readiness, successful uptake by the educators and successful implementation thereof (Naim et al., 2018: 5). Table 4.2 below illustrates the institutional infrastructure readiness to use BL pedagogy.

Table 4- 12: Infrastructure readiness dimension Nursing education Institutional readiness for BL

Institutional readiness support towards BL		Frequency	Percentage	X^2 value	p-value
Question 1. Have ICT resources to facilitate Blended Learning in my classroom?	Strongly Agree Agree Uncertain Disagree Strongly Disagree	18 41 31 42 12	13 28 22 29 8	25.2361	<.0001
Question 2. My institution offers technical training in using BL?	Strongly Agree Agree Uncertain Disagree Strongly Disagree	12 45 33 30 23	8 32 23 21 16	20.8811	0.0003
Question 3. Institution offers technical staff to monitor and support BL program?	Strongly Agree Agree Uncertain Disagree Strongly Disagree	7 45 32 46 14	5 31 22 32 10	43.8472	<.0001
Question 4. Institution has the potential to support Blended Learning?	Strongly Agree Agree Uncertain Disagree Strongly Disagree	12 30 42 45 13	8 21 30 32 9	20.8811	0.0003

Question 5: Does your institution have a computer laboratory with enough computers to support BL programme?

The data also indicated that 19% of respondents strongly agreed that they had enough computers to support BL, 26% agreed while 20% were uncertain about their institutions having enough computers. In addition, 22% disagreed with 13% who strongly disagreed that their institutions have enough computers in their laboratory to support blended learning. From the total respondents, 2 did not have any input for this question. (Figure 4.18). This data showed that more than 40% of the respondents indicated their institutions having computer laboratories with enough computers to support BL pedagogy, however, more than 30% indicated not having such and the rest were not sure. Possession of modern computer laboratories with enough computers might improve the nurse educators' readiness for the BL pedagogy, since they can be utilised for training purposes.

According to Mirzajani et al., (2016:27) and Jowsey et al., (2020:8), inadequate ICT infrastructure in computer laboratories and computers were reported to be some of the challenges that hindered nurse educators' readiness to successfully utilise BL pedagogy coupled with low ICT skills. In addition, it was confirmed that non-existence of ICT tools slackens BL utilization among nurse educators whereas availability promotes uptake of BL technologies (Ibrahim & Nat, 2019:4).

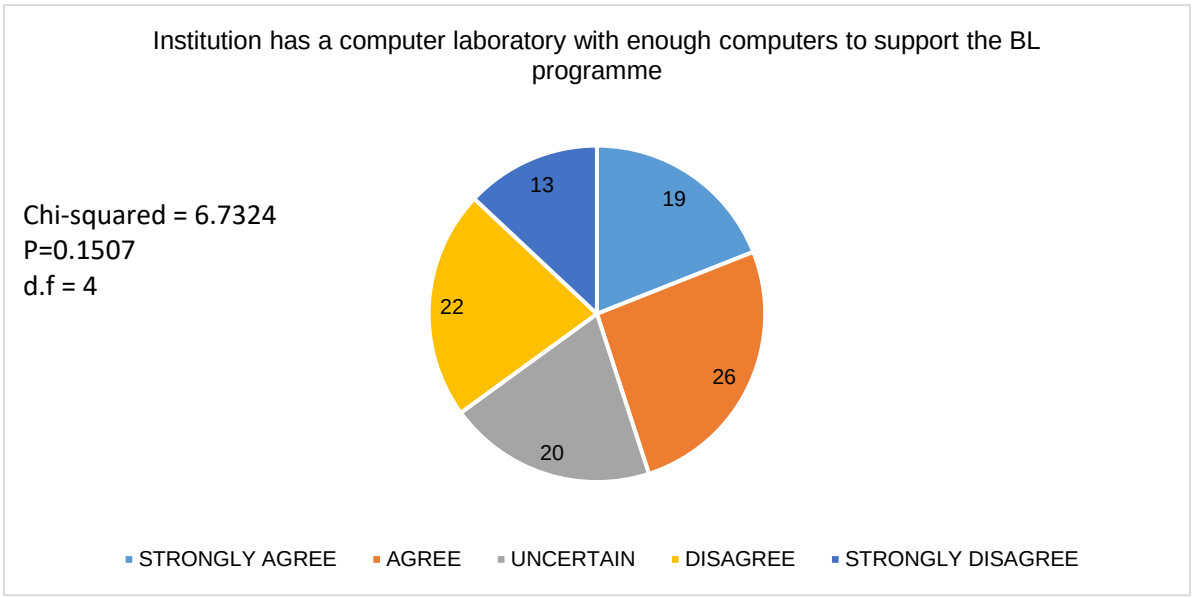

Figure 4- 18: Institution has computer laboratory with enough computer.

Question 6: Does my institution have the financial resources to maintain BL systems adequately?

From the data gathered on the institution's financial ability to maintain BL systems, 6 % of the respondents agreed that their institutions have the financial ability to maintain BL systems, 19% strongly agreed while 28% of them were uncertain. Results show that 12% of the respondents strongly disagreed and 35% agree that the institution have financial resources to maintain BL systems adequately. There was 1 respondent who did not attempt this question. (Figure 4.19). This data indicated that less than 30% of respondents confirmed that their institutions had the financial resources to support BL while close to half of them indicated lacked resources and the rest could not confirm. Literature supports that institutional possession of adequate financial resources, internet connection, ICT policies and procedures prior to inauguration of the BL programmes enhances institutional readiness. Absence of any of these aspects may cripple the implementation process (Al Gamdi & Samarji,2016:25).

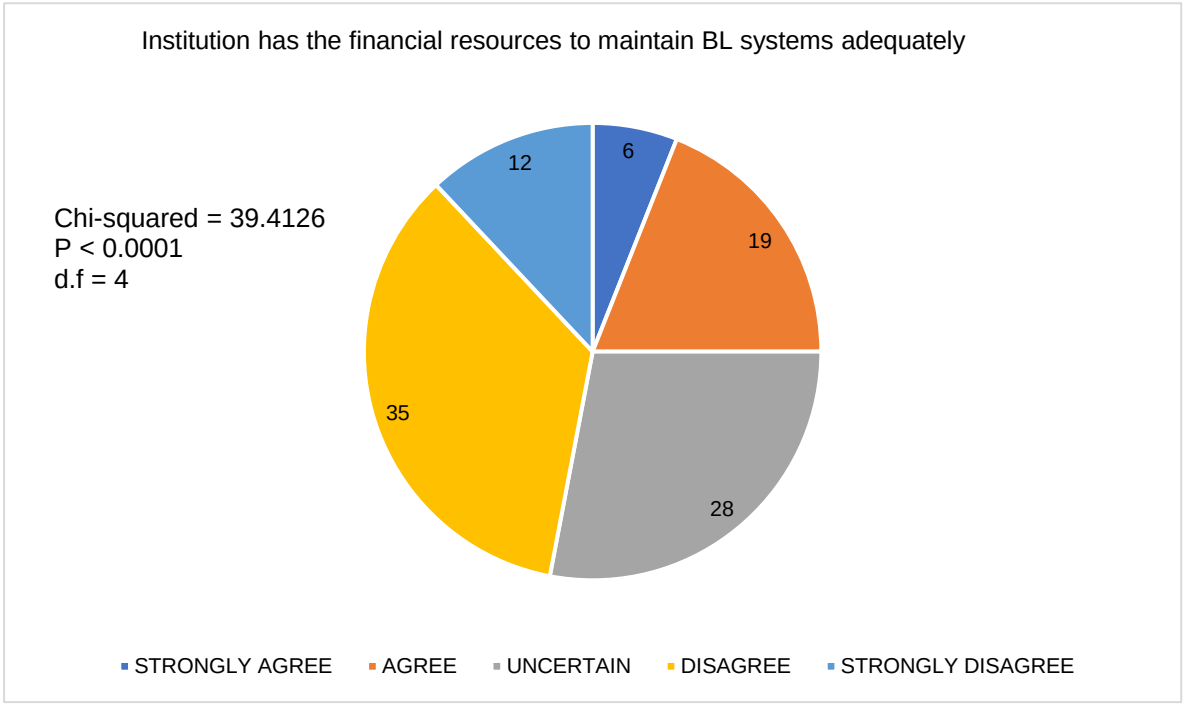

Figure 4- 19: Institution has financial resources to maintain BL systems adequately.

Question 7: Does my institution have online systems that can be used to deliver BL classes?

From the results obtained for this specific question, 26% agreed to have such systems compared with 10% who strongly agreed with such systems. In addition, 13% strongly disagreed with 21% of them who disagreed with such BL online systems, as indicated by Figure 4.20. However, 1 respondent did not answer this question. The data show that less than 40% of respondents indicated that their institutions had online learner management systems while the rest of the respondents said they lacked such systems.

Previous studies confirmed that lack of access to appropriate learner management systems required to support BL hindered the successful integration of BL pedagogy and educators' readiness to use BL thereof. Furthermore, malfunctioning or inferior ICT infrastructure may hinder uptake, especially when the nursing education institution does not have the ICT capacity (Brown, 2016:3; Rizvi et al., 2017:3).

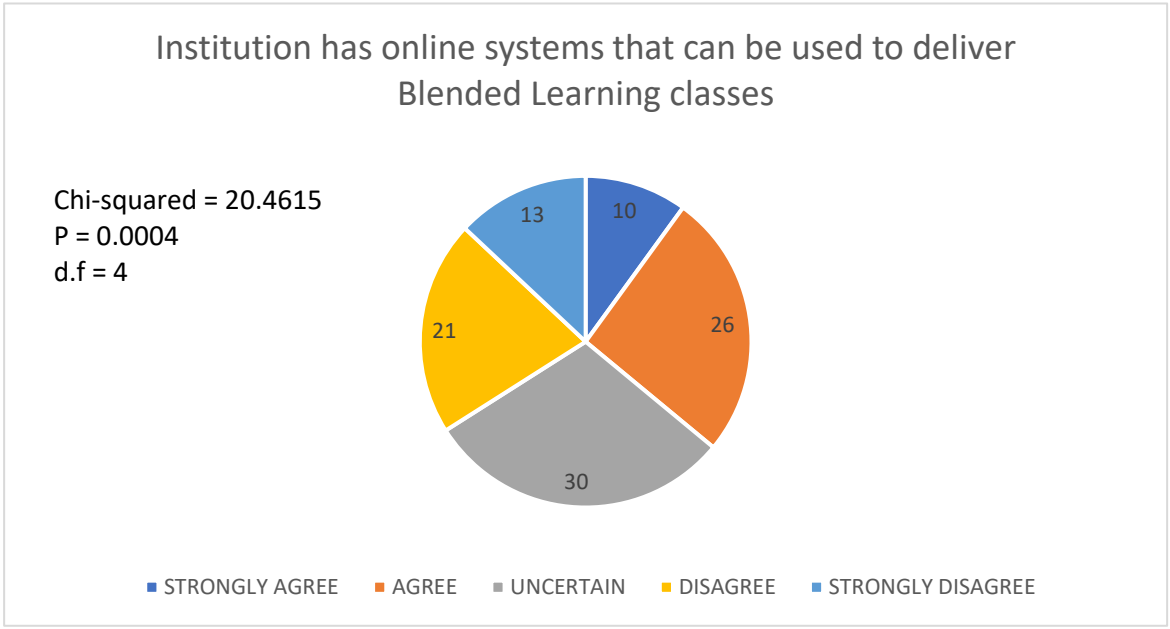

Figure 4- 20: Institution has online systems used to deliver BL lessons

4.7.4 EQUIPMENT READINESS DIMENSION

Question 1 t0 3 in summarised in Table 4.13. Results on institution's readiness in using BL showed that 9% strongly agreed that their institutions have got effective CD-ROM drives that is to say, computers, to support BL, 23% agreed that their institution has effective computers. These results are compared with 39% that were uncertain, 18% who disagreed, and 11% who strongly disagreed with the statement. Four out of a total of 144 respondents did not have this question answered.

The results revealed that approximately 32% of respondents confirmed having computers that support BL compared to more than half who indicated not having them at all. A study on educators' acceptance of ICT indicated that ICT equipment availability can promote educators' readiness to use ICT tools. This would enhance their increased usage, provided training is given (Mirzajani et al.,2016:35).

Furthermore, 17% strongly agreed that their institutions have printers that work effectively, 31% of them agreed, 19% were uncertain, 23% were in disagreement while 10% strongly disagreed in this regard. One respondent left this specific question without any answer. This data shows that over 60% of respondents indicated having printers that work effectively. On the other hand, approximately 40% of the respondents indicated their institutions lacked such equipment. This might have either a positive or negative impact on the readiness of educators to use BL. (Refer to table 4-13). Based on previous studies, it was generally confirmed that when any institution has adequate and effective computers, then there is potential to support BL pedagogy and will also have a positive impact on educators' readiness for uptake and implementation of BL in their respective institutions (Trayek et al.,2016:2016:4).

Additionally, 13% of the respondents strongly disagreed that their institutions have ICT equipment that work well, 26% agreed, 30% were uncertain, and 24% disagreed while 7% strongly disagreed. The results revealed that more than 35% of respondents answered that their institutions had ICT equipment that worked well; similarly, about 31% said they lacked ICT equipment while 30% were not sure. These results imply that when NEIs have adequate ICT equipment, transitioning towards BL use will be much easier since nurse educators will

have the equipment to utilise during their teaching activities. Consequently, readiness to use BL will be enhanced.

Results shows a strong association between Institutional resource readiness to use BL and the statements that the institution has got effective CD-ROM drives to support Blended Learning BL (p-value<0,0001); Institution has printers that work effectively (p-value<0,0001); and that Institution has ICT equipment that work well (p-value<0,0001).

The literature on prior studies revealed that institutional possession of adequate ICT equipment in the form of software, hardware, ICT systems coupled with adequate training and support of both educators and students is crucial for the prompt enhancement of nurse educators' readiness to use BL. This will eventually promote uptake and successful implementation of the BL pedagogy (Trayek et al., 2016:3).

Table 4- 13: Institutional resource readiness to use BL

Institutional resource readiness to support BL		Frequency	Percentage	X^2 value	P-value
Institution has got effective CD-ROM drives to support Blended Learning BL	Strongly agree	13	9	38.9286	<.0001
	Agree	32	23		
	Uncertain	54	39		
	Disagree	26	18		
	Strongly disagree	15	11		
Institution has printers that work effectively	Strongly agree	24	17	18.5694	0.0010
	Agree	45	31		
	Uncertain	27	19		
	Disagree	34	23		
	Strongly disagree	14	10		
Institution has ICT equipment that work well	Strongly agree	18	13	27.1748	<.0001
	Agree	37	26		
	Uncertain	43	30		
	Disagree	35	24		
	Strongly disagree	10	7		

Question 4: Does my institution have financial ability to use BL?

