

**UNIVERSITY OF KWAZULU-NATAL**

**FACILITATION OF THE DEVELOPMENT OF BLENDED E-LEARNING  
MODEL FOR NURSING EDUCATION IN A RESOURCE-CONSTRAINED  
EDUCATIONAL SETTING IN NIGERIA**

**By**

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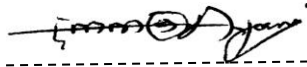
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**February, 2016**

## DECLARATION

I Emmanuel Olufemi Ayandiran, hereby declare that this thesis titled ‘Facilitation of the Development of Blended E-learning in a Resource-Constrained Educational Setting in Nigeria’ is my original work. The thesis, supervised by Professor N.G. Mtshali, has been submitted for any purpose at any university. All written sources (scholarly works) used in this thesis have been properly acknowledged and referenced.



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**Emmanuel O. Ayandiran**

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**Prof N.G. Mtshali**

## **DEDICATION**

This thesis is dedicated to the memory of my late father, Pa Zacheus Ajala AYANDIRAN who taught me the paediatrics of writing and whose passionate desire is to have his children thoroughly educated.

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Writing and completing a PhD thesis is a pivotal achievement. While it is a feat that demands a lot of hard work from the principal author, it is never a solo journey. Indeed, it has been a long walk, but a worthwhile journey. The almighty God, the author of life, has been faithful. I owe all the wisdom and inspiration to Him.

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## ABSTRACT

Nursing education in Nigeria has passed through many waters. The purpose of the study was to facilitate the design, development and testing of a blended e-learning model for nursing education in a resource-constrained educational setting in Nigeria. The study has as its specific objectives to: assess the current modes of delivery of nursing education and stage of development of e-learning in nursing education in Nigeria; establish the perceptions of e-learning as a mode of teaching and learning among nursing stakeholders (nursing students, nurse academics, nurse practitioners, nursing administrators and nursing leaders); appraise the nurses' computer literacy level, their computer skills and e-learning experiences. Others are to: explore the contextual factors and antecedents (preconditions) necessitating the use of e-learning in nursing education in Nigeria; examine the essentials for developing and testing a blended e-learning model in the Nigerian context; and pilot the developed blended e-learning model.

The Khan Framework for E-Learning and the Garrison and Anderson's Community of Inquiry Model served as the theoretical underpinning for the study. The study adopting the education action research approach has pragmatism as its philosophical stance. The study design comprises three serial cycles (the assessment/exploration, development and the implementation/testing cycle), reminiscent of action research. Each cycle was a complete mini study and consisted of an iterative cyclical loop of sequential steps of problem identification, planning, acting, observing, and reflecting that necessitated the concurrent use of quantitative and qualitative research designs.

Cycle 1 (the assessment / exploration cycle) employed a complimentary quantitative / qualitative data collection approach. Quantitative data were collected with the aid of an adapted structured questionnaire administered on a cluster sample of 402 nurses selected across the six geo-political zones of Nigeria, and qualitative data gathered through key informant interviews of 16 purposively selected information-rich nursing leaders. Quantitative data analysis done with the aid of SPSS 21 employed both descriptive (frequency count, percentage, mean) and inferential statistics (such as Pearson Chi-square and Kruskal-Wallis tests), while qualitative analysis employed content analysis technique, with both quantitative and qualitative findings integrated.

The development cycle (Cycle 2) adopted majorly qualitative design utilizing critical reflection, synthesis of findings from the preceding needs assessment/exploration cycle, the use of reflective journal, brainstorming and consultative sessions with research team, to develop the theoretical blended e-learning model. The evolving model was critically reviewed and progressively refined before piloting. The final cycle, the implementation / testing cycle (Cycle 3), adopted a case methodology design to pilot the developed blended e-learning model among two purposively selected arms (1st and 4th year) of the part-time bachelor of nursing science students. Two nursing modules previously taught via face-to-face mode were administered using the newly developed blended e-learning model over a period of one semester. A pre- and post-test survey and focus group discussions held (one among the students and the other among teaching staff) to assess the effectiveness and suitability of the model for deploying nursing education.

Results showed that a majority (69.4%) of the nurses holds only professional diploma qualifications in nursing. The computer literacy and computer skill of the nurses though adjudged as largely fair, the 34% that had poor computer literacy and the 32.8% of the nurses that exhibited poor computer skill is a cause for concern. A majority (73%) of the nurses had no prior learning experience in computer, thus the need for inculcation of a computer appreciation programme into the proposed blended e-learning model. There was however a generally positive perception of e-learning as a mode of teaching and learning among Nigerian nurses (79.6%). There was also a significant relationship between computer literacy and nurses' perception of e-learning ( $p < 0.05$ ); and nurses' perception of e-learning and their e-learning experiences ( $p < 0.05$ ).

The antecedents for use of e-learning for nursing education in Nigeria are development and globalization, technological advancement, internet revolution and policy directives from the NUC. Contextual factors established by the study include: massive demand for university education in nursing, growing dissatisfaction with diploma professional nursing qualifications among nurses, the need to enrich the learning experience of nurses undergoing ODL baccalaureate nursing programme while at the same time lessening the burden experienced by those enrolled in the programme. Yet significant is the unearthing of some challenges to the use of e-learning for nursing education in a typical resource-constrained environment which include: inadequate power supply; inadequate interconnectivity; lack of infrastructure; and ignorance-related issues. Further, the study established the following as the essentials for

developing and testing a blended e-learning model in a resource-constrained educational setting: an eye that sees possibilities, institutional readiness; good planning; support at different levels (individual, institutional, national); collaboration (holistic teamwork); 360 degree feedback, robust project management, policies and strategic direction.

The developed blended e-learning model for nursing education in a resource-constrained educational setting was piloted for a whole semester (about 4months). The result of the piloting showed that the developed model was not only found suitable by both learners (students) and the instructors but largely effective at achieving learning objectives. It was noted that its use has facilitated an increase students' involvement in their own learning and the use of multiple teaching-learning approaches. While certain itches (inadequate student-student and teacher-student interaction secondary internet connectivity problems and tablet-related issues) were experienced, the model has proven to be a useful tool for increasing access to nursing education while not compromising on the quality of learning.



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# CHAPTER ONE

## 1.0 CONCEPTUALIZATION AND BACKGROUND TO THE STUDY

### 1.1 INTRODUCTION

E-learning is gaining an educational foothold all over the world (Gunasekaran, McNeil, & Shaul, 2002; Ruiz, Mintzer, & Leipzig, 2006; Allen & Seaman, 2007; Chikte & Khodowe, 2010). Its' multiple benefits which include its flexibility; convenience; great adaptability to learners' needs; cost effectiveness; and its propensity to make learning student-centred (McPherson, 2005; Meyer, 2007) and its' potentiality to facilitate simultaneous independent and collaborative learning experience (Garrison & Kanuka, 2004) makes it one of the most suitable platform for deploying distance learning in many parts of the world. The grandeur of e-learning is that learners can be independent of space and time – yet together (Community of Inquiry). Building competencies of professional practitioners without moving them away from their workplaces have therefore become plausible through the instrumentality of e-learning.

However, despite the phenomenal growth of e-learning and the transforming power of Information Communications Technology (ICT), Nigeria is yet to fully take advantage of the transformative potential of this cutting-edge technology in her formal and informal education sector. Adomi and Kpangban (2010) for instance bemoan the low rate of ICT adoption and application in Nigerian secondary schools in spite of the proven dividends of enhancing quality education and skilled human development. Ololube, Ubogu, and Egbezor (2007) similarly reported that the integration and diffusion as well as impact of ICT on distance learning in the Nigerian higher education has in the least been sub-optimal. Furthermore, there are anecdotal reports of scepticism regarding the adequacy of e-learning platform as a stand-alone for educating professionals in practice disciplines like Nursing without watering down the quality of education, hence the preference for the dual mode of learning (Blended e-learning).

Nursing education in Nigeria though had evolved over time into formal organised basic, post-basic and university programmes, is still dominated by the basic hospital training programme run under the aegis of the Ministry of Health. Recent transformation in nursing has however resulted in the articulation of the Bachelor of Nursing Science as the basic level of professional practice. One immediate effect of this is that many nurses with basic certification for nursing practice are opting for degree programme in Nursing, making demand for

university nursing education to further outstrip the supply. The recognition that many of the nurses who are currently in full employment may not be able to leave their jobs led to the emergence of the part-time degree programme being implemented by the Department of Nursing Science, Obafemi Awolowo University (OAU), Ile-Ife, using mainly face-to-face mode of delivery and minimal e-learning approach. While the part-time bachelor of nursing science programme has contributed immensely to academic progression and upward career mobility of the basic and post-basic nurses, its utility is hampered by time and space constraint; travel fatigue and accidents. The above consideration makes OAU to rethink blended e-learning for nursing education.

This introductory chapter therefore presents the general background to the study, problem statement, purpose and objectives of the study. It also includes a section on the research questions, significance of the study, and operational definition of key terms used in the study. The chapter closes with a layout / structure of the thesis.

## **1.2 BACKGROUND TO THE STUDY**

From the dawn of civilization to the present, evidence prevails that education is the bedrock of development. The opposite is equally true that illiteracy is the bane of development, whether at the individual, household, community, national or professional level. This explains why every society through the ages, from the most primitive to the most developed, have evolved one form of education or the other, be it indigenous or western.

The term education, according to Uwaifo and Uddin (2009), has not lent itself to any strict consensual definition as it depends on the perspective from which it is viewed. The authors nonetheless defined it as the process of acquiring knowledge, skills, attitudes, interests, abilities and the cultural norms of a society by people so as to transmit the way of life to the coming generations in order to enhance perpetual development of the society. This again reinforces the indispensability of education at the micro and macro levels of development. Beyond the discourse of education within the context of society, education in organized curricula provides for teaching-learning for professional development, growth and practice. Such curricula also recognize the need for learning in the cognitive, psychomotor and affective domains, hence the usual consideration for whatever will enhance knowledge acquisition in these three main domains. In recent times, the need to improve quality and access to education generally and for professional development has made demands for use of information and communications technology (Kokol, Blazun, Micetić-Turk, & Abbott, 2006).

In the world of the 21<sup>st</sup> century, knowledge is driven by information and communications technology (ICT), and the education of health professionals has been significantly influenced by the enormous volume of information that is accessible through electronic media. Technology enhanced education has not only advanced the knowledge explosion that ultimately influenced the education of the health professions and health care delivery system, but has also improved access to information by consumers of health care. The knowledge explosion has given health professionals a better understanding of human nature and diseases in stimulating new discoveries in drug therapies, and identifying changing trends in disease patterns and the changing nature of consumers of health care. This in turn demands efficient use of technology to advance teaching and learning. The knowledge explosion, along with the current market-driven economy, dramatic technological developments and changing demographics have created a climate of rapid change in health care and educational institutions (Oermann, 1994; Lindeman, 2000; Heller, Oros, and Durney-Crowley, 2000).

The advent of telemedicine, telenursing, telehealth, distance learning, e-learning/virtual learning, expanding diversity, emergence of better informed consumers, and increased complexity of care in a more complex environment have combined to make the 21<sup>st</sup> century healthcare system increasingly complex and challenging. All these have culminated in changing the environment of nursing education and practice, which thus influences the delivery of health care. There is therefore a call for a nursing workforce who are suitably educated and prepared for the expanding role of the nurse, the acceleration of health care delivery changes and the ever increasing need for community based care (American Association of Colleges of Nursing, 2000; American Organization of Nurse Executives, 2008). Nursing education must take cognizance of all these challenges and plan for appropriate reforms in terms of curricula contents, modes of delivery of curricula in pre-service and continuing professional development education for new entrants and practitioners respectively.

As Choules (2007) observed with medicine, which is also applicable to nursing, students and practitioners, in acquiring extensive knowledge, skills and attitudes, must achieve a large number of learning objectives in the cognitive, psychomotor and affective domains of learning to be considered competent to practice. In the last few decades the acquisition of learning objectives in both undergraduate and postgraduate medical (and nursing) education is being achieved by a mixture of modalities, including apprenticeship, didactic teaching



(lecturing), self-study and small group learning, with high deployment of information technology, especially through electronic learning.

Apart from the education of students, from neophytes to postgraduate levels, practitioners, as competent nurses, are needed to work in an evolving sophisticated healthcare team alongside specialists from other health professions. Tele-medicine/nursing has made it possible to build the competencies of these practitioners without moving them away from their workplaces, thus supporting care within the context of continuing professional development programmes. Empirical evidence has shown that better patient outcomes can be attributed to higher levels of nursing education and competence (American Association of Colleges of Nursing [AACN], 2000; National Advisory Council on Nurse Education and Practice [NACNEP], 2001; Bartels, 2005; Reams & Stricklin, 2006; American Organization of Nurse Executives, 2008).

High level competence is associated with the ability for scientific reasoning and critical reasoning. These are only achievable within higher education and specialization through creative and innovative educational programmes that deploy information technology maximally. The vast advancement in science and technology in today's digital age has made available an enormous amount of knowledge and is still growing exponentially (Siemens, 2004). The half-life or, better still, the shelf-life of knowledge (i.e. the time span from when knowledge is gained and when it becomes obsolete) dwindles so quickly (Gonzalez, 2004) that lifelong learning has become an imperative option. This coupled with quick changes in the field of ICT is forcing educational and other institutions to think about different ways of teaching and learning in both formal and informal environments (Kokol, Blazun, Micetić-Turk, & Abbott, 2006). The challenge, thus, for quality assured nursing and professional development is that of guaranteeing access to standard pre-service and post qualification continuing education programmes and lifelong learning through innovative methods, particularly blended e-learning.

The letter "e" in e-learning does not connote electronic as many will be quick to state. Over the years there have also been various conceptualizations of the term, of which literature is replete: electronic supported learning and teaching, computer-enhanced learning, web-based learning, virtual classrooms, cost-effective online training, cyberspace learning environments, computer-driven interactive communication, distributed learning, digital training, and borderless education, to mention a few (Tavangarian, Leypold, Nölting, Röser, & Voigt,

2004; Guri-Rosenblit, 2005). Although it is indisputable that the term is still evolving, this study employs an adaptation of two definitions. The first, by Jeurissen (2004), views e-learning as the use of innovative technologies and learning models to transform the way individuals and organisations acquire new skills and access knowledge; and the second, by Aldrich (2004), conceptualizes e-learning as a broad combination of processes, content, and infrastructure to use computers and networks to scale and/or improve one or more significant parts of a learning value chain, including management and delivery. Put together then, e-learning can simply be construed as technology or ICT enhanced learning and teaching or learning facilitated through the use of ICT. According to Beetham (2004), this definition is relatively uncontested, though some would want to limit e-learning to the use of *computer-based* technologies, or even more narrowly to *networked, computer-based* technologies, thus excluding free-standing devices such as electronic whiteboards and residually analogue media such as video.

The word blended literarily means to thoroughly mix different things together or to produce a pleasing combination with no conspicuous part or noticeable transitions. However, defining the term blended learning is not as straightforward. To say the term lacks a unified definition is like stating the obvious, as a variety of definitions addressing different aspects of instruction exist. While most authors concur that blended learning involves the thoughtful fusion of face-to-face and online learning experiences, there is recognition that blended learning may also include different combinations of technologies, pedagogies and contexts (Graham, 2006; Stacey & Gerbic, 2007; Garrison & Vaughan, 2008; Mackey, 2008). Garrison and Kanuka (2004), for instance, observed that blended learning is both simple and complex; at its simplest, blended learning is the thoughtful integration of classroom face-to-face learning experiences with online learning experiences, but then there exists at the other extreme a considerable complexity in its implementation with the challenge of virtually limitless design possibilities and applicability to so many contexts. Similarly, Mackey (2008), making reference to a number of other scholars, declared that defining blended learning is far from simple as there is a lack of consensus ranging from those who suggest the term is so broad that it embraces all learning and is therefore bereft of real meaning (Masie, 2006; Oliver & Trigwell, 2005), through to those who suggest it is a complex concept, which offers transformational potential for learning (Cross, 2006; Singh, 2006). This controversy and the need for clear conceptual definition inform the study title – ‘Blended E-learning’.

Given that nursing is as much a practice profession as an academic discipline, this amalgamated approach therefore holds great promises for higher-order learning, while at the same time providing a platform for lifelong learning. The multiple benefits of e-learning/blended learning include its flexibility, convenience, great adaptability to learners' needs, cost effectiveness, improved pedagogy and propensity to make learning student centred (McPherson, 2005; Meyer, 2007). Furthermore, the inherent ability of asynchronous Internet communication technology to facilitate a simultaneous independent and collaborative learning experience, the hallmark of higher education (Garrison & Kanuka, 2004), makes it one of the most suitable means by which distance learning is deployed in many parts of the world. While distance learning by its very definition denotes the physical separation of learner from the instructor/facilitator, at least at certain stages of the learning process (Keegan, 1988; O'Brien & Shiro Geist, 1995; Guri-Rosenblit, 2005), the beauty of the blended e-learning approach is that learners can be independent of space and time – yet together (community of inquiry).

Scholars (Swan, 2001; Garrison & Cleveland-Innes, 2003; Garrison & Kanuka, 2004) have however being apt to identify that much of the satisfaction and success of blended learning experiences are attributable to the interactive capabilities of Internet communication technology and at the heart of this argument is the quality and quantity of the interaction and the sense of engagement in a community of inquiry and learning, achieved through the effective integration of Internet communication technology. Garrison and Kanuka (2004) posit further that a concomitant property of learning with Internet communication technology is that it has a significant educational implication resulting from its emphasis on written communication, stressing that under certain circumstances, writing can be a highly effective form of communication that encourages reflection and precision of expression. As such, when thoughtfully integrated with the rich dynamic of fast-paced, spontaneous verbal communication in a face-to-face learning environment, the educational possibilities are multiplied. In view of this and the increasing evidence that ICTs are transforming much of society, there is little reason to believe that it will not be the defining transformative innovation for higher education in the 21st century (Garrison & Kanuka, 2004; McPherson, 2005; Meyer, 2007).

Nonetheless, in an increasingly electronic world, transformation of learning environments in higher education settings is critical to ensure that the benefits are fully realized (Williams,

2002). In Nigeria, the transformation in nursing over time has led to the articulation of a bachelor degree in nursing as the basic level of professional practice. One immediate effect of this is that many nurses with basic certification for nursing practice are opting to pursue the degree programme in nursing. This demand and the recognition that many nurses are currently in full employment and may not be able to leave their jobs led to the emergence of the part-time degree programme currently being implemented by the Department of Nursing Science, Obafemi Awolowo University (OAU), Ile-Ife, using mainly face-to-face mode of delivery and minimal e-learning approach.

Akin to that is the need for nurses to keep abreast of new developments in their fields of specialization through acceptable and sustainable continuing education programmes, a task that has remained a challenge thus far. In an earlier study titled 'Planning Health Education: Internet and Computer Resources in South-western Nigeria', Oyadoke, Salami, and Brieger (2001) observed that although the use of the Internet as a health education tool and resource in health education planning is widely accepted as the norm in industrialized countries, access to computers and the Internet is quite limited in developing countries where not all licensed service providers operate; telephone connections are unreliable; and electricity supplies are intermittent. Ololube, Ubogu, and Egbezor (2007) similarly observed that the integration and diffusion as well as impact of ICT on distance learning in Nigerian higher education has been sub-optimal because of certain challenges, such as inconsistent government policies, lack of funding, institutional problems, inadequate infrastructural facilities and human capital problems.

Using the state of e-learning in the developed world as a standard of what e-learning practice should be, Oye, Salleh, and Iahad (2011) examined other challenges confronting the implementation of e-learning in Nigeria. Notable among these challenges are the need for stable internet connectivity and the issue of ICT training for university staff. These findings, no doubt, make Nigeria a resource constrained setting. It is within these constraints and the emergent context that the 21<sup>st</sup> century Nigerian nurse must of necessity imbibe the dynamics of changing learning modes pre-service and in practice as her roles expands beyond being a care provider, to an educator, a collaborator, a manager/supervisor and a researcher among others. These forces of change have reinforced the need to take a holistic view at the need and applicability of e-learning in nursing education in the peculiar Nigeria socio-economic environment.

There are various factors strengthening the need for e-learning in Nigeria, ranging from individual, organizational to national factors. The first, and perhaps the most significant, is Nigeria's drive to enhance access to quality education, improve maternal health and increase human capacity development, all of which are fundamental to achieving the Millennium Development Goals (MDGs). Nigeria, the world's most populous African nation, is currently plagued with high infant and maternal mortality. Yet it is a fundamental truth that the attainment of the Millennium Development Goals (MDGs) the world over is human capital intensive. For Nigeria to succeed in her 'Vision 2020', she needs increased services of well trained, up-to-date professionals especially the healthcare professionals, which is only attainable through the platform of human capacity building. Nurses are particularly vital to the attainment of MDGs in Nigeria because they constitute the major providers of health care services, particularly for maternity care (Gerein, Green, and Pearson, 2006). As the most readily available healthcare providers to the underserved populations and by very nature of their work and their closeness to community people, investing in the development of this group of healthcare professionals will no doubt bring about a sharp drop in the unenviable maternal and infant mortality record of Nigeria within a relatively short time.

Another factor is the inadequacy of the current traditional methods of education. With uneven access to even basic education, there is a huge challenge in meeting the massive need for continuing education and professional development of nurses post qualification in Nigeria. Kanwar and Daniel (2009) observed the inadequacy of existing institutions to cater for the rising demand. Currently, over a million candidates sit for the Unified Tertiary Matriculation Examination (UMTE) annually. The 104 universities in Nigeria can only absorb about 225,000 new entrants out of which a small proportion are accepted into the few accredited nursing departments in the country. As at July 2015, there are only 21 accredited Departments of Nursing in the Nigerian universities with only four hosting postgraduate nursing programmes. This has made demands for higher education in nursing to persistently outstrip the supply. As Ojo (2010) earlier noted, this presents a daunting challenge to capacity building, as well as the development and utilization of evidence-based practice and best practices in nursing in Nigeria. In essence, demands for higher and professional education in nursing in Nigeria far outstrip the supply. This gap in Daniel's (2006) view has made e-learning a veritable tool for radical improvement in scope and scale of learning.

A third factor involves geographical difficulties that add to the stress of students undergoing the part-time bachelor degree programme in Nursing Science at the Obafemi Awolowo University, Ile-Ife, many of whom have to travel long distances to attend lectures on a weekly basis, sometimes abandoning their duty posts and damning the consequences. They also face the associated risk of road accidents.

The fourth factor promoting the need for e-learning in Nigeria is its phenomenal growth worldwide, its pervasive effect on the development and transmission of knowledge (Rossett, 2002; Welsh, Wanberg, Brown, & Simmering, 2003) and the success that trails the use of e-learning in the education and training of nurses in other parts of the world, such as the United States of America, the United Kingdom, South Africa and Asian countries (Chang, Sheen, Chang, & Lee; Williamson, Maramba, Jones, & Morris, 2009; Moule, Ward & Lockyer, 2010).

The last, but not the least, factor is that to date, no clear and specific e-learning models for academic and professional development of nursing exists in Nigeria. Ajuwon (2003) observed that although several studies in different countries have explored the extent to which health science students use the computer and the Internet, little research is available on this subject in Nigeria. In a recent study on e-learning uptake and associated barriers among nurses in a teaching hospital in south-west Nigeria, Irinoye, Ayandiran, Fakunle, and Mtshali (2013) observed that nurses in the teaching hospital lacked the skills and competencies needed to advance ICT-moderated and evidence-based care, as desirable for the 21<sup>st</sup> century healthcare system, and that the required tools (computer; Internet access) are also not within the reach of these nurses. The question that readily comes to mind is that ‘is this a general phenomenon or a case of an isolated few’? This question is quite pertinent because the study was conducted in just one of the many teaching hospitals in the country, hence making generalization difficult.

Nonetheless, since nursing is as much a practice profession as an academic discipline, and an internationally mobile occupation whose practitioners are in short supply all over the world, it becomes necessary to think about adopting a more flexible and cost effective means of training as opposed to the traditional face-to-face classroom teaching; a vision that has become plausible using the e-learning platform. However, it is evident that this can only be successfully implemented in the context of the peculiar Nigeria socio-cultural and economic milieu.

Garrison and Kanuka (2004) contend that the real test of blended learning is the effective integration of the two main components (face-to-face and Internet technology), as a blended learning design represents a fundamental re-conceptualization and reorganization of the teaching and learning dynamics, starting with various specific contextual needs and contingencies (e.g., discipline, developmental level, and resources). Implicit in this statement is that no two blended learning designs are identical. To this end, this study assesses the modes of delivery of education for nurses as well as the state of development of e-learning in nursing education in Nigeria. It also examines the issues of nurses' perceptions of e-learning, computer literacy, contextual factors/antecedents necessitating the application of e-learning, and key supports needed for engagement in e-learning in nursing in Nigeria with a view to ultimately develop a suitable blended e-learning model for nursing education in Nigeria.

### **1.3 STATEMENT OF RESEARCH PROBLEM**

E-learning is gaining an educational foothold all over the world (Gunasekaran, McNeil, & Shaul, 2002; Ruiz, Mintzer, & Leipzig, 2006; Allen & Seaman, 2007; Chikte, & Khondowe, 2010; <http://training.amref.org/index.php>). Littlejohn and Pegler (2007) declares that the integration of our physical world with the digital domain is becoming ubiquitous. In Littlejohn and Pegler (2007) words 'everyday thousands of new digital communities are created across the world and online social spaces are gaining rapid popularity'. The extensive use of e-learning, its impact on distance learning, as well as its impact on improving access to learning for both students and practitioners in the first world and a few developing countries are thus not in doubt (Rossett, 2002; Welsh, Wanberg, Brown, & Simmering, 2003; Punie, Zinnbauer, & Cabrera, 2006; University of South Africa – [www.unisa.ac.za/](http://www.unisa.ac.za/); University of Maryland – [www.umd.edu/](http://www.umd.edu/)). However, despite the phenomenal growth of e-learning and the transforming power of ICT, scholars (Garrison & Anderson, 2000; Laurillard, 2002; Britain & Liber, 2004) have observed that its influence in traditional educational institutions has been weak – in reality, little more than an enhancement of current practices. Thus e-learning has yet to make a significant impact on the quality of teaching and learning, and pedagogical innovation; even though these are most commonly cited as key drivers.

One factor that has been clearly implicated in this trend is the dearth of e-learning theory. Beard, Wilson and McCarter (2007) observe that e-learning is frequently technology-led rather than theory-led. Anderson, Corbett, Koedinger and Pelletier (1995) hit the nail on the head when they declared that there are really no models of e-learning, what is rather available

are e-enhancements models of learning. In more recent writings, Anthony, Picciano, (2014) making reference to the works of other scholars (Drysdale, Graham, Spring, & Halverson, 2013; Graham, 2013; Graham, Spring, & Drysdale, 2012) decry limited efforts invested on understanding the development and use of theory in the domain of blended learning research. Ravenscroft (2001) suggests that this has made education technology-led rather than theory-led. Yet developing models and theory is essential to the knowledge creation process (Anthony, et al., 2014). Apart from that, it is generally believed that reforming practice requires transformations of understanding of principles that are assumed – sometimes implicitly – in the practices (Mayes & de Freitas, 2004).

Besides, it has been observed that designers of online courses faced with a growing number of disciplines (online mathematics, science, history, philosophy) and an ever changing array of new media (streaming video, blogs, wikis) are often confused about how to integrate these technologies into online learning environments in ways that will enhance student learning of diverse content (Shea & Bidjerano, 2009). These authors argue that theoretical and conceptual frameworks are frequently missing from attempts to address these challenges, especially models that provide the online faculty and instructional designers a mechanism for integrating technology and pedagogy in ways likely to impact learning across the many disciplines now available via online education. Further, for e-learning to have a significant impact on education, it must grow beyond being a medium to conveniently access content to building on its communicative and interactive features that blend diversity and cohesiveness into a dynamic and intellectually challenging learning ecology (Garrison & Anderson, 2003).

