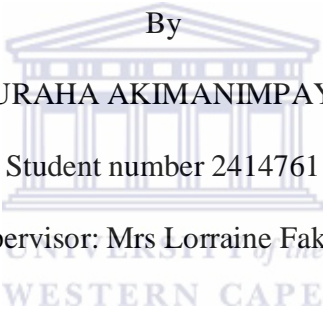**ATTITUDES OF UNDERGRADUATE NURSING STUDENTS TOWARDS**

E- LEARNING AT THE UNIVERSITY OF THE WESTERN CAPE

A mini-thesis submitted in partial fulfilment of the requirements for the degree of Magister

Education in the school of nursing, University of the Western Cape

By

FURAHA AKIMANIMPAYE

Student number 2414761

Supervisor: Mrs Lorraine Fakude

July 2012

DECLARATION

I declare that the report: *Attitudes of undergraduate nursing students towards e-learning at the University of the Western Cape* is my own work, that has not been submitted before for any degree or examination purposes in any other university, and that all the sources used or quoted have been duly cited and acknowledged with complete reference.

Furaha Akimanimpaye   July 2012

Signed.....................................

ABSTRACT

The development of internet has provided an opportunity for offering online learning. Online learning otherwise known as 'e-learning' is a fast growing new concept of modern education. Substantial evidence indicates that many universities across the world have started offering study programmes through a variety of e-learning methods.

Although e- learning environments are becoming popular, there is minimal research on learners' attitudes toward online learning environments. Past research has recommended a variety of factors affecting user attitude so far as e-Learning is concern. It is thus against this background that this study purports to determine the attitudes of undergraduate nursing students toward e – learning at the University of the Western Cape. The study developed an integrated model with six dimensions: learners, instructors, courses, technology, design, and environment.

A survey was conducted on 213 undergraduate nursing students to assess their attitudes toward e-learning. The study employed the survey methodology based on the questionnaire that was distributed randomly to students to assess their attitudes towards e-learning and to find out if any existing demographical factors impact on the students' use of e- learning.

The results revealed that males and females differed significantly in terms of satisfaction levels. When specific demographic variables with two outcome levels (age group, computer facility at home, computer training experience and experience in e-learning prior to registering at UWC) are considered, there is no statistically significant difference (from the sample t-test) in learner satisfaction between these groups.

From a valid response rate (90% of the sample), statistical analysis (multivariate analysis) revealed that learner satisfaction as the control variable is influenced by perceived easy to use, gender and year level of participants. The findings also showed a significant difference between male and female satisfaction. In this regard, 4th year nursing students were proven to be less likely to be satisfied with e-learning than 2nd year nursing students, whereas female nursing students are more likely to be satisfied with e-learning than male nursing students. Generally, the study's findings demonstrate a favourable attitude towards e-learning among nursing students at University of the Western Cape.

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KEYWORDS

1. Student nurses**;**

2. E-learning**;**

3. Undergraduate nurses**;**

4. Nursing education**;**

5. Attitudes**;**

6. Information technology**;**

7. Web supplemented**;**

8. Learner attitude**;**

9. Web dependent**;**

10. Blended learning.

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ACKNOWLEDGEMENT

The completion of the study has been an intensive effort. Therefore I am grateful first to the almighty God, the most gracious, the most merciful, for his true guidance and strength bestowed upon me through this endeavour.

I am also indebted to my supervisor Mrs L.Fakude for her persistent advice and guidance throughout the research.

I also express my thanks to the undergraduate nursing students of the school of nursing for their co-operation in providing the data that was required to address the study's aim and objectives.

Finally, I should not forget to thank my husband and my children for being patient and supportive to me during this study. My thanks should also go to my friends for their encouragement, support and sustaining prayers for my success.

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List of abbreviations

ADL   Advanced Distributed Learning

CBL   Computer-based Learning

CBT   Computer-based Training

GPRS   Global Packet Radio Service

ILT   Instructor Led Training

IS   Information Systems

IT   Information Technology

IBT   Internet-based training

NGOs   Non-governmental Organizations

OL   Online Learning (OL

PDA   Personal Desktop Assistants

TRA   Theory of Reasoned Action

UWC   University of the Western Cape

B Nursing 1 First year nursing students

B Nursing 2 Second year nursing students

B Nursing 3 Third year nursing students

B Nursing 4 Fourth year nursing student

WWW   World Wide Web

Table of Contents

1. Chapter Outline

The thesis consists of five chapters. Chapter 1 provides the introduction and background and of the study, summarizing what the thesis is about. Chapter 2 provides the literature review, which looks at previous theories and models that gives clarity to the study topic. Chapter 3 discusses the research design and methodology. Chapter 4 presents the research analysis and discussion. Chapter 5, which is the last chapter of the study, presents a summary of the findings, draws conclusions and recommendations, and suggest directions for future research

2. CHAPTER 1

2.1. Introduction

The concept 'e-learning' refers to all forms of teaching and learning through Information and Communication Technologies (Choi, 2003). This includes any course content that is delivered through the use of the Internet, audio and videotape, CD-ROM, satellite broadcast, MP3 players, podcasts, interactive television, PDAs, email, and blogs. Indeed, e-learning is a relatively new phenomenon that is growing in a significant number of universities around the world, enhancing the learning and teaching processes. Enhancements include incorporating text, audio, video, and animation into course lectures; retrieving information from online journals, periodicals, and newspapers; including simulations and multi-media presentations in the classroom; enhancing communication and collaboration between professors and students and uploading course content and tests to university websites.

One important advantage of e-learning is that it can help educators and students to overcome time and place barriers. Kenny (2002) points out that e-learning has benefited teaching and learning environments; it can also assist students and institutions in terms of course availability, affordability, and convenience (Horton, 2006), by offering students opportunities to interact with an instructor and other students and be engaged in the environments that are not bound by time and place (Kirkwood, 2003).

Literature shows that there has been a remarkable progress in the use of e-learning in the past few years, and consequently, computer-mediated communication has attracted more attention. When e-learning was introduced; it created excitement among researchers and practitioners. Many educators and researchers had high hopes for e-learning, believing that it would provide more access to information and communication, and would eventually lead to a new revolution in education. Hence, several studies have been conducted to examine

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attitude towards e-learning all over the world. However, essentially it would seem that little research is done in this area in the school of nursing at the University of the Western Cape. The current study therefore attempts to contribute towards filling this research gap in undergraduate nursing education context at the University of the Western Cape.

This study examined the attitude of undergraduate nursing students towards e-learning as a teaching and learning strategy at University of the Western Cape. Hence the findings expect to give insight about the level of satisfaction towards e-learning among undergraduate nursing students at the university of the Western Cape. Furthermore, this can assist in designing effective strategies towards enhancing the use of e- learning and improving the quality of technological skills of nursing graduates.

This opening chapter basically introduces the study and provides amongst others background to the study, research problem and question, purpose, aims and objectives and methodology followed by a chapter outline.
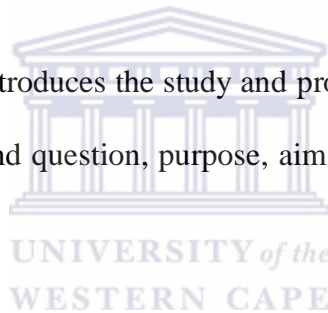
2.2. Background

The use of Information Technology (IT) in teaching and learning has created a need to transform how students from higher institutions learn by using more modern, efficient and cost-effective alternatives in the form of e-learning. E-learning can broadly be defined as a delivery of course content via electronic media such as Internet, Intranet, Extranet, satellite broadcast, audio/video tapes, interactive TV and CD-ROMs (Urdan and Weggen, 2000).

E-learning concept has been in existence since the last few decades and is one of the most significant recent developments in the Information Systems (IS) industry (Wang, 2003) and has been viewed as synonymous with Web-based learning (WBL), Internet-based training (IBT), advanced distributed learning (APL), Web-based instruction (WBI), online learning (OL) and open/flexible learning (OFL) (Kirkwood 2003).

E- learning depends mainly on the use of computer as assisting tools, the most significant characteristics of e-learning are that the teacher and the learner are in different physical environments and that the communication throughout the teaching and learning process is carried out via e-mail, forums and through the Internet (Al-Dujaily and Ryu, 2006). Instructional materials are transferred electronically or through the Internet or through course software with the help of computer technologies (Akkoyunlu and Soylu, 2008). Therefore students are required to have appropriate computer skills in order to access e-learning materials (Saade&Bahli, 2005).

Some of e-learning system benefits are that it provides the content of the course in a longer period of time compared to classroom environment and other methods. Furthermore; it reaches more number of learners, at the same time ensuring a learning environment that is

independent of time and place; particularly for adult learners (Dziuban, Hartman, and Moskal, 2004).

With reference to the University of the Western Cape (UWC), e-learning was introduced in 2005 as a method of teaching and learning at the School of Nursing. This initiative, in conjunction with face-to-face class sessions commenced with the 3rd year nursing students and was extended to the rest of the academic staff and students in 2006.E-learning system approach is in consonance with the philosophies and principles of the case based and constructive approach adopted by the UWC School of Nursing. This enhances the knowledge and skills of undergraduate nursing students and improves the efficiency and effectiveness of educational interventions in the face of social, scientific and pedagogical challenges (Hala and Kling 2001).

Since information technology has developed and expanded, the benefits of e-Learning have become extensively recognized in terms of the following:

2.2.1. Teaching, learning and economic benefits

E-learning provides consistency in the delivery of educational activities, reduce instruction time, enhance cognitive recall and mastery of learning, and increase students' motivation and satisfaction (Herriot, 2003).Furthermore, the literature shows that e -learning support self-directed learning, students' acquisition of skills and confidence in using information technology, a transition from classroom to independent learning (Smith, 2002), and individually paced learning.

Moreover, e-learning can be time-efficient for teachers as well, thus freeing them to focus on students educational needs (Berke and Wiseman, 2004). This can easily provide convenient,

economical and active teaching and learning (Huckstadt and Hayes, 2005) that are more learner-centered than traditional teaching methods (Al-Dujaily and Ryu, 2006).

2.2.2. Students benefits

E-learning teaching and learning systems provides educational opportunities for those with limited time and space through the combination of systematic teaching plans and computer technology. Learners can flexibly select suitable times, places, and methods for learning, via interaction with the teacher and classmates through media. The system also offers increased opportunities for continuing professional development, flexibility of learning, asynchronous teaching-learning and enhanced curriculum accessibility. This is particularly important in healthcare where students often balance their learning with shift rotations, overtime work, and family commitments (Blake, 2010).

On the other hand, the implementation of e-learning systems does not however guarantee a high-quality education. There are still many obstacles commonly related to technological aspects including issues concerning access to resources, internet connection and familiarity with the computer amongst students (this will be discussed in details in chapter 2). Although the advancement of technology has helped to minimize these obstacles, it seems that the problems have shifted to the learners who may feel isolated and unmotivated when using e-learning systems (Saade&Bahli, 2005). It is therefore necessary to study the factors that influence the attitudes of students towards e-learning in order to overcome these obstacles.

2.3. *Problem statement*

Like every other profession, computer technology has become an essential tool for facilitating nursing education and improving health communications, healthcare delivery and patient monitoring in hospitals, community health agencies, and other settings in which nurses function (Blake, 2010).

In recent times, the increased availability and usage of computer networks and the internet are producing a changing climate in education as well as in the health sector. This thus prompts a need to increase computer knowledge among nurses. Nursing students benefit endlessly from e-learning as they have to manage their busy life whereby they are required to do their practical work at the hospital and combining with their classroom based studies at the campus. Hence they have to make use of e-learning for some of their nursing modules in order to free ample time for their practical work.