The results indicated that 6% of the respondents strongly agreed that their institutions had the financial ability to use BL. Similarly, 19% agreed, while 28% were uncertain about their institution's financial ability to support BL. On the contrary, 35% of the respondents disagreed with 12% strongly disagreed that their institutions could not afford using BL. Of the 144 respondents, only 1 respondent did not answer this question. Similarly, only 14% of the respondents strongly agreed, and 20% agreed that their institution might not afford to use BL. Over 15% of them strongly disagreed, 18% disagreed, while 33% of the respondents were uncertain. (Figure 4-21).

Results indicated that over 30% of respondents were positive that their institutions may not afford BL perhaps because it is costly, and 33% were uncertain because they lacked this kind of information. Similarly, nearly half of the respondents indicated that their institutions lacked the financial resources to adequately maintain BL systems, while less than 20% indicated that their institutions have the financial ability.

According to Rizvi et al., (2017:3), lack of or inadequate financial resources is among the most fundamental barriers to adopting ICT tools as it directly hinders faculty's and nurse educators' readiness to use BL. When monetary resources are unavailable, it is difficult for the institution to have BL systems, internet connectivity set up or even have technical training and support for the staff. This in the end will impede the implementation of the pedagogy.

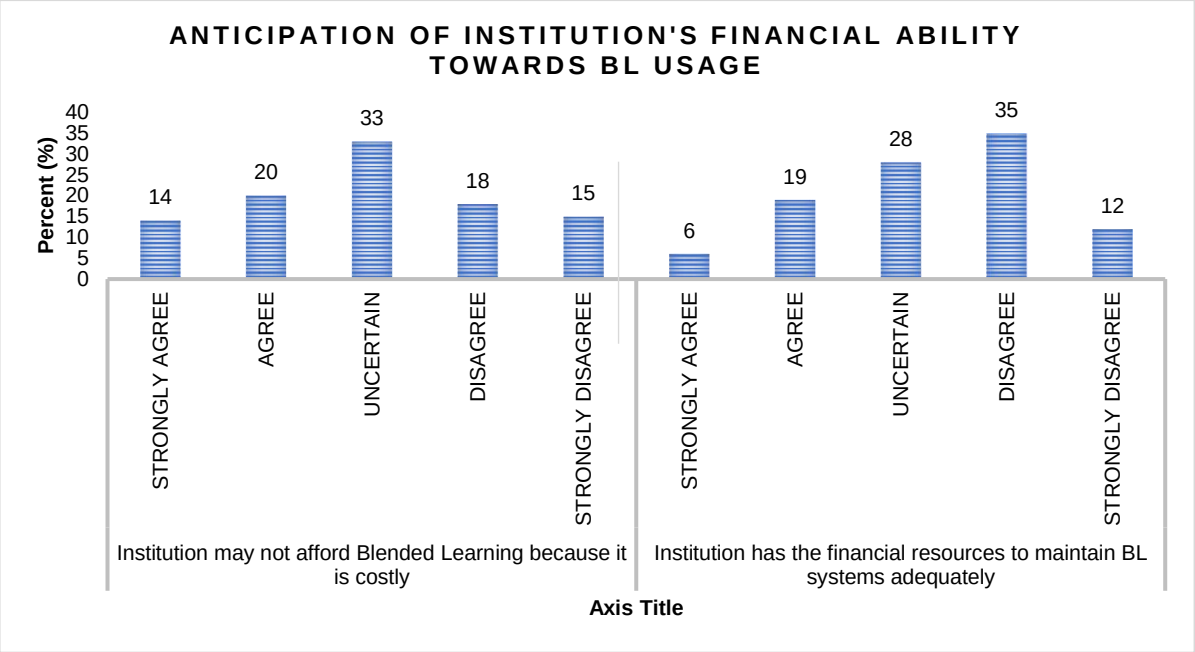

Figure 4- 21: Respondents' anticipation of institutional financial ability to use BL

4.8 EVALUATING THE ASSOCIATION BETWEEN DEMOGRAPHICS AND RESPONDENTS' READINESS TO USE BLENDED LEARNING

This analysis was done using the Chi-square test of independence. The Chi-Square test of independence assesses whether there is an association amongst categorical variables, for instance, if the variables are independent or associated (Bonett & Wright,2015:2; Bujang et al, 2018: 85). In this investigation, p-value below 0.05 level of significance or below will be regarded as significant whilst the p-value above 0.05 is not regarded as significant. The measure of association was calculated using *phi* (ϕ) and was only given for the significant associations. The ϕ coefficient is between 0 and 1. Anything between 0 and 0.3 is considered to be weak, 0.3 to 0.6 as moderate, and more than 0.6 as a strong association.

4.8.1 Level of association between demographical information and BL readiness

This section presents results of the Chi-square test conducted to test the level of association between demographical information of the participants and BL readiness. This was done

through assessing each of the questions that the respondents were asked. The participants' responses were cross tabulated with demographical information, i.e., Age group, Educational level, and employment classification. These Chi-square test results were used to test the hypothesis constructed for each question to identify the level of association between demographical information and BL readiness. The results are as follows:

Question 1: Do you have an idea of what is Blended Learning is?

H_0: Demographics is not associated with having an idea of what is blended learning is.
H_a: There is an association between demographics and having an idea of what bended learning is.

Table 4.14 show that there is no association between demographic variables and whether participants have an idea of what BL is as the computed p-value is greater than the significance level alpha=0,05. The study fails to reject the null hypothesis H_0 for all the demographical variables tested against participants having an idea of what BL is. These results show that there not enough evidence to conclude that demographic variables of participants is associated with having an idea of what blended learning is.

Table 4- 14: Demographical variables x Question 1

Demographical variables	p-value	X^2 value	Degrees of freedom	Conclusion
Age group	0.2206	15.3935	3	Fail to reject H_0
Educational level	0.8416	13.7772	5	Fail to reject H_0
Employment classification	0.472	15.7296	4	Fail to reject H_0

Question 2: Do you know the components of blended learning very well?

H_0: Demographics is not associated with knowing the components of blended learning very well. H_a: There is an association between demographics and knowing the components of blended learning very well. Table 4.15 illustrates that there is no association between demographic variables and whether participants know the components of blended learning very well as the computed p-value is greater than the significance level alpha=0,05. The study fails to reject the null hypothesis H_0 for all the demographical variables tested against

participants knowing the components of Blended Learning very well. These results show that there not enough evidence to conclude that demographic variables of participants is associated with knowing the components of blended learning very well.

Table 4- 15: Demographical variables x Question 2

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.6216	9.9353	3	Fail to reject H_0
Educational level	0.4154	20.6928	5	Fail to reject H_0
Employment classification	0.4559	15.9575	4	Fail to reject H_0

Question 3: Do you have some previous training in using blended learning?

H_0: Demographics is not associated with having some previous training in using blended learning. H_a: There is an association between demographics and having some previous training in using blended learning. As summarised in Table 4.16, there is no association between demographic variables and whether participants have some previous training in using blended learning as the computed p-value is greater than the significance level alpha=0,05. The study fails to reject the null hypothesis H_0 for all the demographical variables tested against participants having some previous training in using blended learning. These results show that there not enough evidence to conclude that demographic variables of participants is associated with participants having some previous training in using blended learning.

Table 4- 16: Demographical variables x Question 3

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.1173	17.9488	3	Fail to reject H_0
Educational level	0.7119	16.0757	5	Fail to reject H_0
Employment classification	0.1601	21.4989	4	Fail to reject H_0

Question 4: Do you anticipate that blended learning will be easy for me to use once introduced?

H_0: Demographics is not associated with anticipate that blended learning will be easy for me to use once introduced. H_a: There is an association between educational level and anticipate that blended learning will be easy for me to use once introduced.

As illustrated in Table 4.17, there is an association between demographical information (educational level) and anticipation that blended learning will be easy for them to use once introduced. As the computed p-value is less than the significance level alpha=0,05, thus, with this regard, the study rejects the null hypothesis H_0 that demographic information of participants is not associated with anticipating that blended learning will be easy for them to use once introduced. This means that there is enough evidence to conclude that educational level has an association with participants anticipating that blended learning will be easy for me to use once introduced. However, age group and employment classification do not have an association with anticipation that blended learning will be easy for the participants to use once introduced since the computed p-values were greater than the p value of 0,05 respectively.

Table 4- 17: Demographical variables x Question 4

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.8721	6.7754	3	Fail to reject H_0
Educational level	0.0429	32.0335	5	Rejected
Employment classification	0.2165	20.0824	4	Fail to reject H_0

Question 5: Are you ready and willing to integrate ICT learner systems in teaching activities?

H_0: Demographics is associated with ready and willing to integrate ICT learner systems in teaching activities. H_a: There is no association between demographics and willing to integrate ICT learner systems in teaching activities, as summarised in Table 4.18. Results show that there is no association between demographic variables and participants' readiness and willingness to integrate ICT learner systems in teaching activities as the computed p-value is greater than the significance level alpha=0,05. The study fails to reject

the null hypothesis H_0 for all the demographical variables tested against participants' readiness and willingness to integrate ICT learner systems in teaching activities. These results show that there not enough evidence to conclude that demographic variables of participants is associated with participants' readiness and willingness to integrate ICT learner systems in teaching activities.

Table 4- 18: Demographical variables x Question 5

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.4181	12.3487	3	Fail to reject H_0
Educational level	0.1841	25.4689	5	Fail to reject H_0
Employment classification	0.5075	15.2355	4	Fail to reject H_0

Question 6: Do you have enough ICT skills to use blended learning?

H_0: Demographics is not associated with Have enough ICT skills to use blended learning. H_a: There is an association between demographics and Have enough ICT skills to use blended learning. (Table 4.19). Results show that there is no association between demographic variables and whether participants have enough ICT skills to use blended learning as the computed p-value is greater than the significance level alpha=0,05. The study fails to reject the null hypothesis H_0 for all the demographical variables tested against participants having enough ICT skills to use blended learning. These results show that there not enough evidence to conclude that demographic variables of participants is associated with participants having enough ICT skills to use blended learning.

Table 4- 19: Demographical variables x Question 6

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.1759	16.346	3	Fail to reject H_0
Educational level	0.913	12.0878	5	Fail to reject H_0
Employment classification	0.0815	24.3824	4	Fail to reject H_0

Question 7: Do you have some experience in using blended learning?

H_0: Demographics is not associated with have some experience in using blended learning.

H_a: Having some experience in using blended learning is associated with demographics. Table 4.20 show that there is no association between demographic variables and whether participants have some experience in using blended learning as the computed p-value is greater than the significance level alpha=0,05. The study fails to reject the null hypothesis H_0 for all the demographical variables tested against participants having some experience in using blended learning. These results show that there not enough evidence to conclude that demographic variables of participants is associated with participants having some experience in using blended learning.

Table 4- 20: Demographical variables x Question 7

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.2802	14.3292	3	Fail to reject H_0
Educational level	0.0837	29.2104	5	Fail to reject H_0
Employment classification	0.4899	15.4786	4	Fail to reject H_0

Question 8: Do you have challenges with internet access?

H_0: Demographics is not associated with have some experience in using blended learning. H_a: Having some experience in using blended learning is associated with demographics. As illustrated in Table 4.21, there is no association between demographic variables and whether participants Have challenges with internet access as the computed p-value is greater than the significance level alpha=0,05. The study fails to reject the null hypothesis H_0 for all the demographical variables tested against participants having challenges with internet access. These results show that there not enough evidence to conclude that demographic variables of participants is associated with participants' having challenges with internet access.

Table 4- 21: Demographical variables x Question 8

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.3628	13.087	3	Fail to reject H_0
Educational level	0.7533	15.3964	5	Fail to reject H_0
Employment classification	0.6415	13.4239	4	Fail to reject H_0

Question 9: Do you have an idea on how to fix ICT media tools?

H_0: Demographics is not associated with have an idea on how to fix ICT media tools.
H_a: There is an association between demographics and have an idea on how to fix ICT media tools. The results are summarised in Table 4.22 and show that there is no association between demographic variables and whether participants have an idea on how to fix ICT media tools as the computed p-value is greater than the significance level alpha=0,05. The study fails to reject the null hypothesis H_0 for all the demographical variables tested against participants having an idea on how to fix ICT media tools. These results show that there not enough evidence to conclude that demographic variables of participants is associated with participants having an idea on how to fix ICT media tools.

Table 4- 22: Demographical variables x Question 9

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.0678	19.9639	3	Fail to reject H_0
Educational level	0.1476	26.5771	5	Fail to reject H_0
Employment classification	0.2382	19.612	4	Fail to reject H_0

Question 10: Can you monitor virtual platforms and make learning more meaningful?

H_0: Demographics is not associated with have an idea on how to fix ICT media tools.
H_a: There is an association between demographics and have an idea on how to fix ICT media tools.

Results show that there is no association between demographic variables and whether participants can monitor virtual platforms and making learning more meaningful as the computed p-value is greater than the significance level alpha=0,05. The study fails to reject the null hypothesis H_0 for all the demographical variables tested against participants' ability to monitor virtual platforms and making learning more meaningful. These results show that there not enough evidence to conclude that demographic variables of participants is associated with participants' ability to monitor virtual platforms and making learning more meaningful. Table 4.23.

Table 4- 23: Demographical variables x Question 10

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.4435	12.0271	3	Fail to reject H_0
Educational level	0.2711	23.3668	5	Fail to reject H_0
Employment classification	0.3578	17.4379	4	Fail to reject H_0

Question 11: Do you have sufficient knowledge and skills to use blended learning?

H_0: Demographics is not associated with don't have sufficient knowledge and skills to use blended learning. H_a: There is an association between employment classification and don't have sufficient knowledge and skills to use blended learning. (Table 4.24). Results show that there is an association between demographical information (educational classification) and not having sufficient knowledge and skills to use blended learning as the computed p-value is less than the significance level alpha=0,05. Thus, with this regard, the study rejects the null hypothesis H_0 that demographic information of participants is not associated with not having sufficient knowledge and skills to use blended learning. This means that there is enough evidence to conclude that educational classification has an association with participants not having sufficient knowledge and skills to use blended learning. However, Age group and employment level do not have an association with not having sufficient knowledge and skills to use blended learning since the computed p-values were greater than the p-value of 0,05 respectively.

Table 4- 24: Demographical variables x Question 11

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.4379	12.0975	3	Fail to reject H_0
Educational level	0.9489	10.8942	5	Fail to reject H_0
Employment classification	0.0493	26.3492	4	Rejected

Question 12: Is it a good intervention to use blended learning your institution?