The challenge, thus, is to develop a blended e-learning model that takes advantage of the inherent interactive and transactional capacity of the e-learning mode to drive the teaching-learning dynamic, taking cognizance of various specific contextual needs and contingencies (e.g., discipline, developmental level, and resources) without denigrating on the richness of the learning content and the attainment of higher-order learning. At the moment, no such e-learning model is in existence for nursing education in Nigeria. This study, therefore, will explore the state of e-learning in nursing education in Nigeria, conduct an e-learning needs analysis, develop and deploy, as well as test, a blended e-learning model for academic and professional education of nurses in Nigeria.



#### **1.4 PURPOSE OF THE STUDY**

Adopting an educational action research approach, this study seeks to design, develop, and pilot a blended e-learning model that is appropriate for effective delivery and learning of nursing knowledge and skills in a resource constrained community like Nigeria.

#### **1.5 RESEARCH OBJECTIVES**

In pursuit of the above lofty goal, the objectives of the study are to:

1. Assess the current modes of delivery of education for nurses and examine the stage of development of e-learning education at both the basic schools of nursing and universities in Nigeria.
2. Establish the perceptions of e-learning as a mode of teaching and learning among nursing stakeholders: (a) nursing students (b) academics (c) nurse practitioners (d) nursing administrators, particularly those in the Nursing and Midwifery Council of Nigeria (e) nursing leaders and heads of nursing professional associations.
3. Appraise the nurses' computer literacy levels, their computer skills and e-learning experiences.
4. Explore contextual factors and antecedents necessitating the application of e-learning in nursing education in Nigeria.
5. Analyse the essentials for developing and testing a blended e-learning model in the Nigerian context.
6. Pilot the developed model for effectiveness at achieving set learning goals.
7. Identify barriers to the implementation of the developed blended e-learning model.

#### **1.6 RESEARCH QUESTIONS**

The study seeks to investigate and provide answers to the following research questions:

1. What are the current modes of delivery of nursing education and stage of development of e-learning in nursing education at both the basic schools of nursing and universities in Nigeria?
2. What are the perceptions of e-learning as a mode of teaching and learning among nursing stakeholders: (a) nursing students (b) academics (c) nurse practitioners (d) nursing administrators, particularly those in the Nursing and Midwifery Council of Nigeria (e) nursing leaders and heads of nursing professional associations?
3. To what extent are nurses computer literate and what level of computer skill do they possess?
4. What are the nurses' e-learning experiences?

5. What are the contextual factors and antecedents (preconditions) necessitating the use of e-learning in nursing education in Nigeria?
6. What are essential for developing and testing of blended e-learning model in Nigerian context?
7. How effective is the blended e-learning model in achieving the set learning goals?
8. What are the barriers to implementation of nursing education using the developed blended e-learning model?

## **1.7 SIGNIFICANCE OF THE STUDY**

The impact of e-learning on all facets of human endeavour cannot be overemphasized. The evidence is all around us. Consequently, the deployment of e-learning in nursing education will not only enhance nursing education and practice, but will also impact positively on nursing research, nursing administration, and Nigeria's drive at meeting the MDGs tagged 'Vision 2020'. In addition, it will positively influence health services policy and facilitate professional networking among nurse practitioners.

The outcome of this study may give guidance on how e-learning can be effectively deployed to increase access to nursing education in a resource constrained setting and with a geographically dispersed population as in Nigeria. It may also help relieve the pressure of over-enrolment at Nigeria's higher institutions and ameliorate the high student-teacher ratio that has become a cardinal feature at these places of learning. The study also promises to bring about a paradigm shift from the traditional teaching learning approach currently being employed in many of our nursing institutions to a well-blended pedagogical approach.

Supported ICT-enabled blended learning allows materials to be presented in multiple media, which motivates and engages students in the learning process and makes learning student centred, thereby revolutionizing nursing education. This carries with it the dual advantage of simplifying abstract concepts and promoting learning. Going by the evidence from the field of human resource development (Mcpherson, 2005; Meyer, 2007), the deployment of e-learning in nursing education will not only improve access to higher nursing education by many nurses aspiring to improve their education either through university degree or sub-degree programmes, it will also give practitioners opportunities to improve their knowledge, attitudes and competence while still on the job.

Furthermore, the development of a suitable e-learning model for nursing academic and professional education holds the potential of amplifying informal learning i.e. outside the class, which Siemens (2004) identified as a significant aspect of the learning experience, stressing that learning now occurs in a variety of ways (through communities of practice, personal networks, and through completion of work-related tasks). Related to this is its' inherent capacity to foster lifelong learning, that has become a necessary requirement for professionals in today's rapidly changing world, where the shelf-life of knowledge dwindles so quickly. Apart from its flexibility, great adaptability and convenience, the ready opportunity to recall learning materials at will makes it possible for learners to learn at their own pace. Of significance again is the fact that the development and adoption of e-learning for academic and professional development of Nigerian nurses has the potential of bridging the digital divide in terms of educational opportunities, thereby cushioning the effect of brain-drain and, above all, providing a road map for nursing education in Nigeria.

As regards nursing practice, the development and subsequent adoption of e-learning in the education of nurses as intended by this study also promises to promote, foster and facilitate critical thinking, diversity, collaboration and evidence based practice. Fundamentally, lecturing/teaching is about imparting information, not about encouraging critical thinking or even about understanding ideas (Garrison & Anderson, 2003). Recent advances in the field of education have shown that when a teacher stands in front of a class to lecture, the average learning retention rate is 5%, but when the students are engaged in group discussion, as in online discussion fora, the average learning retention rate increases to 50%, and when they practice by applying the concepts, as well as when they teach one another, the retention rate rises further to seventy-five percent (75%) and ninety percent (90%) respectively (<http://www.lifewisdominstitute.org/learningpyramid.html>). By providing flexibility in time and location and enhancing interaction among learners and institutions of higher learning, e-learning will not only facilitate group discussion and collaboration, but will also foster situations where students teach one another. A long term benefit of this will be an improvement in the overall quality of nursing care for consumers of health care with resultant improvement in the health status of the nation.

Apart from its flexibility, adaptability and being convenient for learners, the adoption of e-learning is likely to cut the costs of travel, administrative overheads and, more importantly, the cost of people away from their jobs. It follows then that e-learning may help to curtail

labour shortages with its attendant problems such as longer working hours, increased workloads, stress and burnout, orchestrated by many nurses seeking study leaves at the same time. By extension, it promises to be a veritable tool for easing the administrative burdens associated with ensuring effective ward coverage while not erring in the International Labour Organization's mandate on Occupational Health and Safety (OHS) that stipulates adequate protection of the life and health of workers in all occupations (Alli, 2001).

Furthermore, the study will stimulate further studies on e-learning in nursing in Nigeria where a dearth of knowledge currently exists. Finally, this study will boost the efforts of the Nigerian government at capacity building, reduction of maternal and infant mortality and drive to meet other Millennium Development Goals.

## **1.8 DEFINITION OF TERMS**

Words, ideas and concepts generally have the potential of becoming ambiguous when taken out of context. To ensure clarity of thought and enhance understanding of this work, the following terms are therefore operationalized within the context of this empirical study as follows:

### **1.7.1 Facilitation**

This entails working with a consultative research team to seek nurses' views about e-learning and using those views to inform decision making; in this case the design and development of a blended e-learning model suitable for delivery and enhancement of acquisition of nursing knowledge and skills.

### **1.7.2 Blended**

The word blended as used in this study connotes the fusion of ICT, pedagogy and delivery modes (without obvious transition or boundaries) to enhance or facilitate learning of nursing knowledge as well as acquisition of nursing skills.

### **1.7.3 E-learning**

The teaching and learning that is delivered through the use of ICT (which ranges in complexity, sophistication, application, capacity and flexibility) within an organized and structured context integrating innovative pedagogical techniques with invigorating collaborative quest for knowledge through online learning communities or community of inquiry (Conrad, 2000; Garrison & Anderson, 2003; Engelbrecht, 2003; McPherson, 2005; Meyer, 2007; Alobiedat, 2010).

#### **1.7.4 Model**

Models are generalised, hypothetical descriptions, often based on an analogy, used to analyse or explain something (Glanz & Rimer, 1995: 11). They are likened to visual presentations of how abstract concepts (categories) are related to one another (Merriam, 2009: 189). Models are equally viewed as ‘a set of relatively abstract and general concepts that address the phenomena of central interest to a discipline, the propositions that broadly describe those concepts, and the propositions that state relatively abstract and general relations between two or more concepts’ (Fawcett, 2005). In this study, a model then refers to a framework or an abstraction of reality or representation of a blended e-learning prototype that emanates from an orderly, systematic data collection and analysis; and a thoughtful blending of rich pedagogical and instructional designs, as well as other related courses of action, for nursing education in a resource constrained educational setting.

#### **1.7.5 Development**

This refers to planned sequence of activities specifically designed for building or constructing of a new thing or improving an existing condition or situation, in this case, a blended e-learning model that is appropriate for the academic and professional development of nurses in Nigeria.

#### **1.7.6 Resource Constrained**

The word resource constrained connotes a sense of lack or inadequacy of resources, be it human, material, finance or infrastructure. In this study, however, the use of the term or concept ‘resource-constrained’ is limited to a description of a ‘relative lack’ of manpower and infrastructure compared to what is needed for facilitating the teaching-learning process in a large and widely dispersed population like Nigeria.

#### **1.7.7 Perception**

A set of feelings and ideas that guide the behaviour of individuals and influence their position on issues, matters and situations that face them (Alobiedat, 2010). In this study it is used to mean the general impression, mindset or position of nurses about e-learning, including its applicability for facilitating the teaching-learning process in nursing.

#### **1.7.8 Acceptance**

This is an expression of willingness, mental accent or a written and/or verbal indication on the part of nurses to employ or utilize e-learning as a tool for their academic and professional development.

### **1.7.9 Assessment**

An assessment is a judgment about something based on the understanding of the situation or a careful examination of a practice, act or procedure.

### **1.7.10 Nurses**

Individuals who have completed a formal programme of nursing education in an accredited nursing school or university and who have been licensed by the Nursing and Midwifery Council of Nigeria to practice nursing; may or may not necessarily have a midwifery qualification, but could possess multiple nursing qualifications, such as theatre techniques and peri-operative nursing, public health nursing, ophthalmic nursing, psychiatric and mental health nursing, nursing administration, renal nursing, accident and emergency nursing, to mention a few.

### **1.7.11 Nursing Students**

The term nursing student is used in this study to refer to registered nurses who are currently participating in either a post-basic nursing programme or a bachelor degree in nursing, either on a part-time or full-time basis.

## **1.9 STRUCTURE / LAYOUT OF THE DISSERTATION**

The report of this empirical study is organised into seven chapters. Below is an overview of these chapters:

### **Chapter One: Introduction and General Background**

Chapter one opens the door into the world of this thesis by providing a lucid discourse on the nature, rationale and context of the study. It proceeds by stating in unequivocal terms, the research problem, the purpose, objectives of the study, research questions, and the significance of the study. In view of the importance of a clear conceptual definition to the understanding of the thesis, a separate section is dedicated to operationalizing the key concepts/terms used in the study. The chapter then closes with a succinct outline or layout of the thesis.

### **Chapter Two: Literature Review**

Chapter two presents a summary of pertinent literature on the phenomenon of study. The chapter is divided into three sections with overlapping subsections. Section 1 (2.1) provides the historical and contextual overview of the development of nursing education in Nigeria. Section 2 (2.2) examines reforms in nursing education in Nigeria and gives insight into the

rationality and feasibility of expanded use of blended learning in nursing education in Nigeria. The third section (2.3) discusses the concepts of e-learning/blended learning and their ramifications, including their evolution, applicability as well as gains and challenges associated with their use in the education of health professionals.

### **Chapter Three: Theoretical Framework**

Chapter three weaves together, in a coherent piece, the various theories and models that formed the theoretical underpinning for the study. It is important to point out that in order to ensure that the blended e-learning model evolving from this study is not just technology-led but one that is capable of harnessing the rich collaborative, cohesive and critical discourse inherent in e-learning for teaching-learning process, the theoretical underpinning for the study is therefore sought in an interplay of the Khan's Framework for E-Learning and Garrison and Anderson's Community of Inquiry Model.

### **Chapter Four: The Research Approach**

Chapter four presents the methodology employed in the study. It specifically describes the research paradigm (pragmatism); research design (a combined quantitative/qualitative approach); study setting; study population; and sampling and sample size determination. The chapter also discusses how the research instruments were developed and/or adapted; how institutional permission and informed consent as well as other ethical considerations were obtained; and how data were collected and analysed. It is perhaps worthwhile to state here that because the study is essentially action in approach, comprising three sequential cycles of assessment, development, implementation and testing (with each cycle consisting of a continuing spiral of sequential steps of planning, acting, observing, reflecting and re-planning), the presentation of many of the information in this chapter follows this cyclical pattern.

### **Chapter Five: Results of the Assessment Cycle**

Chapter five reports on the findings of the assessment cycle chronicling the state of development of e-learning in nursing education in Nigeria, the perception of e-learning among nurses, Nigerian nurses' computer literacy level and experiences of e-learning, antecedents and contextual factors necessitating the development and use of e-learning in nursing education, perceived constraints and suggestions for building an e-learning model for nursing education in a resource constrained setting like Nigeria.

### **Chapter Six: The Model Development**

Chapter six deals with a subject matter that deservedly stands out as the heart of this study – the development and subsequent refinement of the emerging blended e-learning model for nursing education in Nigeria. The chapter discusses the details of the steps, process and strategy culminating in the emergence of the blended e-learning model for a resource-constrained setting.

### **Chapter Seven: Model Testing, Summary and Conclusion**

Chapter seven, the grand finale, presents the details of the procedure employed in the testing of the model and the outcome thereof. It also provides a succinct summary of the study, the conclusion and discusses the implication of the study. The chapter ends with an outline of the limitations of the study and how these limitations were handled such that they do not adversely affect the interpretation of the findings and recommendations of the study.



## CHAPTER TWO

### 2.0

### LITERATURE REVIEW

The importance of literature review to the success of any study cannot be overemphasised. In view of this, a comprehensive literature search was embarked upon in order to properly situate the study in the context of what is already known about blended e-learning, establish gaps in literature, and identify inconsistencies/contradictions in the existing body of knowledge. The literature search afforded the investigator the opportunity to gain further insight into the theoretical framework for the study as well as the methodology employed for the study.

The process of literature review for the study commenced with the identification of relevant information sources. This was followed by 'query formulation' which encompasses finding a focus; identifying key concepts/alternative terms; and annexing these key concepts through the use of Boolean operators (such as AND, NOT, and OR). The net result was the generation of search statement(s) that were suitable for the retrieval system. Some of the generated search terms that were used singly and/or in combination using Boolean or parenthesis include: e-learning, online learning, blended learning, ICT/Technology enhanced learning, development, blended and e-learning model, history/evolution of nursing education, distance learning, the teaching-learning process, demerits/flaws/disadvantages of e-learning and blended learning, merits/benefits/advantages of e-learning and blended learning, and Nigeria. Iterative searches were carried out periodically on the structured University of KwaZulu-Natal (UKZN) library repository (<http://library.ukzn.ac.za/Homepage>) which cover several academic databases such as the JSTOR, BioMedCentral, Sciencedirect, Springerlink, Pubmed, Hinary, Ebscohost, Medical Literature Analysis and Retrieval System On Line (MEDLINE), Educational Resource Information Centre (ERIC), Cumulative Index of Nursing and Allied Health Literature (CINAHL); and the less structured Google Scholar (<http://scholar.google.co.za/schhp>) until the conclusion of the study. In addition hand-searches of relevant books and documents were done on a periodical basis throughout the course of the study.

Searches were delimited to peer-reviewed articles, policy documents from government parastatals, and position papers from renowned scholars that were published in English language alone. Relevant articles produced by the iterative searches were progressively

screened using their titles and abstracts. This was followed by in-depth analysis and critical review of those that look promising to ascertain their relevance as well as retrieve information that are crucial to the phenomenon of the study. Pertinent information gathered were then knitted together, critiqued, and integrated into a coherent piece that forms the literature review chapter for the study. The chapter written in a discursive prose format is divided into three sections with overlapping subsections that present a thematic review of selected literature. Section 1 (2.1) provides the historical and contextual overview of the development of nursing education in Nigeria. Section 2 (2.2) examines reforms in nursing education in Nigeria and gives insight into the rationality and feasibility of expanded use of blended learning in nursing education in Nigeria. A part of this section titled '*Education Reforms in Nigeria: How Responsive is the Nursing Profession?*' has been published in International Journal of Nursing Scholarship 2013; 10 (1): 1 – 8 (A copy of the article is included as annexure). Section 3 (2.3) introduces and explores the concepts of learning, focusing more on new trends in the teaching-learning process. It also presents a lucid discourse on the concepts of e-learning, blended learning, and their ramifications. The section closes by examining the conceptualization, application, benefits and risks of e-learning and blended learning approach.

## **2.1 THE DEVELOPMENT OF NURSING EDUCATION IN NIGERIA: AN HISTORICAL AND CONTEXTUAL OVERVIEW**

Many may wonder why consider history when there are seemingly more vital issues begging for attention? On the contrary, history is no less important, as it serves as a vehicle for the transmission of culture from generation to generation and helps us to connect the modern society with the traditional one. Like Jayasekara and McCutcheon (2006) rightly pointed out, understanding the evolution of nursing in a country, provides perspective on the origins of current successes and dilemmas and enables the development of strategies and plans for future trends in the profession. In congruence with that is Teferra and Altbach (2004) remark that the impact of the colonial past and of the continuing impact of the former colonial powers remains crucial in any analysis of African higher education. So, there are always lessons to learn from history. The subsequent paragraphs therefore present the chronicles of events culminating in the development of nursing education in Nigeria.

Like the development of nursing worldwide, the evolution of nursing and the development of nursing education in Nigeria, cannot be separated from happenings around the world especially the political and socio-economic changes; knowledge explosions; technological

and industrial developments and their associated challenges; as well as nursing's quest for a professional identity. Nigeria, the renowned world most populous black nation, has over the years been bedevilled by diverse challenges (British colonization, civil war, incessant coups and military dictatorship, political instability, economic depression, terrorist attacks/Boko Haran insurgency, to mention a few), all of which have exerted considerable influence on all sectors of the nation including her educational system. The country which was birthed following the amalgamation of the northern and southern protectorates by the British Empire in 1914 houses several distinct cultural, ethnic, and linguistic groups, such as the Oyo, Benin, Nupe, Hausa, Fulani, Igbo, ijaw, Ibibio, Tiv, etc (Nigerian Demographic and Health Survey, 2008). The Federal ministry of Education (2005) observed that this massive diversity and complexity impacts significantly on many aspects of the nation's indigenous cultures, including approaches to education.

Anecdotal report suggests that nursing practice in Nigeria predates the British colonization but there is a dearth of information on how nurses were trained and educated in the pre-colonial Nigeria; probably untaught and instinctive. There were no health clinics/hospitals, no formalised planned healthcare services, nor any caregiving training evident. Consequently, much of what is known today about the development of nursing education in Nigeria occurred during the colonial and post-colonial period. Even literature on the development of nursing education during the colonial era is sparse. Among the few literature that are handy are the works of Adelowo (1988); Ajibade (2012); Agbedia (2012); and Dolamo and Olubiya (2013) whose historical accounts of the evolution of nursing in Nigeria provide substantial insight into the contextual development of nursing education in the country.

The historical account presented by these authors are similar though with little nuances. A central theme in their writings is that though the existence of nursing predates the colonial era, the birth of modern nursing and formal nursing training in Nigeria comes with the colonial administration. Ajibade (2012) for instance writes that as at the time of colonial administration, the pioneering efforts of Florence Nightingale had started yielding fruits with graduates of Florence Nightingale School taking over the campaign for organised and formal training of nurses all over the world, especially in the British Colonies and protectorates. According to him, by the end of the 19th Century and early 20th Century, training of nurses and midwives had started in Nigeria. Dolamo and Olubiya (2013) equally notes that as at the time Nigeria became a British colony in 1914, the revolutionary post Crimean war reforms in

nursing education embarked upon by Florence Nightingale had already started gaining foothold in Europe; and that the British subsequently imported this wave of modern nursing into her colonies including Nigeria, primarily to safeguard the health and wellbeing of her citizens (the British army and administrators with their families) and those of Nigerians.

The period also witnessed an influx of missionaries into the country, some of whom settled in Abeokuta (South West Nigeria), Calabar (South East Nigeria), and other regions. History has it that these missionaries when confronted with the stark reality of unavailability of health clinics for the treatment of the sick not only engineered the establishment of dispensaries and mission posts, but also helped in the treatment of the sick, the care of those in the convents as well as carrying out relief works amongst the citizens. These mission posts later became the nucleus for the early training schools of nursing and midwifery in Nigeria. Training mode during that period was informal and possibly lower than the hands on apprenticeship type of training. In Ajibade's (2012) words, *'apart from the nursing or reverend sisters, individuals recruited could at best be regarded as aides as they had no formal education other than being loyal housemaid, servants, cooks or stewards to the missionaries'*. Agbedia (2012) making reference to Ojo's (2010) inaugural lecture similarly notes that the training was majorly apprenticeship kind of training with emphasis on motor manipulative skills, strict obedience to rules and regulations but with dismal prospect for creativity, accountability and professional development. Dolamo and Olubiyi (2013) submission that the nursing care at that period adopted the *'do as you are told approach'* gave credence to this view. These authors suggest that nursing care were performed with little creativity and by individuals with little or no formal education who were directed by more experienced ones.

Following the lead provided by the missionaries, formal training of nurses and midwives in the country began in 1930 (Adelowo, 1988). Informal sources have it that the training which at inception was situated mostly in the mission hospitals and a few locations in the existing government hospitals was regulated by the Midwives Board of Nigeria established by the Ordinance of 1930 and inaugurated in June 1931. Information also has it that although the minimum entry requirement into these schools was a full secondary school education, however due to want of qualified candidates, individuals with less educational qualifications such as Standard VI and Government Class IV were offered admission in certain regions of the country. The University College Hospital (UCH) School of Nursing, Ibadan established in 1952 however maintained a rigid observance of the minimum entry qualification of full

secondary school education. The UCH training was adjudged superior and her graduates were recognised as possessing qualification equivalent to SRN (State Registered Nurse) of England and Wales (Koyejo, 2008).

Documentary evidence reveals that the Midwives Board was saddled with the responsibility of determining the standard and skill to be attained by individuals seeking to become members of the Midwifery profession in Nigeria; formulating policies on registration of midwives and maintaining discipline among members of the profession. The Board later assumed responsibility as examining body with its own approved syllabus for Grade II midwifery training (1year training obtainable mainly in most mission hospitals schools of midwifery) and Grade I Midwifery (available in government approved schools of midwifery) (Ajibade, 2012). The author observes further that with the enactment of the midwives decree of 1966, the training of Grade II midwives was phased out and a better syllabus for training of midwives was put in place.

The Nursing Council of Nigeria, the sole regulatory body for nursing profession in Nigeria, came into existence officially by the Nurses ordinances of August 1947. The ordinance set out the requirements for the education, examination, registration and discipline of nurses (Adelowo, 1988; Ajibade, 2012; Dolamo & Olubiyi, 2013). By 1952, the pioneering ordinance of 1947 was repealed and a new one (the Nurses Act of 1957) that was later replaced by the Nurses ordinance of 1959 (following the introduction of 1954 Macpherson constitution) to reflect the new political structure in the Country (Ajibade, 2012). It was reported that the new ordinance reconstituted the defunct Nursing Council of Nigeria as it provided for the inclusion of members representing their regions with resultant increase in membership of the Council to 21, all of whom, except two were nurses.

Nigeria attained independence in 1960. The post-colonial era witnessed the establishment of more of the UCH type of basic school of nursing and post basic nursing programmes across the length and breadth of the nation. Informed by her role as the regulatory organ for nursing education and practice in Nigeria, the Nursing Council sets up a committee to look at the system of nursing education in the country. The committee submitted the new standard of nursing education syllabus which was approved in 1965 and with the enactment of the Midwives Board decree of 1966, midwifery education also received a boost. Emphasis was placed on the practice of scientific midwifery; an improved syllabus was provided; and the training of Grade II midwives was phased out.

The year 1965 also saw the establishment of the first Department of Nursing at the University of Ibadan, to produce nurse educators and administrators in order to fill the vacuum created by mass exodus of the British colonial nurse educators and administrators. Few years later (1973) the University of Ife now Obafemi Awolowo University commenced the generic bachelor of nursing science programme. A few other universities, notably the University of Nigeria, Enugu Campus, Amadu Bello University, Zaria, caught the vision and established their own Departments of Nursing Science. Over time, with involvement of private organizations in university education in Nigeria, more universities have commenced nursing programmes to meet the challenge of university education for nurses. As at 2013, the number of university nursing programmes accredited by the National University Commission (NUC) of Nigeria was put at 17 (Dolamo & Olubiyi, 2013). In recent times, the number has however grown to 21.

Further, in response to the peculiar challenge faced by the products of the basic schools of nursing who have started working and cannot afford to enrol in full-time studies that requires taking a full leave of absence from job, new focused university nursing programmes that target these graduates have been developed in addition to the conventional university nursing programmes. Two of such programmes that have received full accreditation from the National University Commission of Nigeria are the National Open University of Nigeria programme and the Obafemi Awolowo University Bachelor of Nursing Science (BNSc) Part-Time degree programme that has gradually metamorphosed into full open and distance learning programme. Other universities like BABCOCK University, Ilishan-Remo and Ladoke Akintola University of Technology (LAUTECH), Ogbomoso, have equally through their Nursing Departments started their own variant of distance learning programme. In spite of the emergence of these new programmes, the demand for university nursing education in Nigeria still surpasses the demand. Although Aluede, Idogho and Imonikhe (2012) observation that only 5.2% to 15.3% secure university enrolment out of the multitude that seeks university admission every year in Nigeria shows that the problem of inadequate access to university education may not be peculiar to the discipline of nursing, but that of nursing is somewhat hyper acute.

Contrary to what obtains in the past when postgraduate education in nursing was only available in only three of the first generation universities in Nigeria (Obafemi Awolowo University, Ile-Ife, University of Ibadan, Ibadan, and University of Nigeria, Enugu Campus),

there has been a gradual increase in number of universities offering postgraduate training in Nursing, albeit too small to meet the need of the teaming nurses seeking postgraduate qualifications in Nursing. At the moment only Obafemi Awolowo University, Ile-Ife and the University of Ibadan, Ibadan, offers Nursing at doctoral level (PhD). It is obvious from the foregoing that the development of nursing education in Nigeria has come a long way. Although started off through a non-formalized structure; ad hoc institutions to fill a vacuum (humanitarian job by early missionaries, meet hospital need for trained nurses, generate additional funds for hospitals); it has come of age. It has evolved from its pre-colonial state of getting people who were to practice nursing to be able to recognize equipment (“the gallipot nurses”) and obey instructions of physician (“the yes doctor” nurses), through the apprenticeship on the job, basic skills training that in the past produced the “technical nurses” that carry out routine tasks based on over-learned procedures without thinking through, to becoming an organised school based programme with curricula that produce practitioners who are awarded certificates and university graduate nurses.

## **2.2 REFORMS IN NURSING EDUCATION IN NIGERIA AND THE FEASIBILITY/RATIONALITY FOR EXPANDED USE OF BLENDED E-LEARNING**

Nursing education in Nigeria has passed through many challenging stages; some planned and predetermined and others occasioned by forces of change and serendipity. It is good to note from the outset that the discourse of the complexity surrounding reforms in nursing education and the feasibility/rationality of expanded use of blended e-learning in nursing education in any country cannot be done in isolation of the general polity and reforms of the country’s educational system. To do that, will be fool hardy. Nonetheless, in this piece, efforts have been made to shy away from the details of the general educational reforms in order to appropriately situate reforms in nursing education in Nigeria.