However, most research done on e- learning have shown that successful adoption of any information system (IS) depend on the right and favourable attitudes of the potential users such as students and lecturers in case of educational settings. It is yet hypothesized that attitudes affect users' behavioural intention which in the end affect users' actual use of the technology (Rainer and Miller, 1996).

Additionally, the literatures demonstrate that a significant relationship exist between users' attitude towards computer and satisfaction with IS/IT (Information System/Information Technology), perceived performance and system usage in a number of studies (Compeau and Higgins, 1995; Rainer and Miller, 1996; Thompson *et al.* 1994).

A host of social scientists such as Fishbein and Ajzen, (1975) in their Theory of Reasoned Action (TRA) postulate that, belief about an object leads to an attitude, and this further lead to behavioural intentions regarding the object, which affect the actual behaviours toward the object of target. In other words, a more positive attitude toward IT, for example, when students are not afraid of the complexity of using computers, will result in more satisfied and effective learners in e-Learning environment (Picoli, Ahmad, and Ives, 2001).

Furthermore it is argued that, gender, prior knowledge training, self-efficacy, experiences and interests of the students may affect their attitude towards e-learning (Arbaugh and Hong 2002); possibly due to the fact that most undergraduate nursing students have poor socio-economic backgrounds with no access to computers, while mature students seem to have attitudinal issues towards computer usage because of their lack of prior knowledge or confidence. Therefore, it is likely that students in the school of nursing may have different views and attitudes towards e-Learning.
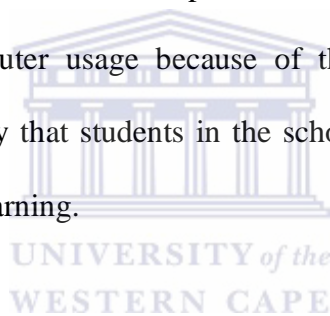
2.4. *Research Aim and Objectives, Questions and Hypotheses*

The aim of the study was to examine the attitude of undergraduate nursing students towards e-learning as a teaching and learning strategy at University of the Western Cape.

2.4.1. Objectives

The objectives of the study were to:

1. Determine the satisfaction level of undergraduate nursing students towards e-learning at the school of nursing, UWC.

2. Determine the factors that influence nursing students' satisfaction with e-learning at UWC.

2.4.2. Questions

In order to achieve the above objectives the following research questions informed the study.

1. What are the attitudes of undergraduate nursing students towards e-learning at UWC?
2. To what extent are undergraduate nursing students at UWC satisfied with e-learning?
3. What are the factors that influence satisfaction of undergraduate nursing students with e- Learning at UWC?

2.4.3. **Research framework**

Learner dimension
-Learner attitude toward computers
-Learner computer anxiety
-Learner Internet self-efficacy
Instructor dimension
-Instructor response timeliness
Course dimension
-E-Learning course flexibility
-E-Learning course quality
Technology dimension
-Technology quality
-Internet quality
Design dimension
-Perceived ease of use
Environmental dimension
-Diversity in assessment
-Learner perceived interaction with others

Perceived e-learner satisfaction.

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Table 1: Research framework

2.4.4. **Hypotheses**

The following hypotheses were tested in the study.

Hypothesis 1: student attitude toward computers will positively influence perceived e-Learner satisfaction

Hypothesis 2: student computer anxiety will negatively influence perceived e-Learner satisfaction with e-Learning

Hypothesis 3: student Internet self-efficacy will positively influence perceived e-Learner satisfaction with e-Learning.

Hypothesis 4: lecturer response timeliness will positively influence perceived e-Learner satisfaction with e-Learning.

Hypothesis 5: E-Learning course flexibility will positively influence perceived e-Learner satisfaction with e-Learning.

Hypothesis 6: E-Learning course quality will positively influence perceived e-Learner satisfaction with e-Learning

Hypothesis 7: Technology quality will positively influence perceived e-Learner satisfaction with e-Learning.

Hypothesis 8: Internet quality will positively influence perceived e-Learner satisfaction with e-Learning.

Hypothesis 9: student perceived ease of use of the e-Learning system will positively influence perceived e-Learner satisfaction with e-Learning.

Hypothesis 10: Diversity in assessment will positively influence perceived e-Learner satisfaction with e-Learning.

Hypothesis 11: Student's perceived interaction with others will positively influence perceived e-Learner satisfaction with e-Learning.

2.5. *Significance of the study*

The study is relevant in several ways. It is, to the best of the researcher's knowledge, the first of its kind in the school of nursing to investigate the attitude of undergraduate nursing students towards e-learning. The importance of the study stems from the fact that it will contribute to filling the research gap with regards to the use of e-learning in the school of nursing at the University of the Western Cape. It is expected that the findings emanating from the study will contribute towards clarifying the extent to which e-learning as a method enhances learning. The study, in addition, contributes to the knowledge of e-learning and serves as a basis for further research in areas such as the use of modern technology in nursing education in the near future.

2.6. *Overview of Research Methodology*

The researcher selected a sample randomly to attain the research objectives. The sample consisted of 249 nursing students (Raosoft, 2004) including participants from different age groups and educational levels from (2nd year to 4th year). It is important to note that 1st year nursing students were excluded from the scope of the study, as they were used for the pilot study. The researcher held a meeting with undergraduate nursing students after a lecture session; the main purpose was to introduce the study and request their voluntary participation and jointly discuss the research instrument. Self administered questionnaires were offered to different classes of undergraduate nursing students at the University of the Western Cape.

The researcher used the instrument which was developed by Pei-Chen Sun et al (2008), which has been reported to be valid and reliable. The questionnaire assesses attitudes towards e-learning and consists of a 5 point likert scale of 40 items and biography profile. However, the pilot study was conducted first to re-check the validity and reliability of the instrument.

2.6.1.   Pilot study

A pilot study was conducted with 30 first year nursing students who had exposure on e – learning during their first semester. Questionnaires were offered in order to get more details to examine the validity of the instrument. No change was made from the questionnaire according to the results from the pilot test. The final version of the questionnaire is in appendix A with its sources. Subjects who participated in the pilot study were excluded from the subsequent study.

2.6.2. Data collection method

Information was collected by means of self-administered questionnaires, which incorporate SCALES (semantic differential scales) to measure attitudes. A 5 point Likert scales ranging from strongly disagree to strongly agree was used for measuring attitudes. A low reliability caused by random guessing is expected. One easy way to overcome this problem was to include "I don't know" in multiple choices hence the researcher instructed students to choose "I don't know" instead of making a guess if they really don't know the answer. Low reliability is a signal of high measurement error, which reflects a gap between what students actually know and what scores they receive. The choice "I don't know" can help in closing this gap. In addition, students were given enough time to answer the questionnaire as they were given approximately one week to bring back the questionnaires.

2.6.3.   Research Instrument

The questionnaire included three major components: (a) demographic information, (b) computer and Internet experience, and (c) attitudes toward e-learning.

The following shows the content of the Questionnaire:

a) Demographic information: The demographic component covered gender, race, age and the year of the study.

b) Computer and Internet experience: In this component, participants were asked to indicate whether they had previous experience or training on e-learning

c) The rest of the questionnaire consists of 5-point likert scales to assess Attitudes toward e-learning: Participants were asked to indicate their attitudes toward learning. These 40 questions all adopted 5-point likert scales (from 1 which means ''strongly disagree' 'to 5 which means ''strongly disagree').

An in-depth description and explanation of the entire research methodology is provided in *chapter 3*.

3. CHAPTER 2

3.1. *LITERATURE REVIEW AND THEORETICAL FRAMEWORK*

3.2. *Introduction*

This chapter is divided into two main sections namely literature review and theoretical framework. The literature review provided key features of the thesis, focusing on general theory related to e-learning. It discusses amongst others; e-learning concepts and history timeline of e-learning system, the uses of e-learning as a teaching and learning strategy, positive and negatives attitudes towards e - learning, nursing students and technical issues in general as well as the attitudes of nurses towards computer technology. The differences in attitudes towards e-learning based on gender and education levels also were discussed. This section also looked at the advantages and disadvantages associated with e-learning, and illustrated the comparison between e-learning and traditional teaching and learning methods. The second section sketches the theoretical framework that informs the study. It basically explores relevant theories such as the constructivism theory in the context of nursing education amongst others that form the basis of the study. This is followed by conclusion.

3.3. *Definitions of terms and operational definitions*

3.3.1. E-learning

Is the use of telecommunication technology to deliver information for education and training. This kind of learning depends on networks and computers, but likely evolve into systems consisting of a variety of channels (e.g., wireless, satellite), and technologies (e.g., cellular phones, personal digital assistants) as they are developed and adopted. With the progress of

information and communication technology development, e-learning is emerging as the paradigm of modern education. The great advantage of e-learning includes liberating interactions between students and instructors, or students and students, from limitations of time and space through the asynchronous and synchronous learning network model (Katz, 2000; Katz, 2002; Trentin, 1997). Therefore e-learning characteristics fulfil the requirements for learning in a modern society.

3.3.1.1. **Some notable e-learning definitions**

1. E-Learning is instruction that is delivered electronically, in part or wholly – via a Web browser, through the Internet or an intranet, or through multimedia platforms such as CD-ROM or DVD (Hall and Higgins, 2005).

2. Allen (2003) also defined e -Learning as a structured, purposeful use of electronic system or computer in Support of the learning process.

3. According to Bottino (2004), e-learning covers a wide set of applications and processes, such as Web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes delivering content via the Internet, intranet/extranet (LAN/WAN), audio and videotape, satellite broadcast, interactive TV, and CD-ROM.

4. E-learning is a training delivered on a computer (including CD-ROM, Internet, or intranet) that is designed to support individual learning or organizational performance goals (Clark and Mayer, 2003).

5. E-learning is the integration of instructional practices and Internet capabilities to direct a learner toward a specified level of proficiency in a specified competency (Conrad, 2000).

3.3.1.2. Attitude

In this study, attitude toward behaviour was defined as the degree to which performance of the behaviour was positively or negatively valued (Ajzen and Fishbein, 1980, Fifshbein and Ajzein, 1975), and student satisfaction was used as a dependant variable to assess the success of e- learning among undergraduate nursing students at the University of the Western Cape.

3.3.1.3. Satisfaction

In this study, student satisfaction was defined by student attitude toward instructors, courses, instruction method, and e-learning technology; therefore, course (organization/clarity and extent coverage of the digital contents) and instruction (instructor enthusiasm, group interaction and individual rapport) would have direct influence upon student satisfaction. (Pirrong and Lathen, 1990),
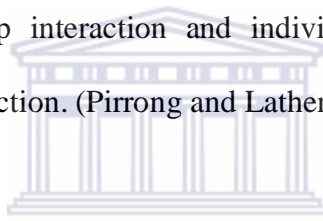
In addition, perceived learning value would directly influence satisfaction based on the outlined model, this relationship was similar to prior research findings where perceived value led to students' satisfaction (chiu, Hsu, Sun, Lin, and Sun 2004). Because student satisfaction was comprised of a student's attitude toward teacher, teaching method, course and teaching environment (Pirrong and lathen, 1990), it was then the outcome variable for the current research.

3.4. *Various generation of e-learning*

Connolly and Stansfield, (2007) have pointed out that e-learning has gone through four distinct generations. The first generation, took place from 1994-1999 and was marked by the passive use of the Internet where traditional materials were simply reformatted to an online format. The second generation took place from 2000-2003 and was marked by the transition

to higher bandwidths, increased resources and the move to create virtual learning environments. The third generation that was started from 2004 is marked by the incorporation of greater collaboration, socialization, project-based learning and reflective practices.