H_0: Demographics is not associated with it's a good intervention to use blended learning in my institution. H_a: There is an association between age groups and it's a good intervention to use blended learning in my institution. Results show that there is an association between demographical information (age group) and participants feeling that It's a good intervention to use blended learning in my institution. As the computed p-value is less than the

significance level alpha=0,05. Thus, with this regard, the study rejects the null hypothesis H_0 that demographic information of participants is not associated with participants feeling that It's a good intervention to use blended learning in my institution. This means that there is enough evidence to conclude that age group has an association with participants feeling that it's a good intervention to use blended learning in my institution. However, employment level and employment classification do not have an association with participants' feeling that it's a good intervention to use blended learning in my institution since the computed p-values were greater than the p value of 0,05 respectively. (Table 4.25).

Table 4- 25: Demographical variables x Question 12

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.0029	29.9349	3	Rejected
Educational level	0.7056	16.1775	5	Fail to reject H_0
Employment classification	0.4222	16.4470	4	Fail to reject H_0

Question 13: Are you willing to use blended learning if introduced in your institution?

H_0: Demographics is not associated with willing to use blended learning if introduced in my institution. H_a: There is an association between age group and willing to use blended learning if introduced in my institution. (See Table 4.26).

Regarding willingness to use BL if introduced in participants' institution, results shows that there is an association between demographical information (Age group) and willingness to use Blended Learning if introduced in my institution. As the computed p-value is less than the significance level alpha=0,05. Thus, with this regard, the study rejects the null hypothesis H_0 that demographic information of participants is not associated with willingness to use blended learning if introduced in my institution. This means that there is enough evidence to conclude that Age group has an association with participants' willingness to use blended learning if introduced in my institution. However, educational level and employment classification do not have an association with willingness to use blended learning if introduced in my institution since the computed p-values were greater than the p value of 0,05 respectively.

Table 4- 26: Demographical variables x Question 13

Demographical variables	p-value	X^2 value	Degrees of freedom	H_0
Age group	0.0075	27.1034	3	Accepted
Educational level	0.7440	15.5526	5	Fail to reject H_0
Employment classification	0.0831	24.3006	4	Fail to reject H_0

In summary demographical information of participants does have an association with participants' Q4: Anticipation that blended learning will be easy for me to use once introduced (Educational level); Q11: Not having sufficient knowledge and skills to use blended learning (Educational classification); Q12: It's good intervention to use blended learning in my institution (Age group) and Q13: Willingness to use blended learning if introduced in my institution (Age group).

4.9 SUMMARY OF THE CHAPTER

This chapter presented comprehensive, pragmatic descriptive and inferential results of evaluated data. The descriptive statistics about nurse educators' readiness to use blended learning were presented. The outcomes of the analysis regarding the level of association between respondents' demographic information, i.e., age, educational level and employment classifications compared with blended learning readiness, were confirmed and presented.

CHAPTER FIVE

DISCUSSIONS, LIMITATIONS, CONCLUSIONS, AND RECOMMENDATIONS OF THE STUDY

5.1 INTRODUCTION

The previous chapter presented the results from the analysed data acquired through questionnaires. The current chapter describes the overall presumptions evolving from the study outcomes on Nurse educators' readiness to use blended learning in public Nursing Education institutions in Gauteng Province. At this stage, the research question was addressed.

5.2 OBJECTIVES OF THE STUDY

This research study aimed to investigate nurse educators' readiness to use blended learning in public nursing education institutions in Gauteng province.

The objective of the study was:

- To determine the nurse educators' readiness to use blended learning in Nursing education institutions in Gauteng province by assessing the following dimensions areas:
    - Describe nurse educators' demographic data
    - Assess nurse educators' technological readiness
    - Assess nurse educators' psychological dimension
    - Assess nurse educators' infrastructure readiness
    - Assess nurse educators' equipment readiness

5.3 SUMMARY OF RESULTS

The outcomes from the data collected were comprehensively discussed in the previous chapter based on the study variables. The study variables comprised of demographic data

and nurse educators' readiness to use blended learning in public nursing education institutions in Gauteng province using the four-dimension areas of readiness i.e., technological; psychological dimension; infrastructure readiness; and equipment.

5.4 DATA COLLECTION TOOL

This was a quantitative research study that used the descriptive survey design. Data was gathered using questionnaires as hard copies and as online survey links as reflected in Chapter 3.

5.4.1 Demographic profile of the participants

From the demographic data reflected in the previous chapter, it was apparent that most nurse educators in public nursing education institutions in Gauteng province were mostly females (n=126) with an overall percentage of 88%. Concerning the SANC overall statistical demographic data on the gender of registered nurses per province, Gauteng had the highest number of female nurses (SANC,2020). Furthermore, this is supported by a study on nurses' opinions about occupational HIV PEP services at the selected hospital in the Tshwane district, which revealed that there is a distribution of more female than male nurses in South Africa.
Out of the hundred and forty-four (144) respondents, 31.94% (n=46) & 30.56% (n=44) were between 36 and 55 years, thus the majority were at the periphery of retirement which calls for strategies to be put in place to attract younger nurse educators into the profession. This is supported by SANC overall statistical data on the age distribution of registered nurses countrywide, which revealed that most nurses were within the age bracket of 40 to 59 years (SANC,2019). Furthermore, it was evident that 80% (n=112) of the respondents were emerging from the black ethnicity category ((Statistics South Africa,2020; Van Der Heever et al., 2019:5). In this study, it was revealed that the educational level of respondents mostly comprised of bachelor of nursing degree 33.6% (n=48).

From the data gathered, it was evident that most respondents were employed as lecturers, 68.53% (n=98) who are often the initiators of BL pedagogy. Thus, there is a need for the NEIs to conduct a thorough assessment on the technical and psychological sphere of readiness to use the pedagogy before its implementation, as this might assist in identifying their ICT needs in terms of strengths and weaknesses, such that training can be conducted.

This is in line with the strategic plan for nurse education, training, and practice 2012/132016/17) which emphasizes that ICT resources must be integrated into both nursing practice and education curricular to ensure quality teaching and quality patient care (National Department of Health, 2013).

The Chi-Square test of Independence was also used to assesses whether there is an association amongst categorical variables, for instance, age, educational level, and employment classification, and results were illustrated. The probability-value (p-value) of below or less than 0.05 was regarded as significant whilst the p-value above 0.05 was not significant. The measure of association was calculated using ϕ coefficient which ranged between 0 and 1. Values between 0 and 0.3 were regarded as weak, 0.3 to 0.6 were moderate, while those more than 0.6 were regarded as strong associations.

5.4.2 Nurse educators' readiness for blended learning

This section consisted of one broad research question that aimed to investigate nurse educators' state of readiness for BL before implementing the pedagogy. The study utilized Chapnick's readiness model to conduct a readiness assessment of the nurse educators, described under four dimensions technological, psychological, infrastructure, and equipment readiness. The outcomes of this study were assessed and analysed as follows.

5.4.2.1 Technological readiness dimension

It was evident that the respondents had an idea about blended learning, that is; 25% & 27% agreed and strongly agreed that they had an idea of what blended learning was and was a positive indication of readiness for educators to successfully implement the pedagogy. However, 12% and 17% disagreed and strongly disagreed while 19% had no idea at all. Literature supports the fact that nurse educators' ICT knowledge and skills are relevant in enhancing their readiness for BL pedagogy to successfully render meaningful teaching (Harerimana& Mtshali, 2017:1). No association was evident between the three demographic variables used: age, educational level, and employment classification with an idea of BL ($p>0.05$).

Furthermore, only 5% and 19% of respondents reported knowing whilst 36% and 29% did not know at all about the components of BL. These results indicated that although more than half

of the respondents previously had an idea, less than 25% of them know the components of BL well and more than 60% were still ignorant about its components. Previous studies support that BL pedagogy readiness must be consistent with nurse educators' expertise in understanding the components in terms of ICT tools for successful execution (Trayek et al., 2016:2). Therefore, it will be beneficial if more information is provided for these educators to understand all the relevant BL components for successful uptake. No association was evident between respondents' age, educational level, and employment classification with knowledge of BL components ($p>0.05$). 7.1% and 35.5% agreed and strongly agreed while 32.6% and 12.8% disagreed and strongly disagreed with prior training. These results indicated that more than 40% of the respondents reported having received prior training, nevertheless, more than half are still unsure or have never received training, yet this might enhance their readiness for successful uptake and implementation thereof. These results are supported by a study done by Jantjies and Joy, (2016:8), whose findings indicated that many institutions with limited ICT technical support and training for their staff had reduced uptake and educators' readiness for successful implementation, even with existing ICT infrastructure. No association was significant between respondents' demographic variables used, that says; age, educational level, and employment classification with having an idea of BL ($p>0.05$).

More training and support of educators would be recommended for all institutions to increase their readiness for BL pedagogy before its successful implementation or competent use where its already in existence. Institutions should strive to provide regular training of the educators and existing ICT infrastructure to increase the possibility of success of the pedagogy (Mirzajani et al.,2016:27). 24.7% and 25.4% agreed and strongly agreed to have positive anticipation towards the use of BL once introduced whilst 10.6% and 28% disagreed and strongly disagreed. The results showed that even though half of the respondents were enthusiastic about BL uptake, more than 30% were still reluctant. Evidence revealed that enthusiasm towards the use of ICT tools increases the person's inclination towards readiness, uptake, and successful use of the BL platforms (Sugiharto, Corebima, &Susilo 2019:122). There was no association ($p>0.05$) between age and employment classification and respondents' anticipation of easy use of BL, however, educational level was associated ($p=0.0429$). There is therefore a need to investigate this association further.

Furthermore, 26% and 22% agreed and strongly agreed to be willing to integrate ICT in teaching activities whilst 19% and 20% were not in favor of the innovation. These results show that nearly half of the respondents were positive whilst more than 25% were not in support of ICT innovations. Previous studies should be noted that all educators must be flexible, willing,

and skillful in using virtual ICT learner management systems to effectively implement BL pedagogy (Jowsey et al., 2020:8). No association was identified between respondents' demographics and willingness to integrate ICT in teaching activities.

In addition, the results revealed that only 8% agreed while 22% of the respondents strongly agreed to have ICT skills needed for them to be able to use BL. On the other hand, 27%, 29% and 14% of the respondents respectively disagreed, strongly disagreed and unsure about having such skills. It is therefore evident that only 30% of the respondents had ICT skills needed for them to be able to use BL while more than half of the respondents lacked ICT skills required for integration of BL educational components, which might hinder their readiness to use BL pedagogy should the institution decide to implement it. No association was identified between respondents' demographics and possession of ICT skills required to use for BL.
This data is supported by previous studies conducted by Brown (2016:4) and Ibrahim and Nat, (2019:4), which indicated that prevailing technical challenges such as; inadequate ICT skills hinder nurse educators' readiness to use BL thus impeding the successful uptake and implementation of the pedagogy in various institutions. It would be beneficial if nursing education institutions can embark on training of nurse educators in ICT skills and establish appropriate ICT infrastructure to enhance nurse educators' readiness for successful uptake of the BL pedagogy (Trayek et al., 2016:2).

The study revealed that 9% and 20% of respondents agreed and strongly agreed respectively in having an idea on how to fix ICT media tools while 25% and 27% respectively disagreed and strongly disagreed having an idea in that aspect. The study, therefore, revealed that less than 30% of the respondents had basic skills in fixing ICT media tools, however more than half had no idea in this regard. Therefore, institutions might need to place more emphasis on this aspect, by organizing regular technical training and support in using BL pedagogy. Previous studies have indicated the need for all nurse educators to have a high level of technical skills, cognizance, and enthusiasm to increase their readiness for the effective operation of the pedagogy (Miglani & Awadhiya, 2017:60). No association was significant between demographics and having an idea on how to fix ICT media tools.

The results revealed that 10% and 27% of the respondents alluded that they could monitor virtual platforms and make learning meaningful, while 23% and10% alluded to lacking such ability and the 30% indicated not being sure as to whether they can ably do it. This study, therefore, indicated that less than 40% of the respondents could monitor virtual platforms and make learning more meaningful while more than half of them were either unsure or had no

clue, perhaps because their institutions do not have such systems, which might hinder their readiness for effective use of the pedagogy. There was no association between demographics and respondents' ability to monitor virtual platforms. These study results are supported by Jantjies and Joy, (2016:8), whose study showed that nurse educators have a substantial role required in the successful integration of BL pedagogy, including monitoring of BL virtual platforms to make learning more meaningful. Furthermore, another study by Harerimana and Mtshali, (2017:2) reported that most nurse educators still encounter inadequate ICT skills and creativity challenges thus hindering the effective incorporation of ICT tools into the BL pedagogy.

Approximately 7% and 24% indicated having competence in integrating ICT media for teaching as only 28%, 34%, and 7% respectively indicated being incompetent in that aspect. This study discovered that more than 30% of respondents indicated being competent in carefully integrating ICT media during their teaching activities. Nonetheless, more than half of them confirmed being incompetent in that aspect, and others were not sure. This could be a possible hindrance to BL readiness and successful implementation. No association existed between respondents' ability to integrate and their demographics. The results in this study are supported by various studies that have established that institutions transitioning towards BL pedagogy use often encounter various hiccups since nurse educators have inadequate knowledge and expertise needed for designing and constructing BL pedagogical activities, e-study resources, e-assessments, flexible and creative teaching strategies, etc. Additionally, the BL pedagogy necessitates a more technical approach in terms of restructuring the students' syllabus and balancing the virtual and face-to-face activities suitably. It is both time-intensive and costly for the educator and the NEI to render expertise training to all its educators to ensure implementation of the programme (Ma'arop& Embi,2016:42).

In this study, about 5% and 29% of respondents confirmed having some experience in using BL but 19% and 35% respectively had no prior experience and 12% barely had a clue. This data shows that over 30% of the respondents had experience in using BL whilst nearly half had no previous experience and the rest were not sure. Having prior experience on part of the respondent might increase their level of readiness for the uptake of BL pedagogy. In a previous study by Ibrahim and Nat, (2019:2), it was confirmed that having prior experience in using ICT tools on the part of the educators and students might improve their approaches and skills in effectively using BL pedagogy. No association was found significant between respondents' demographics and their experience to use BL.

The data showed that 15% and 29% of the respondents had serious internet access challenges however 32%, 15%, and 9% indicated having no challenges in accessing the internet and the rest were unsure. Over 40% of the respondents had internet access challenges which might be a barrier for respondents' readiness to use BL whilst more than 45% had no challenges which might be a facilitator for readiness to use BL pedagogy. Nursing education institutions are required to provide adequate internet access for all respondents before the commencement of BL as this might promote the readiness of nurse educators in using BL. Having challenges with the use of ICT tools did not have any association with respondents' demographics. Other studies support these study results, which revealed the numerous barriers such as internet access challenges, poor ICT infrastructure among others that impede the smooth transitioning of NEIs towards the use of ICT tools, as they strive to improve their teaching activities. This negatively affects nurse educators' readiness to effectively use BL pedagogy (Harerimana & Mtshali,2017:2; Ma'arop & Embi,2016:45).