Nigeria runs a three-tier system of government (local, state and federal governments) and education is a shared responsibility of these three levels of governance. In accordance with the Nigeria’s constitution, the administration of primary education is the local government’s responsibility, though the federal and state governments still exercise appropriate oversight functions like policy formulation, coordination and monitoring. State governments are saddled with responsibility of administering secondary education except for the “Unity Schools” and “Technical Colleges” which are run under the umbrella of the federal ministry of education. Unlike secondary education, higher education (obtainable at universities,

polytechnics and colleges of education) are jointly run by the federal and state governments. All federal government-owned higher institutions (with the exception of schools of nursing and a few health and healthcare-related institutions that are managed by the ministry of health), are overseen by the federal ministry of education. The state-owned higher institutions are equally controlled through the apparatus of the state ministry of education except for the state schools of nursing and other healthcare related schools that are being managed under the auspices of the state ministry of health. The private-owned higher institutions including schools of nursing (both basic and post-basic) and mission schools of nursing are however run by their respective hospital management boards. Available statistics from the Nursing and Midwifery Council of Nigeria (NMCN) website as at May 2014 put the number of accredited basic and post-basic schools of nursing at 155 (<http://www.nmcnigeria.org/>). What then constitute a nagging concern is that in almost all instances, these schools of nursing are administered by other health professionals. What does this portend for the quality of training and development of nursing education in Nigeria?

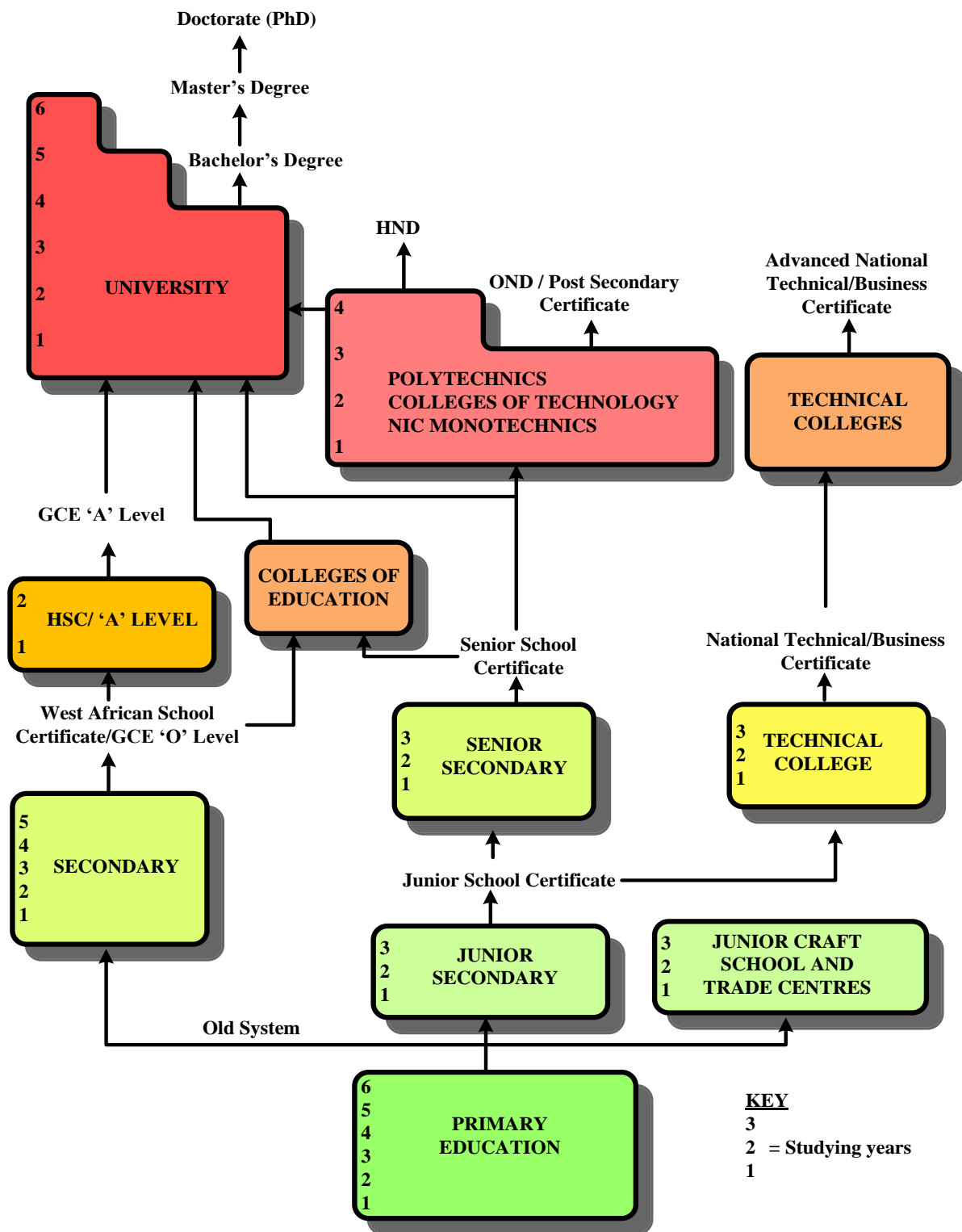
This is against the backdrop of the series of educational reforms that the Nigerian nation had embarked upon. Informed by the flaws of the educational system inherited from the colonial British administration, cum the dynamic global socio-economic and political tide with its varied implications, successive Nigerian administrations have had to introduce new system of education. Fafunwa (1974); Adamu (2003); Gusau (2008); and Okonjo (2008) proclamation that the colonial education was heavily criticized as lacking vitality and relevance lend so much support to this assertion. The reforms were therefore targeted at ameliorating the observed defects or perhaps ills of the past educational systems with a hope of coming up with a more relevant, functional and excellent education for the generality of Nigerians. This noble aspiration gives an insight into why the country education's evolved from the 8-6-2-3 system (eight years of primary schooling, six years of secondary, two years of higher school certificate and three years of university education) of the colonial era to the 6-5-2-3 system in 1954 (Gusau, 2008).

The year 1983 saw the birth of another education reform. The 6-5-2-4 system gave way to the popular 6-3-3-4 system (six years of primary, three years of junior secondary, three years of senior secondary and four years of university education, though the professional courses like nursing, pharmacy, dentistry, medicine, engineering, take much longer). Twenty five years down the lane yet another educational restructuring ensued; the Universal Basic



Education (UBE). Charles and Adebiyi (2008) and Uwaifo and Uddin (2009) asserted that the UBE was conceptualised in furtherance of the attainment of the Millennium Development Goals (MDGs) The principle and goal of the new system, UBE is to give every child nine years of compulsory uninterrupted schooling, followed by the three years of optional senior secondary education and four years of higher education (9–3–4). These reforms give guide to reforms in professional education with good prospects but what remains contentious is how responsive is nursing profession in Nigeria to these reforms?

That is a pertinent question that cannot and should not be scratched on the surface or swept under the carpet. This is because innovative advances in healthcare system in the 21st century demands that nursing as a profession should prepare practitioners who are well equipped to meet the challenges of care within the context of a complex milieu; a feat that is only realizable by a thoughtful, systematic and sustained continuing education and professional development of nurses that is consistent with global reforms and educational policy thrust of the country. Perhaps a look at the national education framework of Nigeria will offer more insight into nursing's pitiful educational situation.



**Fig 2.1: Nigeria's Education System and Qualification Structure**  
*Adapted from Nigerian Federal Ministry of Education*

As reflected on figure 1 above, three distinct educational pathways are available in the country: academic, technical, and vocational. The general education framework provides a layout of the educational ladder that ensures continuity and educational growth of every

discipline with the exception of the hospital-based nursing programmes. For instance, the Ordinary National Diploma (OND) that is awarded as the first level certificate of polytechnic education is appropriately recognized and linked with the Higher National Diploma (HND) in the technical sub-grouping. The same goes for the National Certificate of Education (NCE) that has a direct link with degree programme in education. Unlike other academic and professional programmes that are appropriately situated within the academic, technical and vocational streams of the national education framework with clearly defined education pathways, the place of the hospital-based nursing programmes is found wanting and neither is the face-value of its certificate quantified. The consequence is the tortuous academic pathway of graduands of these hospital-based nursing schools and their rather slow academic progression and dawdling career mobility. With the benefit of hindsight, it is thus crystal clear that the protracted efforts at realigning the hospital-based nursing programmes with the national and international education reforms are not unconnected with the historical antecedents of its placement in the ministry of health.

The testimony of how a number four nurse of the nation had to go crisscross in order to obtain a higher qualification (Ndatsu, 2002) speaks volume of the challenge orchestrated by the location of the basic and post-basic nursing programmes in the ministry of health as well as the ordeal nurses go through to update themselves. The former secretary general/registrar of the NMCN, Ndatsu (2002) relay that the need for a restructuring of the nursing education and a reappraisal of its professional certificates (RN, RM, RPN, RPHN) always crop up each time the nurses have opportunity to meet with the council in an official capacity. And as he rightly pointed out, many had left the profession out of frustration and discontentment with a profession that is almost suffering from content overload and a certificate that takes years to earn yet lacks the requisite equipping to readily access university education.

In what looks like a preliminary move to correct this imbalance, the NMCN (the sole legal, administrative and corporate organ responsible for regulation of nursing and midwifery practice in Nigeria as well as ombudsman for nursing education in Nigeria) in 2006 articulated a uniform entry requirement for all nursing and midwifery programmes. The new admission policy of the council stipulates that the minimum entry requirement for anyone seeking admission into the Schools of Nursing is five “O” level credits passes in English Language, Mathematics, Physics, Chemistry and Biology at not more than two sittings. Same as requirements for enrolment into the Bachelor of Nursing Science programme in any of the

Nigerian universities except that candidates will have to have appropriate score in the University Matriculation Examination (UME) to qualify for admission into the university of their choice. This ultimately guarantees that every nurse possesses the requisite qualification for admission into the university. By this move and the recognition of the open and distance learning alternative for nurses who are already in practice, the NMCN has unequivocally demonstrated that university education is the future direction for nursing education in Nigeria. In addition, curricular of the various hospital-based programmes have been subjected to periodic reviews to ensure relevance and adequacy of content and to be in conformity with national and international standards.

The council (NMCN) has equally invested substantial effort into the mainstreaming of the hospital-based programmes in the Nigerian national education framework. While attempt by successive administrations of NMCN to resolve this imbroglio through the gateway of affiliation, assimilation and integration of these schools with universities has been a challenge, the alternative option of engaging with the National Board for Technical Education (NBTE) seems to have yielded some fruits, with subsequent appraisal of the RN certificate to be equal to HND and Schools of Nursing directed to upgrade to Monotechnics. Dolamo and Olubiyi (2013) reported that the association with NBTE was a stopgap when it becomes obvious that less than 10% of the then existing Schools of Nursing possessed the criteria for affiliation with the university. By all standards, these are no mean achievements but there are still concerns over the long term effects of this restructuring. While the quantification has no doubt promoted the de facto recognition of nursing certificate (RN) and holds the promise of improving the job placement of nurses at start-off point, it does not offer any clear-cut career pathway for upward educational and career mobility as desirable and neither does it satisfy the need for genuine commitment to scholarship; an ingredient that is vital for meeting the complex needs of a highly sophisticated society of the 21<sup>st</sup> century.

It is rather pathetic that in spite of this huge and courageous effort of the NMCN and the obvious shortcomings of the hospital-based programmes, it continues to be perpetuated with resultant proliferation of these middle level technical resources. Also regrettable is the issue of educational preparation for entry into nursing practice in the country that is still far from being clarified. Like Hess (1996) observed of the United States of America nursing years ago, multiple education tracts (diploma, baccalaureate, masters and even doctorate) are still being used to prepare nurses for licensure and practice in Nigeria today. Yet licensure laws and

regulations remains largely unchanged and neither has practice been differentiated to accommodate nurses with different types of education for different levels of practice. This multipronged approach to nursing education in Nigeria and specialization at diploma level deserve due considerations. This is against the background that the world over, specialization is conventionally conferred at the postgraduate level (master's and doctorate); a level that is believed that candidates have acquired sufficient knowledge and proficiency to be regarded as specialists in their fields of endeavour. It is instructive to learn that many other health professions in Nigeria, share similar humble beginning with nursing but today their structures of education have been appropriately engrafted into the Nigerian educational system with specialization at the postgraduate level.

Be that as it may, there is nonetheless some level of optimism, especially with the proposed new service scheme for nursing and the re-engineered internship scheme for graduates of university nursing schools. It is believed that if implemented, these measures are capable of sparking off the fire of motivation and genuine commitment to scholarship among the practicing nurses. Another welcome development is the successful harmonization of university nursing education, particularly with the emergence of more departments of nursing in the Nigerian university sector. It should be recalled that university nursing education in Nigeria started in 1965 with the University of Ibadan offering bachelor degrees in nursing education and nursing administration. Today, the programme is adjudged to have outlived its relevance and subsequently faced out. Nursing commentators believed that the reason for phasing out the programme originates from two forces of change. The first is the policy directive from the National University Commission (2010) that makes the generic nursing programme the benchmark for the Nigerian nation. The second is the recognition that for university nursing education to impact positively on the quality of nursing care while at the same time meeting the multifaceted health needs of a sophisticated and informed 21st century consumer, its products needs to be abreast of the basics and be capable of swinging roles seamlessly (the idea of the polyvalent nurse).

The above consideration possibly informs the emergence of the innovative OAU generic Bachelor of Nursing Science (BNSc) as the national gold standard for nursing education in Nigeria. The BNSc programme has as its goal to prepare Nurse/Midwife/Public Health Nurse Practitioners capable of assuming professional responsibilities in various health delivery agencies (the concept of the polyvalent nurse practitioner), who with further experience can

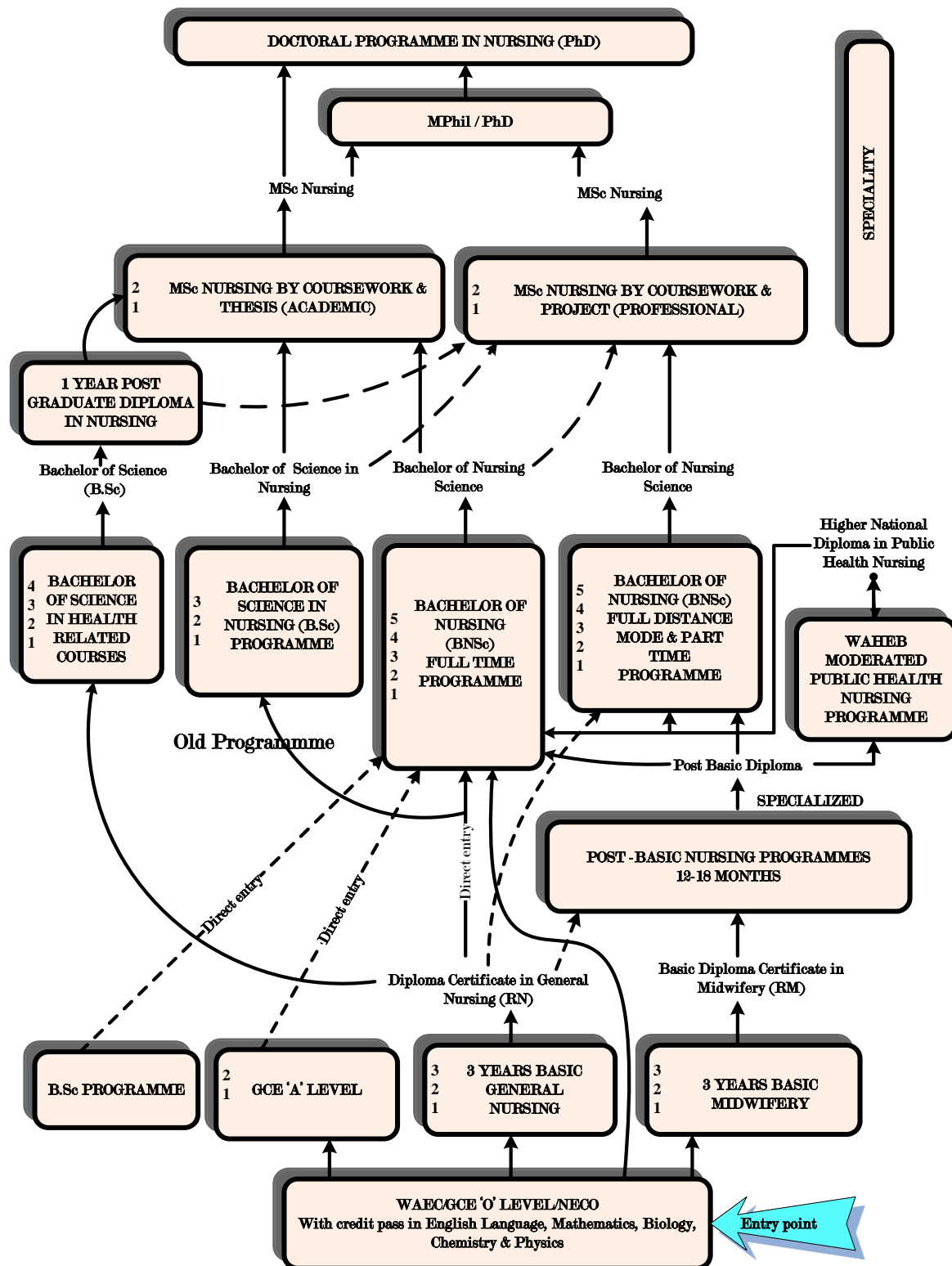
assume greater responsibilities in nursing and health care and can proceed to graduate studies in nursing and other relevant disciplines. The school conceptualizes nursing as an art as well as a science of caring and nurturance emanating from the interpersonal relationship amidst sociocultural and value system between the care recipient and the formal caregiver (BNSc Curriculum, Department of Nursing Science, OAU, Ile-Ife, 2012). The curriculum expounds that ‘a professional nursing programme should incorporate knowledge from the arts, sciences, humanities and nursing in order to ensure sound professional training; stimulate research and continued acquisition of new knowledge; promote individual self-development’ and advance public welfare; as this forms the basis for an orderly progression in learning.

The observed increase in the number of nursing departments in the Nigerian ivory tower and the slow but gradual increase in the postgraduate nursing studies is another positive development. Not only has there been an increase in the conventional undergraduate nursing programmes, there has also been the emergence of newly focused university nursing programmes that target absorbing the graduates of the hospital-based nursing schools, who by historical placement of their education under the ministry health had perennially experienced peculiar challenges accessing university education. Such programmes as earlier mentioned include: the Department of Nursing Science, OAU, Part-Time BNSc programme, the National Open University of Nigeria (NOUN) Distance Learning Programme, LAUTECH, Ogbomoso and BABCOCK University, Ilisan-Remo, programmes. As much as this is in consonance with the Nigerian Policy on Education that recognizes the place of open and distance learning (ODL) in achieving lifelong education, it suffers a major deficiency. This has to do with the heavy reliance of these programmes on the traditional face-to-face teaching and/or facilitation; meaning that learners still have to leave work to travel hundreds and sometimes thousands of kilometres to receive lectures or tutorial at designated centres on weekend basis or other short term arrangements.

There is no gainsaying that the aforementioned programmes have contributed to capacity building, however they have fallen short of meeting the massive need for continuing education and professional development of nurses post qualification as well as the need for radical improvement in the scale and scope of learning among nurses. It is the realization of these shortcomings and its implication for the nation’s education that prompted the Federal Government of Nigeria through its agent, the NUC (the statutory quality assurance agency in the Nigerian university system) to issue a directive that all part-time and sandwich courses be

upgraded to full ODL mode (Abdulrahman, 2009). ODL, otherwise called distance learning is a form of education in which the learner and the instructor/facilitator are separated by physical barrier (Ololube, Ubogu & Egbezor, 2007).

The NUC Guidelines for ODL in Nigerian Universities (2009) states inter alia that the goals of open and distance education are to: provide access to quality education and equity in educational opportunities for those who otherwise would have been denied; meet special needs of employers by mounting special certificate courses for their employees at their work place; encourage internationalization especially of tertiary education curricula; and ameliorate the effect of internal and external brain drain in tertiary institutions by utilizing experts as teachers regardless of their locations or places of work (Federal Ministry of Education, National Policy on Education, 2004). The policy stated further that although the Nigerian National policy on Education has over the years recognized the place of ODL in achieving lifelong education and affirms that lifelong education shall be the basis of the country's education, a critical appraisal of the scope of ODL reveals a glaring mismatch between policy and practice, thus the need for restructuring. Consequently, OAU commenced the transition of its Part-Time BNSc programme into full ODL mode in 2010 using ICT as an instrument par excellence. The process which has gone reasonably well, is still ongoing.



**Fig 2.2: The Evolving Structure of Nursing and Midwifery Education in Nigeria**  
Adapted from Irinoye, (2009)

Arising from these reforms, is the proposed structure of the nursing and midwifery education in Nigeria (presented in Figure 2 above). The structure not only provides clear pathway for nurses' academic progression but also presents a promising career ladder. A major concern



for nursing philosophers and leaders of thought however is the issue of continuity and sustainability of this structure, in the face of dearth of universities offering nursing and the sparse nursing faculty in the country. This is quite pertinent because the evolving structure can only provide the much needed succour for education-related challenges facing nurses and the nursing profession when sustained.

Given the peculiar Nigerian socio-cultural terrain and its massive population, going the way of the traditional face-to-face teaching will be suicidal for two reasons. The first is the obvious and widely acknowledged perennial inadequacies of the conventional face-to-face mode in meeting the higher educational aspirations of a large number of Nigerians, especially in the university sector (NUC Guidelines for ODL in Nigerian Universities, 2004). The general belief is that this may further compound the difficulty encountered by the graduates of the basic and post-basic schools of nursing in securing enrolment into the university. The second, which is related, is that it stands the likelihood of worsening the well-known syndrome of lack of genuine commitment to scholarship among Nigerian nurses. This leaves the profession with only one rational option – that of maximizing the effort of its lean academic faculty through the adoption of innovative pedagogies and the e-learning/blended e-learning approach. Indeed, there is increasing body of evidence that suggests ODL as a promising strategy for combating the challenges of equity, capacity building and access to education (Olakulehin, 2008; Ekundayo & Ekundayo, 2009).

It is good to note here that higher education in Nigeria like some other developing African countries, has traditionally been done through the conventional face-to-face mode of delivery. However, inspired by the pervasive positive influence of ICT on teaching-learning and research together with the policy directive from the Federal Government of Nigeria to use e-learning as a veritable tool for educational advancement in the country (Abdulrahman, 2009), there has been a gradual adoption of e-learning in the country's education industry with obvious benefits. These include: increased access; cost effectiveness; improved quality of learning; standardization of content and delivery; ease of updating content; better preparation of students for a knowledge-based society; lifelong learning; rapid acquisition of knowledge and skills; and propensity to enhance development and globalization (Yusuf, 2005; Nwagwu, 2006; Appana, 2008; Adomi & Kpangban, 2010; Olojo, Adewumi & Ajisola, 2012). Although the Nigerian government intention to officially embrace e-learning became only evident in the year 2004 when it officially entrenched the need for ICT use in the country's

national education policy (Adomi & Kpangban, 2010), the government's interest in the development of telecommunications actually dated back to 1886 when a cable connection was established between Lagos and the colonial office in London (Olaniyi, 2006).

Olaniyi (2006) went a step further to chronicle the events that culminated in the development of the ICT industry in Nigeria as follows:

*By 1893, government offices in Lagos were provided with telephone service, which later extended to Ilorin and Jebba. A slow but steady process of development in the years that followed led to the gradual formation of a national telecommunications network. With less than 30,000 telephone lines in the pre-independent period to 90,000 lines in the 60s and 1500 telex in the late 19th century to 2000 telex lines in the post independent era. And with the commencement of GSM services, the number of phone lines skyrocketed to a whopping 4.2 million lines in 2004. The number of Internet Service Providers (ISPs) rose from 11 in 2000 to almost 30 in 2004) while internet users increased from 100,000 to more than 500,000 in 2004. The 90s witnessed a change in the telecom and information sector with the government liberalization policy of the industry. The internet sector was not left out, as more companies were licensed to offer internet services in various towns and cities of the country, while many were empowered to provide Very Small Aperture Terminal (VSAT) solution and other telecom value added services. From Dial-up connection through wireless access, then ubiquitous VSAT connection, internet access grew astronomically.*

Even with this supposedly laudable achievement, ICT integration into teaching, learning and research or better still, the adoption of e-learning, was still at the infancy level (Aduwa-Ogiegbean & Iyamu, 2005; Ogunsola & Aboyade, 2005; Manir, 2009; Awodele, Kuyoro, Adejumobi, Awe, & Makanju, 2011); what Oye, Salleh, and Iahad (2010) describes as partial e-learning. According to Olaniyi (2006) the commonest type of e-learning adopted in Nigerian universities such as OAU and National Open University of Nigeria (NOUN) was in form of lecture notes on CD-ROM which can be played as when the learners desire. The challenge of this method like he rightly pointed out was that it lacks the interactive and collaborative component of learning, hence its ability at facilitating higher order learning is very doubtful.

Apart from the issue of policy and political will, the advent of computers, internet and other telecommunication gadgets that have made possible easy storage and retrieval of information; swift access to an ever increasing body of knowledge from across the globe; and enhancement of the teaching-learning process through synchronous and asynchronous modes in Nigeria. Related to this is that the ready availability and adoption of multimedia support

that enables learners have access to texts, graphics, audio and video materials has made nonsense of the ancient educational delivery media like the black or white board and overhead projectors (Folorunso, Ogunseye, & Sharma, 2006). Folorunso, Ogunseye, and Sharma (2006) however warned that there are hurdles to the adoption and acceptability of this technology in Nigerian universities. Such include: mass unawareness, low computer literacy, high cost of e-learning infrastructure with associated poor financing (Folorunso, Ogunseye, & Sharma, 2006); poor ICT infrastructure development, high cost of broadcast equipment, high cost of radio/television presentations, high cost of access/interconnectivity, bandwidth problem and erratic/poor power supply (Iloañusi, 2007; Sofowora, 2012; Adewole-Odeshi, 2014); inadequate digital learning resources creation, storage and maintenance system as well as limited or non-availability of ICT-trained teaching staff (Aduke, 2008; Manir, 2009). Contrary to report of mass unawareness, Manir (2009) study presents a dissenting voice to the issue of awareness. Contrary to the report of low awareness, his findings indicate high awareness of e-learning among Nigerian universities, and thus shifted the blame of low adoption of e-learning among Nigerian universities to poor investment and lack of commitment to developing e-learning programmes.

The observed constraints, no doubt, are many and complicated, but the good news is that there are equally factors/conditions within the Nigerian sector that make for the adoption of e-learning. Ekundayo and Ekundayo (2009) dub these e-learning enablers. Paramount among them are: the changing healthcare arena (American Association of Colleges of Nursing, 2000; American Organization of Nurse Executives, 2008); education reforms (Yusuf & Yusuf, 2009); increasing awareness of e-learning among university community (Manir, 2009); positive students' attitude and disposition to the use of ICT (Awoloye, Siyanbola, & Oladipo, 2008; Adewole-Odeshi, 2014). Others include: the changing student – from the 'Veteran' to 'Baby Boomer' to 'X Generation' to the 'Net Generation or Digital Natives', who have a preference for visual and kinetic learning and now the 'Neo-Millennial' who use immersive environments and augmented reality, in addition to the world-to-desktop interface that the Net generation uses (Mastrian, McGonigie, Maham, & Bixier, 2011); and the changing faculty – from 'Oldskies', alien to cell phones and personal computer, to 'Tweeners', born on the fringe of personal computing, to 'Newskies' or 'Digital Immigrants' who have grown up with computers and sophisticated video games (Mastrian, et.al, 2011). Also noteworthy are: the staff-student ratio that has over the years been a mismatch (Ekundayo & Ekundayo, 2009); broad geographical reach of Nigeria and the need to cut down on associated travel cost

and requests for study leave; the proven cost effectiveness of e-learning and its capacity to serve as a springboard for development and globalization. Yet instrumental is the fact that it has been employed in other parts of the world with good degree of success (Punie, Zinnbauer, & Cabrera, 2006; Kaur, 2013; McKenzie, Perini, Rohlf, Toukhsati, Conduit, & Sanson, 2013). It is thus no surprise that in spite of the documented challenges/constraints, Nigeria is witnessing a rise in the deployment of e-learning in her higher educational institutions (Adewole-Odeshi, 2014). Sofowora (2012) specifically noted that adoption of web-based learning system was high in OAU, Ile-Ife, despite the fact that facilities and infrastructure for it were inadequate for the student population. His comment about students being enthusiastic to accept and use the web-based learning system is perhaps the most telling.