Brief timeline on the evolution of e- learning is discussed below:

3.4.1. Instructor Led Training (Pre 1983)

Preceding the availability of computers universally, Instructor Led Training (ILD) was the primary training method. ILT allowed students to focus on their studies and to come in direct contact and interaction with their instructors and classmates. The disadvantages associated with ILT were high costs and time. Students had to take time off from all other activities and be enrolled into academic institutions and spend most of their time there. These also hiked educational expenses whereby it was not easy for everyone to afford these standards.

3.4.2. Multimedia Era (1984 to 1993)

The mid 1980's and early 1990's showed a much changing computer era. Most of the people started to understand the importance of computers and it started to become a need rather than a luxury product. Various operating systems like Windows, Macintosh for Apple Computers with their easy to use Graphical User interface made it easy for the users to take a much more liking towards computers.

Applications also evolved with higher standards focusing on the ease of use by the end-users. Microsoft's Office package that included standards day-to-day applications like MS-Word, MS-Excel, MS-PowerPoint, MS-Access and such added software's made using programs easier. Out of this applications such as PowerPoint became handier tool for e-learning.

However, CD-ROM's made it easier for these programs to be carried and stored easily rather than carrying multiple numbers of Floppy Disks. All this led to the advancement of the multimedia era. With the use of multimedia applications and in an attempt to make training more transportable and visually engaging, Computer Based Training (CBT) courses were delivered via CD-ROM. This availability of anytime, anywhere via CD-ROM's provide time and cost savings compared to the ILT's and gradually reshaped the training industry.

On the other hand, these also had its weaknesses. In spite of these benefits and saving of time and cost, these courses lacked the personal student-instructor interaction and dynamic presentations making the experience slightly less satisfying thus Students started to find it slower and less engaging.

3.4.3. Introduction of Web - (1994 - 1999)

The internet and the World Wide Web, provided visions into training providers to explore its potentiality and find ways to improve training. The introduction of email, Web browsers, HTML, media players, low fidelity streamed audio/video and simple Java began to change the face of multimedia training. CBT's improved with text and graphics, but the graphics provided were of low quality. E-mails provided standards whereby CBT's and similar contents could be reached to students with ease, but care had to be taken for these files to be of small file size due to the Internet bandwidth capacity.

3.4.4. The Next Generation Web (2000 and beyond)

Numerous technological advancements have enhanced the way e-learning is done in recent times. Application like Java and other IP (Internet Protocol) applications help restructuring rich media. Internet has evolved with high bandwidth lines enabling users to access large files

easily and with rapidity. This has led to a combination of ILT along with electronic highway. Today, live instructor led training (ILT) via the Web can be combined with real-time mentoring, improved learner services and up-to-date. This growth in Internet, Web enables instructors to deliver high quality content directly to the users.

With the evolution of PDA (Personal Desktop Assistants) and Smartphone and wireless technologies such as WLAN (Wireless Local Area Network), GPRS (Global PacketRadio Service) web based contents and emails can be accessed from anywhere, anytime. These enhanced training solutions provide greater cost savings, higher quality of learningexperience and are the educational standards are being revolutionise and changing to adopt e-learning as the basis for many educations levels.

3.5. Uses of e-learning

E-learning is used in everywhere and across all types of areas including businesses – private or public sectors, non-profit organisations, NGO's (Non-governmental Organisations) and educational institutions. Its main objective is to enhance the students' knowledge and cost saving. E-learning also helps to reach geographically detached groups, to provide "anywhere-anytime" learning, aiming to provide consistency, to ensure compliance with regulations, and to improve productivity.

Some businesses used e-learning for introduction or orientation learning of their organizations and their products and services in addition to remedial training, to provide certifications, to promote products and services, to support organisational initiatives and to keep up to date with the latest software's.

Furthermore, most educational institutions used it for expanding the academic scope. E-learning can provide much more references and learning scopes than the ones provided in the

usual text books. Also, class assignments can become assigned to the students and also submitted back using e-learning portals.

3.5.1. The use of e-learning in nursing education

In the early stages of e-learning, computer-assisted instruction was utilized to enhance the teaching/learning process (Kenny, 2002). Currently e- learning seems to be a strategy of choice for delivering information and teaching skills in nursing education. As reflected in a number of nursing studies related to the use of e-learning, positive learning outcomes have been reported. However barriers and inconsistent results have been found. A brief overview of these studies follows in the following paragraphs: Online learning reports have shown that positive learning outcomes tend to focus on learners' knowledge base and skill set, while program satisfaction seems to focus on users' perception of the online learning experience.

Huckstadt and Hayes (2005) have evaluated interactive courses used for educating advanced practice nurses. Their results indicated significantly higher post-test knowledge scores obtained after the completion of two online modules (back pain and dermatology), compared to pre-test knowledge scores obtained prior to starting the modules. Focusing on program satisfaction, participants evaluated the online modules as innovative, time saving, convenient, available and economical.

In a study using individual interviews and focus groups regarding nursing students' experiences with a health informatics online course, Kenny (2000) noted four major themes from the study namely computer confidence, flexibility, active learning and practicalities of teaching. Students were positive towards e-learning as they indicated that the content and process for the e-learning course was useful and beneficial to their work. However, other

studies showed negative attitude towards e-learning, for example in a study by Woo and Kimmick (2000), the results showed that e-learning discussions have been noted as being time consuming and difficult.

Furthermore, inconsistent results also were reported in a review of 25 nursing education evaluation reports, comparing e-learning to traditional instruction methods, some studies have indicated that e-learning is more effective, while others have found it to be less effective or demonstrating no difference in outcomes when compared to traditional teaching–learning methods (Murray, 2003 and Hobbs, 2002).However, it seems that the inconsistency in findings might be related to the computer expertise of the students involved or the fact that the earliest e-learning methods relied solely on text, while the more recent methods rely upon a combination of strategies (i.e. videos, DVDs, internet).

3.6. Constructivism theory and E- learning
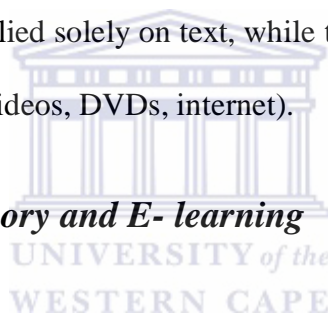
Constructivism is a learning theory that can be useful for designing and developing an e-learning program (McMahon, 2007). Constructivism is a theoretical foundation that advocates transformation from teacher-centered to a learner-centered (Young and Maxwell, 2007). The theory is influenced by the work of Piaget and Vygotsky (Woo and Reeves, 2007) who encourage learners to build their own body of knowledge based on individual experience and to apply this knowledge directly to their environment. The theory states that: there are multiple ways of understanding knowledge; reality is created by an individual; and, knowledge comes from a personal interpretation of interactions with the world (Ali,Hodson, Carlton, and Ryan, 2004).

The constructivist's perspective indicates that the educator plays the role of facilitator, while the learner's role is one of constructing reality through interactions with the environment (Hiemstra, 2007). Furthermore, constructivism support students to be active in the learning environment; develop social and interpersonal skills; enjoy learning; have an understanding of the content being taught; and learn to think in an efficient manner (Kelsey and Low, 2007).

3.6.1. Constructivist approaches and E-learning in Nursing Education

For enhancing nursing competency, several strategies based on constructivism are suitable for e-learning in nursing education. Examples are case studies (Pullen, 2006), gaming (Royse and Newton, 2007), gaming problem-based learning in small groups (Rogal and Snider, 2008), concept-mapping (Conceicao and Taylor, 2007) and simulation-based learning (Reilly and Spratt, 2007).

Also the use of electronic technologies, such as a blog, e-mail, a discussion board and/or video streaming can also enhance active learning and social interactivity among learners, provide for user-created content, and supports collaborative learning. Learners can collaborate on projects and research and share resources, links, and materials. Similarly, discussion boards can also be seen as the communication resource which is designed around a specific topic or for a specific group, for posting messages for others to read and respond. Podcasting allows students to download and share a collection of media files related to their courses, such as audio/video, text, image, and PDF files (Evans, 2008).

Moreover, technology has made available other technological devices, such as MP3 players and I phones that can be utilized as tools in e-learning courses. These devices allow students to watch or listen anywhere at any time. Therefore, e-learning, based on constructivism,

forces students to be actively involved in the educational process and to use creative thinking to build a knowledge base (Kelsey, low and Reeves, 2007).

Although social interaction context is considered as a factor influencing effective learning (Ali and Hiemstra, 2007) the quality of learning materials also is viewed as an important factor influencing learning outcomes (Gerjets and Hesse, 2004; Woo and Kimmick, 2000).

3.6.2. The link between learning theories and learning outcomes

Although a number of studies have been conducted on the outcomes of e-learning in nursing education, few studies have been conducted on the relationship between outcomes and the use of theories (Reilly and Spratt, 2007). Failure to use a learning theory when designing an e-learning experience could affect learning outcomes.

Glen (2005) argued that although technology has advanced, teaching–learning activities still tend to focus on presentation of content rather than ensuring students are fully engaged in learning. He proceeds to assert that technology alone will not promote effective teaching–learning outcomes, therefore nurse educators need to design teaching–learning activities based on learning theories, so as to enhance positive learning outcomes.

3.7. Attitude towards e-learning

3.7.1. Student attitude toward e- learning

According to Ajzen and Fishbein (1980), attitudes are positive or negative evaluations of objects, peoples, or situation that predisposes us to feel and behave toward them in positive or negative ways. Several studies have highlighted the students' attitudes on computer (Robertson, Calder, Fung, Jones, and O'Shea, 1995; Todman and File, 1990; Kirkman, 1993; Gattiker and Hlavka, 1992).

Demographic variables are also considered important in explaining attitudes toward online learning. Most literature shows that Males, older students, and those with family responsibilities are considered more likely to prefer online classes (Jones, Morales, and Knezek, 2005). However, some studies illustrate that prior experiences with the computer seems to be a significant factor influencing attitude of students towards e- learning (Saade and Bahli, 2005).

Therefore, the literature is available that has studied the various demographical variables such as: gender, age, computer ownership, skill and use of the computer and Internet (Katz 2002; Shashaani, 1997; Gattiker and Hlavka, 1992; Francis, 1993; Roca, Chiu and Martinez, *2006*; Paris, 2004 and Bertea, 2009). These variables have considerably contributed toward the formation of the computer and e-learning attitudes in educational setting.

3.7.1.1. **Positive attitudes toward e -learning**

In the context of e-learning attitudes,Wernet, Olliges, and Delicath(2000) surveyed students who used WebCT in a social work course; found that all of the respondents considered the e-learning course materials beneficial to their overall learning experience. Sanders and Morrison-Shelter (2002) examined student attitudes with regards to the Web-enabled learning components in a general biology course for undergraduate. The results showed a positive effect on student learning, problem-solving skills, and critical thinking skills.

Paris (2004) also assess the cognitive, affective and behavioural attitudes of fifty-two students from a public school in Australia to further examine specific online e-learning (OWAL). His results indicate that students responded better towards OWAL, however gender based difference in attitudes was noticed. Positive correlation was noticed among the Internet users and OWAL attitudes.

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In a quantitative survey study using a structured questionnaire conducted at the University of Taiwan, School of Nursing to explore attitude toward web based distance learning among public health nurses in Taiwan, it was found that students had positive attitudes toward e learning as they tend to agree that the Internet learning model is a feasible new way of learning which has certain strengths such as flexibility in time, space and conveniences (Yang, 2006).