Furthermore, Respondents' possession of insufficient knowledge and skills to use BL was assessed which revealed that 15% strongly lacked sufficient knowledge, 31% agreed to have skills inadequacies required to use BL, while 19% were doubtful about their skills' abilities. 26% felt sufficiently equipped with BL knowledge and skills while 9% strongly disagreed with inadequate knowledge and skills. These results indicated that although 35% of the respondents indicated having knowledge and ICT skills to use BL, more than 45% still mentioned that they had insufficient knowledge and skills that might impede the implementation and sustainability of the BL pedagogy. Prior literature supports that educator readiness crucial in enhancing successful implementation thus the need to measure educators' BL readiness in terms of Nurse educators' knowledge and ICT skills (Blayone,2018:429; Rohayani et al.,2015:231; Aung & Khaing:2016:406). There was no association between the respondents' age and educational qualifications, nevertheless, employment classification illustrated an association (p=0.0493). There is a need to investigate this aspect further so to gain more insight into the concrete rationale.

5.4.2.2 Psychological readiness dimension

Under this dimension, about 18% and 25% indicated that it would be a good intervention to use BL in their institutions whilst 27% and 17% were in total disagreement and 13% indicated not being sure if it would be a good intervention. Over 40% of the respondents contemplate that use of BL is a good intervention in their institution, although more than 40% do not believe

so, perhaps because they lack information about the pedagogy. Having positive expectations towards BL on the part of the respondent might improve thus enhancing their readiness.

According to Brown, (2016:4) and Ibrahim and Nat, (2019:7), all educators affiliated with various educational institutions usually adhere to shared philosophical goals and mission statements that usually influence their decision-making practices to the adoption of ICT tools before the implementation of BL. Such beliefs or values might influence their decisions in either accepting or rejecting such new technological inventions. Therefore, educators with positive attributes towards the use of ICT tools are usually enthusiastic about use, increasing their readiness level. No association was significant between the respondents' education and employment categories with good intervention to use BL, however, an association existed between age group and the belief that is a good intervention to use BL if introduced ($p=0.0029$).

Approximately 21% and 28% of respondents indicated their positive willingness to adopt BL should their institution introduce it. On the other hand, 18% were unwilling to use the BL and 16% were not sure at all. The study showed that nearly half of the respondents had a positive enthusiasm for BL use and therefore ready to use it once their institutions decided to implement it. The other 30% of the educators were reluctant possibly due to lack of interest or rigidness to change. Currently, many higher learning institutions are increasingly transforming towards the use of BL pedagogy, however, some of the nurse educators may have negative attitudes towards the use of BL which eventually impedes their psychological state of readiness, thus hindering successful implementation. All individual nurse educators should be encouraged to have a high sense of eagerness to successfully implement the pedagogy (Ibrahim & Nat, 2019:2; Rizvi, Gulzar, Nicholas & Nkoroi, 2017:2). Furthermore, readiness to use BL is enhanced through institutional technical training and support to increase educators' knowledge, skills, motivation, and confidence in using ICT tools (Ibrahim & Nat, 2019:7).

Furthermore, the study revealed that approximately 22% and 18% of the respondents indicated that BL would make teaching more effective, however, 20% and 19% were not in favor of the pedagogy while 21% were not sure. This study revealed that 40% of respondents envisaged that BL learning will make teaching more effective. However, 39% of them did not think otherwise while 21% were not sure which might harm their level of readiness in using BL. The findings in this study are supported by Mahmud et al., (2016:26), who asserted that educational revolutions such as BL have become inexorable due to benefits like improved effectiveness in terms of teaching and learning activities in various NEI milieus. Once nurse

educators come to understand the positive side of the pedagogy, their readiness to use BL will consequently be heightened thus leading to its successful implementation.

The study indicated that 19% and 26% agreed and strongly agree that BL may save a lot of time once implemented. On the other hand, 16% and 23% were doubtful if the pedagogy could save time while 16% were uncertain. This data reflects that although more than 40% of the respondents expressed that BL may assist in saving time, 39% opposed the view while 16% were not sure at all. These results are contrary to Brown, (2016:3), in a study that indicated that the use of BL is both costly and time-intensive for institutions intending to implement it. The issue around the cost might be that there is a need for extreme prior planning of the educational content required for integration into BL pedagogy. Thus, all nurse educators and faculty out to ensure thorough prior planning to increase nurse educator's readiness for successful uptake and implementation of the pedagogy. In a similar study, Cassum et al., (2016:223) indicated that although many educators were positive towards the inauguration of the BL pedagogy, most faculty members complained about time wastage during online study materials preparation and would hinder the successful implementation of the pedagogy.

Results in this study indicated that 18% and 27% BL would enhance students' and nurse educators' autonomy once implemented while 20% and 15% were not in favour of this. 20% were against the whole idea. This data indicated that although more than 40% of respondents were optimistic that BL would promote autonomy amongst educators and students, more than 30% disagreed with this, which could enhance or impede their readiness and satisfaction for implementing the pedagogy. Li, He, Yuan, Chen, and Sun, (2019:51), supports findings in this study, who indicated that BL is linked with an increased level of flexibility and autonomy for both nurse educators and students during asynchronous interactions, thus making it possible to pace their teaching and learning activities.

In this study, approximately 15% and 27% of respondents anticipated being motivated to use BL, whereas 25% and 13% of them were against the idea and 20% were not sure. More than 40% of the respondents were in positive anticipation towards the introduction of BL while more than 35% expressed negative attitudes and the rest or were not sure. Respondents' expression of positive anticipation towards the use of BL might enhance their readiness to successfully use the BL pedagogy provided the ICT infrastructure is in place. These results are generally in line with Brown, (2016:4), whose findings confirmed intense experiences of technological anxiety by educators and faculty during the initial stages of BL pedagogical implementation coupled with reduced motivation. Additionally, Mirzajani et al., (2016:28) and

Ibrahim and Nat, (2019:2) explained that many educators may have lowered motivation towards the use of the pedagogy due to individual negative attitudes about the pedagogy, such as; the belief that it wastes a lot of time due to increased workload, leading to instant rejection of the pedagogy.

About 14% and 26% of respondents indicated having confidence whereas 21% and 14% were doubtful and 25% were not even sure. This data indicates that approximately 40% of the respondents anticipate having confidence in using BL for teaching whilst over 30% indicated negative anticipation and the remaining portion were unsure in terms of their confidence. Having confidence on part of the respondent might enhance their readiness whilst their lack of confidence might indicate non-readiness for the pedagogy. According to Coopasami et al., (2017:301) and Cassum et al., (2016:223), it was revealed that nurse educators' uptake for BL is linked to their psychological temperament, as far as confidence levels, commitment, and aptitude aspects are concerned. Also, educators' possession or lack of ICT skills has the potential to enhance or impede the confidence and commitment levels of nurse educators to use BL pedagogy thus promoting their readiness to use.

In this study, 14% and 31% confirmed that knowledge acquisition would be easier and flexible while easy whereas 23% and 14% were in total doubt in this regard and18% were neutral. The study indicated that over 40% of the respondents confirmed that knowledge acquisition would be easier and flexible once BL pedagogy is introduced whilst over 30% disagreed and the remaining respondents had no idea. Previous studies have confirmed that Blended learning is beneficial since it allows students and educators to interact amongst themselves and the educational content during the learning process. Students can easily access information from a wide range of sources with maximum ease and flexibility while having synchronous or asynchronous interactions, thus increasing the acquisition of lifelong knowledge and skills (Alexander et al.,2019:2; Rizvi et al., 2017:1).

Furthermore, over 19% and 17% of the respondents agreed and strongly agreed to be comfortable in using face to face method, 27% and 25% agreed and strongly disagreed being comfortable with face to face whilst 9% were unsure. Similarly, 18% and 21% believed that traditional face-to-face is the best method of teaching, 9% were not sure whether whilst 32% and 20% disagree. The results revealed that over half of the respondents were negative towards the use of traditional face-to-face learning because they felt uncomfortable when using it and they disagreed that it is not a good method of teaching students.

Technological innovations have changed the face of nursing education due to the establishment of ICT virtual teaching platforms such as BL. These results are supported by literature from previous studies, which confirmed that although traditional face to face learning has several benefits such as shared learning, acquisition of skills, etc., many educators still faced challenges such as failure in addressing students' unique needs, use of flexible strategies and inability to manage a large crowd of students which made their facilitation very difficult (Ndawo,2016:2). The use of BL platforms might be a solution to challenges such as a large number of students, as the educator can reach out to a larger group of students. Technology-aided strategies such as the use of videos, media, and various strategies could also be utilized in enhancing the learning process.

The results indicated that respondents who agreed and strongly agreed that BL might waste a lot of time had a similar percentage (16%) whilst those who disagreed and strongly disagreed were 26% and 26% had no idea. Five questionnaires had no answers to this question. This data reveals that over 30% of respondents expect BL to be time-wasting and demanding once introduced, while more than 40% disagreed in that regard, and the rest were unsure. According to Ibrahim and Nat, (2019:5), it was confirmed that use of blended learning is associated with numerous challenges such as time intensiveness; increased workload in terms of structuring the online-learning educational objectives, conducting e-assessments, feedback, supervisory demands of virtual spaces during both synchronous and asynchronous learner interactions. In the end, the educators often develop a negative attitude and frustration towards the pedagogy, thus compromising their readiness to use as well as the actual implementation of the pedagogy.

5.4.2.3 Infrastructure readiness dimension

The results indicated that 28% and 13% of the respondents confirmed having ICT resources to facilitate BL in their classrooms, whilst 29% and 8% indicated not having such. 29% of them were uncertain. The results revealed that over 40% of the respondents indicated having ICT infrastructure to facilitate BL in their classrooms, however, more than half of the respondents indicated not having these ICT infrastructures or any idea at all in this regard. According to Brown, (2016:3), many institutions lack adequate access to ICT infrastructure, reliable internet of ICT, and complexity of ICT technologies which hinders their successful uptake and implementation of the BL pedagogy thereof. Additionally, 8% and 32% of the respondents confirmed that their institutions offered technical support in using BL, 21% and 16% said they lacked training while 23% were not sure. In this study, only 40% of respondents indicated

receiving technical training in using BL, and the rest of the 37% confirmed receiving no training at all, while 23% were unsure perhaps because their institutions have not implemented the BL pedagogy or lack the policies that support this move. These results can be equated to previous studies by Porter and Graham, (2019:5) and Mirzajani et al., (2016:36), it was confirmed that only 4.1% of educators were offered training opportunities required for ICT usage, before the implementation of online learning programmes and this harmed the readiness of educators to use the BL as the training inadequate.

The results also indicated that 5% and 31% of the respondents confirmed that their institutions offer technical support staff to monitor BL. 10% and 32% of respondents were of the view that their institutions do not offer technical staff to monitor and support BL programs. 31% and 5% indicated that they did not have any technical support staff. The results in this study revealed that less than half of the respondents indicated having ICT technical support staff to smoothly facilitate the success of BL in their respective institutions while less than 40% had no support at all, perhaps because the pedagogy had not been introduced yet. Previous studies indicated that a lot of educators rarely receive adequate ICT training and lacked technical support to empower them with relevant skills needs for effective delivery of BL pedagogy (Mirzajani et al., 2016:36).

The study indicated that over 8% and 21% feel that their institutions have the full potential, 32% and 9% are doubtful if their institutions have such potential, while 30% are not sure. The results indicate that less than 30% of respondents indicated that their institutions might have the potential to support BL, over 40% of the respondents were totally in doubt if their institutions could do so while 30% were uncertain. Similar studies on BL indicated that all institutions planning to establish the pedagogy must assess the required ICT requirements and establish a logical plan and ICT policies before implementation. They must secure a budget and maintenance plan for the pedagogy to ensure readiness and sustainability (Naim et al., 2018: 5).

Approximately 19% and 26% of respondents agreed that institutions have enough computers in the computer laboratories, to support BL. Results revealed a 22% and 13% indicated that their institutions lacked such equipment while 20% were not sure. These results indicated that more than 40% of the respondents confirmed that their institutions had computer laboratories with enough computers to support BL pedagogy. However, more than 30% indicated not having such and the rest were not sure, yet the availability of computer laboratories with enough computers might improve the nurse educators' readiness for the BL.

Similar studies by Mirzajani et al., (2016:27) and Jowsey et al., (2020:8) confirmed similar findings that inadequate ICT infrastructure were some of the challenges that hindered nurse educators' readiness to successfully utilize BL pedagogy coupled with low ICT skills. Another study confirmed that the nonexistence of ICT tools slackens BL utilization among nurse educators while availability usually promotes successful uptake (Ibrahim & Nat, 2019:4).

When asked about their institutions' financial ability, 6% and 19% strongly indicated that their institutions could maintain BL systems, 12% and 35% feel that their institutions lacked their ability to do so, while 28% are not sure. Thus, the data showed that less than 30% of respondents confirmed that their institutions had the financial resources to support BL while close to half of them indicated lacked resources and the rest could not confirm. Related studies confirmed that when institutions have adequate financial resources, internet connection, ICT policies, and procedures before the inauguration of the BL programs, readiness and successful implementation will be enhanced whilst inadequacy of these aspects may distort the implementation process (Al Gamdi & Samarji, 2016:25).

Furthermore, 26% and 10% of the respondents confirmed that their institutions have online systems that can be used to deliver BL classes, 21%, and 13% alluded to the non-existence of such online systems at their institution while 30% were uncertain. This revealed that less than 40% of respondents said that their institutions had online learner management systems, less than 35% of the respondents said they lacked such systems, while 30% were not sure. Similar studies confirmed that lack of access to suitable ICT learner management systems required for BL hindered the successful integration of BL pedagogy and educators' readiness to use BL thereof. Likewise, poor, or malfunctioning ICT infrastructure may hinder uptake especially when institution lacks ICT capacity (Brown, 2016:3; Rizvi et al., 2017:3).

5.4.2.4 Equipment readiness dimension

About 9% and 23% alluded that their institutions had effective CD-ROM drives to support BL, 11% and 18% disagreed while 39% were uncertain. The results revealed that more than 30% of respondents confirmed having CD-ROM drives that support BL in comparison with less than 30% indicated not having them at all. A similar study indicated that the availability of ICT equipment can promote educators' readiness to use ICT tools, as this would enhance their increased usage, provided training is given (Mirzajani et al.,2016:35). Furthermore, 17% and 31% confirmed that their institutions have printers that work effectively, 23% and 10%

indicated that they lacked good printers while 19% were uncertain. This data shows that nearly half of respondents indicated having printers that work effectively while less than 40% of them lacked such equipment which might have negatively or positively impacted the readiness of educators to use BL. Prior studies confirmed that when any institution has adequate and effective CD-ROM drives, it will have the potential to support BL pedagogy thus increasing the educators' readiness for uptake and implementation of BL while those without will generally struggle (Trayek et al.,2016:2016:4).