It goes without saying then that e-learning has come to stay. What remains debatable is the appropriateness of its use as a stand-alone in the delivery of education in some disciplines? This is because the pedagogical approaches used in students' education can vary greatly depending on the nature of the learning required (Stuart, 2014). Nursing being as much an academic as a practice profession requires its practitioners to develop their affective, cognitive and psychomotor skills so as to be able to provide quality health care to individuals, families and community. This may justify the aura of scepticism and concern that surrounds the suitability of the use of e-learning as a stand-alone in the education of nurses. This concern has led to the consideration of a combination of multi-media, internet-moderated and conventional instructor-led face-to-face teaching in the education of nurses; what experts describe as hybrid, mixed mode or blended learning approach (Graham, 2006; Moskal, Dziuban & Hartman, 2013). McKenzie, et.al, (2013) observe that blended learning is increasingly being adopted in course delivery and most university courses have some online component.

The adoption of the blended e-learning approach holds great promises for higher order learning and lifelong learning. Its relevance and practical utility goes beyond the pre-service education of nurses. Continuing professional development and improvement in competence as desirable post qualification in this information age/knowledge era, would benefit from its effective application. There are nonetheless fears about the feasibility of this new approach (blended e-learning) in the training of Nigerian nurses given the country's limited resources particularly in the area of infrastructure. Rather than being overwhelm by this concern and the size of the problem, the possibility of taking advantage of developments in the area of

ICT to create teaching-learning opportunities that are hitherto unavailable is too real to be ignored. This consideration challenges our collective ingenuity as a nation to come up with an innovative blended e-learning tailored for a resource constrained setting like Nigeria. This is against the backdrop of inventions of inverters, solar panels, power banks, and other alternative sources of energy that are readily available; and increased access to social networking tools such as customised tablet with long battery life, mobile phones, blogware, podcast, e-mails, Facebook, and WhatsApp., all of which provides ready solution to some of the identified constraints.

### **2.3 THE CONCEPTS OF E-LEARNING, BLENDED LEARNING AND THEIR RAMIFICATIONS**

The paradigm shift occasioned by the advent of internet, developments in ICT with associated availability of profuse information in today's knowledge era has brought a lot of changes in the way we teach and learn. The face-to-face teaching that used to be the industry's gold standard for the delivery of education is now gradually being relegated to the background. This section discusses a number of the new innovative dynamic approaches that have evolved and exerted their transformative potential on the teaching-learning process. Perhaps, a convenient spot to start is to beam our search light on learning; what has changed?

#### **2.3.1 Learning: Is there anything new?**

It is a factual statement that the ultimate goal of education is to ensure learning. So when learning fails to take place, the whole essence of instruction, facilitation, demonstration, group discussion, assignments, role play and many other teaching-learning strategies becomes a mirage. Although teaching and learning are like a composite half but the centrality of learning in the teaching-learning process is not in question. In fact, how people learn is fundamental to the design of good instruction in any medium (Shank & Sitze, 2004). Interestingly, there has been so much discourse, arguments, opinions, propositions, theories and researches on the subject down the years, all of which have helped shaped what we know about learning. This is evident by the volume of theories, principles, and researches available on the subject matter.

It is however rather strange that, as well researched as the subject of learning is, achieving a precise universal definition of learning has been an uphill task. Braungart and Braungart (2003) observed that despite the significance of learning to development, there has been so much debate about how learning occurs, what kinds of experiences facilitate or hinder

learning process, and what ensures that learning becomes relatively permanent. The authors paraphrasing Hilgard (1996) and other scholars (Gage & Berliner, 1998; Woolfolk, 2001) writings noted further that most discussions and debates about learning were grounded in philosophy, public and normal school administration, and conventional wisdom until the late nineteenth and early twentieth century when scientific study of learning and teaching began. Knowles, Holton III and Swanson (2005) making reference to works of Smith (1982) equally acknowledge the difficulty surrounding attaining a precise definition of learning. They reverberated Smith (1982) opinion that the term learning defies precise definition because it is put to multiple uses:

*Learning is used to refer to (1) the acquisition and mastery of what is already known about something, (2) the extension and clarification of meaning of one's experience, or (3) an organized, intentional process of testing ideas relevant to problems. Put together, it is used to describe a product, a process, or a function.*

To Braungart and Braungart (2003), learning can be defined as:

*a relatively permanent change in mental processing, emotional functioning, and/or behaviour as a result of experience. It is the lifelong, dynamic process by which individuals acquire new knowledge or skills and alter thoughts, feelings, attitudes, and actions.*

Ormrod (2012) defines it as '*long-term change in mental representations and associations as a result of experience*'.

Knowles, Holton III and Swanson (2005) provided an interesting twist to the discourse of learning. They declare that any attempt at defining learning must of a necessity be preceded by a consideration of the distinction between education and learning. They subsequently define education as an activity undertaken or initiated by one or more agents that is designed to effect changes in the knowledge, skill, and attitudes of individuals, groups, or communities. Similar to that is Bruce, Klopper, and Mellish (2011) submission that the word 'education' comes from the Latin *educere* – *e* meaning 'from' and *ducere* meaning 'to lead'; and that when put together can be construed as leading someone from the known to the unknown. They explained that it implies facilitating learning, giving guidance, providing opportunities and facilities for learning, and assisting those who are studying; meaning education is not a haphazard activity but rather a planned series of incidents (teaching tasks or activities) directed towards the participants learning and understanding.

Arising from Knowles, Holton III and Swanson (2005) definition of education is the conception of an educator as a change agent who presents stimuli and reinforcement for

learning and designs activities to induce change, while the learner is construed as the person in who change occurs or is expected to occur. This should however not be misconstrued as if the learner is passive in the teaching-learning process. The erroneous impression of the learner as being a passive agent may explain the erstwhile predominance of the instructor-centred approaches in teaching and learning process. However with emergence of new theories of learning (from pedagogy to andragogy; cognitive to behavioural learning theories; social learning theories to constructivism and connectivism; the list is unending); new discoveries in genetics and biological sciences about the relationship between innate disposition and educational process (Preiss & Sternberg, 2010); and breakthroughs in the world of ICT, the learning landscape has kept unfolding; hence the move towards the more dynamic, creative, and interactive learner-centred learning approaches. To borrow the words of Bruce, Klopper, and Mellish (2011), emphasis is now shifting to the teacher as a facilitator of learning as against the erstwhile notion of the teacher as a transmitter of information. Education scholars, thinkers and researchers (Braungart & Braungart, 2003; Kaufman, 2010) have variously contended that the development and refining of these learning theories have contributed in no small measure to our understanding of how people learn, acquire knowledge, change their ways of thinking, feeling and behaving. Braungart and Braungart (2003) observe further that the accumulated body of research information has not only been used to guide the teaching and learning processes but has also challenged a number of popular notions and myths about learning.

One lesson that has clearly emerged from the consideration of the various learning theories is that people learn differently. That is, there is no one unified way of acquiring knowledge. Some learn better by listening to lecture, podcasts, or music (they can remember anything they are told); some learn better through visuals, they can readily remember what they see (reading, video, PowerPoint presentations, surroundings); while learning is facilitated yet in others by touching and doing – the kinaesthetic learners.

The other lesson that is related to that is that there are different kinds of learners: the immature or young learners and the matured or adult learners; each with strikingly different characteristics and orientation to teaching/learning. Meeting the learning needs of the young/immature or even the novice learner of any age calls for the use of the structured pedagogical principles while that of the mature/adult learner requires the more flexible andragogical approach (Woodring & Woodring, 2011). Worthy of note also is Manca (2010)

submission that the continual growth of online education is rapidly changing how and when people, especially adults, choose to engage in learning. Like the author rightly observes, nowadays, it is more a question of choosing the most convenient and personally suitable way to receive ‘instruction’ and training rather than attending a traditional ‘physical’ institution. In her view, this shift of perspective is gradually changing our view of the social nature of learning too.

Mastrian, et.al (2011) in their discourse of the different types of learners counsel that it is important to note that each generation is shaped by world circumstances as well as how they and their families are personally affected by these events. Substantiating their submission with the work of other scholars (Oblinger & Oblinger, 2005; Dede, 2005; Hart, 2008), they presented a classification based on the stage of descent (generation to generation): The first generation by their grouping are the ‘*Veterans or Matures*’. They describe the Veterans as the oldest living generation, born before 1946, whose families experienced war and tough economic times and are consequently able to persevere, value hard work, and have respect for authority but are technologically naïve. The second are the ‘*Baby Boomer*’ born between 1946 and 1964, who by virtue of being born at a time that the economy is buoyant and into intact supportive family tends to be workaholic, optimistic, with low technological know-how. The third is the ‘*X Generation*’ born between 1965 and 1980; a tough economic period that is characterised by layoffs, downsizing, and increased divorce rate, all of which have probably combined to make them slackers, distrustful but adaptable and independent. The fourth are the ‘*Net Generation or Digital Natives*’ born between 1980 and 1995, who are provided with numerous opportunities, strong family and financial support, which experts believe makes them socially and politically conscious, ‘having preference for multitasking, visual/kinetic learning, and being exposed to more intuitive technology’. The last but not the least is the ‘*Neo-Millennial*’, born after 1995 ‘who are not just observer or user of technology but participants in technology creation who create avatars of themselves to visit different online places and interact with people from all over the world’.

These divergence in characteristics of learners from one generation to the other, makes it imperative for instructors not only to have a mastery of their subject matter but also to develop a working knowledge of the learners before deciding on a specific theoretical/model and or teaching strategy (Woodring & Woodring, 2011). In their words:

*The concept of know-thy-student has always been important; however, now it is not only important but critical. Many classrooms are filled with students*



*born after 1980 who have been raised in the wireless, techno age while faculty may be uncomfortable even communicating electronically. This means that in order to bridge this generation gap, the teacher must understand and acknowledge that the new learner has a very short attention span, an arsenal of electronic devices at their fingertips (and in your classroom), is used to multitasking (answering text messages and listening to electro-tunes while reading about neuroanatomy), and is used to handling a rapid barrage of information. In order to address these different needs, the proficient teacher will accompany the lecture with other adjuncts such as electronic innovations ... to accommodate the new and or adult learner.*

It is suffice to state that the paradigm shift engendered by man's increasing understanding of the learning process has prompted the development of a number of teaching-learning approaches; some new and others old but refined. These approaches, some of which can be used singly or in combination with others, are a pointer to the radical transformation happening in the global education industry. They include: Outcome-Based Education, Problem-Based Learning, Experiential Learning, Reflective Learning, Case-Based Learning, Community-Based Education Co-operative Learning, Distance Learning, E-Learning, Blended Learning, and Community of Practice. Just as there are different learning modes and different types of learners, there are also a multiplicity of teaching strategies that the instructors can use singly or in combination to facilitate learning (lecture, lecture-discussion, demonstration, lecture-demonstration, role play, group discussion, tutorials, seminars, symposia, problem solving, assignments, projects, case study and simulation).

The point that has been made thus far is that a lot has changed in the teaching-learning process. This is well exemplified in the caption below, taken from the Committee on Developments in the Science of Learning in collaboration with the Committee on Learning Research and Educational Practice, National Research Council (2000) book titled '*How People Learn: Brain, Mind, Experience, and School*' (Expanded Edition):

*Today, the world is in the midst of an extraordinary outpouring of scientific work on the mind and brain, on the processes of thinking and learning, on the neural processes that occur during thought and learning, and on the development of competence.... Research on learning and transfer has uncovered important principles for structuring learning experiences that enable people to use what they have learnt in new settings. Work in social psychology, cognitive psychology, and anthropology is making clear that all learning takes place in settings that have particular sets of cultural and social norms and expectations and that these settings influence learning and transfer in powerful ways. Neuroscience is beginning to provide evidence for many principles of learning that have emerged from laboratory research, and it is showing how learning changes the physical structure of the brain and, with it,*

*the functional organization of the brain..... Emerging technologies are leading to the development of many new opportunities to guide and enhance learning that were unimagined even a few years ago. More than ever, the goal of education is better conceived as helping students develop the intellectual tools and learning strategies needed to acquire the knowledge that allows people to think productively about history, science and technology, social phenomena, mathematics and arts.*

### **2.3.2 Conceptualization, Application, Benefits and Risks of E-learning and Blended Learning: An Outlook of the Terrain**

In today's knowledge society, advances in information and communication technologies (ICT) have sparked off a radical transformation in the teaching-learning process. However, to sustain this transformation and better appropriate its gains, there is a need for deep understanding of the key drivers of this transformation. This section therefore zero in on e-learning and blended learning and their ramifications. It also examines the spectrum of their integration, application and utilization in health professions education particularly in resource-constrained environment, as well as the perceived risks and benefits associated with their adoption and use.

#### ***2.3.2.1 Defining and Clarifying the Concepts E-learning, Blended Learning and their Ramifications***

There are as many definitions of e-learning as there are authors on the subject but central to all these definitions is the notion of the use of technology, particularly ICT, in the deployment of education or learning mediated by electronics (Adewole-Odeshi, 2014). For instance, Iloański (2007) drawing from the work of other scholars defines it as the use of electronic technology/media, which include computer, communication and mobile technologies to enhance and extend learning, deliver and access education and information. Clark and Mayer (2008) expound this a little further when they describe e-learning as instruction/training delivered via a computer by way of CD-ROM, Internet, or Internet that is armed with the following features: content relevant to the learning; employs instructional methods such as examples and practice to help learning; uses media elements such as words and pictures to deliver the content and methods; may be instructor-led or designed for self-paced individual study; and builds new knowledge and skills linked to individual learning goals or to improved organization performance.

Consistent with Clark and Mayer's definition is Awodele, Kuyoro, Adejumobi, Awe & Makanju (2011) conception of e-learning as 'an innovative approach for delivering electronically mediated, well-designed, learner-centred interactive learning environments to

anyone, any place, anytime, by utilizing the internet and digital technologies in conformity with instructional design principles'. Naidu (2006:1) sums it up beautifully as 'all educational activities that are carried out by individuals or groups working online or offline, and synchronous or asynchronous via networked or standalone computers and other electronic devices'.

Implicit in the above definitions is the notion that e-learning comprises all forms of electronically supported learning and teaching (Ruiz, Mintzer, & Leipzig, 2006), whether from a distance or in a face-to-face classroom setting. As such it encompasses such things as: Computer-Based Training (CBT), Computer-Assisted Learning, Web-Based Training or Learning (WBT), Technology-Delivered Instructions, Online Learning, Networked Learning, Distributed Learning, Multimedia Learning, to mention a few. Also inherent in the aforementioned definitions as Clark and Mayer (2008) rightly observed are also elements concerning the what, how and why of e-learning. Clark and Mayer (2008) shed more light on this. In Clark and Mayer (2008) words:

*The 'e' in e-learning refers to the 'how': the course is digitized so it can be stored in electronic form. The 'learning' in e-learning refers to the 'what': the course includes content and ways to help people learn it; and the 'why' refers to the purpose: to help individuals achieve educational goals or to help organizations build skills related to improved job performance.*

It is what stressing that the term 'ICT' as it is used in e-learning is not restricted to computers alone but refers to the broad array of technologies that are employed in teaching and learning (Conole & Oliver, 2007). Equally worth noting is that creating e-learning materials involve a series of steps: content development, management, delivery and standardization; and content creators utilize instructional design and pedagogical principles to produce learning objects and instructional materials (Ruiz, Mintzer, & Leipzig, 2006). The content, according to these authors comprises all instructional materials, which range in complexity from discrete items to larger instructional modules. Unpacking this further, they defined a digital learning object as any grouping of digital materials structured in a meaningful way and tied to an educational objective. To borrow their words *'learning objects represent discrete, self-contained units of instructional material assembled and reassembled around specific learning objectives, which are used to build larger educational materials such as lessons, modules, or complete courses to meet the requirements of a specified curriculum'*. To these authors, content management includes all administrative functions (e.g. storing, indexing and cataloguing) needed to make e-learning content available to learners.

To be further cleared about e-learning, the terms synchronous and asynchronous e-learning deserve some measure of explanation. Synchronous e-learning denotes real time, instructor-led learning, analogous to a physical classroom, where all learners receive information simultaneously and communicate directly with other learners such as in interactive online chat / internet chat forums, teleconferencing or videoconferencing and instant messaging (Fallon & Brown, 2003; Ruiz, Mintzer, & Leipzig, 2006; Akudolu, 2011). The interaction can even be recorded and archived for later viewing, in which case it becomes asynchronous. Asynchronous e-learning then refers to communication with time delay i.e. the transmission and receipt of information do not occur simultaneously but are usually available to learners twenty four seven (24/7) such as online discussion through electronic mail list, online bulletin board, weblogs, recorded CD-ROM, (Fallon & Brown, 2003; Ruiz, Mintzer, & Leipzig, 2006; Akudolu, 2011). Fallon and Brown (2003) noted added that typically such courseware is managed and monitored by a learning management system (LMS). Raymond and McKimm (2010) describe Learning Course Management Systems (LCMS) as software packages that enable institutions to introduce web-based courses that allow learners to have access to their assigned course materials, communicate, assess/track learners' progress and administer these courses while using both synchronous and asynchronous technologies e.g. Blackboard Learning System and Moodle (modular object-oriented dynamic learning environment), a free open source e-learning platform that supports interactive and collaborative construction of content.

This brings us to the question of what makes a good e-courseware. In addressing this issue, Clark and Mayer (2008) draw attention to four main considerations: the goal of the training/education; the prior knowledge of learners; the environment for the deployment of the education/training; and the instructional architecture. In their view, the goal or intended outcome of the training/education (whether it is to inform or acquire skill) gives a guide on what will be appropriate to consider. Similarly, the authors argued that learners' prior knowledge and experience will give direction on appropriate instructional methods to use since research has proven that learner's prior knowledge of course content exerts most influence on learning. According to the authors, the third factor is the environment, which they construed as encompassing such issues as technical constraints of the delivery platform, network, and software, cultural factors in institutions such as the acceptance of and routine familiarity with technology, and pragmatic constraints related to budget, time and management. Last but not the least is the e-learning architecture. To the authors, all e-

learning are delivered via electronic gadgets, but different courses reflect different assumptions of learning. Over the years three dominant views of learning have emerged (information acquisition; response strengthening; and knowledge construction) and hence the resultant e-learning architecture: Receptive, Directive and Guided Discovery.

**Table 2.1: The E-Learning Architecture**

Architecture	View	Inter-Activity	Used for
Receptive	Information acquisition	Low	Inform training goals such as new hire orientation
Directive	Response strengthening	Medium	Perform procedure training goals such as software skills
Guided Discovery	Knowledge construction	High	Perform strategic training goals such as problem solving

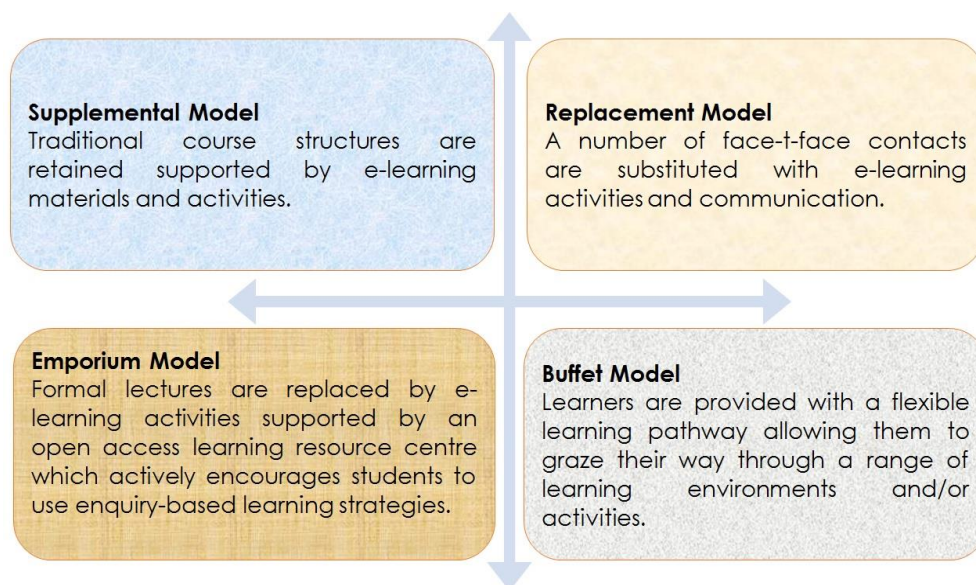
**Source: Clark and Mayer (2008)**

While it may be difficult to capture all the dimensions of e-learning in one small piece like this, it will be good to highlight what makes e-learning unique. Clark and Mayer (2008) pointed out four potentially valuable instructional methods unique to e-learning viz: (1) Practice with automated tailored feedback; (2) integration of collaboration with self-study; (3) dynamic adjustment of instruction based on learning; and (4) Use of simulation and games.

So much about e-learning. The term blended though a relatively new concept, claimed to have been around for decades. Kitchenham (2011) for instance, wrote in the foreword of his book ‘Blended Learning across Disciplines: Models for Implementation’ that Paul Myers of the BBC College of Journalism was credited to have coined the term. The author noted further that today; the usage of the term has gone viral especially in commercial organisations where time is an expensive overhead and supporting learning outside of the classroom affect the bottom line. MacDonald (2008) in the introductory chapter of her book ‘Blended Learning and Online Tutoring’ similarly noted that though the word blended is not particularly scientific or even academic, it is currently widely in use by practitioners in both academic and commercial sectors. In her words, ‘with changes in student demography, increasingly large classes, and a growth in part-time study, many course developers and tutors are turning to online media for teaching and learning’.

While it may be true that the term itself is just a label for certain types of learning delivery and that those practices had already been emerging for some time (Kitcheham, 2011), the concept ‘blended learning’ otherwise called hybrid or mixed learning has undergone tremendous amplification and complexity over the years with resultant diversification in its meaning. At its most basic level, the concept ‘blended learning’ is defined as an integrated learning approach that combines the traditional face-to-face instruction with e-learning technology i.e. the combination of virtual and physical environments (Garrison & Kanuka, 2004; Graham, 2006; Ruiz, Mintzer, & Leipzig, 2006; MacDonald, 2008; Davison, 2011; Akudolu, 2011; Kitcheham, 2011; Yen & Lee, 2011; Graham, 2013; Poon, 2013; Stuart, 2014). Graham (2006) particularly puts it as ‘organic integration of thoughtfully selected and complementary face-to-face and online approaches and technologies. Stuart (2014) building on the works of Garrison and Kanuka (2004) introduced an interesting caveat in the conceptualization of blended learning. To him, blended learning is not just about finding the right mix of technologies or increasing access to learning, but it is inherently about rethinking and redesigning the teaching and learning relationship.

Other scholars have advocated for a more holistic approach which seeks to understand the complexity of blended settings and processes in order to properly situate the concept (Kaur, 2013). What looks like a modicum of effort in that direction can be seen in the works of Twigg (2003) and Kaur (3013). Twigg (2003) for instance, classified blended learning into four major paradigms namely: supplemental, replacement, emporium and buffet models as reflected in Figure 3 below.



**Figure 2.3: Twigg’s Model of Blended Learning (Adapted from Twigg 2003)**

Kaur (2013) in a much recent article grouped blended learning, on the basis of existing definitions, into five distinct perspectives as follows:

**Holistic perspective** – *This is delivery of instruction via multiple media. It includes the integration of instructional media into a traditional classroom, or into a distance learning environment as well as any combination of media that supports instruction, regardless of the mix of synchronous or asynchronous media (Holden & Westfall, 2006).*

**Educational perspective** – *From an educational perspective, blended learning means courses that integrate online with traditional face-to-face class activities in a planned pedagogically valuable manner; and where a portion of face-to-face time is replaced by online activity. It is primarily focused on integrating two separate paradigms, the classroom – synchronous, and online – asynchronous (Laster, 2005).*

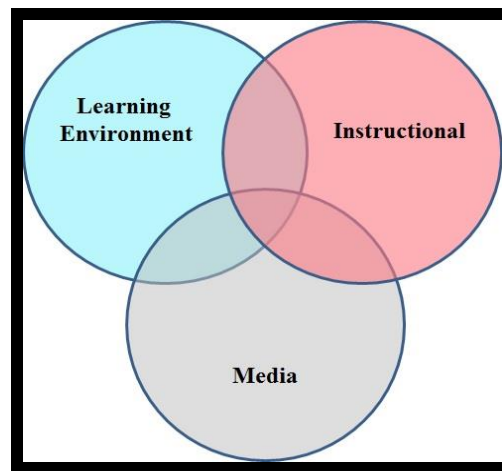
**Pragmatic perspective** – *Courses that are taught both in the classroom and at a distance, and that use a mix of different pedagogic strategies (combine various pedagogical approaches such as constructivism, behaviourism, cognitive learning approaches to produce an optimal learning outcome with or without the use of instructional technology; combine any form of instructional technology such as CDs, films, web-based learning with face-to-face instructor-led programming; mix instructional technology with actual job tasks in order to create a harmonious effect in terms of learning and working).*

**Corporate training perspective** – *The use of multiple instructional media to deliver one course or curriculum such as sales training course involving pre-reading, lectures and role play practices (Wexler, 2008).*

**Chief learning officer perspective** – *Executing a learning strategy that integrates multiple deliver modalities (both synchronous and asynchronous) and, in doing so, creates the best possible learning solution for the target audience (Peters, 2009).*

Making reference to the work of Holden and Westfall (2006) and adopting a model-like approach, Kaur (2013) went further to explicate the components of blended learning (the learning environment, media and instructional component). In line with Holden and Westfall (2006) thesis, Kaur submits that the learning environment can either be synchronous or asynchronous; each with its distinctive set of benefits and shortcomings. The goal of blended learning however is to leverage the specific positive attributes of each environment for maximal utilization of resources and attainment of goal and learning objective. Kaur (2013) liken the media component to the vehicle or medium of delivery of content. While acknowledging that no medium is inherently better or worse than the other, she pointed out that some are more suited than others for either the synchronous or asynchronous learning environment, stressing that media selection could affect the design of the content. The instructional component has to do with selection of most appropriate instructional strategies that support learning objective. Still drawing evidence from Holden and Westfall (2006) writing, Kaur (2013) contends that since such strategies which are offshoots of learning

objectives helps to facilitate the transfer of learning, learning objectives therefore need not be compromised when developing a blended learning solution.



**Fig 2.4: Components of Blended Learning (Adapted from Kaur, 2013)**

From the foregoing, one cannot but agree with Moskal, Dziuban and Hartman (2013) submission that ‘blended learning has become an evolving, responsive and dynamic process that in many respects is organic, defying all attempts at universal definition’. In their view, ‘the bad news is that it frustrates the search for specificity, but the good news is that its flexibility permits individual institutions and collaborative groups to tailor the concept to maximize its potential while being responsive to a new generation of students’. It is therefore easy to understand why in recent times, organisations and educational institutions, especially those in transition from traditional learning to e-learning, have begun to recognise that in many instances the blended learning approach is the perfect solution to a given learning need (Fallon & Brown, 2003). Nonetheless, McKenzie, Perini, Rohlf, et al. (2013) observe that the successful integration of different teaching strategies, learning modalities and resources, as it is the case in blended learning, is a challenge. This observation further strengthens the need for a planned and systematic approach to building and implementing a blended e-learning programme, particularly in a resource-constrained setting.

#### ***2.3.2.2 Integration, Application and Utilization of Blended and E-learning in the Education of Health Professionals in Resource-Constrained Environments: An Outlook of the Terrain***

Globally, e-learning and blended learning have grown in leaps and bounds, especially in the corporate and higher education world (Ruiz, Mintzer & Leipzig, 2006; Graham, 2013; McKenzie, Perini, Rohlf, et al., 2013; Vaona, Rigon, Banzi, et al., 2015). Available evidence however suggests that this growth is not uniform. While e-learning continues to be widely



integrated into the training of health professionals in the western world/developed countries (Anderson & Mercer, 2004; Kim, 2006; Moja, Moschetti, Liberati, Manfrini, Deligant, Satolli, et al. 2007; Vaona, Rigon, Banzi, et al., 2015), its diffusion and assimilation in the low- and middle-income countries can be at best described as minimal. The paucity of studies on the subject readily strengthens this assertion. It is pertinent to state that majority of the few articles yielded by successive searches on the use of e-learning in the healthcare industry in resource-constrained settings had concentrated on other things than the use of e-learning for the training or education of the health professionals. This lends support to Ajuwon (2003) finding that though studies from different countries have explored the extent to which health sciences' students use the computer and the internet, there is a dearth of research on this subject in Nigeria.