In another study, Kirkwood (2003) used a survey and a focus group to determine the attitude of nursing student toward e-learning technology at the Open University in the United Kingdom. His findings showed that students were strongly positive about the use of multimedia technologies in e learning.

Similarly, Shang (2005) conducted a study of Taiwanese university students' attitudes towards using e-mail journaling as a means to learn a second language. An open-ended survey was used to elicit feedback and attitude. Students viewed learning with e-mail positively and the study self-efficacy measure indicated that these positives attitudes contributed to the effectiveness of e-mail for improving second language reading performance.

Collins (2000) also looked at the effect of delivering a biology course by three different methods on the achievement and satisfaction of the students of the department of biology at Memorial University of Newfoundland in Canada. In this experiment, 105 students were taught by correspondence mail course, while 151 students were given classic on-campus lectures, and 22 students used a website to study the course online. However, neither the academic background of learners nor the group's size was taken into account by the researcher.

The achievement of the groups was investigated via midterm and final examinations, while the satisfaction of web course students was investigated via a questionnaire distributed to the students at the end of the course. The results indicated that the correspondence course students achieved the highest mean of achievement followed by the on-campus lecture course students, then the web course students, but the differences between the achievement means were not statistically significant. Only 21 students of the web course completed the satisfaction questionnaire and they were very satisfied with the course (positive attitude).

3.7.1.2. **Negative attitudes towards e-Learning**

However, negative attitudes student responses to online learning are identified with low level computer skills, technological anxiety, and computer hardware problems, as well as poor study skills, low motivation, and an inability to work independently (Smith.,Caputi, and Rawstorne,2000, Govindasamy,2002 and Rosenberg, 2001).
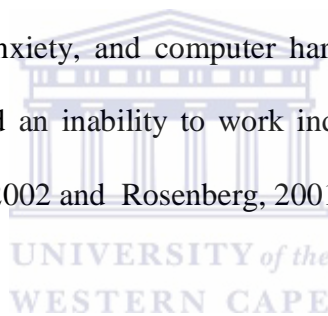
Another factor identified as producing negative perceptions of online learning is the view that online classes lack personal contact with the teacher and other students. Research has shown that some students report feelings of isolation and loneliness when required to face a computer screen. They miss the face-to-face contact with students and the instructor found in the traditional classroom (Ponzurick, France, Russo, and Cyril, 2000).

More recently, furlong and Sutherland (2000) used a mixed method design to study over eight hundred elementary and secondary school's computer use and attitude in the United Kingdom, they found that while students were positive about using computer at home, they were quite negative about using computer at school. Specifically, students viewed school lesson as too dictatorial, which left slight to no time for playfulness and discovery.

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3.8. Prior experience

Student's previous experience with the computer is a significant factor influencing attitude toward e-learning with more experiences resulting in more positive attitudes (Alghazo, 2006). In an early study of student's attitude toward e-learning, Loyd and Gressard (1984) used the Computer Scale Attitude (CSA) to measure three components of students' attitudes: computer anxiety, computer confidence and computer liking, for all three of these areas, prior experience with computer was a significant influence on student's attitudes. Students with more experiences had more positive attitudes.

In a more recent study, Jones, Morales and Knezek (2005) completed a comparative study of post-secondary students who were pre-service teachers taking a computer in education overview course. The treatment used a three-dimensional online learning environment in a blended online and face to face course while the control group used a standard face-to-face environment. Because the treatment group had to use technology to fulfil the requirement of the course and were thus immersed in using computers, their fears and anxieties about dehumanizing effect of computer lowered. In other words, those students who gained more tangible experiences with technology lowered their anxiety toward computer hence making it easier to participate in e-learning environment.

3.9.   *Factors affecting student's attitude on e- learning*

3.9.1. Students and technical issues

Most students in a variety of studies expressed frustration with technical issues related to learning with technology. Furlong et al. (2000) found that students became frustrated with the hardware and software at school because it was significantly slower than that which they accessed at home.

Barron (2001) argued that technical support and technological advancement are the major contributors to the effectiveness of the e-learning system. He conducted a study (survey) of web based environment at the University of Malaysia Sarawak (UNIMAS). His findings revealed that students preferred face-to-face tutorials as compared to pure online learning. That is to say students preferred printed module to online texts and Internet for communication.

Moreover, students in Alghazo's (2006) study done at the University of Bristol, England, acknowledged several technical issues which caused frustration, including slow Internet speed and difficulties accessing their web-based course from home. To buttress the above, Hall and Higgins (2005) also documented students' frustrations with technical problems when using interactive whiteboards because it caused delays and disruptions.Generally speaking, negative responses with e-learning might be due to the students' anxiety and confusion of computer terminology jargon (Hester, 1999).Despite that technical issues may be hard to avoid with technology lessons, some studies indicate that students' attitudes again point to the need for educators to be trained thoroughly in using technology or to have a fully trained resource at hand.

3.10. Attitude of nurses towards computer technology

The literature demonstrates that the implementation of technological innovations would benefit nursing education, administration, research, and clinical practice. It is evident from a historical review of nursing literature regarding technological innovation that previous experience, exposure, and knowledge regarding technological innovations have been repeatedly hypothesized as resulting in favourable attitudes toward computer technology (Aydin, 1986; Morin, 1982; Zmud, 1982, McBride, and Nagle, 1996).

However, results have been different (Aydin, 1986; Hodge, 1977; Startsman&Robinson, 1972). Three early studies concluded that nursing personnel were more negative toward computer technology than physicians and other hospital personnel.

In another study done by Reznikoff, Rosenberg, Stroebel, and Ericson, (1967), using a 35-item Likert attitude scale, concluded that staff nurses and nursing students held negative attitudes toward computer technology in the area of loss of control and fear of dehumanization.

However, several individual variables have been proposed to affect the implementation of technological innovation. Three variables which have been cited repeatedly in the literature were cognitive style, age of the subject, and previous computer experience. In regards to age, on one hand, younger subjects were more likely to have been exposed to technological innovations. Therefore, were more likely to express more favourable attitudes toward computer technology (Aydin, 1986; Ball & Hannah, 1984; Kerr &Hiltz, 1982; Reznikoff, Startsman& Robinson, 1972; Zmud, 1982).

Moreover, employees of the psychiatric institution for more than 10 years and less than one year also held negative attitudes (Reznikoff et al., 1967). Several other later studies also concurred that positive attitudes toward computer technology among health care professionals were correlated with high levels of education (Brodt &Stronge, 1986; Reznikoff& Rosenberg, 1969).
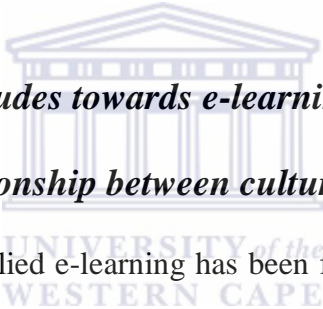
3.11. *Differences in attitudes toward e-learning based on gender*

Previous research generally found no differences between males and females in attitudes towards e-learning. For example a study by Abouchedid and Eid (2004) show that there is no significant differences between males and females that were found on the interest scale except on four items.

To substantiate, females registered a lower mean rank (124.1) in web teaching than males (144.9) with <0.05, i.e. they did not favour Web teaching and were also not interested when compared with males in using technology in the classroom as well as in displaying their course syllabus on the net. Females, however, were significantly (P<0.05) more interested than their male counterparts in receiving e-learning training.

Another study done by Cheng (2006) was done in a technical college in Taiwan to survey students' level of acceptance in applying e-learning for business courses. The purpose of the study was to provide a clear reference for developing and promoting e-learning in all business courses. A questionnaire survey was used in three stages. The first stage was to receive the inputs from professional academicians in the related field. The second stage targeted students from various departments; 45 in total. The final stage was a second batch of students excluding the first 45 from the various departments and this batch equalled to 180 students. The data was tested using Chi-square test.

The results showed that gender does not have an obvious effect on the students' level of acceptance in applying e-learning for business courses; the experience of applying e-learning for business courses played a key factor in affecting the level of acceptance; school systems do not play a key factor in affecting students' level of acceptance in applying e-learning for business courses; computer skills do not play a key role affecting students' level of acceptance in applying e-learning for business courses and that the experience of applying e-learning greatly influences students' level of acceptance in applying e-learning for business courses. Generally speaking, most literature illustrate that gender does not have an obvious effect on the students' level of acceptance in applying e-learning. However, the means for males almost always appeared to be higher than those for females.

3.12. Differences in attitudes towards e-learning based on educational levels and relationship between cultural background

The experience of previously applied e-learning has been found to play an important role in e-learning. For example, Cheng (2006) indicated that the students who previously opted e-learning for any course were found to be much more willing to utilize e-learning again. It is easy to see that students who applied for e-learning previously have a positive attitude and appositive feeling towards the e-learning.

With regard to attitude based to educational levels, Al-Khashab (2007) studied 276 respondents to determine Kuwait society's attitudes towards e-learning. The results indicated a significant difference in the attitudes towards e-learning based on educational levels and also revealed that Kuwaiti students generally have good attitudes towards e-learning.

With reference to cultural background, Downey et al. (2005) conducted a study with the aim to investigate possible relationships between national culture and the usability of an e-learning system. The study was done to determine the usability and cultural variables that might influence the relationship between national culture and the usability of an e-learning system. The 'usability' variables under Downey's study were Learn ability (ease of learning), error (rate of errors), and satisfaction (user satisfaction) were the three usability attributes that were used to guide the usability aspect of this study (Nilsen, 1993).

The population for this study was composed of thirty attendees in an international workshop on training improvement held in Penang, Malaysia. These people were selected for this study because of the attendees' diverse cultural backgrounds and their underlying interest in all forms of training and instructional delivery. The samples consisted of various nationalities from Canada, China, Denmark, Ethiopia, France, India, Indonesia, Italy, Libya, Malaysia, Singapore, Thailand, the United States, and Zimbabwe.

The study targeted major areas "Power Distance and the Usability of an E-learning System"; "Relationship between Individualism and Collectivism and Usability of an E-learning System"; "Relationship between femininity/masculinity and the Usability of an-learning System"; "Relationship between Uncertainty Avoidance and the Usability of an E-learning System". The results were as follows:

1. The higher an individual's power distance score (e.g. greatest acceptance of unequal distribution of power), the higher their time and clicks in the e-learning tasks.

2. Individuals from collectivist societies found the system more satisfying to use versus those from individualistic societies.

3. With regard to the femininity/masculinity factor, there was no significant relationship with any of the three usability variables. Participants who were least likely to accept risk were also the ones who made the most errors in navigating the e-learning system.

3.13. *Advantages and Disadvantages of e-learning*

3.13.1. Advantages

Given its many benefits and advantages e-learning is considered among the best Methods of education. These benefits have been referred to by a number of researchers (Ammenwerth, Mansmann, Iller and Eichstadter, 2003; Atack, Bloom and Hough, 2003). Some of these advantages include the following:

3.13.1.1. Independence

Tunison (2001) maintain that independence is the most common benefit of e learning. Although, most students identified the teacher as the ultimate source of information, many students enjoyed the opportunity to work on their own and to figure out things for themselves without having to wait for their teacher to tell them what to do.

A grade-8 student (Canadian Secondary School) wrote, "You can challenge yourself, and get a real taste of what high school is going to be like… You can see how well you can do without a teacher to always turn to." Another student put a slightly different spin on this theme: "You don't get into trouble for doing nothing; you don't have to log on everyday".