Additionally, 13% and 26% of the respondents agreed and strongly agreed respectively that their institutions have ICT equipment that works well, 24% and 7% said they lacked such equipment while 30% were uncertain. The data revealed that more than 35% of respondents confirmed that their institutions had ICT equipment that works well, less than 35% lacked ICT equipment while 30% were not sure. Previous studies revealed that the availability of adequate ICT equipment in form of software, hardware, ICT infrastructure along with proper training and support of both educators and students is crucial for increased readiness of educators and successful implementation of BL (Trayek et al.,2016:2016:3).

Approximately 20% and 14% of the respondents are confident in their institution's financial ability to support BL, 18% and 15% have no confidence in their institutional financial ability while 33% are uncertain. When asked about their institutional financial resources, 6% and 19% indicated that their institutions had the resources, 12% and 35% doubted their institutional ability while 28% were uncertain. This data generally gave an impression that more than 30% of respondents indicated that their institutions may not afford BL because it is costly. Approximately 33% of them were not even sure perhaps because they lack this kind of information. Similarly, nearly half of the respondents indicated that their institutions lacked the financial resources to adequately maintain BL systems while less than 30% had confidence that they would afford them. Similar studies confirm these results by Rizvi et al., (2017:3), which confirmed lack of or inadequate financial resources is one of the major barriers to the adoption of ICT tools and this will harm both faculty's and nurse educators' readiness to use BL pedagogy. Accessibility to proper ICT infrastructure, internet connectivity, technical training, and support for the staff will all be a challenge due to lack of finances.

5.5 ASSOCIATION BETWEEN VARIABLES

5.5.1 Associations between respondents' demographic variables and their readiness to use Blended Learning

Associations between the demographics and blended learning readiness were determined. In this study, there was no significant ($p>0.05$) association between the age and employment classification of the respondents regarding their readiness to use blended learning in comparison with most of the research questions used. There was however some significance identified, where four hypothesised relationships showed significance, thus making conclusive findings for the previously established researcher's hypothesis and a more comprehensive understanding of how educators' readiness impacts the overall implementation of the BL pedagogy in various public NEIs. Thus, these results provided considerable support for the suggested model, that is to say; Chapnick's readiness model.

There was a moderate association between educational level and respondents' anticipation that Blended Learning will be easy to use once introduced ($p=0.0429$). ($X^2=32.0335$, d.f.= 20, $p=0.0429$) with the strength of association being moderate ($\phi = 0.4166$). Additionally, there was significance ($p=0.0075$), between respondents' age group and willingness to use Blended Learning if introduced in the institution.

Furthermore, age group was associated with respondents' belief that it is a good intervention to use Blended Learning in the institution ($p=0.0029$). This implies that age plays a significant role in terms of influencing the educators' readiness for BL and should be further investigated. Subsequently, the employment classification was also associated with respondents' possession of insufficient knowledge and skills to use Blended Learning and this variable was found significant ($p=0.0493$). Thus, when educators have insufficient skills, there is a negative impact on their readiness to adopt BL pedagogy, which might lead to possible failure. As a result, the null hypothesis H_0 was accepted in these instances as illustrated in the Table below;

Summary of Chi-square test on the assessment of respondents' demographic variables as previously discussed in 4.8.5 (chapter 4).

Have an idea of what is Blended Learning		**p-value**	**H_0**	**Test Interpretation**
Age group	<=35 36-45 46-55 >55	0.2206	Fail to reject H_0	H_0: Demographics is not associated with having an idea of what is Blended Learning. Ha: There is an association between demographics and having an idea of what Blended Learning is As the computed p-value is greater than the significance level alpha=0,05, the study fails to reject the null hypothesis H_0
Educational level	Degree in Nursing Diploma Nursing Master's Nur Ph.D. in Nur PGDip pub health Clinical Nurse	0.8416	Fail to reject H_0	
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.472	Fail to reject H_0	
Q2 Know the components of Blended Learning very well				H_0: Demographics is not associated with knowing the components of Blended Learning very well. There is an association between demographics and knowing the components of Blended Learning very well. As the computed p-value is greater than the significance level alpha=0,05, the study fails to reject the null hypothesis H_0
Age group	<=35 36-45 46-55 >55	0.6216	Fail to reject H_0	
Educational level	Degree in Nursing Diploma Nursing Master's Nur Ph.D. in Nur PGDip pub health Clinical Nurse	0.4154	Fail to reject H_0	
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.4559	Fail to reject H_0	
Q3 Have some previous training in				

using Blended Learning				
Age group	<=35 36-45 46-55 >55	0.1173	Fail to reject H_0	H_0: Demographics is not associated with having some previous training in using Blended Learning
Educational level	Degree in Nursing Diploma Nursing Master's Nur Ph.D. in Nur PGDip pub health Clinical Nurse	0.7119	Fail to reject H_0	Ha: There is an association between demographics and having some previous training in using Blended Learning
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.1601	Fail to reject H_0	As the computed p-value is greater than the significance level alpha=0,05, the study fails to reject the null hypothesis H_0
Q4 Anticipate that Blended Learning will be easy for me to use once introduced				H_0: Demographics is not associated with anticipate that Blended Learning will be easy for me to use once introduced
Age group	<=35 36-45 46-55 >55	0.8721	Fail to reject H_0	Ha: There is an association between educational level and anticipate that Blended Learning will be easy for me to use once introduced.
Educational level	Degree in Nursing Diploma Nursing Master's Nur Ph.D. in Nur PGDip pub health Clinical Nurs	0.0429	Rejected	As the computed p-value is less than the significance level alpha=0,05, the study rejects the null hypothesis H_0.
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.2165	Fail to reject H_0	BUT H0 is not rejected for an association between demography and age and employment classification with anticipation that Blended Learning will be easy for me to use once introduced. As the computed p-value is greater than the significance level alpha=0,05, the null hypothesis H0 is not rejected

Q5 Read and willing to integrate ICT learner systems in teaching activities				H_0: Demographics is associated with ready and willing to integrate ICT learner systems in teaching activities Ha: There is no association between demographics and Willing to integrate ICT learner systems in teaching activities As the computed p-value is greater than the significance level alpha=0,05 the study fails to reject the null hypothesis H_0.
Age group	<=35 36-45 46-55 >55	0.4181	Fail to reject H_0	
Educational level	Degree in Nursing Diploma Nursing Master's Nur Ph.D. in Nur PGDip pub health Clinical Nurs	0.1841	Fail to reject H_0	
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.5075	Fail to reject H_0	
Q6 Have enough ICT skills to use Blended Learning				
Age group	<=35 36-45 46-55 >55	0.1759	Fail to reject H_0	H0: Demographics is no associated with Have enough ICT skills to use Blended Learning Ha: There is an association between demographics and Have enough ICT skills to use Blended Learning As the computed p-value is greater than the significance level alpha=0,05, the study fails to reject the null hypothesis H_0
Educational level	Degree in Nursing Diploma Nursing Master's Nur Ph.D. in Nur PGDip pub health Clinical Nurs	0.913	Fail to reject H_0	
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.0815	Fail to reject H_0	
Q7 Have some experience in using Blended Learning				H0: Demographics is no associated with Have some experience in using

Age group	<=35 36-45 46-55 >55	0.2802	Fail to reject H_0	Blended Learning
Educational level	Degree in Nursing Diploma Nursing Master's Nur Ph.D. in Nur PGDip pub health Clinical Nurs PhDNurs	0.0837	Fail to reject H_0	Ha: Having some experience in using Blended Learning is associated with demographics As the computed p-value is greater than the significance level alpha=0,05, the study fails to reject the null hypothesis H_0.
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.4899	Fail to reject H_0	
Q8 Have challenges with internet access				H0: Demographics is not associated with Having challenges with internet access
Age group	<=35 36-45 46-55 >55	0.3628	Fail to reject H_0	
Educational level	Degree in Nursing Diploma Nursing Master's Nur Ph.D. in Nur PGDip pub health Clinical Nurs	0.7533	Fail to reject H_0	Ha: There is an association between demographics and Having challenges with internet access
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.6415	Fail to reject H_0	As the computed p-value is greater than the significance level alpha=0,05, the study fails to reject the null hypothesis H_0
Q9 Have an idea on how to fix ICT media tools				
	<=35	0.0678	Fail to	H0: Demographics is not associated

Age group	36-45 46-55 >55		reject H_0	with Have an idea on how to fix ICT media tools
Educational level	Degree in Nursing Diploma Nursing Master's Nur Ph.D. in Nur PGDip pub health Clinical Nurs	0.1476	Fail to reject H_0	Ha: There is an association between demographics and Have an idea on how to fix ICT media tools
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.2382	Fail to reject H_0	As the computed p-value is greater than the significance level alpha=0,05, the study fails to reject the null hypothesis H_0
Q10 Can monitor virtual platforms and making learning more meaningful				H0: Demographics is not associated with Have ability to monitor virtual platforms and making learning more meaningful
Age group	<=35 36-45 46-55 >55	0.4435	Fail to reject H_0	
Educational level	Degree in Nursing Diploma Nursing Master's Nursing Ph.D. in Nursing PGDip pub health Clinical Nursing	0.2711	Fail to reject H_0	Ha: There is no association between demographics and Have the ability to monitor virtual platforms and making learning more meaningful
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.3578	Fail to reject H_0	As the computed p-value is greater than the significance level alpha=0,05, the study fails to reject the null hypothesis H_0
Q11 Don't have sufficient knowledge and skills to use Blended Learning				H0: Demographics is not associated with Don't have sufficient knowledge and skills to use Blended Learning
Age group	<=35 36-45 46-55	0.4379	Fail to reject H_0	Ha: There is an association between employment classification and Don't

	>55			have sufficient knowledge and skills to use Blended Learning
Educational level	Degree in Nursing Diploma Nursing Master's Nursing Ph.D. in Nursing PGDip pub health Clinical Nursing	0.9489	Fail to reject H_0	As the computed p-value is less than the significance level alpha=0,05, the study rejects the null hypothesis H_0
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.0493	Rejected	BUT Ha: Don't have sufficient knowledge and skills to use Blended Learning is not associated with age group and educational level As the computed p-value is greater than the significance level alpha=0,05, the study fails to reject the null hypothesis H_0.
Q12 It's a good intervention to use Blended Learning in my institution				H_0: Demographics is not associated with It's a good intervention to use Blended Learning in my institution.
Age group	<=35 36-45 46-55 >55	0.0029	Rejected	Ha: There is an association between age groups and It's a good intervention to use Blended Learning in my institution.
Educational level	Degree in Nursing Diploma Nursing Master's Nur Ph.D. in Nur PGDip pub health Clinical Nurs	0.7056	Fail to reject H_0	As the computed p-value is less than the significance level alpha=0,05, the study rejects the null hypothesis H_0
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.4222	Fail to reject H_0	**BUT** Ha: It's a good intervention to use

				Blended Learning in my institution is not associated with gender, educational level, and employment.
Q13 Willing to use Blended Learning if introduced in my institution				H_0: Demographics is not associated with Willing to use Blended Learning if introduced in my institution. Ha: There is an association between age group and Willing to use Blended Learning if introduced in my institution. As the computed p-value is less than the significance level alpha=0,05, the null hypothesis H0 is rejected. **BUT** Ha: Willing to use Blended Learning if introduced in my institution is associated with educational level and employment classification As the computed p-value is greater than the significance level alpha=0,05, the study fails to reject the null hypothesis H_0.
Age group	<=35 36-45 46-55 >55	0.0075	Accepted	
Educational level	Degree in Nursing Diploma Nursing Master's Nursing Ph.D. in Nursing PGDip pub health Clinical Nursing	0.7440	Fail to reject H_0	
Employment classification	Clinical facilitator HOD Lecturer Nurse admin Preceptor	0.0831	Fail to reject H_0	

5.6 RECOMMENDATIONS

5.6.1 Recommendations for Nursing research

It is suggested that comparable studies ought to be carried out in other nursing education institutions in South Africa that have not implemented blended learning yet. This will offer a true picture of nurse educators' readiness to use Blended Learning in various nursing education institutions across South Africa.

This study only investigated nurse educators' readiness for blended learning. It is recommended for future researchers to study blended learning readiness from the students' perspectives.

Future studies should investigate the availability of ICT resources at various nursing education institutions as well as strategies and policies available for supportive implementation thereof.

It would be more pertinent for future nurse researchers to explore other dimensions of Chapnick's model in terms of; human resource, content, financial, and environmental readiness aspects, which could be very influential in influencing institutional readiness for successful uptake and implementation of blended learning in their classrooms.

Future researchers should investigate the extent to which institutional policy, organization, and support choices may expedite or hinder the implementation process of Blended learning.

5.6.2 Recommendations for nursing education

Implementing Blended Learning has become inevitable as part of the national strategic objective which emphasises that the nursing profession must integrate ICT resources into nursing education and practice to improve quality education and practice (Department of Health, 2013).

Since nurse educators are critical stakeholders in delivering educational content, it would be very fruitful for all institutions to carefully explore the perspectives of all nurse educators to identify learning gaps and address them promptly for successful implementation of the BL pedagogy. Educators should be afforded professional autonomy to make didactic decisions.

The institutional management should consider the allocation of personal laptops and Tablets to both staff and students. The institutions should motivate for the need for ICT tools and have a budget to fulfill these innovations.

All public institutions in Gauteng province should provide sufficient and reliable internet connection facilities to all staff and students to support the use of Blended learning more efficiently.

Institutions should ensure maximum flexibility, especially in the Coronavirus disease (COVID-19) pandemic by exploring various virtual learning platforms, making up for the lost time during the lockdown, and supporting social distancing policies.

The institution should have regular in-service training of their staff in various ICT teaching and learning ventures to promote effective use of blended learning virtual platforms.

5.6.3 Recommendations for Policy makers

The government should also give adequate support to these institutions in establishing the Information and Communication Technology infrastructure.

The provincial departments of health should formulate ICT policies that will effectively enforce and regulate of ICT issues for the various NEIs within Gauteng province. The content and recommendations in the policy should support activities pertaining to accessibility of ICT learner management systems, internet access, regular training of all nurse educators and students on how to use the ICT infrastructure.

The management of nursing education institutions should consider utilizing Chapnick's readiness model in terms of technical, psychological, equipment, and infrastructure, among other aspects, before the actual implementation of BL pedagogy to ensure sustainability.

The nursing institution management should consider the necessity to cultivate blended learning promoters at various institutional levels to institute a collective implementation philosophy amongst all members and achieve essential ICT resources required for successful use.

5.6.4 Contribution to the body of knowledge

The study emphasised the significance of conducting periodic assessments to determine the general readiness of nurse educators and the challenges associated with the execution of BL pedagogy.

The outcomes achieved could be used to improve ICT integration and implementation processes used for the delivery of educational content in the institutional milieu as it might guide nurse educators in the effective preparation of systematic BL experiences for students

based on theoretical learning assumptions, styles, and teaching strategies to maximize positive learning experiences.