Amongst the few relevant literature found is the work of Kushniruk (2011) who in his editorial comment similarly noted that while modern healthcare is beginning to be transformed through the emergence of new information technologies and rapid advances in health informatics, health professionals (medical, nursing and allied health professionals) lack an understanding of how these technologies can bring about the desired transformation in their healthcare practice. Similar to Kushniruk (2011) assertion is Raymond and McKimm (2010) remark that although the advent of web 2.0 technology and the attendant plethora of technologies has given medical educators around the world opportunities to develop and extend the use of e-learning in mainstream medical education, course directors and curriculum designers still battles with decision on how to effectively engage these technologies. The authors noted further that while internet penetration is high in the larger countries of the Oceania region such as Australia, it is considerably lower for nations in the South Pacific with resulting in difficulties to access and maximise the use of these technologies.

Adanu, Adu-Sarkodie, Opare-Sem, Nkyekyer, Donkor, Law-Son and Engleberg (2010) detailed a moderate effort at electronic learning and open educational resources for medical students of the University of Ghana Medical School and the School of Medical Sciences, Kwame Nkrumah University of Science and Technology in alliance with the University of Cape Town, University of Western Cape (both in South Africa) and the University of Michigan (USA). Yet significant is Frehywot, Vovides, Talib, et al. (2013) review of pertinent literature on e-learning in medical education in low- and middle-income countries

(LMICs). The authors reported that of the relevant articles retrieved, most referred to e-learning in Brazil (14 articles), India (14 articles), Egypt (10 articles) and South Africa (10 articles). They equally noted that while e-learning has been used by a variety of health workers in LMICs, the majority (58%) reported on physician training, while 24% focussed on nursing, pharmacy and dentistry training. Another cogent finding of their study is that motivation for investing in e-learning are diverse, but at the core of it all lies expanded access to education. Last but not the finding that blended learning approach was the most common methodology (49 articles) among the various forms of e-learning employed in medical education, followed by computer-assisted learning (45 articles), simulation and use of multimedia software (20 articles), web-based learning (14 articles), and eTutor/eMentor programs (3 articles) in descending order. The report also has it that of the 69 articles that evaluated the effectiveness of e-learning tools, 35 studies compared outcomes between e-learning and other approaches, while 34 studies qualitatively analysed student and faculty attitudes towards e-learning.

Similar pattern was found in this study. When searches were delimited to adoption and use of e-learning or blended learning in nursing education/training (whether in-service training, distance learning programme, or the full-time nursing education programme), the retrieved articles grew leaner, almost tending towards single unit. Further examination of the few articles retrieved showed that only a tiny portion is relevant to the discourse of adoption and use of e-learning in nursing education/training. Prominent among these few articles, is D'Souza, Karkada and Castro (2014) article that explored the perception of use and satisfaction with e-learning among nurse educators in an undergraduate nursing programme in Oman, Middle East. The study concluded that there is an increasing awareness of the use of e-learning (Moodle) among nurse educators and moderate satisfaction with blending learning approach.

Yu, Chen, Yang, Wang and Yen (2007) in their nationwide cross-sectional study among public health nurses in the Asian country of Taiwan found that a majority (88.8%) showed an affirmative intention towards adopting e-learning as their one way of continuing education. In view of this positive disposition of the majority and the reasons adduced by the participants such as potential for achieving life learning, fulfilling personal interests, flexibility in time, reasons of cost-effectiveness, reduced interference with family duties and life, the authors concluded that the e-learning approach is feasible, suitable and valuable learning method for

public health nurses continuing education and by extension all health care professionals. They were however apt to advise on the imperative of need assessment at the preparatory stage of e-learning programme.

In East Africa and certain region of the Southern African Development Community (SADC), the African Medical and Research Foundation (AMREF) programme was the most widely reported e-learning initiative designed and implemented to upgrade the skills of nurses, midwives and community extension workers (CHEWs). According to AMREF Health Africa (2015), the programme that commenced in 2005 was a national programme and was executed in collaboration with Accenture (a global management consulting, technology services and outsourcing company), the Kenyan Ministry of Health and the Nursing Council of Kenya, to address the critical shortage of nurses in Kenya. AMREF stated further that in 2007, the programme expanded to include the AMREF Virtual Nursing School and as at 2009 the transition of the Kenyan eLearning Nurse Upgrading Programme to eHealth Programme began. Following the successful conversion of the programme, it has been expanded in scope from local to regional and under different aegis from eLearning to mLearning and mHealth, being replicated in various countries across the region including Uganda, Tanzania, Malawi, Zanzibar, Zambia, and Lesotho (AMREF, 2015). As supposedly good and helpful the AMREF programme appear to be, one immediate shortcoming of it is that it has only been employed to deliver short term certificate and diploma courses.

Efforts at retrieving articles on development, integration and adoption of e-learning in nursing education in the West Africa and the North Africa region however yielded no fruitful result. While there have been visible presence of the use of ICT in the delivery of healthcare services; the banking and account firms; and in the higher educational institutions in these two regions of Africa, it seems glaring that there have been no concerted effort at developing a structured and well-designed e-learning programme for the education of nurses, even in the face of obvious need. The present study is no doubt is a worthwhile effort at filling this gap and facilitating lifelong learning among Nigerian nurses as desirous in this 21<sup>st</sup> century knowledge society.

### ***2.3.2.3 Perceived Pitfalls and Benefits of E-learning and Blended Learning***

The benefits/advantages of e-learning and blended learning are well documented in literature. What appear not to have been given much prominence are the flaws/pitfalls of both learning approaches. Punie, Zinnbauer and Cabrera (2006) in the opening paragraph of their review of

impact of ICT on learning declared that ‘it is difficult and maybe even impossible to imagine future learning environments that are not supported, in one or another, by ICT; and that there is a widespread belief that ICTs have an important role to play in changing and modernising educational systems and ways of learning’. They established inter alia that there is ample evidence that educational achievements are positively influenced by ICT, but not only by ICT used in formal learning environments, but that access to ICT at home play a more important factor. This informed their conclusion that educational achievements are not shaped only by the way education is organised, but also by the socio-economic background of the learners, their socio-cultural environments, the changing skills and competencies that are needed for employment, training, self-development and participation in society. In consonance with Punie, Zinnbauer and Cabrera (2006) finding, Poon (2013) following a review of related literature asserted that there is considerable evidence that blended learning can positively impact student achievement.

Some other studies have equally proven that learning in a virtual/online environment can be as effective, if not more effective, than learning in traditional classrooms (Tallent-Runnels, Thomas, Lan, Cooper, Ahern, Shaw, & Shaw, 2006; Ruiz, Mintzer & Leipzig, 2006; Clark & Mayer, 2008; Akudolu, 2011; Vernadakis, Giannousi, Derri, Michalopoulos, & Kioumourtzoglou, 2012; Kaur, 2013). Proponent of this school of thought contends that when well-designed and well-implemented, blended and/or e-learning can offer additional dividends over and above what is obtainable in the traditional face-to-face approach especially concerning improvement in quality of teaching and learning (Ruiz, Mintzer & Leipzig, 2006; Ololube, Ubogu & Egbezor, 2007; Olojo, Adewumi & Ajisola, 2012).

Of the multitude of writings on the subject matter are the works of Ruiz, Mintzer and Leipzig (2006) and Olojo, Adewumi and Ajisola (2012) who polarised the benefits/advantages of e-learning into two distinct groups: learning delivery and learning enhancement. Drawing from the works of other scholars, they sum up that ‘learning delivery’ (the most often cited advantage of e-learning) as including increased accessibility to information, ease of updating and revising content, potential for tailored or personalised instruction, ease of distribution and standardization of course content and delivery, as well as its innate propensity to facilitate accountability. The ‘learning enhancement’ which they claim are a less well recognised, yet potentially more revolutionary aspect of e-learning, includes opportunity for greater learner interactivity; promotion of learner’s efficiency; potential to improve motivation, cognitive

effectiveness and flexibility of learning style. Above all, the automated tracking and reporting of learners' activities, which the e-learning machinery readily offers, lessens faculty administrative burden.

In their systematic review of literature on e-learning in medical education in resource constrained low- and middle-income countries, Frehywot, Vovides, Talib, Mikhail, Ross, Wohltjen, et al (2013) admit that e-learning can result in greater educational opportunities for students while simultaneously enhancing faculty effectiveness and efficiency. They nonetheless noted that this potential of e-learning assumes a certain level of institutional readiness in human and infrastructural resources that is not always present in low- and middle-income countries. Similarly, Dyrbye, Cumyn, Day and Heflin (2009) in their qualitative study of physicians' experiences with online learning in a master's degree programme, reported that from their participants' perspective, the online format is convenient, flexible and beneficial for learning. Leu, Liao, Chang and Su (2009) also observe that the e-learning mechanism offers a way out of the time and spatial constraints associated with face-to-face learning which tend to hinder nursing staff from enrolling in ladder system training classes.

Other scholars, Oye, Salleh and Iahad (2011) reported that e-learning allows for efficient transfer of knowledge anywhere and anytime, regardless of subject matter. These authors also expressed that e-learning opens up a world of learning previously unavailable in most corners of the world while simultaneously equipping learners with the information technology awareness and critical skills needed for success in today's global knowledge economy. In Manir (2009) opinion, the benefits are many but include cost-effectiveness (as less time and money is spent travelling), enhanced responsiveness to change, timeliness, flexibility, easy update of instructional materials, opportunity for use of multiple multimedia materials, prompt feedbacks, ready potentiality to customize learning materials to meet individual needs and improve retention.

Similar notions were expressed by Ruiz, Mintzer and Leipzig (2006). In their words, 'e-learning technologies offer learners control over content, learning sequence, pace of learning, time and often media, allowing them to tailor their experiences to meet their personal learning objectives'. For Iloañosi (2007), the advantages are: enhanced and consistent delivery of lectures, improved administration of assessment and group projects; improved awareness of the institution through greater interaction and collaboration among lecturers and

students; potential for self-paced learning, increased retention and better control over learning material; cost effectiveness; broader geographical reach; and just-in-time learning. Folorunso, Ogunseye and Sharma (2006) building on Elearnframe (2000) works take this to another level by forecasting that increasing level of e-learning presence in Nigerian universities will ameliorate the problems of overcrowding in lecture rooms and hostels, low lecturer to student ratios, insufficient laboratory equipment, cultism, too many applicants for too few schools and a lot more.

As good as e-learning is, it is however believed that not all skills can be acquired via e-learning; and that neither is it possible to deliver all educational content via remote means, hence the relevance of blended approaches (Wakefield, Carlisle, Hall & Attree, 2008). This supports Ruiz, Mintzer and Leipzig (2006) earlier discovery that students do not see e-learning replacing the traditional instructor-led training but as a complement to it. Akudolu (2011) in a review of other studies on blended and e-learning, summarily concluded that blended learning enhances learning better than face-to-face instruction and stand-alone e-learning; a view supported by most scholars on the subject. Indeed, many are persuaded that the integration of both the traditional and the e-learning approach, as it is in blended learning, will bring about a synergistic effect of their benefits on teaching and learning. López-Pérez, Pérez-López and Rodríguez-Ariza (2011) study for example shows that blended learning can foster a decrease in student attrition and facilitate an increase in the student pass rate.

Kaur (2013) for instance declared that blended learning provides flexibility in learning for both students and teachers. Taking a cue from Bliuc, 2007, she argued that the blending of the physical with the virtual landscapes enables both the instructors and the students to become learners, but added that this is most effective when there is institutional support through the provision of professional learning and the opportunity for redesigning courses for the most appropriate blend. Adomi and Kpangban (2010) outline the strength of blended learning as follows: it satisfies both instructor-centred and student-centred learning approach; creates flexible learning environment; enhances curriculum relevance; provides easy to use cultural interfaces; enhances communication and interactivity; decreases language difficulties; allows for more effective and highly satisfactory learning; enhances self-learning, self-motivation and independence; reduces learning and training costs; supports various learning styles and strategies; provide a balance between new and traditional education environment.

Kaur (2013) presents a persuasive and well-reasoned thesis on the merits of blended learning:

*It represents a switch from passive learning to active learning; the focus of the classroom shifts from a presentational format to one of active learning.... Offers learners the opportunity to be either together or apart.... Allows students to learn and access material in a variety of modes – an important feature since students often have different learning styles (In fact research indicates that blended learning increases students' chances of meeting course outcomes compared with fully online and even fully face-to-face courses, by decreasing dropout rates, increasing test scores and increasing motivation on the part of students). It adds a human touch to teaching (The interactive content enables the instructor to create a high level of interest, accountability, and real assessment). Enhances individualization, personalization and relevance (It let the instructor tailor learning content to the unique needs of different audience segments). Offers students the best of both worlds because instructors and students have greater flexibility and accessibility without sacrificing face-to-face contact.... It is an effective and low-risk strategy aimed at meeting the challenge of transformational changes that technological developments bring to higher education (Hancock & Wong, 2012).*

McKenzie, Perini, Rohlf, et al (2013) similarly argue that due to the difficulties/deficiencies of using the lecture approach especially with large cohorts (poor attendance, low level of engagements by unprepared students and other factors that are well documented in literature), substituting the traditional, didactic lectures with online activities (such as quizzes simulations, online discussions) as it is the case in blended learning can encourage active learning and results in improved learning outcomes.

One cannot go wrong then to conclude that blended and e-learning approaches do not only facilitate and enrich the delivery of learning content with resultant efficient transfer of knowledge, but also holds the potential to impact significantly on the quality and reach of education in any setting. It must however be realised that they are not devoid of pitfalls/flaws. Manir (2009) noted that e-learning may cost more to develop and may require new skills for the production of content. In an attempt to cut cost, what get developed may be cheap and substandard. He noted further that the associated technology might be intimidating, at times confusing, frustrating and costly; and besides e-learning requires more responsibility and self-discipline on the part of the learner to keep up with an unconstrained and robust learning process.

Another author, Akudolu (2011) observes that most e-learning scenarios have been criticized for presenting facts and figures, without a significant social and teaching presence, which can help promote and sustain the learner's attention and interest. Sometimes the content is all too

often mostly text, boring and sleep-inducing. Many have argued that without real engagement, the probability of active learning is low and the odds against course completion is high. This no doubt, has contributed in no small measure to the hitherto high student attrition rate observed with many e-learning courses. The e-learning and the low end blended learning approach, particularly the ‘presentation model’, has also been observed to be prone to a dearth of reliable and consistent guidance for students in how to make the most of the learning opportunities afforded by the diverse resources (McKenzie, Perini, Rohlf, Toukhsati, Conduit, & Sanson, 2013). While Akudolu (2011) suggestion of presenting content as digital stories could help, making the course more interactive may produce more fruitful result.

Clark and Mayer (2008) equally note that despite the impressive capabilities of e-learning, two common challenges militate against the full realization of its potentials. These are: (1) losing sight of the job, leading to transfer failure; and (2) media abuse, leading to over or under use of technology in ways that impede learning. According to them, humans have limited capacity to absorb information, as such over-enthusiastic use of software features can depress learning; in the same vein, underutilizing or ignoring media capabilities can retard learning. Dyrbye, Cumyn, Day and Heflin (2009) reported challenges relating to the asynchronous communication environment; difficulties in negotiating team work and in building relationships; technical demands; and learning style preferences.

There are quite a few others, like the perceived ease of impersonation and perpetration of other fraudulent practices such as examination malpractice associated with stand-alone e-learning. Lack of exchanges and relations with other learners; absence of physical presence of teacher; and decrease motivation to learn reported from the work of other scholars by Vaona, Rigon, Banzi, et al. (2015). The good thing is that these and other issues are not beyond redemption. Evidence suggests that a good number of these challenges could be resolved with careful planning, good design and effective implementation of a blended learning approach. This might be part of the consideration for Akodolu (2011) submission that in a not-so-rich technology environment like Nigeria, it would be better to start with blended e-learning design.

Perhaps what makes blended learning more suitable for a resource constrained environment like Nigeria could be seen in the light of Moskal, Dziuban and Hartman (2013) observation that blended learning can increase access within the scope of existing resources while



maintaining or enhancing quality. To buttress their point, the authors assert that in many instances, it can improve return on investment; provide increased opportunities for faculty to design more effective teaching and learning environments; and holds the potential to foster a much more reflective student population and extends learning far beyond classroom borders. In summary, while blended and e-learning approaches are not without defects, a critical evaluation of the benefits vis-à-vis the weaknesses shows that the benefits outweigh the flaws; and as such worth trying out in the current world of education that is dominated by the digital/net generation and the neo-millennial generation.

## CHAPTER THREE

*The research worker needs a set of assumptions as a starting point to guide what he/she does, to be tested by experiment, or to serve as a check on observations and insights. Without any theory, researcher activities may be as aimless and as wasteful as the early wanderings of the explorers in North America ..... knowledge of theory always aids practice (Kidd, 1959; retrieved from Knowles, Holton III and Swanson, 2005:9).*

### 3.0

## THEORETICAL FRAMEWORK

In this chapter, the theoretical underpinning of the study is examined. Each of the theories considered relevant to the study is discussed with particular reference to its relevance and how it is integrated into the study.

### 3.1 OVERVIEW

The centrality of theory to development of practice across all fields and particularly in the design and implementation of e-learning cannot be over-emphasized. Mayes and de Freitas (2004) assertion that it is all the more important when implementing e-learning approaches, to be clear about the underlying assumptions aptly buttress this fact. The importance of theoretical framework is further strengthened by Bezuidenhout (2014) submission that theory and practice are two sides of the same coin that cannot and should not be separated. In Bezuidenhout (2014) view, the same inseparability characterises research and theory and consequently liken theoretical concepts and constructs metaphorically as breadcrumbs that we use to help crisscross the research journey

Burns and Grove (2009) defines a framework as an abstract, logical structure of meaning. McNiff (1988) while acknowledging that action research possesses within itself the ability to incorporate previous approaches, since its focus rests on the enquirer rather than the methodology, advise that the educational action researchers need to equip themselves more rationally to select the philosophical base and methodology that allows for democratic participation. Nichols (2003) observe that it is unlikely that e-learning practice will continue to evolve unless the theoretical underpinnings of e-learning are explored and debated, providing a wider platform and a common philosophy for e-learning development. His logical and persuasive argument is captured herein:

*If literature is likened to a 'tree of knowledge' about a particular subject, the dire need for more eLearning theory becomes clear. Practice based research can be likened to the branches of the tree, those parts that are readily visible and most easily appreciated. Theoretical principles can be likened to the roots; they do not provide any practical things for people like shade or fruit and neither are they aesthetically pleasing. However it is the root system that determines the health of the tree and also the extent to which it can grow. Unless attention is given to eLearning theory, the branches cannot stretch out for fear of toppling the entire structure. Unless attention is given to eLearning theory, eLearning practice cannot develop fully. Without further debate and development in the theoretical underpinnings, we will be left with bonsai eLearning.*

The present effort is clearly an attempt to avert this dangerous trend. In order to ensure that the blended e-learning model evolving from this study generates the collaborative, cohesive and critical discourse and other benefits inherent in e-learning, rather than just being technology-led, the theoretical underpinning for this study is sought in an interplay of the Khan Framework for E-Learning; and the Garrison and Anderson's Community of Inquiry Model. This approach provides opportunity for a perfect fusion of technology, pedagogy, context and process related issues in the development, deployment, and evaluation of the new model, hence their consideration for this study.

The Khan framework though serves as a useful template in the exploratory and development cycles of the study fails to project clearly how the teaching-learning activities and the sense of community is built into e-learning. However to facilitate higher-order learning, there is a need for a sustained interaction among the community of learners (collaborative learning) and hence the inculcation of the community of inquiry model (CoI). It is equally a known fact that human beings are thinking reasoning beings. Their intent, attitudes, actions and inactions, are believed to be motivated by intrinsic and extrinsic factors. The CoI offers a more comprehensive guide on how the cognitive, teaching and social presence could be integrated and sustained in a virtual environment.

### **3.2 A FRAMEWORK FOR E-LEARNING**

This framework was created by Badrul Khan, an associate professor and director of educational technology leadership graduate cohort program at the George Washington University. Khan holds a PhD in Instructional Systems Technology from Indiana University, Bloomington, USA. His career in research, teaching and leadership include: former assistant professor of education and founding director of educational technology, graduate programme, University of Texas, Brownsville; ex instructional developer and evaluation specialist, School of Medicine, Indiana University, Indianapolis; and the author of the bestseller 'Web-Based Instruction'. He has over the years contributed immensely to discourse in the field of distributed learning.

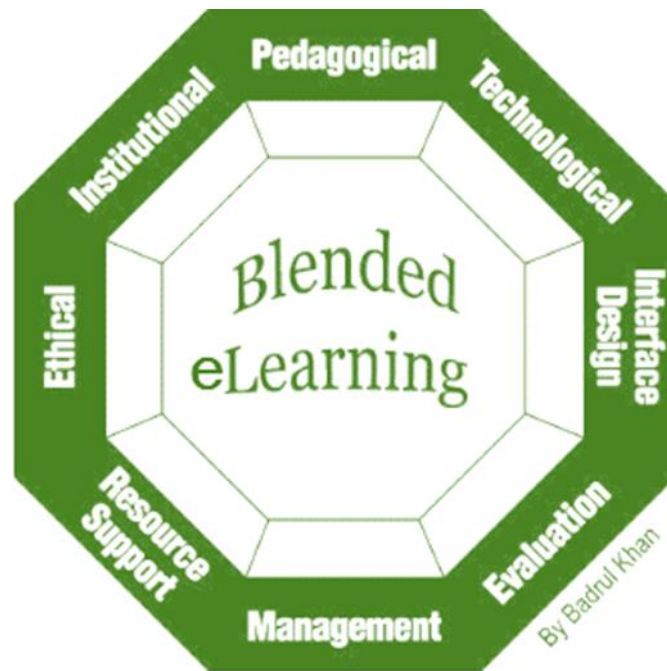
Khan (2001) observed that advances in information technology and new developments in learning science provides opportunities to create well-designed, learner-centered, engaging, interactive, efficient, easily accessible, affordable, flexible, meaningful distributed and facilitated e-learning environments. He posits that the design, development, implementation and evaluation of open flexible and distributed learning systems, otherwise referred to as e-

learning, requires thoughtful analysis and investigation of how to use the internet and digital technologies in concert with instructional design principles and issues that are central to various dimensions of online learning environment.

According to him, a variety of factors need to be addressed to create a meaningful and effective e-learning. Many of these factors, in his view, are interrelated and interdependent, and hence his conviction that a systemic understanding of these factors will enable designers to create meaningful distributed learning environments (Khan, 2001; Singh, 2003). To Khan, an e-learning system should not only be meaningful to learners, but should also be meaningful to all stakeholder groups including instructors, support services staff, and the institution. In his words:

*An e-learning system is more likely to be meaningful to learners when it is easily accessible, clearly organised, well written, authoritatively presented, learner centered, affordable, efficient, flexible, and has a facilitated learning environment. For instructors, an e-learning system becomes meaningful when learners display a high level of participation and success in meeting a course's goals and objectives. To support staff, an e-learning system becomes meaningful when learners enjoy all available support services provided in the course without any interruptions. And to the institution as a whole, an e-learning system is meaningful when it has a sound return-on-investment (ROI), a moderate to high level of learners' satisfaction with both the quality of instruction and all support services, and a low drop-out rate (Morrison & Khan, 2003).*

Khan recalled that the seed for his e-learning framework began to bud with the question 'what does it take to provide the best and most meaningful flexible learning environments for learners worldwide'? The different factors that he perceived as important to building a meaningful distributed learning environment are: institutional, pedagogical, technological, interface design, evaluation, management, resource support and ethical. These factors formed the eight dimensions of his octagonal framework for e-learning as reflected in figure 3 below. As depicted in figure 3, each of the eight dimensions of the framework represents a category of issues that need to be addressed (Khan 2001). It is also important to note that each of these dimensions has several sub-dimensions, with each consisting of issues focused on a specific aspect of an e-learning environment. Singh (2003) expounding on Khan's work submits that these issues help organise thinking and ensure that the ensuing learning programme creates a meaningful learning experience.



**Fig 3.1: Khan’s Octagonal Framework (Adapted from Singh, 2003)**

A succinct description of the issues involved in each dimension is as presented: institutional (administrative matters of education), pedagogical (teaching and learning needs for e-learning), technological (technology infrastructure, hardware and software), interface design (overall look and feel of e-learning programs), evaluation (assessment of learners, instruction and programs), management (maintenance of learning environment, distribution of information), resource support (online and technical support) and ethical (such as social and cultural diversity, copyright and so on).

- i. The **institutional** dimension addresses a number of issues ranging from administrative affairs, academic affairs, to student services as related to e-learning. The *administrative affairs* examines issues such as needs analysis including learners’ needs assessment, institutional preparedness, organization and change, accreditation, budgeting and return-on-investment, information technology services, instructional development and media services, partnerships with other institutions, marketing and recruitment, admissions, financial aid, registration and payment, graduation, and alumni affairs. The *academic affairs* deals with matters concerning faculty and staff support, workload, class size and compensation, availability of content and infrastructure, instructional quality and intellectual property rights. *Student services* encompasses pre-enrolment services, orientation, advising, counselling, learning skills development, services for students with disabilities, library support, bookstore,

tutorial services, mediation and conflict resolution, social support network, students newsletter.

ii. The **pedagogical** dimension specifically examines what teaching and learning methods should be adopted. Singh (2003) unpacks this a little further. To him, the concern here is thoughtful analysis of the combination of content that has to be delivered (*content analysis*), the *audience analysis*, and *goal analysis* (learning objectives). Included also in the pedagogical dimension are considerations of other matters that are germane to the choice of the design and strategy such as *medium analysis, design approach, organization of content, instructional methods and strategies*. Khan (2001) suggests a number of strategies, viz: presentation, demonstration, drill and practice, tutorials, games, story-telling, simulations, role-playing, discussion, interaction, modelling, facilitation, collaboration, debate, field trips, apprenticeship, case studies, generative development and motivation.

iii. The **technological** dimension deals with issues of technology infrastructure in blended e-learning environments. It includes such things as *infrastructural planning, hardware and software selection* (Khan, 2001). Singh (2003) sheds more light on this as follows:

*This dimension addresses the need for most suitable learning management system (LMS) that would manage multiple delivery types and a learning content management system (LCMS) that catalogues the actual content for the learning programme. Technical requirements such as the server that supports the learning programme, access to the server, bandwidth and accessibility, security, and other hardware, software, and infrastructure issues are addressed.*

iv. The **interface design** denotes the overall look and feel of e-learning programmes. It incorporates such issues as *page and site design (graphics), content structure/design, navigation, usability testing and accessibility* (Khan, 2001). Singh (2003) advises that the interface should be robust enough to integrate the different elements of the blend as this will enable the learner to use each delivery type and switch between different types.

v. The **evaluation** dimension has to do with the usability of a blended learning programme (Singh, 2003). This author suggests that the programme should have the capability to evaluate how effective a learning programme (in terms of the instruction

and learning environment) has been as well as evaluating the performance of each learner (learners' assessment).

- vi. The **management** of blended e-learning refers to the maintenance of learning environment and distribution of information. This encompasses administration of infrastructure and logistics involved in the delivery of a blended learning programme. Singh (2003) states that it also addresses issues like registration, notification, and scheduling of different elements of the blend.
- vii. The **resource support** dimension – Building on Khan (2001) framework, Singh (2003) explains that the resource support dimension has to do with making different types of resources (offline and online) available for learners as well as organising them to facilitate meaningful learning. These supports could be in form of instructional counselling support, technical support, career counselling services, and other online and offline support services.
- viii. The **ethical** dimension explores ethical issues that need to be considered when developing a blended learning programme. Khan (2001) and Singh (2003) highlighted some of these issues: equal opportunity, cultural diversity, socio-political influence, bias, geographical diversity, information accessibility, etiquette, and legal issues such as policy and guidelines, privacy, plagiarism, copyright.