These students felt empowered and in control of their own learning and they appreciated the opportunity to make decisions about when, where, and for how long they worked on their cyber school tasks. This student's statement summarizes this sub-theme. "I got to choose

when I wanted to do parts of the course, like if i was sick i could leave or come back and do more later on. I could also do more at a time instead of having to quit when the bell rings. I didn't feel as rushed".

3.13.1.2. **Flexibility**

Flexibility in terms of time and place, where every student chooses the time and place that suits him also has been listed as a major advantage of e-learning. Flexibility in a variety of forms was also an often-identified positive feature of the on-line school. Students were able to work at home, to get extra credits that did not fit into the regular school day, and/or to take a course that was not offered at their home school.

3.13.1.3. **Active participation, Accessibility and Cost effective**

E-learning improves the efficiency of knowledge and qualifications through accessibility to a vast amount of information, including access to expertise featuring global universities.
E-learning is cost effective as students do not need to travel; it also provides learning opportunities for a maximum number of students without the need for more buildings. E-learning systems as a method of teaching and learning provides opportunities for interaction between students through discussion forums and through eliminating the barriers that might hinder participation such as fear to talk to others. In addition, e-learning always appears to takes into account the differences between individual learners. For example, some learners prefer to focus on certain parts of the course, while others are ready to review the whole course. This may be demonstrated in a study done by Alghazo (2006) which aimed at investigating students' attitudes toward web-enhanced instruction in an educational technology course taught in the College of Education at the United Arab Emirates University. The study was done in the Middle East region specifically in the United Arab Emirates using

a sample of 66 students with an age range between 19 and 21 of female gender. From the sample, 88% own a personal computer, 26% prefer reading from paper and 74% prefer reading from a screen. At the time of the study, there were no sections of this course offered for male students and hence only female students were selected.

Data collection was done using modified version of the Web-based Instruction Scale developed by Sanders and Morrison-Shetlar (2001), and a Likert type response scaling asking participants to specify the degree of agreement or disagreement with items about their attitude toward Web-based instruction and two items as free-response questions.

This study dealt with the following issues: student attitudes toward Web-enhanced instruction, the effect of learning preference on attitude toward web-enhanced instruction, effect of previous experience with Web-enhanced instruction on attitude, advantages of Web-enhanced instruction as seen by female students, and obstacles to Web-enhanced instruction as seen by female students.
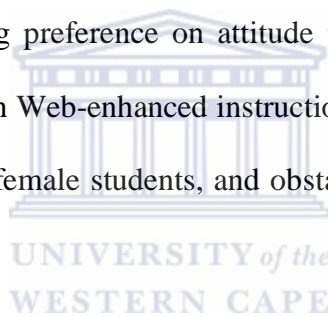
The results from the total 66 female respondents revealed that they have positive attitudes toward Web-enhanced instruction, 26% preferred reading from screen, 74% preferred reading from papers, 42% had previous experience with Web-enhanced instruction, and 58% did not have such experience.

In addition, students see many advantages of Web-enhanced instruction such as obtaining grades, communication with instructors, discussing course contents, easy access to course related materials, submitting assignments and enhancement of course understanding and communication with classmates. However, some disadvantages still exist such as accessing the course from home, limited computers in the labs and poor internet bandwidth.

3.13.2. **Disadvantages**

However, despite all the above discussed advantages, e-learning as any educational approach has its negative side. The disadvantages include the following: (Kearns, Shoaf, and Summey, 2004; Magg, 2004; Choi, 2003; Ryan and Carlton, 1999).

3.13.2.1. **Isolation and negative impact of communication**

In e-learning the learner might suffer from introversion, isolation, and lack of social interaction, therefore the learner needs a strong motivation and skills with regard to time management to reduce this effect. Also, e-learning might have negative impact on the development of communication skills of learners. In other words a learner might have acquired an excellent academic knowledge, and yet may not have the skills to deliver this knowledge to others.
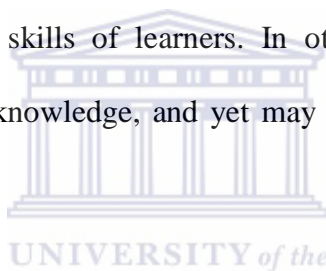
3.13.2.2. **Lack of clarification of content materials**

E-learning might be less effective than traditional learning in terms of clarification and explanation as the learning process becomes easier through face to face encounter.
Loss of lecture presence and possibility of discussion is a main disadvantage for example in Some special subject including nursing requires a lot of discussion and quick feedback and that makes the notion of turning these courses into full-fledged e-courses highly questionable.

However, Blended learning offers solution: lectures in virtual environment, seminars, and practical assignments in class room – in face-to-face environment. Newton (2003) conducted a study that deals with the issues perceived as being important "barriers" to using technology in teaching and learning within the academic staff community working in higher education in

the United Kingdom (UK). The data was gathered using questionnaires distributed to 300 academicians in the Information Technology sector of UK. The questionnaire was divided into three main sections: (1) teaching experience using technology; (2) staff perception on usefulness of technology and additional comments and suggestions. The respondents were selected via institutional websites. This study focused primarily on the Information Technology field. The statistical software package SPSS was used to analyse and present the data.

The Results of the study indicated that although a lack of clarity is evident in distance learning, yet this shows that there is a willingness to participate in this activity which reflects the intrinsic values played by academic staff on teaching and learning. Virtual learning environment barriers are not related to institutional support. Organizational encouragement is important towards the progression of innovation. Organisation should ensure that effective strategies are in place prior to implementing web based distance learning
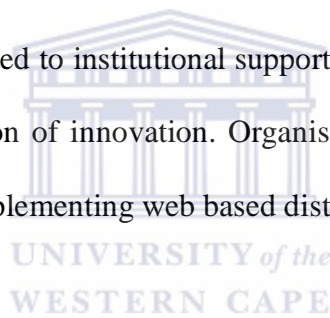
3.13.2.3. Uncertainty

Another disadvantage is the uncertainty on how to measure teaching quality and little interest in co-operation between e-course developers. It appears to be still unclear about how to measure teaching quality in e-learning and also the rules and guidelines on how to prepare and develop a good e-course are missing.

3.13.2.4. Time management

In terms of learning materials and time management, during ordinary learning situation, the planning and time management is being done for the student by curriculum administration department. However, in case of e-learning course, the student himself/herself has to take

active role in it and that necessitates much more self- discipline and becomes one of the major issues why students drop e-courses.

3.14. E-learning versus Traditional Learning

The majority of studies compared Computer based learning (CBL) with traditional lecture.

Cohen, Manion, and Morrison (2000) found CBL to be moderately more effective than conventional methods of instruction. Other studies support this finding such as Kenny (2002) who found that there exist higher examination scores and class participation for an e-learning classroom versus traditional lecture discussion.

Jeffries (2001) also found higher student satisfaction and more cognitive gains when CD-ROM was compared with traditional lecture on oral medication administration. Whilst Jeffries, Woolf, and Linde (2003) compared lecture and demonstration with an interactive CD-ROM in the teaching of 12-lead electrocardiograms. Although no significant difference was found in cognitive gains, students using CD-ROM reported greater satisfaction and self-efficacy.

Moreover, Yoder (1994) in investigating how learning styles relate to the effectiveness of CBI, concluded that learners who prefer active experimenting learn better with interactive video instruction whilst those who prefer reflective observing do better with linear video presentations. Walker, Marti, White, Elliot, Norwood and Mangum (2006) also examined age differences between nursing students in Generation X and Generation Y. They found no significant differences between the age groups and little preference for Web-based learning

Furthermore, Kekkonen-Moneta and Moneta (2002) conducted a study aimed at comparing the effectiveness of e-learning and face-to-face lectures on students learning outcomes at the Hong Kong University of science and technology. Their study compared three groups, one

lecture group and two online groups. The lecture group involved 105 students, and one online group involved 180, while the other featured129 students.

The students learning outcomes were tested through mid-term and final examinations. The means of learning outcomes regarding factual learning were higher in the traditional group compared to e-learning groups, and yet the difference was not significant. The means of learning outcomes regarding applied-conceptual learning were significantly higher in the traditional group in the mid-term exam though significantly lower in the final exam compared to online groups. This led the researchers to conclude that the online format could be deemed as effective as the traditional format regarding the student learning outcomes.

In addition, EL-Deghaidy and Nouby (2008) conducted a study on the effectiveness of blended e-learning cooperative method as compared to face to face lectures on the achievement and attitudes of pre-service teaching program students who took a science teaching methods course at the school of education at Suez Canal University in Egypt.

The study sample was selected randomly from pre-service teaching students in their third year. The sample consisted of 26 students of which 12 biology students constituted the control group, while the remaining 14 chemistry and physics students constituted the experimental group. The experimental group was taught the course through a website designed on the basis of ADDIE model (analysis, design, development, implementation, and evaluation) by the researchers using front page software program.

The control group on the other hand, was taught the same course through the traditional method of teaching. Posttest achievement and attitude scale were used to examine the differences between the two groups in terms of achievement and the attitude. The results of the study revealed significant differences between the two groups favoring the experimental group.

Lastly, Gunnarsson (2001) investigated the effect of web based instruction (WBI) on the achievement and attitudes of first year MBA students studying statistics course at Jesuit University. The researcher designed the WBI in the light of learning theories and previous instructional learning models. The number of students in the course was 42. The experimental group included 13 students who studied the course through the website that was designed using learning space software. The control group consisted of 29 students who studied the course by the traditional method. The results of the study indicated that the online environment has positive effects on students learning attitudes. However, in terms of achievement the results indicated that there were no differences between the achievement of both experimental and control group.

3.15. *Blended learning*

According to Clark and Meyer (2007), the definition of blended learning varies from one researcher to another. For example, Thorne (2003) and Gutierrez (2006) point out that blended learning is the integration between e-learning and face-to-face instruction. Mayadas and Picciano (2007) on the other hand define blended learning as a combination of e-learning and face-to-face instruction.

Recently blended learning has become popular in many institutions of higher education, especially in countries that have adopted distance education and e-learning as alternative delivery methods in their universities (Lim, Morris and Kupritz, 2006; Gutierrez, 2006). However, the school of nursing at the University of the Western Cape where the current study is being conducted is one of them.

Therefore, in the current study, undergraduate nursing students make use of the blended learning which takes the form of a combination between the traditional classroom (face-to-face) and the asynchronous virtual classroom, where the students have to attend classroom lectures, and in the meantime have the access to the asynchronous virtual classroom to do other lectures, and enhance their knowledge through additional reading and through browsing relevant websites.\

3.16. Conclusion

In the light of the above discussion, it is evident that researchers across the globe have studied e-learning usage and organizational adoption. However, the researcher did not come across of many studies in Africa. Many educational institutional all over the world have integrated e-learning methods into their curriculums in the view that its benefits will enhance the quality learning. It can therefore be concluded that e-learning appears to become a standard for today's education, as it opens the door to learning focusing on the individuals priorities and learning skills. However, the individuals' skills and understanding of e-learning methods is critical for ensuring effectiveness and efficiency of e-learning method.

4. CHAPTER 3

4.1. RESEARCH METHODOLOGY

4.1.1. **Introduction**

This chapter describes the research methods that were employed in the study. It begins with a description of the study design followed by the study population and sampling method. Next is the data collection instrument which includes an explanation of how it is administered to the sample and statistical methods used, and finally data processing, analysis and presentation are further described.