The study generated knowledge that will be useful in the effective integration of ICT tools into the traditional face-to-face pedagogy. This will later improve the nurse educators' efficiency of delivering didactics and knowledge acquisition by students once BL is incorporated into the nursing curriculum in the future.

The design of Chapnick's model and outcomes have remarkable prospective significance to policymakers, institutional managers, pedagogical curriculum developers including all faculty stakeholders in generating a consistent and operational BL milieu in nursing education institutions.

Carrying out more research on blended learning will produce results that will be utilized to compare the criteria of blended learning consumption in South Africa and internationally.

The study could generate knowledge that is essential for nurse educators in making didactic decisions associated with BL pedagogy.

5.7 LIMITATIONS OF THE STUDY

The following are the limitations of the study;

- This study assessed the readiness of nurse educators for BL from only five NEIs in Gauteng Province of South Africa which may impede the generalization of the findings to other NEIs within that province as well as other provinces of South Africa. Diverse outcomes could have been attained if the study were conducted in other nursing education institutions and attain a more comprehensive perspective from members in those institutions.
- Larger sample size could have been achieved such that more generalizable outcomes that apply to all educators would be achieved. Although the sample study size was 217, the researcher could not reach the target response rate because of COVID-19 lock down travel restrictions. The lower response was also due to a lack of internet connectivity and ICT devices as indicated by some of the respondents during the study.

5.8 FINAL CONCLUSIONS

This study aimed to investigate the nurse educators' readiness to use blended learning in public nursing education institutions as well as comprehensive recommendations for effective implementation of BL pedagogy in public NEIs. The discussions were directed by the objectives of the study. Furthermore, a quantitative, non-experimental, descriptive survey design was utilized to gather data from Nurse educators in five public NEIs institutions in GP.

The results in this chapter described a summary of Chapnick's readiness model, divided into four dimensions, that is to say technical, psychological, infrastructure, and equipment readiness. It is imperative to use this model for prior assessment of NEIs, before implementing the BL pedagogy to identify the institutional and human resource needs that are crucial for successful uptake and implementation of the pedagogy to ensure sustainability. It would also assist the NEIs in planning, evaluating the programme for effectiveness, and overcoming some of the institutional challenges such as overcrowded classes, through utilization of ICT tools to reach out to a wide range of students and enhancing flexibility in the learning milieu.

Furthermore, nursing education institutions in Gauteng province are relatively experiencing some challenges with effective implementation of BL into their regular learning milieu emerging from factors such as inadequate technical support staff and training, prior experience, knowledge, and ICT skills, inadequate ICT infrastructure, internet access, psychological barriers among others. All these challenges harm not only the educators' readiness to use blended learning pedagogy but also the institution. Therefore, it is recommended that NEIs support nurse educators by establishing a suitable ICT infrastructure, technical training for staff, internet access among others, to facilitate the successful uptake and sustainability of the Blended-Learning pedagogy.

Finally, results in this study provided considerable support for the suggested model, that is to say; Chanick's readiness model due to the conclusive expression of significance with demographic variables such as; respondents' age, educational level, and employment classification, which showed four significant hypothesized relationships with various BL readiness questions thus making conclusive findings for the previously established researcher's hypothesis and a more comprehensive understanding of how educators' readiness impacts the overall implementation of the BL pedagogy in various public NEIs.

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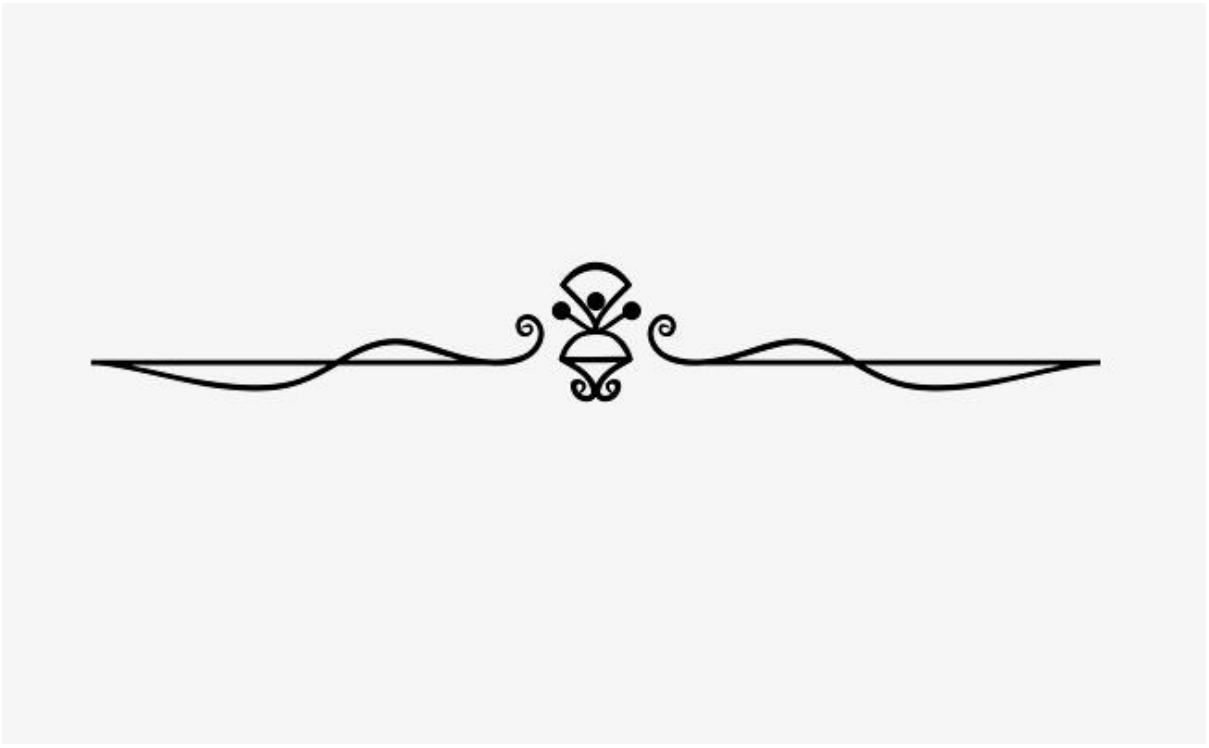
ANNEXURE A

DECLARATION REGARDING PLAGIARISM



Sarah Namulondo

2020

Full names of student: Sarah Namulondo

Student number: 18170367

TITLE OF STUDY: NURSE EDUCATORS' READINESS TO USE BLENDED LEARNIG IN PUBLIC NURSING EDUCATION INSTITUTIONS IN GAUTENG PROVINCE.

Declaration:

I understand what plagiarism is and am aware of the University's policy in this regard.

I declare that this research proposal (e.g. essay, report, project, assignment, dissertation, thesis, etc.) is my own original work.

Where other people's work has been used (either from a printed source, Internet or any other source), this has been properly acknowledged and referenced in accordance with departmental requirements. I have not used work previously produced by another student or any other person to hand in as my own.

I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

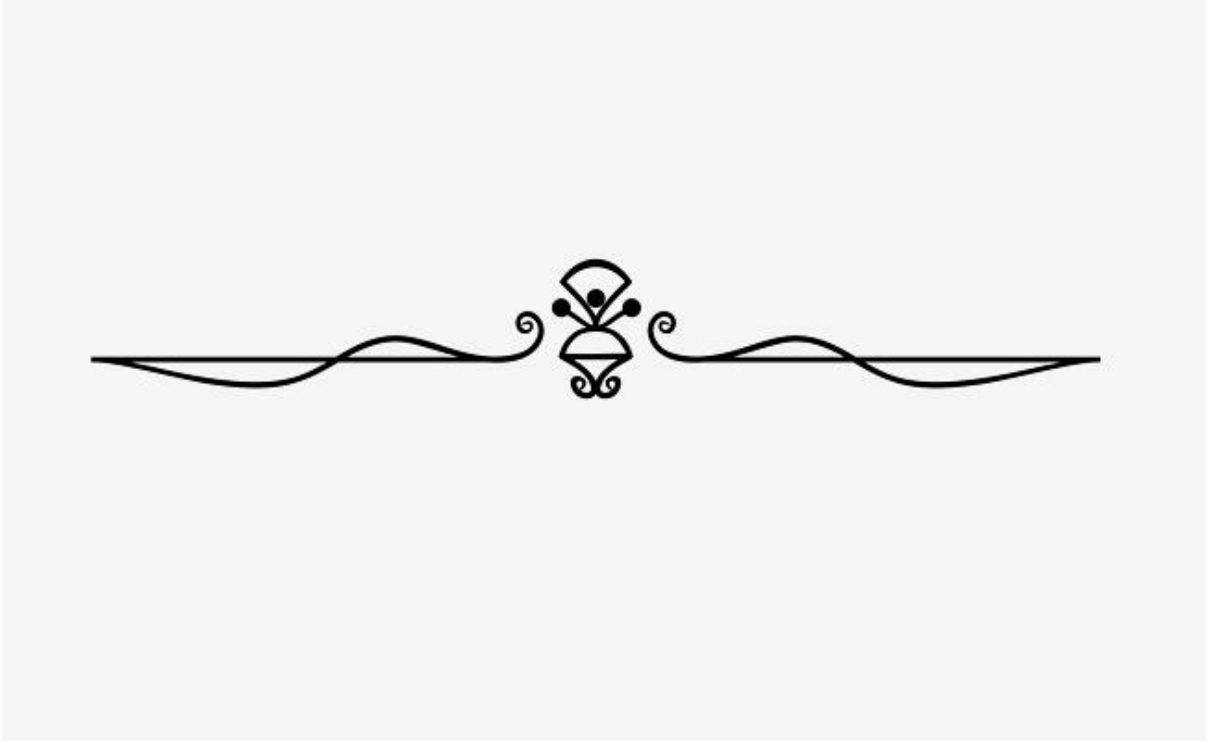
_____

SIGNATURE

Sarah Namulondo

ANNEXURE B

DECLARATION INFORMED CONSENT



PARTICIPANT'S INFORMATION & INFORMED CONSENT DOCUMENT

RESEARCHER'S NAME: SARAH NAMULONDO

STUDENT NUMBER: 18170367 **DEPARTMENT:** NURSING SCIENCE

UNIVERSITY OF PRETORIA

Dear Participant,

NURSE EDUCATORS' READINESS TO USE BL IN PUBLIC NEI IN GP.

I am a final year postgraduate student pursuing a MA nursing education degree at the Department of Nursing Science, University of Pretoria. You are invited to voluntarily participate in my research project on Nurse educators' readiness for BL in higher education institutions in Gauteng province.

This letter gives information to help you to decide if you want to take part in this study. Before you agree, you should fully understand what is involved. If you do not understand the information or have any other questions, do not hesitate to ask me. You should not agree to take part unless you are completely happy about what we expect of you.

The purpose of the study is to investigate nurse educators' readiness to use BL in higher education institutions in Gauteng province.

I would like you to complete this questionnaire/ online survey link and upload it when you are done. This may take about 10 to 15 minutes. Since the link is anonymous, your confidentiality will be assured. Please do not identify yourself on the feedback form to ensure confidentiality. Kindly note that before responding, please read the instructions carefully. I will be available to help guide you as you fill in the questionnaire where possible.

NB: Should you find sensitive questions regarding aspects such as social and sexual habits, feel free not to attempt answering them.

The Research Ethics Committee of the University of Pretoria, Faculty of Health Sciences, and telephone numbers 012 356 3084 / 012 356 3085 granted written approval for this study.

Sarah Namulondo

Your participation in this study is voluntary. You can refuse to participate or stop at any time without giving any reason.

As you do not write your name on the questionnaire/survey form, you give us the information anonymously. Once you have given the questionnaire back to us/submitted the survey link, you cannot recall your consent. We will not be able to trace your information. Therefore, you will also not be identified as a participant in any publication that comes from this study.

In the event of questions asked, which will cause emotional distress, then the researcher is able to refer you to a competent counselling.

Note: The implication of completing the questionnaire/online survey link is that informed consent has been obtained from you. Thus, any information derived from your form (which will be totally anonymous) may be used for e.g. publication, by the researchers.

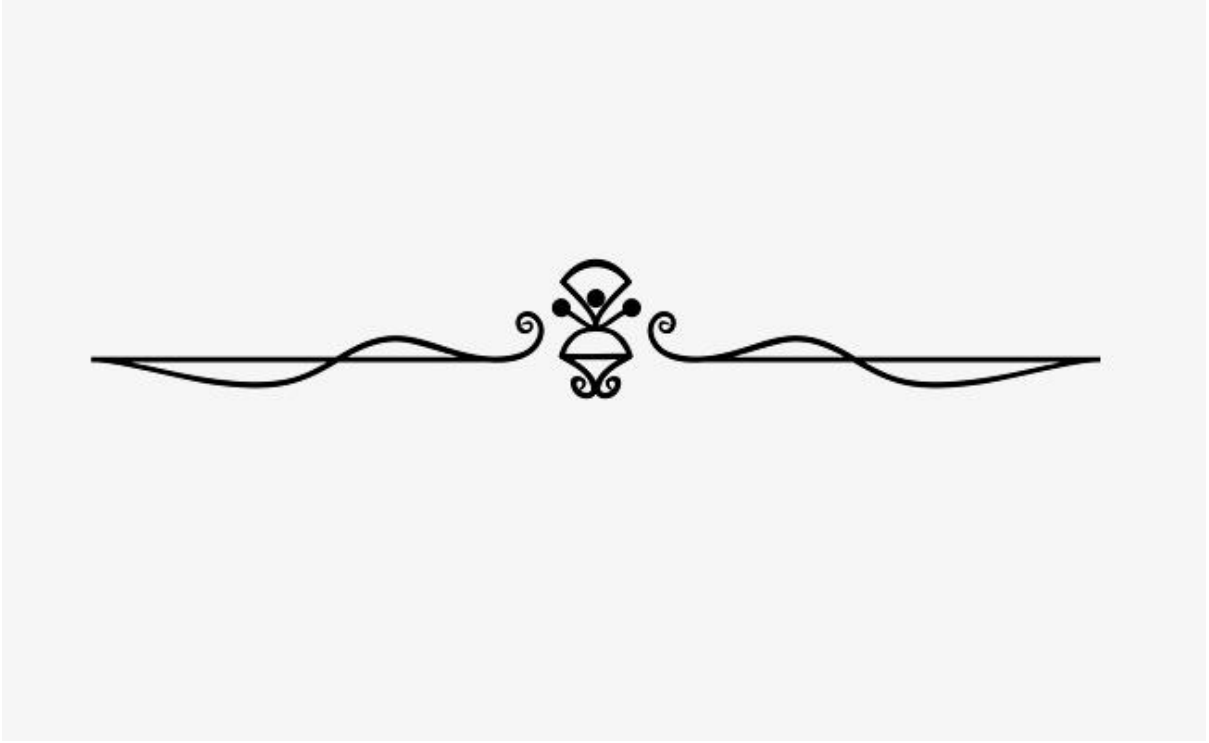
We sincerely appreciate your help.
Yours faithfully,

MISS SARAH NAMULONDO

2020

ANNEXURE C

DATA COLLECTION INSTRUMENT



NURSE EDUCATORS'READINESS TO USE BLENDED LEARNING IN PUBLIC NEI IN GP

INSTRUCTIONS:

Answer the following questions by ticking the most appropriate answer from the list of options given.