Khan was quick to state that the sub-dimensions within each of the eight dimensions are by no means exhaustive. He rhetorically states that “are all sub-dimensions within the eight dimensions necessary for e-learning and by extension for blended e-learning”? In his words, one might equally discover that there are a lot of questions begging for answers and might wonder which one to address. To these, he retorted that the number and types of questions may vary from one programme to the other depending on the scope of learning initiatives and their complexity. To initiate an e-learning degree program, for example, it is critical to start with the institutional dimension of the E-Learning framework and also investigate all critical issues relevant to our specific projects in other dimensions. In this case, a comprehensive readiness assessment (refer to *readiness assessment* section of the *institutional* dimension) should be conducted. However, to create an e-learning lesson, some institutional sub-dimensions (such as *admissions*, *financial aid*, and others) may not be relevant.



While that may be true, the eight dimensions identified by Khan can be likened to foundational stones or building block for an effective e-learning model. This strengthens its suitability as blueprint for this study. Since the strength of a building rests on its foundation, following the sequence of steps suggested by Khan (2001) will not only provide the framework for the e-model but will help to fortify the structure and ensure its successful implementation.

Khan (2001) declared further that his e-learning framework has been reviewed by scholars and practitioners from various countries around the globe, including USA, Canada, UK, Australia, New Zealand, Netherlands, South Africa, Turkey, Korea and China. In view of this, he expressed optimism that the e-learning framework holds the potentiality of providing guidance in:

- planning and designing e-learning materials,
- organising resources for e-learning environment,
- designing distributed learning systems, corporate universities, virtual universities and cyber schools,
- designing LMS, LCMS and comprehensive authoring systems (e.g., Omni),
- evaluating e-learning courses, and programmes.
- evaluating e-learning authoring tools/systems, LMS and LCMS.
- designing and evaluating blended learning environments

Although the relevance and usefulness of Khan's E-Learning Framework is not in doubt, scholars in the field of education (Tu, 2000; Harasim, 2002; Garrison & Anderson, 2003; Swan & Shea, 2005; Shea & Bidjerano, 2009; Lowenthal, 2010) have demonstrated that learning is a social process and that discourse plays a key role in the social process of learning. Shea and Bidjerano (2009) explained that recent conceptions of knowledge development indicate that learners must play a much larger role in the educational process (i.e. become more active in and responsible for their learning). They argued further that:

*What is needed now is a model that provides online faculty and instructional designers a mechanism for integrating technology and pedagogy in ways likely to impact learning across the many disciplines now available via online education. This presentational conception of online educational environments is not unproblematic however, and the authors are careful to remind us that presentation alone is insufficient to the preservation and enhancement of learning in and beyond the classroom. In the absence of clear explanations provided by a capable instructor, for example, even the most dynamic technology-mediated representations may be of little use to learners.*

This observation not only exposes the inadequacy of many e-enhancement frameworks but also entrenches the relevance and importance of the community of inquiry in promoting higher-order learning in virtual environment. It will therefore be foolhardy not to recognise that the implicit denial of community has perhaps been the greatest shortcoming of distance education that focuses on prescriptive course packages to be assimilated by student in isolation (Garrison & Anderson, 2003). This is because education and learning at its best entails collaboration, which includes a sense of belonging and acceptance in a group with common interests (Harasim, 2002; Garrison & Anderson; 2003; Lowenthal, 2010). Studies have even shown that physical separation, the trademark of distance programmes, has the tendency to reduce sense of community with resultant feeling of disconnectedness, isolation, distraction, and lack of personal attention (Rovai, 2002a).

Despite the asynchronous nature of online communication and the potential for disconnectedness, ample evidence exists that a sense of community can be created online (Rovai, 2002a; Thompson & MacDonald, 2005, Garrison, 2007), though this is not a trivial challenge. Literature is replete with the growing emphasis on building learning communities in order to increase student participation and to foster learning in online and blended learning environments (Rovai, 2002b; Barab, Kling, & Gray, 2004; Palloff & Pratt, 2005; Colachico, 2007; Arbaugh, 2008; Akyol, Garrison, & Ozden, 2009; Akyol, Arbaugh, Cleveland-Innes, Garrison, Ice, Richardson, & Swan, 2009). Thus the CoI comes handy to conceptualise possible pathways through which learner–learner and learner–facilitator interaction and collaboration can be enriched in blended learning programmes. The next section discusses the details of this model and its significance to the development and implementation of a successful blended e-learning model.

### **3.3 COMMUNITY OF INQUIRY (COI) MODEL**

The word community is a household word, a word that has enjoyed wide usage in every aspect of human life. Simply put, a community is a group of people with common background or shared interests within a society. Garrison and Anderson (2003) describe it as the fusion of the individual and the group; the psychological and sociological; the reflective and the collaborative. They added that this is no less so from a learning or educational perspective. Conrad (2005: 1) similarly defines it as “a general sense of connection, belonging and comfort that develop over time among members of a group who share purpose and commitment to a common goal”.

While the idea of educational communities is as old as the education industry itself, the construct – ‘Community of Inquiry’ (CoI) – is relatively new. Lipman (1991) is widely believed to have articulated the idea but it was Garrison and Anderson (2003) that popularized it and they are the duo to whom much of its content is attributed. Some other individuals have however equally contributed to the conceptualization and further refinement of the concept (CoI). Notable among them is Henri (1992), a man believed to be one of, if not the first, to develop a framework that identifies both social and cognitive dimensions for studying online learning (Garrison, 2007). Garrison (2007) recalled that it was Henri’s (1992) work that spurred him, Anderson and Archer to first develop a comprehensive framework as an online learning research tool in the year 2000, and subsequently the Garrison and Anderson CoI model in 2003.

Taking a cue from Lipman (1991: 8, 14) writing, Garrison and Anderson (2003) state that the original thought of the CoI is that of a teacher-guided, non-authoritarian community, where societal knowledge is revealed in an equivocal, multidisciplinary manner. The goal, according to them, is to structure relationships to achieve understanding and develop ‘rationality tempered by judgment’. They describe it as ‘a critical community of learners, comprising teachers and students, transacting with the specific purposes of facilitating, constructing, and validating understanding, and of developing capabilities that will lead to further learning’ (Garrison & Anderson, 2003: 23). It is a community where students listen to one another with respect, build on each other’s ideas, challenge one another to supply reasons for otherwise unsupported opinions, assist each other in drawing inferences from what has been said, and seek to identify one another’s assumptions (Lipman, 1991: 15; Garrison & Anderson, 2003: 27; Pardales & Girod, 2006). Shea and Bidjerano (2009) put it nicely: ‘The CoI framework focuses on the intentional development of an online community with an emphasis on the processes of instructional conversations that are likely to lead to epistemic engagement’ (epistemic engagement and dialogic pedagogy). One benefit that stands out clearly from the various authors’ submissions on CoI is that of synergistic existence of both rationality and freedom.

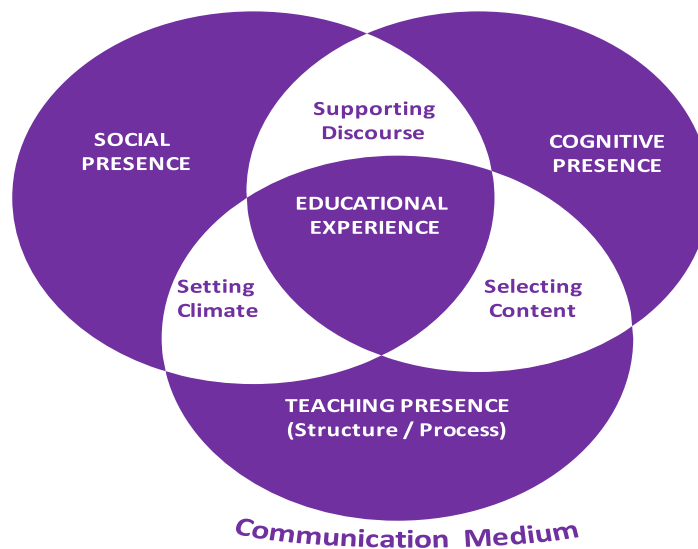
Such a community, no doubt, is essential for higher-order learning. That explains why it is considered as core element in the e-learning conceptual framework (Garrison & Anderson, 2003). Apart from being crucial to precipitating and maintaining personal critical enquiry, as rightly noted by Garrison and Anderson (2003), it is also essential for construction of

meaning, owing to its inherent potential to foster collaboration within the group; a necessary adjunct for individuals to assume responsibility for making sense of educational experience. This strengthens Ramsden (1998) earlier assertion that interactivity and collaboration is essential for deep and meaningful learning outcomes.

Garrison, Cleveland-Innes, and Fung (2004) equally observed that online educational communities have the properties of being both reflective and interactive (that is, individuals have the freedom of private reflective thought equitably balanced with interaction in the public sphere). They stressed that this is made possible through the written word and communication networks especially collaborative written communication that lends itself to concurrent critical reflection and discourse – and ultimately to higher-order learning outcomes. Shea and Bidjerano (2009) share similar view. To them, the epistemic engagement approach, which foregrounds the role of learners as collaborative knowledge builders in online environment, is more fully articulated and extended through the CoI model. Other authors: Akyol, Arbaugh, Cleveland-Innes, Garrison, Ice, Richardson, and Swan (2009), Arbaugh, Cleveland-Innes, Diaz, Garrison, Ice, Richardson, and Swan (2008), Arbaugh (2008), and Arbaugh (2007) have affirmed that the framework has been employed considerably in researches with promising results. Put differently, the concept of community is essential in online learning because a strong sense of community has the potential to facilitate student engagement and boost learning outcomes. The above considerations inform its wide use in online and blended teaching and learning practice.

The CoI defines a good e-learning and by extension, blended e-learning environment through three major elements/components – social, teaching and cognitive presence (Garrison & Anderson, 2003). The three components overlap with educational experience forming the core of the triad. Suanpang and Petocz (2003) state that ‘the model assumes that within this community, learning occurs through the interaction of the three components: cognitive presence, social presence and teaching presence’. This is well complemented by Shea and Bidjerano (2009) submission that the model articulates the behaviours and processes required to nurture knowledge construction through cultivation of various forms of ‘presence’, among which are teaching, social and cognitive presence. Garrison, Cleveland-Innes, and Fung (2004) explained that the triadic structure of the model emerged from the educational literature and the experience of its authors. The authors were equally careful to state that each of the elements/components do not exist in isolation, but rather each can be seen as an

overlapping set of lenses (Shea & Bidjerano, 2009). The relationship and functions of these elements/components are as projected in the diagram below.



**Fig 3.2: Community of Inquiry Model (Adapted from Garrison & Anderson, 2003)**

Garrison and Anderson (2003) explained that although education in the context of this model (CoI) is used to mean learning, it is a specific kind of learning defined by process and outcome. Shea and Bidjerano (2009) take this a little further when they state that the CoI ability to construct knowledge in online environments is contingent on the capacity of teachers and learners to move beyond direct instruction to establishing some form of ‘presence’. They submitted that through the skilful marshalling of teaching and social presence, participants are able to engage in reflection and dialogue and that provides opportunities to extend current understandings and learning. While educational experience is unarguably the very essence of CoI, the teaching and social presence represent the processes needed to create paths to epistemic engagement and cognitive presence for online learners. A further exploration of each of the elements/components of CoI will enhance an in-depth understanding of how they can be created and how their interplay can bring about higher-order learning in the blended e-learning environment. First, the social presence, then the teaching and cognitive presence.

### **3.3.1 Social Presence**

Lowenthal (2010: 129) citing the works of Tu (2000), Harasim (2002), and Swan and Shea (2005) declare that learning is a social process and that discourse plays a key role in it. This author noted that the theory of social presence was initially used by Short, Williams, and Christie (1976) to explain the effects a communication medium can have on the way people

communicate. In his words 'Short et al. (1976) working from previous research in psychology and communication (the Argyle and Dean's concept of intimacy and Wiener and Mehrabian's concept of immediacy) define social presence as the degree of salience (quality or state of being there) between two communicators using a communication medium, which influences the way people interact and communicate'. Gunawardena (1995) sees social presence as the degree to which people are perceived as "real" in computer mediated communication. Garrison, Anderson, and Archer (2000: 94) conceptualize social presence as 'the ability of participants in a community of inquiry to project themselves socially and emotionally, as 'real' people (i.e. their full personality) through the medium of communication being used'.

Lowenthal (2010: 129) reported further that Short et al. (1976) posited that some communication mediums are perceived as having a higher degree of social presence (e.g., video) than other communication mediums (e.g., audio). The reasons are far obvious. Nonetheless, establishing social presence is crucial to achieving collaborative learning, since learning is a social process and discourse plays a key role in the social process of learning. In addition, researchers, over the years, have established a significantly positive relationship between social presence and students' perception and satisfaction with quality and quantity of their learning (Picciano, 2002; Richardson & Swan, 2003; Garrison & Anderson, 2003; Russo & Benson, 2005; Lowenthal, 2010: 131). In a nutshell, the function of this element as Suanpang and Petocz (2003) rightly observe 'is to support the cognitive domain through its ability to instigate, sustain and support critical thinking within a community of learners'. The duo went further to say that 'it supports affective objectives by making interactions appealing and rewarding, leading to an increase in academic, social and instructional integration (and increased course completion)'.

However, in view of the predominantly textual (written words) and asynchronous mode of computer mediated or online communication, creating a cohesive community of inquiry in e-learning medium that provides no visual clues other than images on a screen, appear to present a daunting challenge to educators (Garrison & Anderson, 2003). The submission of Mehrabian (1969: 203) as paraphrased in Garrison and Anderson (2003) article that written communication lacks a sense of 'immediacy' aptly buttress this assertion. A sense of immediacy is used here to mean those communication behaviours that enhance closeness to and nonverbal interaction with another. Garrison and Anderson (2003) argued further that

immediacy is important to a supportive and secure learning environment because it reduces personal risk and increases acceptance, particularly during critical discourse with its sometimes aggressive questioning and challenging trait. The bottom line is that the text-based and asynchronous e-learning medium is a serious limiting factor to a shared 'social presence'.

While acknowledging the profound effect that body language, verbal intonation and other nonverbal cues can have on how message is interpreted in a conventional classroom environment, experts (Garrison, Anderson, & Archer, 2000; Garrison & Anderson; 2003; Lowenthal, 2010) have argued that the nature of written language can be exploited to compensate for lack of these cues. In Rourke and Garrison (2004) view, the socio-emotional cues could be replicated in online medium through establishment of familiarity either by use of greetings, encouragement, paralinguistic emphasis (e.g. capitals, punctuation, emoticons), and/or personal vignettes (i.e. self-disclosure) and that research conducted on text-based e-learning has consistently demonstrated its capacity for a high level of socio-emotional interpersonal communication.

As worthwhile an antecedent to collaboration and critical discourse as social presence is, Garrison and Anderson (2003) were apt to point out the detriment to learning of an excessively exuberance social presence. They observed that while establishing relationships and a sense of belonging are important, supporting a 'pathological politeness' – a situation where students will not be sceptical or critical of ideas expressed for fear that they might hurt somebody's feeling and damage a relationship – is an ill wind that blows nobody any good. In their view, understanding of the purpose of a CoI carries with it social cues to help shape the nature of the interaction that is appropriate and required, and hence the leanness or richness of the medium may well be defined by the task at hand (i.e. purpose) and by compensating opportunities afforded by the medium. Lowenthal (2010) call that it is extremely important that we understand how students and teachers socially interact in online courses where asynchronous computer mediated communication (CMC) is the major form of discourse gave credence to this submission. But while strong social presence is needful, Garrison and Anderson (2003) observed that it is the elements of cognitive and teaching presence that take a community beyond the largely social function to one of inquiry.

Aragon (2003) differentiated between course design strategies (e.g., limiting class size), instructor strategies (e.g., providing frequent feedback), and participant strategies (e.g., sharing personal stories). A number of the strategies identified for instructors and participants

(i.e., online learners) are the same (e.g., contributing to the discussion boards, using humour, using emoticons). Therefore, instructors can model for students, effective ways to establish and maintain social presence in online environments, which can ultimately increase students' satisfaction, learner-to-learner interaction and possibly even student learning.

**Table 3.1: Strategies to establish and maintain Social Presence**

Course Design	Instructors	Participants
<ul style="list-style-type: none"> <li>▪ <b>Develop welcome messages</b></li> <li>▪ <b>Include student profiles</b></li> <li>▪ <b>Incorporate audio</b></li> <li>▪ <b>Limit class size</b></li> <li>▪ <b>Structure collaborative learning activities</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Contribute to discussion boards</li> <li>▪ Promptly answer e-mail</li> <li>▪ Provide frequent feedback</li> <li>▪ Strike up a conversation</li> <li>▪ Share personal stories and experiences</li> <li>▪ Use humour</li> <li>▪ Use emoticons</li> <li>▪ Address students by name</li> <li>▪ Allow students options for addressing the instructor</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contribute to discussion boards</li> <li>▪ Promptly answer e-mail</li> <li>▪ Strike up a conversation</li> <li>▪ Share personal stories and experiences</li> <li>▪ Use humour</li> <li>▪ Use emoticons</li> <li>▪ Use appropriate titles</li> </ul>

*Source: Aragon (2003)*

### 3.3.2 Cognitive Presence

Garrison and Anderson (2003: 55) observe that in an e-learning context, the challenge for participants to communicate their thoughts and insights is no less formidable than creating a social presence. They argue that while social presence is essential, the purpose of an educational community is more than social. What is being said is that at the heart of transactions in an educational community is the acquisition and application of higher order learning through critical exploration of ideas with subsequent integration and resolution (Cognitive presence). In their words, 'the social presence and even teaching presence are, in most respects, facilitators of the learning process'. That is not knocking off the importance of the social and teaching presence they explained, but to buttress that the very essence of the educational experience is learning. However, considering the asynchronous nature of the virtual community and the written text as the dominant means of communication in this community, this is no easy task. Like Garrison, Clevelan-Innes and Fung (2004) suggested, it demands a significant role adjustment.

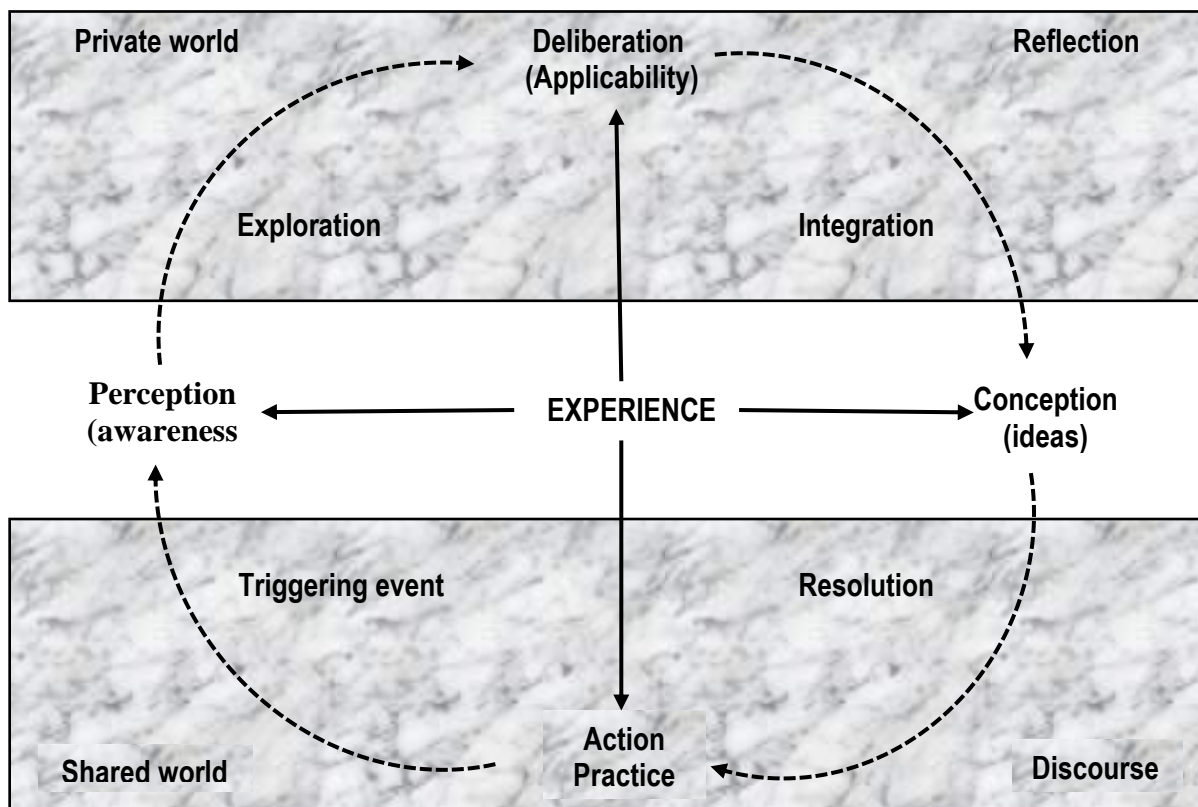
The cognitive presence has been variously defined as 'the extent to which learners in any particular configuration of a community of inquiry are able to construct meaning through



sustained reflection and critical discourse (Garrison, Anderson & Archer, 2000: 5; Garrison, Anderson, & Archer, 2001); the intellectual environment that supports sustained critical discourse and higher order knowledge acquisition and application; and the exploration, construction, resolution and confirmation of understanding through collaboration and reflection in a community of inquiry (Garrison & Anderson, 2003: 55; Garrison 2007). Building on the work of Garrison, Anderson and Archer (2000: 7), Shea and Bidjerano (2009) contend that the notion of cognitive presence reflects higher-order knowledge acquisition and application and that it is most associated with the literature and research related to critical thinking.

The concept of critical thinking, according to Garrison and Anderson (2003) has its roots in the work of John Dewey (1933) reflective thinking which is synonymous with inquiry and in line with constructivist approaches to learning in higher education. The authors noted that for Dewey, reflective or critical thinking has practical value in that it deepens the meaning of our experiences and serves the dual purpose of authenticating existing knowledge while generating new ones; thus further entrenching its intimate connection with education. They submitted further that in line with Dewey (1933) notion, practical inquiry is grounded in experience and integrates the public and private worlds of the learner, a view supported by Vaughan and Garrison (2006). Vaughan and Garrison reasoned that it was this understanding that informed the development of Garrison, Anderson and Archer (2000) practical inquiry model to help guide the analysis of cognitive presence in an online educational programme.

In Garrison and Arbaugh (2007) words, ‘Garrison et al. (2001) operationalized cognitive presence in terms of a practical inquiry model resulting in a four-phase process: (1) the initiation or triggering event, where some issue or problem is identified for further inquiry; (2) exploration, where students explore the issue, both individually and corporately through critical reflection and discourse; (3) integration, where learners construct meaning from the ideas developed during exploration; and then (4) resolution, where learners apply the newly gained knowledge to educational contexts or workplace settings’. Taking a cue from Garrison and Anderson (2003), the duo indicates that the four phases are defined in the interests of parsimony, but that in practice, inquiry is not so discretely defined nor is it immutable. Presented below is a schematic representation of the practical inquiry model.



**Fig 3.3: Practical Inquiry (Adapted from Garrison & Anderson, 2003)**

In furtherance of their goal of making the practical inquiry model, a tool that can provide a practical means of judging the nature and quality of critical reflection and discourse in a collaborative community of inquiry, Garrison and Anderson (2003) offered descriptors and indicators of cognitive presence generated from their research. According to the authors, the first phase (the triggering event) is characterised by conceptualization of problem or issue and hence considered to be evocative and inductive by nature. Suggested educational processes include presenting information that are not only capable of generating curiosity and questions but that can also facilitate further discussion into subsequent phases of inquiry. The second phase (exploration), which involves searching for clarification and attempting to orient one's attention, is essentially an inquisitive and divergent process. The authors advised that educational processes that would be involved include: brainstorming ideas; offering supportive or contradictory ideas and concepts; soliciting narratives of relevant perspectives or experiences; and eliciting comments or responses as to the value of the information or ideas. The third phase, dubbed the integration phase, entails deep and meaningful reflection on how new formation can be synthesized into a coherent whole (Garrison, et al., 2000). To

the authors, the educational transaction for this phase would include: integrating information; offering messages of agreement; building on other ideas; providing a rationale or justification; and explicitly offering a solution. The fourth phase, called the application or resolution phase, involves a vicarious implementation or thought experiment of the proposed solution. Garrison and Anderson (20003) states that this phase often raise further questions and issues, triggering new cycles of inquiry, and thereby encouraging continuous learning.. The descriptors and indicators for each of the phases are as outlined on Table 3.2 below.

**Table 3.2: Practical Inquiry Descriptors and Indicators**

Phase	Descriptor	Indicator
<b>Triggering event</b>	Evocative (Inductive)	Recognise problem Puzzlement
<b>Exploration</b>	Inquisitive (divergent)	Divergence Information exchange Suggestions Brainstorming Intuitive leaps
<b>Integration</b>	Tentative (convergent)	Convergence Synthesis Solutions
<b>Resolution</b>	Committed (deductive)	Apply Test Defend

**Source:** Garrison & Anderson (2003)

The challenge for educators, the authors observed, is to move the discussion and individual cognitive development through each of the aforementioned phases. Building on the works of Kanuka and Anderson (1998) and Garrison Anderson and Archer (2001), they (Garrison & Anderson, 2003) declared that the tendency is to do the first two phases very well, the third phase less well, and the last phase hardly at all, a trend they attributed to the democratic nature of the medium and a lack of strong teaching presence. A position supported by Shea and Bidjerano (2009) observation that the ability to construct knowledge in online environments is contingent on the capacity of teachers and learners to move beyond direct instruction to establishing forms of “presence”. It is through the skilful marshalling of teaching and social presence that participants are able to engage in reflection and dialogue that provides opportunities to extend current understandings (Shea & Bidjerano, 2009). This again underscores the importance of teaching and social presence to creating paths to epistemic engagement and cognitive presence for online learners.

### 3.3.3 Teaching presence

This is the third mutually reinforcing element in the CoI and it encompasses designing and managing learning sequences, providing subject matter expertise and facilitating active learning (Suanpang & Petocz, 2003). The term was said to have been first coined by Garrison, Anderson, and Archer (2000). The trio defined teaching presence as ‘the design, facilitation, and direction of cognitive and social process for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes’ (Anderson, Rourke, Garrison, & Archer, 2001: 5). Vaughan and Garrison (2006) drawing on the works of other scholars (Meyer, 2003; Murphy, 2004; Shea, Pickett, & Pelz, 2004; Garrison & Cleveland-Innes, 2005; Varnhagen, Wilson, Krupa, Kaspizak, & Hunting, 2005) observe that evidence is growing as to the impact of teaching presence on student satisfaction, perceived learning, and sense of community.

Garrison and Anderson (2003) wrote in the opening paragraph of their chapter on ‘Teaching Presence’ that the expanded educational opportunities and choices that come with e-learning has made teaching in an e-learning context an onerous responsibility. In their view, the failure to recognise or take advantage of this liberating and transformational effect of e-learning with associated reverting to the restricted traditional classroom approaches could induce conflict, hence the need to rethink teaching in this digital age. This same view was re-echoed by Rovai and Jordan (2004): *‘Times are changing for higher education. From the de-emphasis on thinking about delivering instruction and the concurrent emphasis placed on producing learning, to using technology to expand distance education, to the recognition of the importance of sense of community, we are witnessing transformation of higher education’*.

However, like Garrison and Anderson (2003) rightly noted, it is only through the presence of a competent and responsible teacher that these transformation potentials could be realised. They contend that with the expanded capabilities and choices that e-learning presents, the tendency to shift towards an interactive and inquiry-based approach is often great. To them, that shift will be more compactible to engineering a learner-centred approach as against a learning-centred approach. They argued that education is a unified process where teachers and students have complementary responsibilities, meaning teachers and students could act to design and facilitate cognitive and social experiences to enhance learning outcomes (Anderson, Rourke, Garrison, & Archer, 2001). According to Garrison and Anderson (2003) the detriment of an unwitting adoption of a learner-centred approach to education is that it

risks marginalizing the teacher as well as learning, the very essence of the transaction in a community of inquiry. They consequently submitted that ‘Teaching Presence’ is concerned with shaping the right transactional balance (along with the learners), managing and monitoring the achievement of worthwhile learning outcomes in a timely manner.