4.1.2. **Research Design and Methodology**

4.1.2.1. **Research design**

The research design used in this study is based on the quantitative paradigm. Specifically, a quantitative cross-sectional survey was employed. According to Burns and Grove (2005), the quantitative research is a formal, objective, systematic process in which numerical data are used to obtain information about the world. This research method is used to describe variables; to examine relationships among variables; and to determine cause-and-effect interactions between variables

In addition, Babbie and Mouton (2001) describe quantitative research as a formal method of collecting information systematically and objectively and involves analysis of numerical data. Its primary aim is to classify features, count them and construct statistical models in an attempt to explain what is observed.

Therefore using this approach allowed for the collection of data amongst a large number of undergraduate nursing students and made possible the facilitation of generalization and the comparison of the findings. The latter cannot be possible if a qualitative approach is used. Qualitative approach which is described as an approach that examine and interpret data based on what has already been covered (Polit and Hungler, 2006) can limit the potentials of the findings due to its subjective nature (Polit and Hungler, 2006). This approach also makes the collection and analysis of the proposed large participant size challenging.

A survey was used to obtain answers to the research questions as it is designed to obtain information regarding people's actions, knowledge, intentions, opinions, attitudes and value. In addition, a survey research is flexible and can be applied to many populations; hence it was suitable for the used sample size (Babbie and Mouton, 2001).

4.1.2.2. **Target population**

The term population refers to all components of the phenomenon, or all individuals and groups who are the subjects of the research problem that the researcher intends to investigate (Entwistle and Nisbet, 1970; Gay, 1976; Owdah and Alkalily, 2000; Obydat, 2003). Therefore, the target population of the current study involved all undergraduate nursing students of school of nursing at the University of the Western Cape.

4.1.2.3. **Sample size and sampling method**

Johnson and Christensen (2008) define the sample as "a set of elements taken from a larger population according to certain rules". Additionally, Cavana (2001) defines sampling as "the process of selecting a number of individuals for a study in such a way that the individuals represent the larger group from which they were selected". Sampling is an important step in

the research process, and its main purpose is to gather data representing the population of interest. The research findings based on the study sample are generalized to the whole population of interest.

In this study, probability sampling was used because this technique gives subjects of the population an equal and independent chance of being selected (Johnson and Christensen, 2008). To avoid biases, the appropriate sampling technique used in the current research was simple random sampling. With advantage of less complexity given to the size of the study population. In addition, this method can facilitate generalizations due to its representativeness (Polit, Beck & Hungler, 2006).Additionally, Cavana (2001) points out that random sampling is the best way to obtain a representative sample.

Based to the population parameter of 700 students with a margin of error of 5% and a 95% confidence interval, the minimum recommended size of the survey was set to 249 students. (Raosoft, 2004)

4.1.2.4. **Data collection method**

The researcher used the existing instrument established by Pei-Chen Sun et al (2008). The instrument was developed based on a number of existing data collection instruments done in previous studies which also focused on e-learning (Gattiker and Hlavka, 1992; Barbeite and Weiss, 2004); Joo et al., 2000; Thurmond et al., 2002; Arbaugh, 2000).

Information was collected by means of self-administered questionnaires, which incorporated SCALES (semantic differential scales) to measure attitudes. Five point Likert scales ranging from strongly disagree to strongly agree was used be used for the measurement of attitudes.

The purpose of the questionnaire was to assess the knowledge, skills and attitude of the students who took part in the study regarding the use of the computer, internet and e-learning. Students had one week to fill the questionnaires. After preparation and confirmation of validity and reliability with the pilot study, the researcher was given a permission to conduct the study by the Head of School of nursing and the Dean of Research at UWC. The questionnaire was distributed to the different year levels at the different dates. At this point it is worth mentioning that the students have shown cooperation and admirable response which has contributed significantly to the success of the study.

4.1.2.5. **Reliability test**

The instrument was tested for validity and Reliability using Cronbach alpha (α) coefficient before being used. Normally, the Cronbach coefficient of items' scale should be above 0.7 (Nunnally, 1978). The Cronbach coefficient of this study is 0.834 (table 4.6), which indicates that the scale that was used has a good internal consistency, that is, items that make up the used scale hang together. In other words, no single item in the scale suppresses the alpha level. Therefore, the e-learning attitudes scale used seems to be a reliable measure of attitudes towards e-learning.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.822	.834	60

Table 2: Reliability statistics

4.1.2.6. **Data Processing, Analysis and Presentation**

The data collected was processed and analyzed using the Statistical Package for Social Sciences (SPSS). The SPSS is one the most widely used statistical software in the academic Community throughout the world (Arksey and Knight, 1999; Foster, 1998; Moore, 2000; Slater, 1990). Data was analyzed using inferential and descriptive statistics (means and standard deviations) for univariate analysis, whilst, bivariate analysis was done using Pearson's correlation, independent samples t-test, one-way analysis of variance (ANOVA). These tools were used to determine the association between independent and dependent variables (attitudes towards e-learning). Finally, a multivariate analysis (stepwise multiple regression) was used to prove the significance of the variables (predictors). Data therefore was presented using descriptive statistics.

4.1.2.7. **Ethical considerations**

Ethical standards are an important issue that should be taken into account while conducting a research study. The researcher should deal with the participants and sites with respect (Creswell, 2008). In this regard, Johnson and Christensen (2008) pointed out that ethical issues such as deception, offering the privacy to individuals and emotions of participants should be addressed. As it can be seen from the implementation process of conducting the study that all the necessary formal consents have been obtained to carry out the study.

In addition the consent of the lecturer of the year levels was obtained to allow the researcher to administer the questionnaires in their classes. Participants also agreed to become involved in the study after being briefed on the nature and the purpose of the study, as well as the methods of data collections and the instruments that was used in the study. They were also told that they have the freedom to withdraw from the study or not to participate.

Additionally, Participants were assured that all information related to them would be treated as confidential and would not be used for any other purpose without their consent.

4.1.3. **Conclusion**

The aim of this chapter was to provide the reader with a clear picture of the research methods and instruments that were used to collect the data for this research and the reasons these methods and instruments have been employed. This included an explanation of how the instrument was obtained and how it was implemented on the research sample as well as the statistical methods that were used in the analysis of the data. The next chapter presents and discusses the research findings.

5. CHAPTER 4

5.1. DATA ANALYSIS AND DISCUSSION

5.1.1. Introduction

This chapter presents the results of the current study. Demographic characteristics of participants are described. Attitudes of undergraduate nursing students towards e-learning at the University of the Western Cape and the relationship between variables denoting attitude and learner's satisfaction as the control variable are examined. The factors influencing learner' satisfaction with e-learning are explored by means of multiple regression model and a summary of results is provided at the end of the section.

5.1.2. Description of demographic characteristics of participants and variables measuring their attitudes towards e-learning

In this study, 213 respondents participated, of whom 82.2% were females and 8.8% were males. The respondents' ages ranged from 19 to 50 with the majority (67.6%) being aged between 19 and 25. The majority of participants were Black / African (67.1%), followed by Coloured (29.6%) and White (3.3%), with no Indian population represented. Most of the respondents were also single and doing fourth year B Nursing 4 (84.5% and 47.9% respectively). More than a half of participants had a computer facility at home and training experience. The results are shown in table 4.1.

Variable	Frequency(n)	Percentage (%)
Gender		
Male	40	8.8
Female	173	81.2
Age group		
19-25 years	144	67.6
26-50 years	69	32.4
Race		
African / Black	143	67.1
White	7	3.3
Coloured	63	29.6
Asian / Indian	0	0.0
Marital status		
Single	180	84.5
Married	26	12.2
Divorced	4	1.9
Widowed	0	0.0
Living together	3	1.4
Year level		
B NURSING 2	66	31.0
B NURSING 3	45	21.1
B NURSING 4	102	47.9
Computer facility at home		
Yes	97	45.5
No	116	54.5
Computer training experience		
Yes	90	42.3
No	123	57.7

Table 3: Frequency distribution of respondents' social demographic characteristics (N=213)

Total scale scores for scales used in this study were calculated first before any statistical analysis. This included learner's satisfaction, attitude towards computers, learner computer

anxiety, learner internet self-efficacy, e-learning course flexibility, computer technology, internet quality, instructor feedback, diversity in assessment, perceived interaction with others and perceived ease to use. The means 'scores' and standard deviations of these variables were then computed (see table 4.2).

Variable	Mean	Std. Deviation	N
Perceived ease to use	6.42	2.444	213
Attitude towards computers	26.04	4.241	211
Learner computer anxiety	17.06	2.891	213
Learner Internet Self Efficacy	22.01	8.373	213
E-learning course flexibility	13.32	4.158	212
Computer technology	13.87	3.756	212
Internet quality	13.6	3.736	212
Instructor feedback	2.78	1.182	213
Diversity in assessment	2.5	1.119	213
Perceived interaction with others	18.67	3.859	213
Learner satisfaction	17.91	3.603	212

Table 4: Descriptive statistics of learner's satisfaction and variables measuring participants attitudes toward e-learning

The outcome variable of this study was learner satisfaction, which had a mean of 17.91 and a standard deviation of 3.603 (table 4.2). The independent-samples t-test results (see table 4.3) indicated that there was a statistically difference in mean scores' learner satisfaction between

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males and females was statistically significant at 5% level [t (55) =-2.263, p =0.028]. That is, males and females differ significantly in terms of their satisfaction levels as learners). The same analysis was done for other demographic variables having two outcome levels (age group, computer facility at home, computer training experience and Experience in e learning prior registering at UWC), but no statistically significant difference in mean scores' learner satisfaction between these groups as the p-values associated with their test statistics were above 5% level of significance.

t-test for Equality of Means						
					95% Confidence Interval of the Difference	
T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
-2.263	55.364	.028*	-1.492	.659	-2.813	-.171

*Significant at 5% level

Table 5: Test for equality of learner satisfaction means of males and females (equal variances not assumed)

The Analysis Of Variance (ANOVA) was also conducted to examine if there were differences in mean scores learner satisfaction and demographic variables with more than two outcome levels (marital status, race and year level). The results (see table 4.4) revealed that there was only a statistically significant difference at 5% level in mean scores 'learner satisfaction for the three year levels (B Nursing 2, B Nursing 3 and B Nursing 4) [$F_{2,209}$=3.535, p = 0. 031]. Post-hoc comparisons using the Tukey HSD test (table 4.5) indicated that the mean score for B Nursing 2 (M = 18.82, SD = 3.73) was statistically different from B Nursing 4 (M = 17.31, SD = 3.34). B Nursing 3 (M = 17.96, SD = 3.80) did not statistically differ from either B Nursing 2 or B Nursing 4.

Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	89.641	2	44.820	3.535	.031
Within Groups	2649.657	209	12.678		
Total	2739.297	211			

Table 6: ANOVA test of mean learner satisfaction by year level

(I) Year level	(J) Year level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
B NURSING 2	B Nursing 3	.860	.690	.428	-.77	2.49
	B Nursing 4	1.502*	.565	.023	.17	2.84
B NURSING 3	B Nursing 2	-.860	.690	.428	-2.49	.77
	B Nursing 4	.642	.637	.573	-.86	2.15
B NURSING 4	B Nursing 2	-1.502*	.565	.023	-2.84	-.17
	B Nursing 3	-.642	.637	.573	-2.15	.86

*The mean difference is significant at 5% level

Table 7: Post-hoc comparisons using the Tukey HSD test

5.1.3. Relationship between learner's satisfaction and variables measuring participants' attitudes towards e-learning

A Pearson correlation analysis was done to determine the relationship between learner's satisfaction and variables measuring participants' attitude towards e-learning. This is presented in the form of a correlation matrix in table 4.7. The results indicate that learner satisfaction is positively correlated with e-learning course flexibility ($r = 0.253$, $p < 0.001$), Computer technology ($r = 0.236$, $p < 0.001$), Diversity in assessment ($r = 0.159$, $p < 0.05$), Perceived interaction with others ($r = 0.206$, $p < 0.001$) and Perceived ease to use ($r = 0.346$,

p < 0.001). The remaining variables were not statistically associated with learner satisfaction since their p-values exceeded 5% level of significance.

|	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Learner satisfaction											
(2) Attitude towards computers	-.028										
(3) Learner computer anxiety	-.101	.420**									
(4) Learner Internet Self Efficacy	.123	-.232**	-.532*								
(5) E-learning course flexibility	.253**	-.002	-.177*	.271**							
(6) Computer technology	.236**	.001	-.136*	.275**	.493**						
(7) Internet quality	.119	-.061	-.125	.220**	.232**	.217**					
(8) Instructor feedback	.113	.076	.038	.010	.224**	.238**	.143*				
(9) Diversity in assessment	.159*	.024	.025	.012	.395**	.209**	.034	.225**			
(10)Perceived interaction with others	.206**	.127	-.008	.060	.369**	.437**	.103	.372**	.350**		
(11)Perceived easy to use	.346**	-.153*	-.201*	.268**	.416**	.378**	.227**	.071	.219**	.298**	

** Correlation is significant at 1% level, *Correlation is significant at 5% level

Table 8: Pearson correlation analysis

5.2. Multivariate analysis

A backward elimination multiple regression model analysis was used to examine first how well a set of variables (variables used in previous studies, namely the attitude towards computers, learner computer anxiety, learner Internet Self-Efficacy, e-learning course flexibility, computer technology, internet quality, instructor feedback, diversity in assessment, perceived interaction with others and perceived easy to use) are able to predict learner satisfaction. Attempt was also made to verify whether particular predictor variables are still able to predict learner satisfaction when the effects of other variables are controlled for (demographic variables in our case). The choice of this model was based on the fact that the dependent or outcome variable is continuous. All independent variables were entered in the model, and those that were not significant at 5% level were deleted to remain with a model with statistically significant predictors.

To avoid the violation of the basic assumptions underlying this method, we plotted the residuals of learner satisfaction to assess the normality assumption by the mean of the histogram. The results are shown in figure 1 and indicate the normality assumption can be assumed since the histogram of residuals shows a bell shape, which is an indication of a normal distribution. The correlation matrix (table 4.7) also indicated that there was no multicollinearity problem since no higher correlations were found between the independent variables ($r < 0.90$).
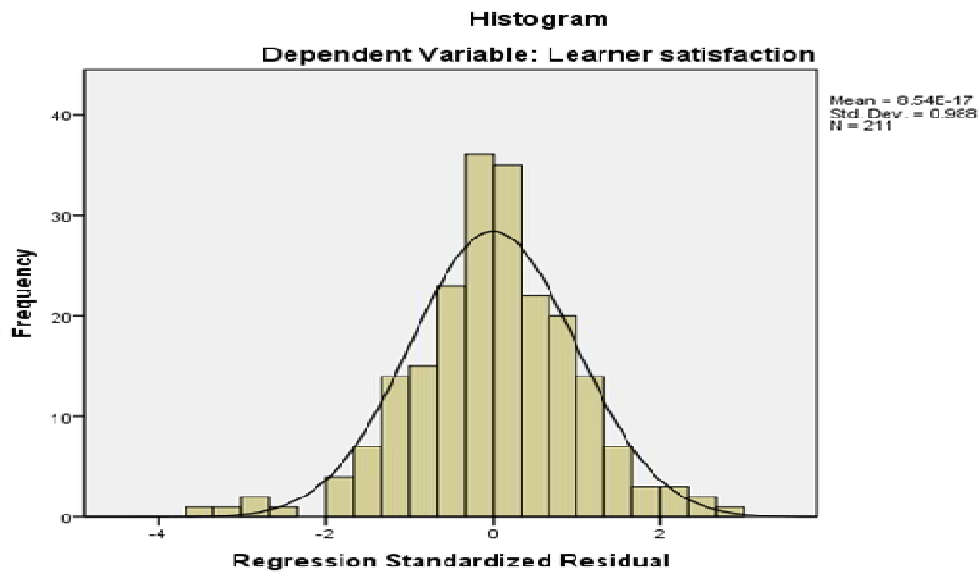
Figure 1: Normality test of the dependent variable (learner satisfaction)

The variables used in previous studies, as previously seen, were first entered in the model (table 4.8) and later, social demographic variables of respondents were also added to make a second and final model (see table 4.9). The first model explained 11.85% of the variance (0.1185 *100) whereas the second model (model as a whole) explained 15.8 % of the variance. It is important to realize that this second R change valued includes all the variables from both models, not just those included in the second step. It can be seen that the addition of demographic characteristics variables of respondents had contributed to the increase in R or variance explained by the model. The ANOVA test indicates that the model as a whole (model that includes all types of variables) is statistically significant [F(3, 205) =12.87; p < 0.001]. The first model (table 4.8) showed that the only factor influencing learner satisfaction is perceived easy to use (beta = 0.05, p < 0.001).

After controlling for demographic characteristics of participants (table 4.9), it was found that in addition to perceived ease to use, the gender and year level of participants are also important predictors of learner satisfaction with e-learning of nursing students at the University of the Western Cape. The results (table 4.9) indicated that for one unit increase in

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perceived ease to use, learner satisfaction increases by 0.508 unit points holding other variables (independent variables) constant. Learner satisfaction reduces by more than one unit points for students who are doing B Nursing 4 than for students who are doing B Nursing 2, and increases by 1.44 unit's points more in females than in males. This amount to say that B Nursing 4 students are less likely to be satisfied with e-learning than B Nursing 2 students, whereas female nursing students are more likely to be satisfied with e-learning than male nursing students.

Variable	Coefficient	Standard error	t	P > |t|	95% Confidence Interval (C.I.)
Perceived easy to use	0.509	0.096	5.270	0.000	[.318, .699]
Constant	14.651	0.663	22.10	0.000	[13.344, 15.958]
F(1, 207) = 27.82					
Prob> F = 0.000					
R-squared = 0.1185					

Table 9: Model 1 with variable used in previous studies

Variable	Coefficient	Standard error	t	P > │t│	95% Confidence Interval (CI)
Perceived easy to use	0.47	0.095	4.92	0	[0.281, 0.658]
Year level					
B NURSING 2* B NURSING 4	-1.066	0.469	-2.27	0.024	[-1.991, -0.140]
Gender					
Male*					
Female	1.443	0.601	2.4	0.017	[0.258, 2.629]
Constant	14.231	0.815	17.46	0	[12.624, 15.838]

F(3, 205) = 12.87

Prob> F = .0000

R-squared = 0. 1585

*Reference category

Table 10: Model 2 with variables used in previous studies and demographic characteristics of respondents

5.3. *Discussion*

5.3.1. **Level of satisfaction of undergraduate nursing students**

The level of satisfaction of undergraduate nursing students towards e-learning was measured using variables including e-learning course flexibility, computer technology, diversity in assessment, perceived interaction with others and perceived ease to use. The correlation analysis indicated that there was a positive relationship between learner satisfaction and the aforementioned variables.

5.3.2. E-learning course flexibility

E-learning course flexibility which was proven to be significant in this research had a positive relationship with e-learning. The vast literature on e-learning concur that flexibility of an e-Learning course is a strong indication of student satisfaction. This result corresponds to Arbaughand Arbaugh (2002) and Duray (2002), who's findings reveal that e-Learning course flexibility played an important role in perceived e-Learners' satisfaction.

In contrast to traditional classroom learning, e-Learning is not constrained by space, time and location; therefore, students have a high degree of flexibility and many self-paced learning opportunities this explains the positive attitude of undergraduate nursing students towards e-learning because e-learning offers the opportunity to effectively balance their practical work at the hospital with their theoretical studies on campus.
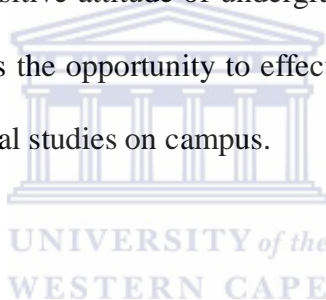
5.3.3.   Perceived interaction with others and perceived ease to use

Perceived ease of use has been applied to marketing and information technology areas to investigating new products or systems. In this research, perceived ease to use by undergraduate nursing students was proven to be significant and thus influenced their attitude towards e-learning. This result is consistent with previous researches that illustrates that perceive ease to use is critical factor in the context of information systems (Karahanna, Straub, &Chervany, 1999; Davis et al., 1989).

Furthermore, literature shows that perceived ease of use also has a significant impact on e-Learner attitude. Users' notion of ease of use is an important antecedent to perceptions of

attitude. According pointed out by Davis, Bagozzi, and Warshaw (1992) ''the easier a system is to use, the less effort required to carry out a given task''. An e-Learning system's ease of use makes it possible for individuals to devote their attention to learning the course materials instead of spending additional effort learning the instrument. Consequently, a higher learning satisfaction should exist.

5.3.4. Computer technology measurement

The results of the study show that computer technology has a significant effect on undergraduate nursing student's attitude towards e-learning at the University of the Western Cape. From interactions with students and observations of the technology in use today, it is reasonable to declare that the technologies used in e-Learning environments are fairly reputable.

E-Learning systems are constructed in a high-speed network environment where software and hardware are superior to those of non-e-Learning environment and because undergraduate nursing students at the University of the Western Cape Use blended learning (both traditional and e learning) it is a big challenge for most students who do parallel processing of multimedia streaming data.

As discussed in earlier sections, the significant effect exhibited in this research suggests that technology is important. However, it must be noted that the technology used in the e-Learning environment seems to be unsatisfactory to undergraduate nursing student at the University of the Western Cape. It is evident that poor technology with frequent technical difficulties discourages students to participate in e- learning courses.

5.3.5. **Diversity in assessment**

Diversity in assessment has a significant impact on perceived e-Learner satisfaction. As illustrated by Thurmond et al. (2002), when diverse evaluation methods exist to assess effectiveness of e-Learning, students' activities and processes might be corrected or improved through multiple feedbacks to achieve better performance.

Therefore, a variety of assessment methods can enable instructors to canvass learning effects from different aspects so that instruction may be more effective.

As for students, diversified assessment methods motivate them to display their best efforts in different evaluation schemes so as to proceed with e-Learning activities seriously and effectively. Hence, higher learning satisfaction occurred.

5.3.6. **Gender, Year level of participants, and Perceive ease of use**

The multiple regression model analysis showed that these variables predict, shape learner satisfaction of nursing students at the University of the Western Cape. This is depicted in the following regression model;

$$LS = ß_o + ß_1 \text{Perceived Ease to Use} + ß_2 \text{ Gender} + ß_3 \text{Year Level}$$

From the above model, LS denotes learner satisfaction and B_i are the regression coefficients that indicate the unit points increase or decrease in the independent variables or predictors (perceived ease of use, gender and year level of participants). Female students were found to be more satisfied with e-learning than male nursing students, whereas B NURSING 4 students appeared to be less likely satisfied with e-learning than B NURSING 2 students.

Hypotheses 5, 9, 10 and 11 were found to be significant and therefore supported by the results (table 4.7).