SECTION A: DEMOGRAPHIC DATA

1. Gender

Male		Female	

2. Age: _____years (Write your age in the space provided)

3. Ethnicity

(a) African /Black
(b) Black Indian
(c) Coloured
(d) White

4. What is your educational level?

a) Diploma in general nursing
b) Bachelor's degree in nursing
c) Specialised clinical training in nursing
d) Additional qualification in nursing education
e) Master's degree in nursing
f) Post-doctoral degree in nursing
g) More than one nursing qualification
h) Other:
Specify_____

5. What is your employment classification?

a) Lecturer/Tutor
b) Clinical facilitator
c) Preceptor
d) Nurse administrator
e) Other
Specify: _____

Section B:

Questions regarding readiness to use BL. Please answer the questions that apply to you, and your readiness to use BL in different dimensions (D).

D1 Technological Readiness

		Strongly Agree	Agree	Uncertain	Disagree	Strongly disagree
		5	4	3	2	1
	D1:Technological readiness					
1	I have an idea of what BL is:					
2	I know the components of BL very well					
3	I have some previous training in using BL					
4	I anticipate that BL will be easy for me to use once introduced					
5	I am ready and willing to integrate ICT learner systems into my teaching activities.					
6	I have enough ICT skills to use BL					
7	I have some experience in using BL					
8	I have challenges with internet access					
9	I have an idea of how to fix ICT media tools					
10	I anticipate having the ability in monitoring virtual platforms and making learning more meaningful					
11	I am competent in integrating ICT media for teaching					
12	I don't have sufficient knowledge and skills to					
	D2: Psychological dimension					
1	I think it's a good intervention to use BL in my					
2	I am eagerly willing to use BL if introduced in my					
3	I think BL will make teaching more effective					
4	I think using BL may assist in saving time once implemented in my institution					
5	I strongly feel implementation of BL will promote independence and autonomy among nurse educators and students					
6	I anticipate having motivation in using BL once introduced in my institution					
7	I anticipate having confidence in using BL for					
8	I feel that knowledge acquisition will be easier and flexible with implementation of BL					

9	I feel more comfortable when using traditional face to					
10	I feel traditional face to face is the best method of teaching students					
11	I anticipate wasting a lot of time if BL is to be introduced as it's demanding					
	D3: Infrastructure Readiness					
1	I am having ICT resources to facilitate BL in my classroom					
2	My institution offers technical training in using BL					
3	The institution offers technical staff to monitor and support BL program					
4	My institution has the potential to support BL					
5	My institution has the financial resources to maintain BL systems adequately					
6	Our institution has got a computer laboratory with enough computers to support the BL programme					
7	My institution has online systems that can used to deliver Blended learning classes.					
	D4: Equipment readiness					
1	My institution has got effective CD-ROM drives to					
2	Our institution has printers that work effectively					
3	My institution has sufficient ICT equipment that work					
4	I anticipate that my institution may not afford BL because it is costly					
5	The educators may not afford to buy own laptops to use during delivery of lectures					

ANNEXURE D

APPROVAL LETTER FROM UNIVERSITY OF PRETORIA ETHICS COMMITTEE

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.

- FWA 00002567, Approved dd 22 May 2002 and Expires 03/20/2022.
- IRB 0000 2235 IORG0001762 Approved dd 22/04/2014 and Expires 03/14/2020.

27 June 2019

Approval Certificate
New Application

Ethics Reference No.: 411/2019
Title: NURSE EDUCATORS' READINESS TO USE BL IN PUBLIC NURSING EDUCATION INSTITUTIONS IN GAUTENG PROVINCE, SOUTH AFRICA.

Dear Miss S Namulondo

The **New Application** as supported by documents received between 2019-05-28 and 2019-06-26 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on its quorate meeting of 2019-06-26.

Please note the following about your ethics approval:

- Ethics Approval is valid for 1 year and needs to be renewed annually by 2020-06-27.
- Please remember to use your protocol number (411/2019) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

Dr R Sommers
MBChB MMed (Int) MPharmMed PhD
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health)

Research Ethics Committee
Room 4-60, Level 4, Tswelopele Building
University of Pretoria, Private Bag X323
Arcadia 0007, South Africa
Tel +27 (0)12 356 3084
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Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tša Maphelo

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

Institution: The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.
- FWA 00002567, Approved dd 22 May 2002 and Expires 03/20/2022.
- IORG #: IORG0001762 OMB No. 0990-0279 Approved for use through February 28, 2022 and Expires: 03/04/2023.

20 July 2020

Approval Certificate
Annual Renewal

Ethics Reference No.: 411/2019
Title: NURSE EDUCATORS' READINESS TO USE BL IN PUBLIC NURSING EDUCATION INSTITUTIONS IN GAUTENG PROVINCE, SOUTH AFRICA.

Dear Miss S Namulondo

The **Annual Renewal** as supported by documents received between 2020-06-05 and 2020-07-15 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on its quorate meeting of 2020-07-15.

Please note the following about your ethics approval:
- Renewal of ethics approval is valid for 1 year, subsequent annual renewal will become due on 2021-07-20.
- Please remember to use your protocol number (411/2019) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

Dr R Sommers
MBChB MMed (Int) MPharmMed PhD
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

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Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tša Maphelo

2020

ANNEXURE E

APPROVAL LETTER FROM GAUTENTENG DEPARTMENT OF HEALTH

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

PERMISSION TO CONDUCT A CLINICAL TRIAL IN PUBLIC FACILITIES INDICATED BELOW

Researcher's Name (PI)	Ms Sarah Namulondo
Organization / Institution	UP
Research Title	Nurse Educators' Readiness to Use Blended Learning in Public Nursing Education Institutions in Gauteng Province, South Africa.
Contact Details	Tel: N/A Cell: 0787447977 Email address: SARALEE.SL@GMAIL.COM
NHRD Number	GP_201907_008
Sites	Gauteng Department of Health Offices

Your application to conduct the abovementioned clinical trial has been reviewed by the relevant provincial structures and permission has been granted to conduct research at the sites indicated.

You agree to submit a report after completion of your study and present your findings to the Gauteng Health Department.

[X] Permission granted

[ ] Permission denied

Supported by

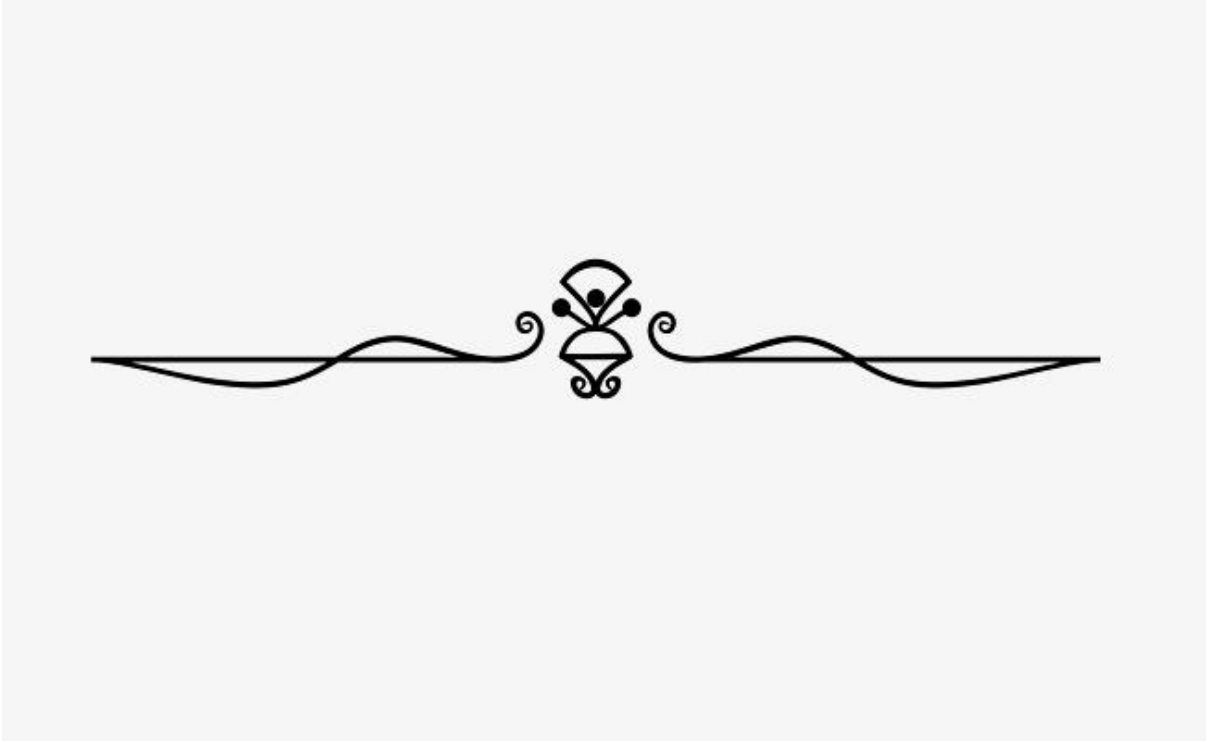
Dr Bridget Ikalafeng
DD: Research & Epidemiology

Date: 21/02/2020

2020

ANNEXURE F

PERMISSION FOR SG LOURENS NURSING COLLEGE



41 Narina Court,
323, Visagie Street,
Pretoria
0001

24th February 2020

The Chairperson,
SG Lourense Nursing College,
Research Committee

REQUEST FOR PERMISSION TO CONDUCT DATA COLLECTION

Good day Sir/Madam,

My name is **Ms S Namulondo (Student No: 18170367)** from University of Pretoria Faculty of Health sciences.

I hereby apply for permission to conduct data collection from your institution during the month of March 2020 (4th March 2020).

My research topic is: **Nurse Educators' readiness to use Blended learning in public Nursing Education Institutions in Gauteng Province, South Africa.**

My study respondents are Nurse Educators (Lecturers) in your institution. All relevant documents where attached as annexures within my proposal protocol.

I will be very grateful if my request is put into positive consideration for successful completion of my study.

Yours faithfully

Miss S Namulondo

Contact: 0787447977/

Tel: 012 356 3156 /**Fax**: +27 (0)12 356 3166

Email: saralee.sl@gmail.com

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Enquiries: Dr RG Malapela
Tel : 012 319 5769
E-mail : Grace.Malapela@gauteng.gov.za or gmalapela@gmail.com
Date : 02 March 2020

Ms. S Namulondo
Protocol number: GP 201907-008

SUBJECT: APPROVAL FOR DATA COLLECTION AT SG LOURENS NURSING COLLEGE

This serves as a response to your request in undertaking the study on: "Nurse educators readiness to use Blended Learning in Public Nursing Education Institutions in Gauteng Province, South Africa"
Permission is hereby granted for the collection of data as indicated in your proposal.
Please take note of the following:

- All information and data collection should be treated as confidential and ethical considerations adhered to as stated in the proposal.
- At the end of the study kindly furnish the college with the study results.
- After completion of your research study, we would appreciate if you could donate a hard copy to the library.
- The committee might invite you to present during their annual research day.

Warm regards

Dr. RG Malapela (Research Committee Chairperson) — Date: 02. 03. 2020

Ms. MP Tjale (College Principal) — Date: 05/03/2020

2020

ANNEXURE G

PERMISSION FROM CHRIS HANI BARAGWANATH HOSPITAL NURSING COLLEGE

41 Narina Court,
323, Visagie Street,
Pretoria
0001
25th February 2020

The Chairperson,
Chris Hani Baragwanath Nursing College,
Research Committee

REQUEST FOR PERMISSION TO CONDUCT DATA COLLECTION

Good day Sir/Madam,

My name is **Ms S Namulondo (Student No: 18170367),** a masters' student from University of Pretoria Faculty of Health sciences.

I hereby apply for permission to conduct data collection from your institution during the month of March 2020.

My research topic is: **Nurse Educators' readiness to use Blended learning in public Nursing Education Institutions in Gauteng Province, South Africa.**

My study respondents are Nurse Educators (Lecturers) in your institution. All relevant documents were attached as annexures within my proposal protocol.

I will be very grateful if my request is put into positive consideration for successful completion of my study.

Yours faithfully

Miss S Namulondo

Contact: 0787447977

Tel: 012 356 3156 /**Fax**: +27 (0)12 356 3166

Email: saralee.sl@gmail.com / u18170367@tuks.co.za

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

GAUTENG COLLEGE OF NURSING
RAHIMA MOOSA CAMPUS

Enquiries: Mrs. T. Makgopela
Tel. 0112473300
E- mail: tebogomakgopela5@gmail.com
Date: 2020/07/15

Name: Namulondo Sarah
Student No: 18170367
Ethics reference no: 411/2019
Address: University of Pretoria

Dear Ms. Namulondo

RE - APPLICATION TO CONDUCT A RESEARCH PROJECT AT RAHIMA MOOSA CAMPUS

Your letter dated 25/02/2020 refers. Permission has been granted for you to conduct a research project titled:

Nurse Educators' readiness to use Blended learning in Public Nursing Education Institutions in Gauteng Province, South Africa

Rahima Moosa Campus requests that you participate in the college research days for the purpose of presenting the different stages of your research project. You are also requested to inform the College of the name of the journal where the completed research project will be published. The college will appreciate it if you would donate a copy of the completed research project document to Rahima Moosa Campus Library.

Regards

Mrs. T Makgopela: Chairperson of the Research Committee — Date: 2020/07/27

Approved

Ms. J. Gassiep: Principal — Date: 27 07 2020

1

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

GAUTENG COLLEGE OF NURSING
BONALESEDI CAMPUS

Enquiries: Mr S. Sojane
Tel. 0116968345
E- mail: Sipho.Sojane@gauteng.gov.za/
sipho.sojane@gmail.com
Date: 2020/09/30

Name: Namulondo Sarah
Student No: 18170367
Ethics reference no: 411/2019
Address: University of Pretoria

Dear Ms, Namulondo

RE - APPLICATION TO CONDUCT A RESEARCH PROJECT AT BONALESEDI CAMPUS

Your letter dated 25/02/2020 refers. Permission has been granted for you to conduct a research project titled:

Nurse Educators' readiness to use Blended learning in Public Nursing Education Institutions in Gauteng Province, South Africa

Bonalesedi Campus requests that you participate in the college research days for the purpose of presenting the different stages of your research project. You are also requested to inform the college with the name of the journal where the completed research project will be published. The college will appreciate it if you would donate a copy of the completed research project document to Bonalesedi Campus Library.