Put differently, teaching presence performs an essential service in identifying relevant societal knowledge, designing experiences that will facilitate critical discourse and reflection, and diagnosing and assessing learning outcomes. The authors were however apt to alert us that with e-learning, this is both easier and more difficult; and consequently advocated for more efforts and creativity to be channelled into understanding and appreciating the integrating elements of teaching presence. This is with a view to facilitate critical thinking and higher-order learning outcomes within an e-learning context (Garrison & Anderson, 2003).

While acknowledging that the role of the teacher in an e-learning context will change (though for better), the authors maintained that the core principles and responsibilities of a traditional transaction are translatable to an e-learning context. They stressed that such principles as clear expectations, critical discourse and diagnosis of misconceptions are common to both face-to-face and e-learning environments. Akin to that is the authors’ submission that while the responsibilities of teaching in both mediums are complex and multifaceted (which include being a subject matter expert, an educational designer, a social facilitator and a teacher), the liberating frame of e-learning significantly alters how these responsibilities are fulfilled. They reported that yet there is a considerable consistency across literature as to the categories of teaching presence associated with e-learning context, though not without little shades of differences. Highlighted on table 3.3 below are the categories.

**Table 3.3: Teaching Roles in E-learning**

<b>Anderson et al.</b>	<b>Berge</b>	<b>Paulsen</b>	<b>Mason</b>
Instructional design and organization	Managerial	Organizational	Organizational
Facilitating discourse	Social	Social	Social
Direct instruction	Pedagogical Technical	Intellectual	Intellectual

**Source:** Garrison & Anderson (2003)

As obvious from the table, the teacher's roles comprises the major categories/elements: instructional design and organisation; facilitating discourse; and direct instruction. The emphasis here is on what the teacher does to create and maintain a dynamic learning environment i.e. the bringing together of the cognitive and the social presence in synergistic and purposeful ways (Garrison and Anderson, 2003). The authors take the discourse further by examining each of the aforementioned elements of the teaching presence.

### Design and Organization

Garrison and Anderson (2003) declared that design and organization provide the macro-level structure for any learning experience and have similar responsibilities and functions. Design, according to them, refers to structural decisions made prior to kick-starting the process, while organization entails similar decisions that are made to adjust to changes during the learning-teaching transaction (i.e. in-situ design). Design and organization of an e-learning course of studies, they noted, is at least initially more demanding than that of a traditional classroom context, for reasons ranging from that of appropriate use of new and emerging technologies to need for approaches that can maximize the capabilities of the medium for teaching and learning. As rightly observed by the authors, this is further compounded by the fact that many students might not have experienced e-learning course (which is typical of Nigeria and some other developing African countries) and as such new expectations and behaviours will require understanding and practice. Table 3.4 below presents the design indicators along with exemplars offered by the authors.

**Table 3.4: Instructional Design and Organization Indicators**

Indicators	Examples
Setting curriculum	'This week we will be discussing.....'
Designing methods	'I am going to divide you into group, and you will debate....'
Establishing time parameters	'Please post a message on Friday....'
Utilizing medium effectively	'Try to address issues that others have raised when you post'
Establishing netiquette	'Keep your message short'
Making macro-level comments about course content	'This discussion is intended to give you a broad set of tools/skills which you will be able to use in deciding when and how to use different research techniques'

**Source:** Garrison and Anderson (2003)

The authors opined that the indeterminate nature of the entry and development of knowledge in students will invariably introduce some uncertainty into the design process, however the interactivity of e-learning places an increased importance on organizational issues. They counselled that if e-learning is to be a collaborative, constructivist process, then students must have some influence on what is studied and how it is approached and as such design must not be separated from delivery. This, in the authors' view, could best be achieved when a teacher can both design and organize the educational experience in a way which will introduce effective responsiveness to developing needs and events.

### Facilitating Discourse

This second element of teaching presence lies at the very heart of e-learning. To Garrison and Anderson (2003), it represents the fusion of purpose, process and outcome; and the centre of the convergence of interest, engagement and learning. The role of the teacher in this element cannot be over-emphasized; in fact it is here that the full skills of a teacher and facilitator come to bear. Any laxity in this respect could result in the session becoming confusing, turning into a boring monologue with its attendant loss of interest and concentration of learners, or even a total social collapse (Harasim, et al., 1995: 173 cited in Garrison & Anderson, 2003: 69), all of which are inimical to higher-order learning.

Garrison and Anderson (2003) reasoned that the reflective and rigorous nature of text-based communication make demands for serious commitment on the part of the learners and instructors alike. They stated further that to sustain this commitment and encourage quality contributions requires that the discourse be focused and productive; a task that calls for a sustained attention to a broad range of issues (pedagogical, interpersonal and organizational). This in the authors' view demands attention to both cognitive and social presence. To this end, they advocated that postings be closely monitored and the nature and timing of the responses be carefully considered. It was also suggested that the community must be somewhat self-sustaining, as too little or too much teaching presence may adversely affect the discourse and the process of building understanding. The authors counselled that while sustaining this balance, teacher's postings must model the critical quality of the discourse and also shape it to constructive learning outcomes.

Besides, the need for guidance on how to engage less responsive students and curtail the exuberance of those with domineering tendencies is of paramount importance. According to the authors, the challenge is not to simply encourage or even reward prolific responses but to

bring attention to appropriate and well-reasoned responses and relate them to other messages, thus inducing in participants a feeling that the discussion is heading towards a purposeful direction. In a nutshell, teaching presence must be as concerned with cognitive development as with positive learning environment; and it must see content, cognition and context as integral parts of the whole (Garrison & Anderson, 2003). That again underscores the need to recognize the unique features of the medium; capitalize on them to achieve intended educational experiences; as well as attend to the inevitable role identity adjustment of the students. The authors take this further by presenting discourse facilitating indicators (Table 3.5).

**Table 3.5: Facilitating Discourse Indicators**

Indicators	Examples
Identifying areas of agreement / disagreement	'Joe, Mary has provided a compelling counter-example to your hypothesis. Would you care to respond?'
Seeking to reach consensus / understanding	'I think Joe and Mary are saying essentially the same thing'
Encouraging, acknowledging, or reinforcing student contributions	'Thank you for your insightful comments'
Setting climate for learning	'Don't feel self-conscious about 'thinking out loud' on the forum. This is a place to try out ideas after all'
Drawing in participants, prompting discussion	'Any thought on this issue?' 'Anyone care to comment?'
Assessing the efficacy of the process	'I think we're getting a little off track here'

**Source:** Garrison and Anderson (2003)

### Direct Instruction

This is the third leg of the teaching presence. Since disciplinary expertise and efficient shaping of the learning experience are essential aspects of any educational experience, direct instruction is believed to be a good antidote to the possible risk of loss of proper educational and intellectual climate and resultant anomie often associated with e-learning (Garrison & Anderson, 2003). It is good to reiterate here Garrison and Anderson (2003) submission that 'teaching presence', as conceptualized in their write-up, 'is not possible without the expertise of an experience and responsible teacher who can identify the ideas and concepts worthy of study, provide the conceptual order, organize learning activities, guide the discourse and offer additional sources of information, and diagnose misconceptions and interject when required'. They contend that these are direct and proactive interventions that support an effective and



efficient learning experience. The template of indicators and examples of direct instruction provided by the authors is as shown in the table below.

**Table 3.6: Direct Instruction Indicators**

Indicators	Examples
Present content/questions	'Bates says ... what do you think'
Focus the discussion on specific issues	'I think that's a dead end. I would ask you to consider ...'
Summarize the discussion	'The original question was ... Joe said ... Mary said ... we concluded that ... We still haven't addressed ...'
Confirm understanding through assessment and explanatory feedback	'You're close, but you didn't account for ... this is important because ...'
Diagnose misconceptions	'Remember, Bates is speaking from an administrative perspective, so be careful when you say ...'
Inject knowledge from diverse sources e.g. textbook, articles, internet, personal experiences (include pointers to resources	'I was at a conference with Bates once, and he said ... You can find the proceedings from the conference at <a href="http://www...">http://www...</a> '
Responding to technical concerns	'If you want to include a hyperlink in your message, you have to ...'

In rounding off this section, it may be useful to repeat Pardales and Girod (2006) comment that 'the CoI is not neutral, or without ideological commitments; and that the community forms by being dialogically inquisitive, active and reflective, articulate, cognitively adept, cooperative, sensitive to content, and explorative'. Another apparently consistent message from authors is that the CoI must work within the confines of curriculum mandates and must be truly collaborative, with learners given opportunity to have some input while being careful to maintain the balance (Garrison & Anderson, 2003; Parales & Girod, 2006). The present study found many aspects of the CoI useful in its pioneering work of developing a blended e-learning model for nursing education in a resource-constrained educational setting in Nigeria.

## CONCLUSION

In synopsis, the Khan framework of e-learning came handy in the needs assessment cycle, the development and testing of the blended e-learning model but the CoI provides a perfect complement and useful guide in the incorporation of the teaching and learning process into

the model. Through a thoughtful consideration of the eight dimensions identified by Khan and the three components of the CoI, principal investigator and the research team adopting the planning, acting, observing and reflecting cycle without denigrating on the context (resource-constrained setting) were able to come up with an innovative blended e-learning model for nursing education.

## **CHAPTER 4**

### **4.0 RESEARCH METHODOLOGY**

This chapter provides a rich, thick description of the research paradigm, approach and design with emphasis on their rationale and suitability for the study. It also presents a reasoned essay on the research setting; target population; sampling technique; data collection instrument; and how the validity and reliability of the instrument was established. Included also in the chapter is a discourse of the ethical issues, procedure for data collection, and methods of data analysis. The chapter closes with a discourse of qualitative rigor for the study – internal validity, external validity, reliability, and objectivity (or what Guba and Lincoln (1985) calls credibility, transferability, dependability, and confirmability).

#### **4.1 RESEARCH PARADIGM**

This educational action research emerged from a general dissatisfaction with access to nursing higher education in Nigeria. This impetus was further driven by the plausibility of ICT application for deployment of nursing education in a resource-constrained setting. The study by its quest (resolving the problem of access to university nursing education in Nigeria) fits squarely into one of the major ethos of pragmatism, which is ‘what works’ and ‘finding practical solutions to the problems’ (Creswell, 2003). Besides, its goal of generating a new blended e-learning model could motivate or set into motion a change process, reform or transformation in the teaching and learning of nursing in a resource-constrained setting. These objectives could be best achieved in a joint research endeavour (working with others) under a natural social setting using a combined quantitative/qualitative data collection approach.

Action, it should be noted, does not occur in a vacuum, but usually involve working ‘with’ rather than ‘on’ people. The study therefore shares two central tenets of pragmatism which are: knowledge generation through action and experimentation; and the role of participative democracy. These initial considerations informed the choice of pragmatism as the philosophical foundation for the study. Johnson and Onwuegbuzie (2004) submission that pragmatism offers an immediate and useful middle position philosophically and methodologically; and a method for selecting methodological mixes that can help researchers better answer many of their research questions further lend support to this choice.

Historically, the term pragmatism has its origin from the Greek word 'pragma' translated 'action', from which the words 'practice' and 'practical' are derived (James, 2000). However, Charles Sanders Peirce that was believed to have first coined and used it in his 1878 article titled 'How to make our ideas clear'. Building on the works of other scholars (Murphy & Ricard, 1990; Tashakkori & Teddlie, 1998; Creswell, 2003), Goldkuhl (2004) and Pansiri (2005) reports that the concept later became articulated into philosophy and popularised partly by the founding fathers' of American pragmatism (Oliver Wendell Holmes, Jr., William James, Charles Sanders Peirce, Chauncey Wright; and by the writings of theorists like Mead, Dewey. Goldkuhl (2004) underscore this point by his assertion that pragmatism has a clear foundation in empiricism. For pragmatists, the meaning of an idea or a concept is the practical consequences of the idea/concept; meaning that actions appear to be the basic phenomena to study, Goldkuhl explained. He nonetheless cautioned that though pragmatism has a clear foundation in empiricism, it does not imply that other phenomena are disregarded, but rather that descriptions and analysis are made with action centeredness.

Powell (2001), another leading proponent of pragmatism points out that the pragmatist epistemology stands in contrast to prevailing positivist and anti-positivist views of scientific discovery. Pragmatism in his opinion, rejects positivism on grounds that no theory can satisfy its demands (objectivity, falsify-ability, the crucial experiment), and rejects anti-positivism because virtually any theory would satisfy them. Pansiri (2005) though holds a similar line of thought, argues that while pragmatism agrees with positivists/post-positivists regarding the existence of an external world independent of people's minds; its emphasis on choosing explanations that best produce desired outcomes makes it to be at variance with it. Goldkuhl (2004) added another dimension by his statement that despite pragmatism's objection of relativistic quagmire, over-emphasis on interpretation and idealistic stance of anti-positivism; it nonetheless share more concerns of the anti-positivist's philosophy than those of positivistic movement. Pansiri (2005) seems to cap it all when he states that the mandate of science is not to find the truth or reality, the existence of which are perpetually in dispute, but to facilitate human problem-solving. The different attributes of pragmatism as extolled by these writers paint pragmatism as very compatible with action research and hence its application in the present study.

Cherryholmes (1994) notes that pragmatists believe that reality, causality, and objectivity are not only context dependent but changes not always in predictable ways. Related to that is

Levin and Greenwood (2001) observation that pragmatism unites theory and praxis in an integrated knowledge construction process, with its central meaning construction process directly linked to cycles of reflection and action that focus on the outcome of acting on material and social factors in a given context. Goldkuhl (2004) takes this a little further with his argument thesis that what people know about the world from the pragmatic standpoint of view is shaped by human action, and that is shaped by what they do, can do and want to do in the world. This pragmatism premise of mutual permeation of knowledge and action again lend credence to its suitability for this study.

Stemming directly from the tenet of mutual permeation of knowledge and action is the pragmatists' belief that it is not sufficient to observe and then generalise or treat knowledge solely as the summaries of the past experiences, but rather necessary to consider knowledge from the angle of what difference it will make in practice (Goldkuhl, 2004). The practicality of knowledge pragmatists argue, is an important criterion for differentiating between knowledge that is meaningful and knowledge that is not meaningful. That is, the truth is what works best for understanding a particular research problem (Patton, 2002; Teddie & Tashakkori, 2009). Powell's (2001) assertion that a true proposition is one that facilitates fruitful paths of human discovery; and it is the one that should be retained, deployed and improved only, as long as it provides a profitable leading, captures this brilliantly. The pragmatists thus hold that it is the research question that should drive the inquiry; and that question is more important than the methods used or the philosophical view underlying each method (Maxcy, 2003; Polit and Beck, 2008). These considerations again make pragmatism well suited for action research and thus its application in the present study.

Implicit in the preceding premise of pragmatism is that actions taken are purposeful (aims at creating desired outcomes) and are evaluated according to how well they produce those outcomes (Levin & Greenwood, 2001). It also presupposes that the knowledge creation process is based on the inquirers' norms, values and interests. The present study kicked off with the exploration of the perception, knowledge and values of all Nigerian nursing stakeholders about e-learning and formation of the research team who worked in consultative capacity with the principal investigator to bridge the identified gap through the later stages of the study (the development, and implementation/testing cycles).

While it may be said that the present study was executed in stages, its execution through the action reflection spiral loop was not in any way arbitrary. The series of steps in each

cycle/stage of the study were carefully planned and carried out as a unified whole, without losing focus of the primary goal. The study's cycles (exploration, development, and implementation/testing) were sequential and neatly linked together, providing a smooth transition. This aids the attainment of the research goal (the development of a blended e-learning model for nursing education in a resource constrained setting). Through the series of deliberate actions in their actual context, indeterminate situations were made determinate thereby conferring some degree of validity on the study; a move that has been recognised as characteristic of pragmatism (Levin & Greenwood, 2001).

Another dogma of pragmatism observed by Reichard and Rallis (1994) that makes it particularly useful for this study is its compatibility with mixed methods research (combined quantitative/qualitative approach). Pragmatism embraces the two extremes normally espoused by positivism/post-positivism and those supported by interpretivists (the former emphasizes quantitative methods as opposed to preference for qualitative approaches by the latter). Tashakkori and Teddlie (1998) affirm that pragmatism rejects 'the either-or dichotomy of the incompatibility thesis as it embraces both points of view and that it is more oriented towards using both qualitative and quantitative methods'. Johnson and Onwuegbuzie (2004) posit that pragmatism is the philosophical partner for mixed methods research. Hoshmand (2003) in a related writing, states that beyond being a ready companion of mixed methods, pragmatism also helps to elucidate how research approaches can be mixed successfully. Ivankova, Creswell, and Clark (2010) share the same view by their comment that pragmatism is considered the best philosophical foundation for justifying the combination of different methods within a study. It is thus no surprise that pragmatism is being hailed as the foundation of mixed-method research (Tashakkori and Teddlie, 1998; Teddlie and Tashakkori, 2003), hence its adoption for this study.

Also noteworthy is Scandura and Williams (2000) submission that every research method has its inherent flaws, thus the choice of a particular method limits the conclusions that can be drawn. In view of this, the use of a variety of methods as suggested by the authors can help to obtain corroborating evidence and enhance validity of the study. Similarly, Amaratunga, Baldry, Sarshar, and Newton (2002) advocate that by utilizing the multiple method approach, the flaws of individual methods will be compensated for by the counter-balancing strengths of the other. This according to them, will help the observers to achieve the best of each, while overcoming their unique deficiencies. Mingers' (2001) views this from yet another

perspective. Since different research methods (especially from different paradigms) focus on different aspects of reality, it follows then that the opportunity for combining multiple methods together in a single piece of research as available in pragmatism, will enrich understanding of the research problem and its resolution thereof. While subscribing to this notion, Johnson and Onwuegbuzie (2004) advise that research approaches should be mixed in ways that offer the best opportunities for answering important questions. This opportunity that pragmatism offers is worth exploring and therefore further reinforced the decision to adopt it as the philosophical framework of this study.

While mixing offers several dividends which include flexibility in strategy and concomitant maximization of strengths and limitation of weaknesses of both quantitative and qualitative approaches, it nonetheless have its own shortcomings. Roux and Barry (2009) for instance draw attention to the possibility of different methods producing opposing results and the need to factor in this in the design of the methodology and the interpretation of the results. They therefore recommend that attention must be given to the careful design of the research methodology; and a balance needs to be struck between focussing on the practical application without losing sight of the implications when adopting the approach.

Johnson and Onwuegbuzie (2004) equally suggest that to mix research in an effective manner and avoid the potential consequences of these weaknesses, researchers need to be conversant with the shortcomings of pragmatism, be reflexive and strategic in their studies. In a bid to avert these weaknesses playing out in the present study, the principal investigator conducted a comprehensive literature search on quantitative and qualitative methods and familiarise himself with their philosophy, strengths and weaknesses while putting together this study proposal. The understanding gained during this process helped with the necessary thinking through while employing this paradigm. In addition, the principal investigator and his team were reflective and strategic throughout all the stages/cycles of the study.

## **4.2 RESEARCH APPROACH**

As earlier stated, the study utilized the educational action research approach. Meyer (2006), states that action research is an approach rather than a specific method of data collection. The choice of this approach was predicated partly upon the social/educational focus of the study. It also hinges on the goal of the study (the development of a blended e-learning model for deploying nursing education in a resource-constrained educational setting), and the impending change associated with its ultimate outcome. The task of developing a blended e-

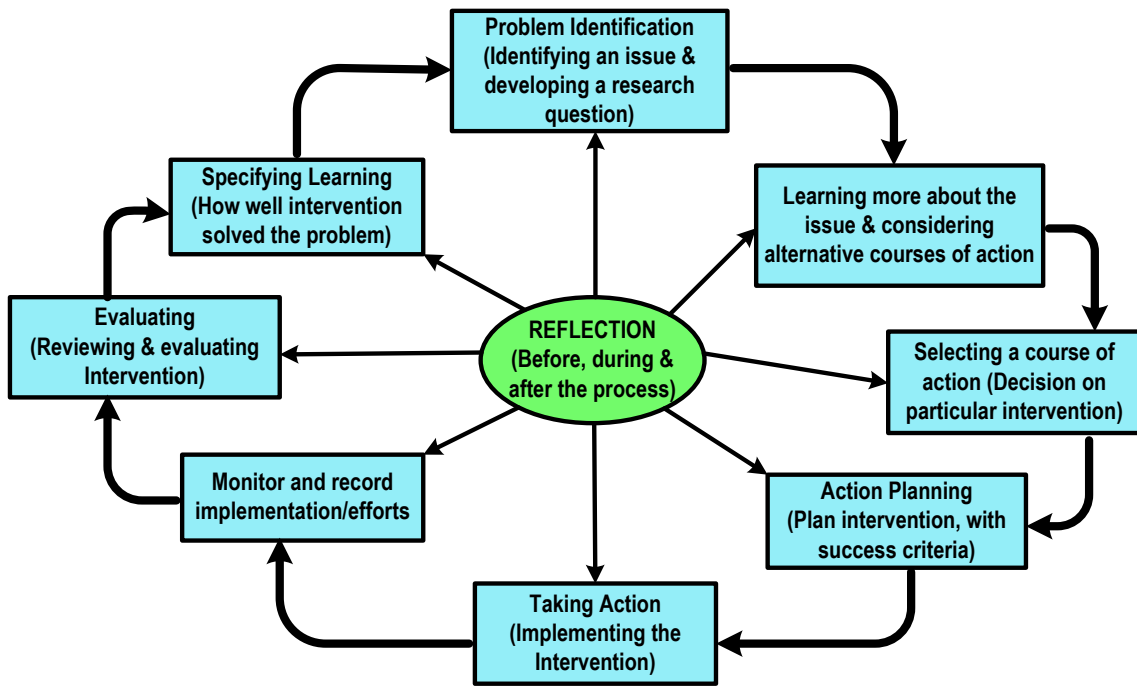
learning model that takes cognisance not only of the contextual factors/exigencies of a resource-constrained setting but also harnesses the inherent communicative and interactive capacity of e-learning, requires a practical approach within a real social setting. These considerations, aside the emergent and responsive nature of the study, places it squarely on the pathway of action research (AR).

The history of AR is complex and its origin somewhat hazy (Masters, 1995; Brydon-Miller, Greenwood, & Maguire, 2003). Brydon-Miller, Greenwood, and Maguire (2003) attributed this historical complexity to its being not a single academic discipline but one that has emerged over time from a broad range of fields (Education, Management, Psychology, etc.). While authors such as Holter and Schwartz-Barcott (1993), Smith (2007), and a number of others were quick at tracing its origin to the work of Kurt Lewin, a German social and experimental psychologist, who is widely believed to have coined the term AR in the 1940s, others (Masters, 1995; Brydon-Miller, Greenwood, & Maguire, 2003) citing the works authors like McKernan (1988; 1991:8) claimed that AR is actually a root derivative of the scientific method and that it dated back to the science in Education movement of the late nineteenth century. These authors added that there was evidence that the use of AR by a number of social reformists predates Lewin's work. What however appears incontestable is that AR as a tradition was largely developed in Europe and the United States of America (USA) and later became progressively embraced by other countries of the world.

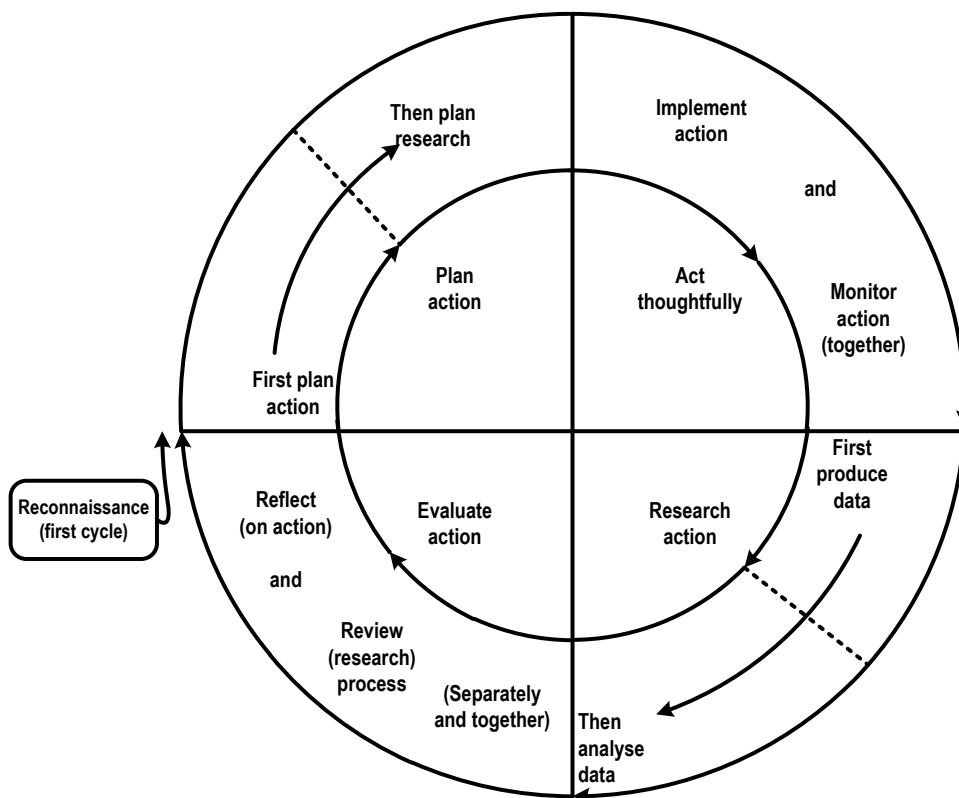
There are as many definitions of AR as there are authors on the subject, but at the heart of these various definitions are four basic themes: empowerment of participants; collaboration through participation; acquisition of knowledge; and social change (Masters, 1995). In its simplest form, AR is described as a family of research methodologies and ideology which pursue action and research outcomes at the same time through empirical, systematised and iterative cycle of problem identification, planning, action, evaluation, and reflective learning (Cassell & Johnson, 2006; Coghlan & Shani, 2005; McNiff, 1988). A more comprehensive definition is that given by Reason and Bradbury (2001:1):

*A participatory democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview which we believe is emerging at this historical moment. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities.*





**Figure 4.1: A Framework for Action Research (Adapted from Cohen, Manion & Morrison (2011))**



**Figure 4.2: The Full Action Research Cycle (Adapted from Cohen, Manion & Morrison (2011))**

Bargal (2008) expounding on Reason and Bradbury (2001) definition added that as a methodology, it prescribes ways to collect and interpret data; and as an ideology, it is rooted

in the democratic philosophy of promoting individual welfare in a humanistic way. Meyer (2006) simplifies this further when she said AR involves doing research with and for people (users and providers of service) in the context of its application. O'Brien (2001) paraphrasing the work of Rapport's (1970:499) similarly submitted that AR aims to contribute both to practical concerns of people in an immediate problematic situation and to further the goals of social science of changing it within a mutually acceptable ethical framework, through collaboration with members of the system. Smith (2007) building on the works of other scholars also asserted that AR is renowned for solving problem in social and organisational settings. The point being made is that contrary to the traditional scientific models, in which the main task is to explore and understand the social problem, the goal of AR is to understand the problem in order to execute intervention (Bargal, 2008).

From the foregoing, two things stand out, irrespective of the preferred theory or strategy, as being peculiar to AR. They are: (i) elements of democratic participation, and (ii) problem solving centeredness. The present study evolved out of a genuine concern for a lasting solution to the problem of inadequate access to university nursing education experienced by majority of Nigerian registered nurses holding diploma qualification(s) only. Initial efforts at resolving the problem were through the establishment of more departments of nursing in the nation's ivory towers and the establishment of part-time nursing programmes. These approaches though helpful in the immediate, were later found to have fallen short of meeting the need for genuine commitment to scholarship and the yearnings for higher education among these practising nurses due to a multiplicity of factors: (i) Only very few universities could embark on the project of building new department of nursing because of the huge human, financial and material resources involved; (ii) A dearth of nurse academics with comparable qualifications for work in the universities; (iii) Majority of the nurses concerned are already working and cannot afford to leave their job for a full-time study because of harsh economic situation in the country. In recent times, the nature and structure of the very few existing part-time nursing programmes in the country had also come under heavy criticism as learners often had to travel a long distance to receive lectures either on a day-to-day or weekend basis for a substantial part of the year.