However, when learner satisfaction was taken as a function of many variables (significant variables in previous studies together with demographic variables of participants) in the regression model, only hypothesis 9 was significant, which is against what other studies such as the study by Pei-Chen Sun, et al. (2008) have found.

Therefore, it can be concluded that apart from gender and year level of nursing students at UWC, perceived ease of use of e-learning is the only factor that influences e-learner satisfaction of nursing students at UWC.

In sum, it must be noted that, the environment play a key role in enhancing e-learning, and or contributing to learners satisfaction. The participants in this research found the e-learning environment at the school of nursing conducive, which made it easy for them to comply with e-learning regulations.

These variables (perceived easy to use, gender and year level of students) have an impact on learner's satisfaction and they greatly seem to motivate learners' attitude towards e-learning. E-learning could become more effective if administrators take into account the effect of these variables on learners' satisfaction, when designing e-learning programmes. It can be deduced from the findings of this research that a higher learning satisfaction may exist because of these variables

6. CHAPTER 5

6.1. *CONCLUSION AND RECOMMENDATIONS*

6.1.1. Introduction

This chapter basically reiterates the study's aim and objectives and outlines the extent to which these have been achieved. It also summarizes the main findings, conclusions and provides recommendations for enhancing e-learning methods and improving the quality of technological skills of nursing students.

6.1.2. Realization of the objectives of the study

The study's aim has been to examine the attitude of undergraduate nursing students towards e-learning as a teaching and learning strategy at University of the Western Cape.

To this end, certain variables were identified and used to measure the attitude of undergraduate nursing students towards e-learning. These variables included e-learning course flexibility, computer technology, diversity in assessment, perceived interaction with others and perceived ease to use.

The objectives of the study were to:

1.   *Determine the satisfaction level of undergraduate nursing students towards e-learning at the school of nursing, UWC.*

2.   *Determine the factors that influence nursing students' satisfaction with e-learning at UWC.*

The data require to address the above objectives were collected using a research instrument developed by Pei-Chen Sun at al (2008), which has been reported to be valid and reliable.

This questionnaire assessed attitudes towards e-learning and consisted of a 5 point likert scale of 40 items and biography profile. In all 213 valid responses were collected and the analysis and results are presented in chapter four. The use of literature review also enabled the researcher to align the study with existing perspectives on e-learning methods. This also provided the basis through which the study enhanced and contributed to the knowledge on e-learning.

6.1.3. **Summary of findings and conclusion**

Several variables were designed to measure attitude of students towards e-learning. This included attitude towards computers, learner computer anxiety, learner internet self-efficacy, e-learning course flexibility, computer technology, internet quality, instructor feedback, diversity in assessment, perceived interaction with others and perceived easy to use. It should be noted also that learner satisfaction in this study is considered as a function of many variables some which include demographic characteristics of participants.

With about a 90% response rate, a total of 213 valid responses were collected. The statistical analysis (independent sample t-test) of the aforementioned variables that influence leaner satisfaction, show that males and females differed significantly in terms of satisfaction levels.

However, the same analysis applied to specific demographic variables having two outcome levels (age group, computer facility at home, computer training experience and experience in e-learning prior to registering at UWC), revealed no statistically significant difference in learner satisfaction between these groups.

Pearson correlation revealed that, learner satisfaction as a dependent variable is positively correlated with e-learning course flexibility, computer technology, diversity in assessment, perceived interaction with others and perceived easy to use. The remaining variables were not

statistically associated with learner satisfaction since their p-values exceeded 5% level of significance.

On the factors that influenced learners' satisfaction, a multivariate analysis (multiple regression) used in this study indicated that, perceived easy to use, gender and year level of participants are the only factors that predict or shape learners satisfaction with e-learning. When demographic variables

6.1.4. **Recommendations**

Indeed e-learning as an alternative to traditional face-to-face education has come of age. It has emerged since 2000 as a convenient method of teaching that is better suited for students or individuals who are constrained by time, distance and other factors that makes it impossible for them to have a physical engagement with an instructor. E-learning is conducted through a medium of technology, specifically the Internet and World Wide Web and computer assisted tools. This implies that learners' ability to use these complex tools is critical for a successful e-learning programme or course.

Learners' technological skills to a large extent influence their satisfaction with e-learning methods, programmes. This may also determine the success of e-learning courses within learning environments. Therefore in order to increase satisfaction levels of students with e-learning it is important for learners to be equipped with knowledge and skills on how to use computers and internet as these are the main tools for e-learning. Hence, a fundamental computer course for first year nursing students (for both males and females) is essential to better equip as well as reduce their anxiety towards e-learning for the years to come (they will need this skill as the study higher).

It is worth noting that instructors attitude towards e-learning is yet another factor that influence student's satisfaction levels. Students perceive easy to use e-learning methods may also depend on the instructors' attitude towards e-learning. An instructor demonstrating commitment and a positive attitude towards e-learning is more likely to erase the perception that students normally hold about e-learning being difficult to use. This positive attitude from instructors will boost learners' interest in e-learning. In this regard, it would be helpful to carefully design a criterion for selecting instructors and to put in place specific training for instructors.

The study also finds that learning course flexibility is an important factor that influences learners' satisfaction with e-learning. Course administrators should therefore design flexible e-learning programmes or methods that broadly capture the diverse needs of learners. It is prudent for learners to be given the chance to select among various e-learning courses or methods the one that conveniently enhances their learning.

The quality of e-learning courses is also vital for effective e-learning. Closely relate to this is the technology that is used to conduct courses. Thus both the content and technology should be designed to ensure that they are easy for students to grasp. Students' perceived easiness to use the technology and the entire course quality will have an impact on their satisfaction levels.

The current research has provided insight into learners' attitude towards e-learning and how e-learning and students' knowledge and skills can better be enhanced to ensure successful e-learning programmes and methods within educational institutions. It is thus the researchers believe that incorporation of the above cues will improve students attitude towards e-learning and facilitate or inform e-learning within the school of nursing at the University of the Western Cape.

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8. ANNEXURE

8.1. Research Questionnaire

<table>
<tr><td></td><td>Questionnaire #: _____

Date: _____2011</td></tr>
</table>

SURVEY: ATTITUDE OF UNDERGRADUATE NURSING STUDENTS TOWARD E LEARNING

I am conducting a survey on e learning as a teaching and learning method among undergraduate nursing students at the University of the Western Cape. The aim is to collect data regarding the knowledge and attitude of undergraduate nursing students toward e learning generally. **Your answers are very important.** Please note that all answers will be kept confidential and presented anonymously and scientifically. **Thank you for your participation!**

Demographic profile

Please indicate the appropriate response to each item as it applies to you

1. Gender

Male	Female

2. **Age** _____ years

3. **Race**

African/Black	White	Coloured	Asian /Indian

4. **Marital status**

Single	Married	Divorced	Widowed	Living together

5. Year level

B.Cur 2	B.Cur 3	B.Cur 4

Do you have a Computer facility at home?

Yes		No	

 Do you have computer training experience?

YES		NO	

Did you have experience in e learning prior to registering at UWC?

YES		NO	

Attitude toward computer, learner computer anxiety and learner internet self efficacy

 Indicate with an X the extent to which you agree or disagree with each STATEMENT in the right hand column
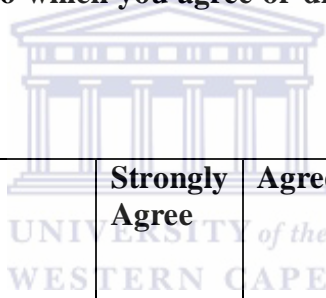
STATEMENT	Strongly Agree	Agree	Don't know	Disagree	Strongly disagree
I believe that working with computer is very difficult					
I believe that working with computer is very complicated					
I believe that working with computer requires technical ability					
Working with computer let me feel psychological stress very greatly					
Working with computer is only advisable for people with a lot of patience					
Computer make a person more productive					
Computer is for young people's only					
I feel confident in using computers to connect to the Internet					
Working with computer would make me very nervous					

STATEMENT	Strongly Agree	Agree	Don't know	Disagree	Strongly disagree
I get a sinking feeling when I think of trying to use a computer					
Computer make me feel uncomfortable					
Computer make me feel uneasy and confused					
I feel confident starting the internet program					
I feel confident connecting to the internet homepage that I want					
I feel confident finishing the internet program during connection					
I feel confident downloading necessary materials from the internet					
I feel confident linking to desired screen by clicking					
I feel confident going to previous pages by using "back" function					
I feel confident going to the next pages by using "forward" function					
I feel confident scrolling around the monitor screen					
I feel confident using internet search such as yahoo					
I feel confident locating necessary information on the internet for a specific topic					
I feel confident printing material from internet					
I feel confident finishing the internet program					

Indicate with an "X" the extent to which you agree or disagree with each in the right hand column.

E learning course flexibility, computer technology and internet quality and instructor feedback.

Statement	Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree
Taking this class via internet allowed me to arrange my work for the class more effectively					
Taking this class via internet saved a lot of time commuting to class					
Taking this class via internet should allow me to finish my degree more quickly					
taking this class via internet allowed me to take a class I would otherwise have to miss					
There was no serious disadvantage to taking this class via the internet.					
Conducting the course via internet improved the quality of the course compared to other courses.					
I would rather listen to a lecture than read the material from a computer screen					
I feel the technology used in e learning course are very easy to use					
Technology used have many useful functions					
Technology used have good flexibility					
Technology used are easy to use					
I feel satisfied with the speed of the intern					
I feel the communication quality of the internet is not good					

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Statement	Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree
I feel the fee to connect to the internet is very expensive					
I feel it is easy to go online					
I feel the quality of the course I took was largely unaffected by conducting it via internet.					
I received comments on assignments or examinations for this module in timely manner.					

Diversity in assessment, perceived interaction with others and perceived ease to use and learner satisfaction

Indicate with an 'X' the extent to which you agree or disagree with each STATEMENT in the right hand column

Statement	Strongly agree	Agree	Don't know	Disagree	Strongly Disagree
This e learning course offered a variety of ways of assessing my learning (quizzes, Written work, oral presentation, etc.)					
Student to student interaction was more difficult than in other courses					
Class discussion were more difficult to participate in than other courses					
I learned more from my fellow students in this class than in other courses					
The instructor frequently attempted to elicit student interaction					
Interacting with other students and the instructor using web based learning system became more natural as the course progressed.					
I felt that the quality of class discussion was high throughout the course					

Statement	Strongly agree	Agree	Don't know	Disagree	Strongly Disagree
It was easy to follow class discussions					
Class dynamic were not much different than in other courses					
Once we became familiar with the web based learning system, it had very little impact on the class.					
It would be easy for me to become skillful at using e learning system.					
Learning to operate e learning system would be easy for me					
I would find e learning system easy to use					
I am satisfied with my decision to take this module via internet					
If I had an opportunity to take another course via internet, I would gladly do so.					
I feel that e learning served my needs well					
I was disappointed with the way e learning worked out					
If I had to do it over, I would not use e learning					
Conducting this module via internet made it more difficult than other modules I have taken.					

8.2. Consent form

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2271, Fax: 27 21-959 2679
E-mail: akimanimpaye@yahoo.com or 2414761@uwc.ac.za

CONSENT FORM

Title of Research Project: Attitude of undergraduate nursing students toward e learning.

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name………………………..

Participant's signature…………………………………

Witness………………………………..

Date………………………

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Study Coordinator's Name: Mrs. L.Fakude

University of the Western Cape

School of Nursing

Private Bag X17, Belville 7535

Telephone 021 959 3566

Fax: (021) 959 2679

Email: lfakude@uwc.ac.za