Regards

Mr. S. Sojane: Research Committee Chairperson — Date: 2020/10/15

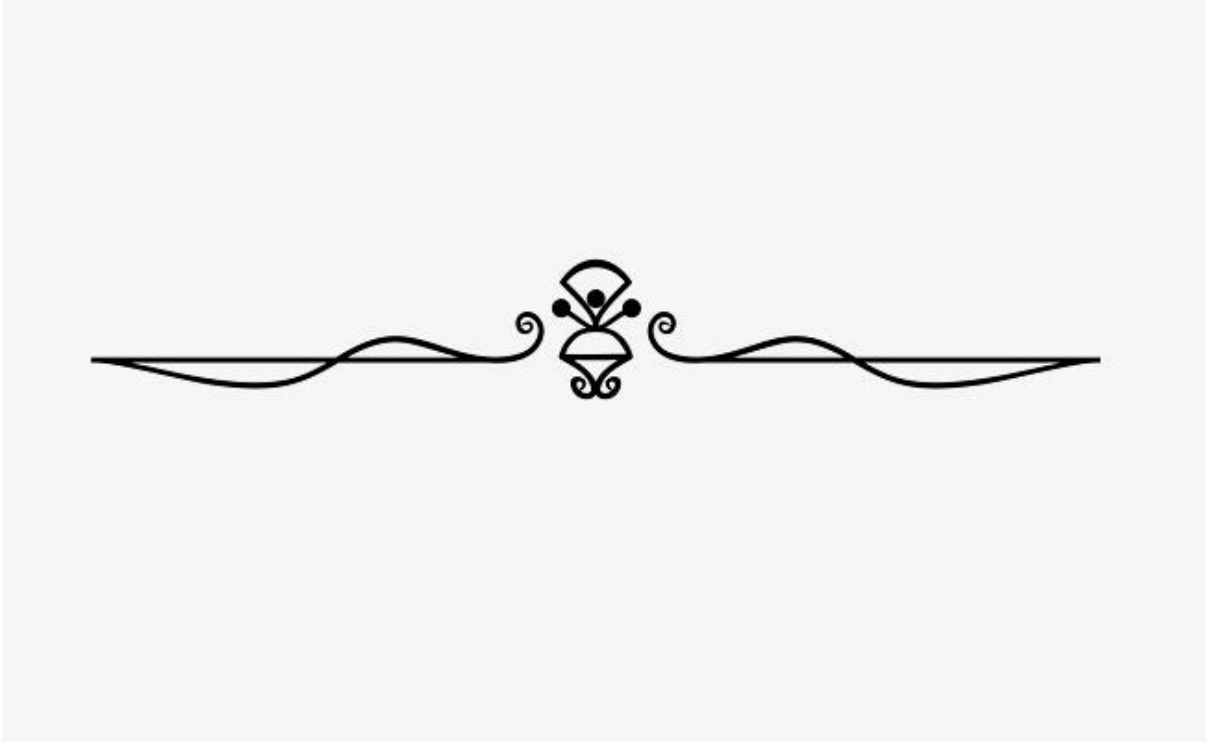
Approved by

Mr. K.T. Baloyi: Acting Vice Principal — Date: 2020/11/13

2020

ANNEXURE H

PERMISSION TO CONDUCT A RESEARCH STUDY AT ANN LATSKY NURSING COLLEGE



41 Narina Court,
323, Visagie Street,
Pretoria
0001
25th February 2020

The Chairperson,
Ann Latsky Nursing College,
Research Committee

REQUEST FOR PERMISSION TO CONDUCT DATA COLLECTION

Good day Sir/Madam,

My name is **Ms S Namulondo (Student No: 18170367)** from University of Pretoria Faculty of Health sciences.

I hereby apply for permission to conduct data collection from your institution during the month of March 2020.

My research topic is: **Nurse Educators' readiness to use Blended learning in public Nursing Education Institutions in Gauteng Province, South Africa.**

My study respondents are Nurse Educators (Lecturers) in your institution. All relevant documents where attached as annexures within my proposal protocol.

I will be very grateful if my request is put into positive consideration for successful completion of my study.

Yours faithfully

Miss S Namulondo

Contact: 0787447977/

Tel: 012 356 3156 /**Fax**: +27 (0)12 356 3166

Email: saralee.sl@gmail.com / u18170367@tuks.co.za

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Enquiries: Ms. SS Bokaba
Tel +(27) 011 644 8944/079 307 3711
email:Stellah.bokaba@gauteng.gov.za

TO: Ms. S Namulondo

FROM: Ms. SS Bokaba (Research chairperson)

DATE: 24.07.2020

SUBJECT: APPROVAL TO CONDUCT A STUDY AT ANN LATSKY NURSING COLLEGE

This serves to inform you that you are hereby granted permission to conduct your study at Ann Latsky Nursing college

The college requires that upon completion, you kindly share the results of your study during the annual research presentation day. Information regarding the research presentation day will be forwarded to you. You are further requested to donate a copy of your dissertation to the college library.

Regards

SS Bokaba
Research chairperson

DEPARTMENT OF HEALTH
ANN LATSKY NURSING COLLEGE
R171 DEPARTMENT
24 JUL 2020
S.S. BOKABA
PRIVATE BAG 40
AUCKLAND PARK 2006

Ann Latsky Nursing College
Private Bag 40, AUCKLANDPARK, 2006 ✆ (011) 644-8900 🖷 (086-443-7935)

GAUTENG PROVINCE
REPUBLIC OF SOUTH AFRICA

I Sarah Namulondo hereby declare that upon completion, I will share the results of my study during the Ann Latsky Nursing College Research day, and donate a copy of my dissertation to the college library

SIGNATURE _____ DATE 25/07/2020

DEPARTMENT OF HEALTH
ANN LATSKY NURSING COLLEGE
R171 DEPARTMENT
24 JUL 2020
S.S. BOKABA
PRIVATE BAG 40
AUCKLAND PARK 2006

2020

ANNEXURE I

SAMPLE SIZE BASED ON DESIRED ACCURACY WITH CONFIDENCE LEVEL OF 95%

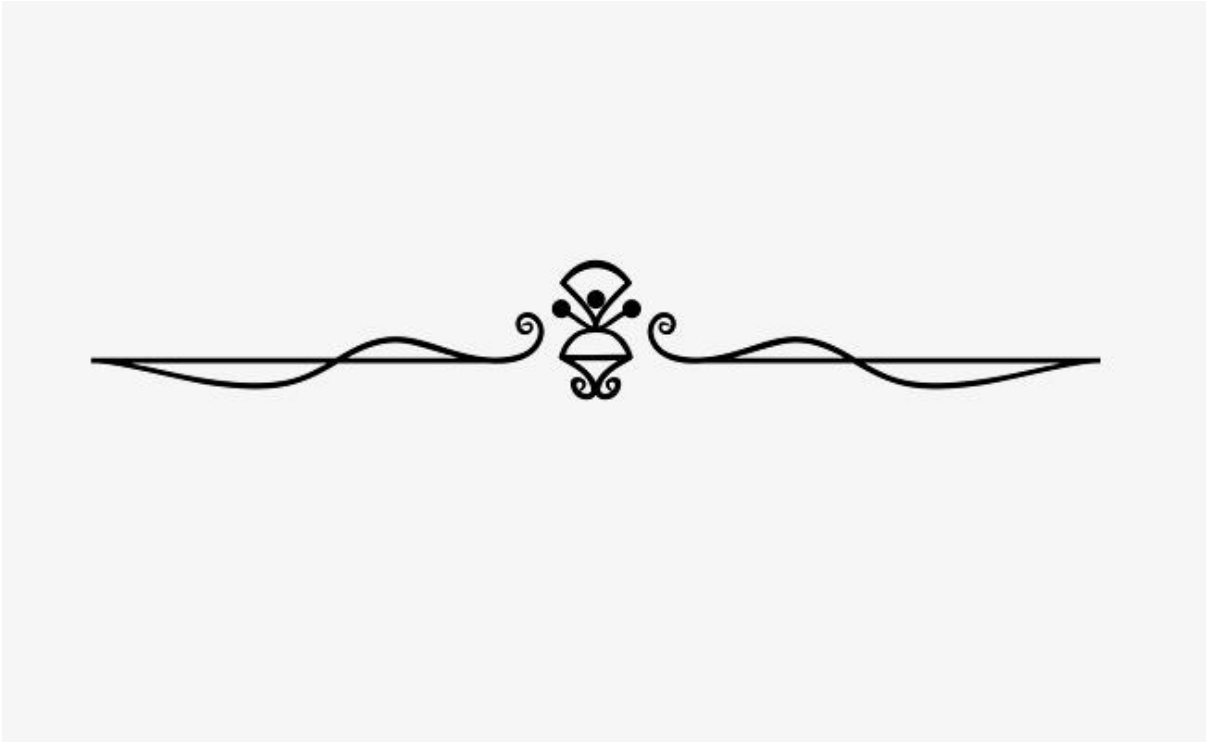
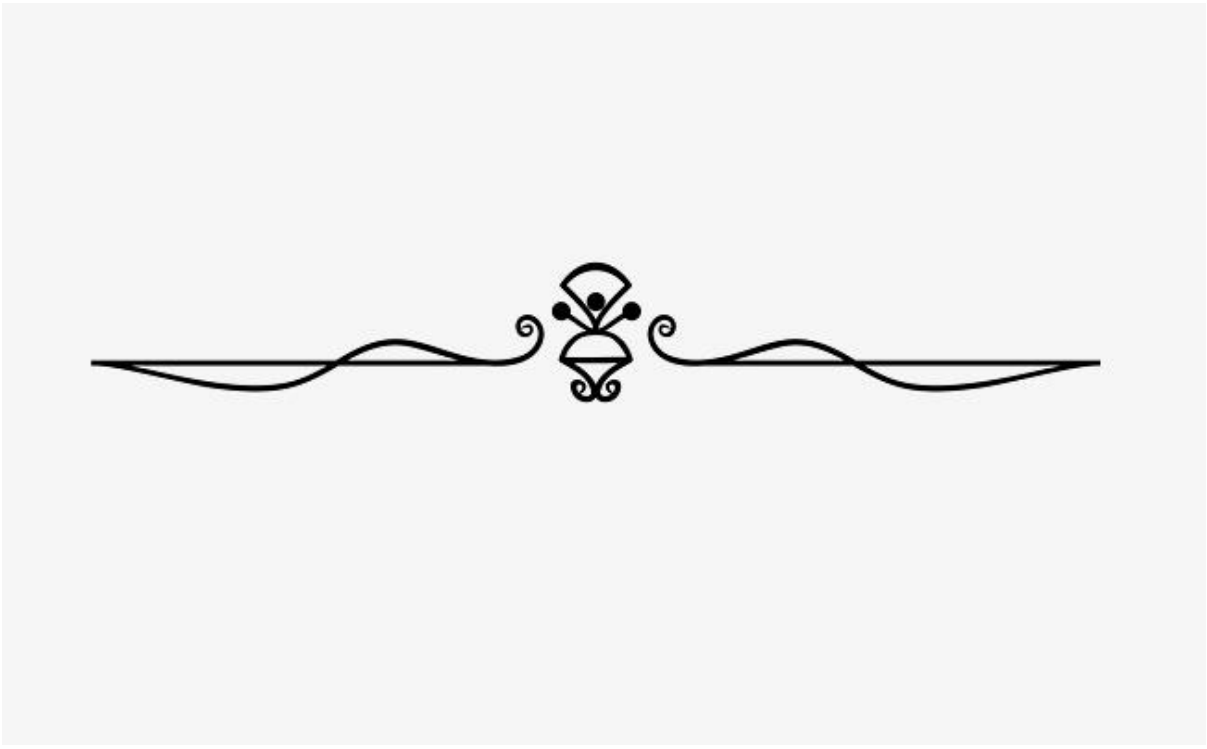


Table 1: Sample size based on Desired Accuracy with Confidence Level of 95% Source: (Gill et al., 2010)

	Variance of the population P=50%		
	Confidence level=95% Margin of		
Population Size	5	3	1
50	44	48	50
75	63	70	74
100	79	91	99
150	108	132	148
200	132	168	196
250	151	203	244
300	168	234	291
400	196	291	384
500	217	340	475
600	234	384	565
700	248	423	652
800	260	457	738
1000	278	516	906
1500	306	624	1297
2000	322	696	1655
3000	341	787	2286
5000	357	879	3288
10000	370	964	4899

ANNEXURE J

CLEARANCE LETTER FROM STATISTICIAN



Sarah Namulondo

AGRICULTURAL RESEARCH COUNCIL

ARC • LNR

BIOMETRY

PO Box 8783, Pretoria, 0001 South Africa
Phone: (012) 427 9811 Fax: (012) 427 9743 (Int: +27 21)
E-mail: NgwaneC@arc.agric.za • Web site:
www.arc.agric.za

Letter of clearance

This letter confirms that **Sarah Namulondo** (student no. **18170367**) studying at the University of Pretoria discussed the project titled **Nurse educators' readiness to use blended learning in public nursing education institutions in Gauteng province, South Africa** with **Cynthia Boitumelo Ngwane** (a statistician working for Biometry at Agricultural Research Council).

I hereby confirm that I assisted the student with determining the sample size, sampling and data collection method. I will also be assisting the student through data analysis and interpretation of the results. The data analysis tool to be used to achieve the study objectives will be Chi-squared test for equal proportions and association and Crammers V test. All data will be analysed using SAS statistical software package.

Name Cynthia Boitumelo Ngwane **Date** 15 May 2019

Signature _____

ANNEXURE K

CLEARANCE LETTER FROM EDITOR

Sarah Namulondo

LR Research & Data Analysis Consulting Letter

CONFIRMATION OF TECHNICAL AND LANGUAGE EDITING

Date: 13/01/2021

This letter is to confirm that Lr Research & Data Analysis Consulting (PTY) LTD priveded the following editing services : Technical and Language editing to Sarah Namulondo,'s study titled:

"Nurse Educators' readiness to use blended learning in public nursing education institutions in Gauteng province, South Africa".

We are an experienced Research consultant company with the following areas of expertise: Research design guidance; Statistical data analysis; Sample size and Sampling methods advice; Technical and Language Editing; Training & Workshop of research related topics.

Lr Research & Data analysis consulting also declares that the study was received and kept confidential in a password protected computer.

I can be contacted in the details below should any clarity be required.

Name: Livhuwani Mphaphuli Nedzingahe
Managing Director Research consultant and Statistician
Lr Research & Data Analysis Consulting (Pty) Ltd
Cell: 076 304 6953

Signature _____

Sarah Namulondo