This growing dissatisfaction provided the initial impetus for the principal investigator (who was at different times the deputy coordinator and coordinator of the part-time BNSc programme of Obafemi Awolowo University, Ile-Ife), to engage both the students and faculty

in an ongoing dialogue aimed at critical consciousness raising about how to resolve the problem of access to higher education for nurses without denigrating on the quality of scholarship. These preliminary observations and deliberations was what later metamorphosed into a full study. This antecedent of its initiating cause, democratic tendencies and focus puts the present study at the vanguard of AR. The study by its design (a continuous spiral loop of iterative steps of problem identification, planning, action, evaluation, and reflection arranged into three serial overlapping cycles of need assessment/exploration, development and implementation/testing), also perfectly fits into the AR framework.

Just as there are as many definitions of AR, so do different models of action research abound in literature (Cassell & Johnson, 2006). Masters (1995) for instance, presents some categorisation of AR done by some early scholars: Technical, Practical, and Emancipatory mode (Grundy, 1988: 353); Technical collaborative, Mutual collaborative, and Enhancement approach (Holter and Schwartz-Barcott, 1993: 301). Meyer (2006) similarly offers the classification given by Whitelaw (2003) – Technical-Scientific and Positivist AR; Mutual-Collaborative and Interpretivist; and Critical and Emancipatory AR. O'Brien (2001) outlines current types of action research as: Traditional AR, Contextual AR (Action learning), Radical AR, and Educational AR. This author remarks that the educational AR has its foundations in the writings of John Dewey, the great American educational philosopher of the 1920s and 30s, who believed that professional educators should become involved in community problem solving. Practitioners of educational AR not surprisingly, operate mainly out of educational institutions, and focus on development of curriculum, professional development, and applying learning in a social context (O'Brien, 2001).

Other authors: Cassell and Johnson (2006), Yasmeeen (2008), to mention a few, have equally written about other typologies of AR. Contrary to opinions in some quarters as regards the scientific basis of AR, Cassell and Johnson (2006) argue that the emergent diversity is not in any way haphazard but rather inspired by different philosophical stance (driven by varying core assumptions about epistemology and ontology), which normatively inform their practitioners in terms of aims and requirements. One lesson that has however been learnt from the categorisation efforts is that it is not quite easy to categorise neatly any specific study into particular type (Meyer, 2006). In Meyer's (2006) view, the value of typologies is to portray the complexity of AR rather than to label; meaning that they only suggest

differences in kinds, but not in value and importance of AR. The present study has characteristics of the educational AR as well as the technical collaborative approach.

McNiff (1988) declares that AR implies adopting a deliberate openness to new experiences and processes, and as such demands that the action of educational research is itself educational. By engaging the nursing community (learners, academics, practitioners, administrators) in in-depth interview, focus group discussions and in consultative capacity, to capture the nurses' experiences as well as their suggestions on the evolving blended e-learning model, this study demonstrates its commitment to the principle of deliberate openness to new experiences and learning. Somekha and Zeichnerb (2009) observe that AR deliberately mixes discourses and thereby erodes boundaries between action and knowledge generation. According to these authors, it is this boundary-crossing nature of AR that makes it a particularly well-suited methodology for educational transformation in the twenty-first century, and hence the chosen approach for this study.

Furthermore, the growing awareness that the traditional approaches/methods of research do not always impact on practice (Sackett, Richardson, Rosenberg, & Haynes, 1997) and that people learn best, and are more willing to apply what they have learnt when they do it themselves (O'Brien, 2001) are some other factors that tilt this study the action research route. Beyond that, AR is a methodology that is grounded in the values and culture of its participant-researchers (Somekha & Zeichnerb, 2009), and one that is committed to active involvement of participants at every stage of the research process, and thus often more ideally suited to ever-changing context of our contemporary days. While this may be true, it is equally important to note that the extent of participant involvement is dependent on the type of study. Since the outcome of the present study (a blended e-learning model for nursing education) ultimately will require a paradigm shift in the teaching and learning of nursing from the predominant traditional face-to-face approach to a more conventional approach, it becomes rational to go the way of AR. Change, many have argued is best implemented when the clients/practitioners/entire community are part of those who help to make them.

Besides, AR is particularly relevant to this study because it uses an eclectic approach to data collection (Meyer, 2006); possibly owing to its tentative and practical nature. Brydon-Miller, Greenwood, and Maguire (2003) remark that 'there may also be a kind of aesthetics at work in AR that welcomes complexity, uncertainty, and struggle as energising and filled with possibility' aptly complement that view. Other commentators (Brydon-Miller, Greenwood, &

Maguire, 2003; O'Brien, 2001; Reason & Bradbury, 2001) have further indicated that what gives AR its unique flavour is its set of core principles and maxim. Some of these and how they play out in this study are presented below:

- AR rejects the notion of an objective, value-free approach to knowledge generation in favour of an explicitly political, socially engaged, and democratic practice (Brydon-Miller, Greenwood, & Maguire, 2003). This is in consonance with O'Brien (2001) assertion that unlike in other disciplines, the initiating researcher in AR, makes no attempt to remain objective, but openly acknowledges their bias to other participants. The focus of this study was obvious to all, right from its inception and it enjoyed some degree of participatory democratic process.
- AR is context-bound and addresses real-life problems. This is based on the premise that knowledge production cannot be done without taking into account the wholeness of the situation (Reason & Bradbury, 2001). The current study focuses on resolving the problem of access to higher education among nurses within its natural context through the development of a blended e-learning model for nursing education in Nigeria.
- AR is inquiry where participants and researchers co-generate knowledge through collaborative communicative processes in which all participants' contributions are taken seriously (Reason & Bradbury, 2001; Winter, 1989). By forming a cohort of inquirers and directly involving the concerned parties (nurses) through questionnaire administration, interviews, FGDs, and brainstorming sessions, this study treads the co-generative pathway to knowledge construction in the development of the blended e-learning model. It particularly takes cognisance of insights gleaned from the nursing community, noting the contradictions both between many viewpoints and within a single viewpoint.
- AR treats the diversity of experience and capacities within the local group as an opportunity for the enrichment of research/action process (Reason & Bradbury, 2001). This is what Winter (1989) refers to as plural structure, and it simply means that AR by its nature embodies a multiplicity of views, commentaries and critiques that leads to multiple possible actions and interpretations. The profuse information including divergent views produced at the exploration cycle of the present study when subjected to critical discourse by the research team and reflexivity led to the emergence of a range of options for action in the development cycle of the study.

- In AR, practical accounts metamorphose into theoretical considerations through reflexive critique and phenomena are conceptualised in dialogue i.e. shared through language [dialectic critique] (Winter, 1989). In the present study, responses to the questionnaire, transcript of interviews and focus group discussion, as well as reflective journal were subjected to critical reflection and meanings teased out using qualitative content analysis technique. The meanings constructed in the inquiry process led to social action (development of blended e-learning) and the reflections on action led to the construction of new meanings. The third and final cycle of the study (implementation/testing cycle) saw the developed blended e-learning model being piloted and feedbacks from learners and teaching staffs used for fine-tuning the model.
- Lastly, the credibility/validity of AR knowledge is measured according to whether actions that arise from it solve the practical problem at hand (workability) and increase participants' control over their own situation (Reason & Bradbury, 2001). Efforts were made to ensure validity and reliability at every stage of this study and the practical utility of the developed model at resolving the identified problem was ascertained by piloting it on the end users (Part-Time Bachelor of Nursing Students) using case methodology technique.

### **4.3 RESEARCH DESIGN**

The study employed a combined quantitative/qualitative design otherwise called the multitrait-multimethod research, complimentary design, methodological triangulation or mixed methods design. Creswell, Plano Clark, Gutmann and Hanson (2003) explain that though central to all of these terms is the idea of combining or integrating different methods, the term mixed methods seems most appropriate as it provides an umbrella term that covers the multifaceted procedures of combining, integrating, linking and employing multi-methods'.

The concept of mixing methods, according to Creswell (2003), was first introduced by Jick (1979) as a means of seeking convergence across qualitative and quantitative methods within social science research. Johnson and Onwuegbuzie (2004) posits that its logic of inquiry includes the use of induction (or discovery of patterns), deduction (testing of theories and hypotheses), abduction (uncovering and relying on the best of a set of explanations for understanding one's result). The duo consequently defines it as the class of research in which

researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study. Akin to that is Tashakkori and Creswell (2007) submission – ‘the research in which the researcher collects and analyses data using both quantitative and qualitative methodology; integrates the findings; and draws inferences’.

Philosophically, the mixed methods design is viewed as the third wave or third methodological movement; and it now emerging as a dominant paradigm across a variety of disciplines such as education, health, nursing and social sciences in recent years (Cameron, 2009; Doyle, Brady, & Byrne, 2009; Johnson & Onwuegbuzie, 2004). Many of its proponents attribute its emergence to the obvious limitations of the sole use of quantitative or qualitative methods. Indeed, the design is now considered by many as a legitimate alternative to the two known dominant traditions in research (Quantitative and Qualitative) thereby offering researchers an opportunity to overcome the ‘paradigm wars’ and the ‘false dichotomy’ between the two earlier foundations (Doyle, Brady, & Byrne, 2009; Johnson & Onwuegbuzie, 2004; Onwuegbuzie & Leech, 2005).

The mixed methods design is also renowned for its capacity to harness the strengths of both quantitative and qualitative methodology while simultaneously reducing their weaknesses, without denigrating on importance of the physical world or the existence of reality, and the influence of human experience (Johnson & Onwuegbuzie, 2004; Kaplan & Duchon, 1988). For Östlund, Kidd, Wengström, and Rowa-Dewar (2011) the use of triangulation as a methodological metaphor can facilitate the integration of quantitative and qualitative findings and help researchers to clarify their theoretical propositions and the basis of their results. Similar utterances abound in mixed methods literature. Particularly of note is Johnson and Onwuegbuzie (2004) submission that mixed methods research is ‘an expansive and creative form of research, not a limiting form of research; as it is inclusive, pluralistic, and complementary; and it suggests that researchers take an eclectic approach to method selection and conduct of research’.

The choice of this design is thus influenced by a number of factors: the action oriented approach of this study; its philosophical stance (pragmatism); the complex nature of social phenomenon it studies; the well-known disposition of mixed methods to draw on the strengths of both quantitative and qualitative methods while minimising their weaknesses; the need for assessing context-specific variables and use of participatory democracy in building a blended e-learning model for a resource constrained educational setting in Nigeria. This

choice was further fuelled by the belief that exploring the research problem through different lenses made plausible in the combined quantitative/qualitative approach, may give the study a wider coverage, richer data, fuller picture and deeper understanding of the phenomenon being studied.

Yet instrumental to this choice is the promise of increasing the robustness of findings through data triangulation and other benefits that the mixed-methods research offers (Johnson & Onwuegbuzie, 2004; Kaplan & Duchon, 1988; Neuman, 2011). Kaplan and Duchon (1988) for instance contend that triangulation of data from different sources can alert researchers to potential analytical errors and omissions. They added that mixing methods can also lead to new insights and modes of analysis that are unlikely to occur if any of the methods is used as a stand-alone. There is equally a consensus among scholars in the field of mixed methods research (Creswell & Plano Clark, 2007; Doyle, Brady, & Byrne, 2009; Ivankova, Creswell, & Plano Clark, 2010; Östlund, et al., 2011) that mixing produces better understanding of complex phenomena than when either of the methods are used alone.

Generally speaking there are many variants of mixed-methods design, but the four major categories that have been given prominence in mixed methods research literature are: explanatory mixed-methods design; exploratory mixed-methods design; triangulation mixed-methods design; and embedded mixed-methods design (Creswell, et al., 2003; Tashakkori & Teddlie, 2003; Ivankova, Creswell, & Plano Clark, 2007; Ivankova, Creswell, & Plano Clark, 2010). Below is a summary description of each of the methods as presented by these authors:

- **Explanatory mixed methods design** is the most straightforward mixed methods design. It involves the collection and analysis of quantitative data, followed by that of qualitative data. The goal is to use the quantitative findings to clarify the qualitative result.
- **Exploratory mixed methods design** is characterised by collection and analysis of qualitative data, followed by that of quantitative data. It is often used when there is need to do initial exploration of a topic with the aid of qualitative data to guide further examination of a phenomenon quantitatively.
- **Triangulation (or concurrent) mixed methods design** – Probably the most familiar, involves the collection of quantitative and qualitative data simultaneously. It nonetheless requires separate data collection, separate analysis, while integration of databases is done at the interpretation and discussion stage of the report. O’Donoghue



and Punch (2003) define it as a method of double-checking data from multiple sources to search for consistencies in research data. It is the preferred option when a researcher need to confirm, cross-validate, or corroborate findings within a single study.

- **Embedded mixed methods design** – This is similar to triangulation design as it entails concurrent collection of quantitative and qualitative data, but unlike the traditional triangulation design it has a predominant method that guides the study. Greene and Caracelli (1997) submitted that this approach requires the researcher to embed one type of data within the methodology associated with the other type of data. Creswell, et al., (2003) states that it may be employed when a researcher chooses to use different methods to study different groups or level within a design or when a researcher needs to gain broader perspectives from using the different methods as opposed to using the predominant method alone. In addition, it is used when the researcher needs to answer a secondary question that is different from, but related to, the primary research question (Creswell & Plano Clark, 2007).

This study adopted the embedded mixed methods design as it avail the principal investigator and his team the opportunity of a broader perspective and well-substantiated conclusions about the phenomenon being studied. The study comprising three serial cycles (the **assessment/exploration, development** and the **implementation/testing** cycle), typical of action research, employed different methods to study different groups at the exploration cycle and had the data collected analysed and integrated before being engrafted at the development cycle for the generation of the blended e-learning model. It is good to reiterate here that each cycle was a complete mini study and consisted of an iterative cyclical loop of sequential steps of problem identification, planning, acting, observing, and reflecting that necessitated the concurrent use of quantitative and qualitative research designs.

In the assessment/exploration cycle (Cycle 1), a nationwide questionnaire survey on nurses (Quantitative) and key informant interviews (Qualitative) were conducted simultaneously. The questionnaire assessed the nurses' computer literacy, computer competencies and e-learning literacy, and their perception of e-learning. The interview session apart from exploring participants' awareness of contextual factors and antecedents necessitating the application of e-learning; perception of e-learning and other related issues; provides opportunity for subtle consciousness raising as per the feasibility of e-learning utilization in

nursing education in Nigeria. Beyond that, it provided an opportunity for participants to raise their own issues and concerns about possible use of e-learning in nursing education in Nigeria. Data analysis/interpretation procedure follows the format suggested by Creswell, et al (2003). Both quantitative and qualitative data were coded and analysed separately; emerging themes compared; results from quantitative analysis compared with findings from qualitative analysis; and finally quantitative and qualitative data combined/integrated into new variables.

The development cycle (Cycle 2) utilised majorly qualitative design. Majority of the actions in the cycle revolve around critical reflection and synthesis of findings from the preceding needs assessment/exploration cycle, the use of reflective journal, brainstorming and consultation sessions with research team, the use of documentary evidences/literature and a consideration of the context (research focus, institutional readiness, available resources) to develop the theoretical blended e-learning model.

The final cycle, the implementation/testing cycle (Cycle 3), adopted a case methodology design to pilot the developed blended e-learning model for its suitability and effectiveness at achieving learning objectives as well as identify barriers to its implementation. Merriam (2009: 50 – 51) has this to say about case study design:

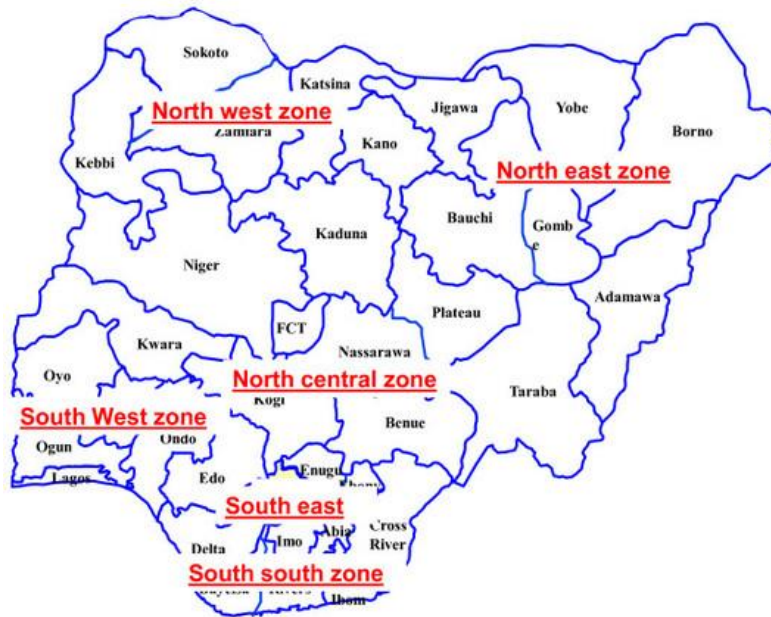
*Case study offers a means of investigating complex social units consisting of multiple variables of potential importance in understanding the phenomenon. Anchored in real-life situations, the case study, results in a rich and holistic account of a phenomenon. It offers insights and illuminates meanings that expand its readers' experiences. Because of its strengths, case study is particularly appealing design for applied fields of study such as education, social work, administration, health and so on. Case study has proven particularly useful for studying educational innovations, evaluating programmes, and informing policy.*

For Strydom and Bezuidenhout (2014), a case study is a thick and detailed description of a social phenomenon that exists within a real-world context. Akin to that is Yin (2003) submission that case study research provides in-depth exploration of intricate topics. Creswell (1998: 61) cited in Cottrell and McKenzie (2011: 231) defines it as an exploration of a bounded system or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information. As Creswell (1998: 61) rightly noted, a bounded system is constrained by time and place and the case being studied is usually a programme, event, activity, or individual.

In this cycle, the case being studied is the newly developed blended e-learning model. Like in the preceding assessment/exploration cycle, it employed a mixed-methods approach, but this time around primarily qualitative with some quantitative elements. Both the quantitative and qualitative data collected were analysed separately and findings integrated at the interpretation and discussion stage as in the assessment cycle. Quantitative data was collected through a pre- and post-test assessment of learners' performances. Qualitative data were collected through focus group discussions (FGDs). One held among the Bachelor of Nursing Science students and the other among the nursing faculty providing a multilevel qualitative data. The transcript of the FGDs were analysed separately, synthesised/integrated, before being combined/consolidated with the quantitative results.

#### **4.4 RESEARCH SETTING**

This action-reflection study was conducted in Nigeria, the world most populous African country; a country located in West Africa on the Gulf of Guinea. Nigeria is a federation of 36 states with the federal capital territory at Abuja. The National Population Commission, Abuja (2010) puts the 2006 Nigerian population at 140,431,790, plus a national growth rate estimated at 3.2 percent per annum. With a landmass of 923,768 square kilometres (including about 13,000 square kilometres of water), 774 constitutionally recognized local government areas, about 374 identifiable ethnic-linguistic groups which spread across the 6 geopolitical zones of the country, and over 500 indigenous languages/dialects (National Demographic and Health Survey, 2008), the country is truly a large multi-ethnic federation. There are however three dominant groups: the Hausa living in the north, the Igbo in the southeast, and the Yoruba in the southwest (Oloyede, 2010). The Federal Ministry of Education (2005) asserts that this massive diversity and complexity exert considerable influence on many aspects of the nation's indigenous cultures, including approaches to education.



**Fig 4.3: Map of Nigeria showing the six Geopolitical Zones of the Country**  
 Retrieved 02 August 2012 from <http://www.google.com.ng/imgres?imgurl=http://>

The country, which officially became a political entity, following the amalgamation of the northern and southern protectorates by her British colonial master, gained independence in 1960. At present, Nigeria runs a three tier system of government comprising local, state, and federal governments with each tier assigned specific constitutional responsibility. Education and health are however a shared responsibility of these three arms of government with schools and hospitals spread across the six geopolitical zones of the country. Consequently, the first cycle of the study (the assessment/exploration cycle) cut across the six geopolitical zones of the country.

While Nigeria is undoubtedly rich in natural resources, vast fossil fuel and gas deposit, it nonetheless has an infamous reputation for poor infrastructural development. It is not a hidden truth that the country has over 113,000 kilometres of surface road that are not well maintained. The railway system is also in deplorable state though efforts are underway to resuscitate it; the ports (land, air and sea) are equally functioning below capacity; all these have combined to make transportation within the country burdensome. The power sector is another quagmire, renowned for its poor power generation and distribution resulting in epileptic power supply in many areas of the country. All is also not well with the education and health sector (hospitals ill equipped and plagued with perennial shortage of health personnel; schools with poor infrastructures; classrooms overcrowded; demands for higher education outstripping supply; over-enrolment and high students-teacher ratio in conventional

universities; to mention a few). These features make the country and her educational institutions really resource-constrained setting.

Nigeria Nursing education had a humble beginning, having been bequeathed to her by her British colonial administrators who patterned it after what operates then in their country. The system had over the years however metamorphosed from non-formalized structure, to formal apprenticeship type of training, and subsequently to more organised hospital-based basic and post basic nursing programmes, and finally to university-based nursing education (Adelowo, 1988; Ayandiran, et al., 2013). It is nonetheless still more of hospital-based training and till date placed under the ambit of the Ministry of Health. This historical antecedent of its location under the Ministry of Health as against the Ministry of Education, has to a great extent hinders its realignment with national and international educational reforms. The end result is a lack of platform for academic progression and career mobility of graduates of the hospital-based and Ministry of Health-managed institutions. Unfortunately, these nurses are in the majority. As at May 2014, the Nursing and Midwifery Council of Nigeria (NMCN) put the number of accredited basic and post basic schools of nursing at 155 (<http://www.nmcnigeria.org/>). While university-based nursing education in Nigeria dated back to 1965, only 21 out of the 104 accredited universities in Nigeria offer nursing at degree level. It is easy then to understand why the demand for university nursing education outstrips the supply.

Obafemi Awolowo University (OAU), the educational institution that served as the fulcrum for the study, is one of the foremost first generation universities in Nigeria. Established in 1963 at Ile-Ife, the university is committed to a tradition of academic excellence and seasoned scholarship, offering courses that span across the liberal arts and languages, humanities, education, administration, social sciences, pure and applied sciences, agriculture, engineering, health sciences and pharmacy. Compared with some other higher institutions in Nigeria, the university can be said to have a fairly developed telecommunication unit with telepresence and a distance learning centre that wields an enviable support for the use of e-learning. Indeed, the university has over the past three years been consistently adjudged the leading ICT centre in Nigeria.

The Department of Nursing Science, OAU, the site that play host to the implementation/testing cycle of the study, runs an array of academic and professional nursing programmes, ranging from first degree to doctorate (PhD). The first degree study (Baccalaureate programme) has two tracks viz: The full-time mode (the regular programme) and the Part-time Bachelor of Nursing Science (BNSc) Programme. The Part-Time BNSc Programme of the department attracts students from the six geopolitical zones of Nigeria. While it may be said that the department is blessed with both young and seasoned lecturers, the school academic staff capacity is grossly inadequate for the teeming number of aspiring students. This in addition with the constraint orchestrated by space (classrooms) and the new policy directive from National University Commission (the body that regulate and control university education in Nigeria), that all part-time programmes be converted to full distance mode programmes (Abdulrahman, 2009) makes the department with the support of the university to rethink ICT in the training of nurses, and hence its suitability for this study.

#### **4.5 TARGET POPULATION**

The study population are mainly nurses (nursing students, nurse clinicians, nursing administrators, nurse educators, and nursing lecturers) and other academic staff who teaches in part-time BNSc programme of the Obafemi Awolowo University (OAU), Ile-Ife. This population not surprisingly varies in composition and size from one cycle of the study to the other. The target population for the assessment/exploration cycle (Cycle 1) for instance, comprises all cadres of nurses that are registered with the Nursing and Midwifery Council of Nigeria (NMCN), across the six geopolitical zones of Nigeria. Statistics from the NMCN showed that as at 30<sup>th</sup> June, 2011, the country has 142,422 general nurses; 97,587 midwives; 5,057 public health nurses; 3,189 nurse educators; and others (A copy of the document is included as an annexure). Since each of these categories of nurses not only possesses general nursing certificate but are also registered as general nurses with the NMCN, the universe for this cycle was therefore taken as 142,422. Unlike the exploration cycle, only the nursing faculty and the part-time bachelor of nursing science students of OAU, Ile Ife, constituted the target population for the implementation/testing cycle (Cycle 3). The Department of Nursing Science, OAU, record showed that 582 students were enrolled for the part-time bachelor of nursing science programme as at 2012 when data collection commenced.

#### 4.6 SAMPLING TECHNIQUES

A combination of probability and non-probability sampling techniques was used. Like the target population, the sampling technique employed also varies from one cycle of the study to the other. Details of the sample size and sampling procedure used are as presented below:

The sample size for the mini nationwide questionnaire survey was determined by Cochran (1963) formula for calculating sample size for large population. This was complemented with PASS 2000 (Hintze, 2002) and power-analysis software (Thomas, 1998) as well as online calculator available from <http://www.openepi.com/Menu>. In addition, useful generalized scientific approximation of sample sizes presented by Sekaran (2003) was also used. These methods are acceptable, valid and are widely used.

$$\text{Adopting Cochran formula; } n_o = \frac{Z^2 pq}{e}$$

*Where  $n_o$  is the sample size,  $Z^2$  is the abscissa of the normal curve that cuts off an area at the tails ( $1 - e$  equals the desired confidence level, e.g. 95%),  $e$  is the desired level of precision,  $p$  is the estimated proportion of an attribute that is present in the population, and  $q$  is  $1 - p$ .*

$$n_o = \frac{Z^2 pq}{e^2} = \frac{(1.96)^2 (.5) (.5)}{(.05)^2} = 385 \text{ nurses}$$

In order to accommodate possible incomplete response to all the survey questions, the sample size for the study was therefore rounded off to 402 nurses.

The country was first stratified into six regions using geopolitical zone as the basis of stratification. Then two states were randomly selected from each geopolitical zone giving a total of twelve states. From each of the states selected, two or more health institutions were selected purposively. Using the selected institutions' employee (nurses) lists as the sampling frame, a proportionate fraction of the nurses were earmarked for questionnaire administration. Although relatively equal sample was initially proposed for each zone, the Boko Haram insurgency in the north eastern part of Nigeria thwarted that effort as some areas of that region were simply unsafe. Nonetheless, a fair representation of nurses from that part of the country was achieved through the use of research assistants who reside in that region.

The sample for the key informant interview was also originally set at 10 – 18 participants; however as at the time of interviewing the 16<sup>th</sup> key informant, data saturation had set in. Unlike the participants for questionnaire administration, all key informants were purposively

selected. Cresswell (2012) describes purposive sampling as a qualitative sampling approach in which researchers deliberately select individuals and sites to study in order to comprehend the central phenomenon. Criterion for selection was that they must be information rich sources; either senior academics or nurse educators or senior nurse clinicians in administrative position in any of the renowned hospitals in Nigeria or officers of the Nursing and Midwifery Council of Nigeria. Members of the research team were equally selected by purposive sampling technique.

Theoretical sampling was adopted in the selection of documentary evidences for use in the development cycle (Cycle 2) but the implementation/testing cycle (Cycle 3) saw the use of a combination of sampling techniques. Purposive sampling was to select two arms of the part-time BNSc class to be used for piloting the model and a census for participants' selection. The criterion for class selection was one must comprise relatively green or novice bunch of students (as far as university nursing education is concerned) and the other must be in a relatively advance level of nursing studies possibly the penultimate year. All students in the first year and the fourth year of the part-time BNSc programme as at 2015 totalling 409 were chosen for the pre- and -post-test survey. The participants (8 students) for focus group discussion (FGD) were however selected purposively. The same goes for the FGD participants from the nursing faculty.

#### **4.7 INSTRUMENTS FOR DATA COLLECTION**

Four major instruments were used for data collection. The first is a semi-structured self-administered questionnaire adapted majorly from Elder and Koehn (2009) 'Assessment Tool for Nursing Student Computer Competencies' used during the assessment/exploration cycle of the study. Application for permission to use the tool was made at the early part of proposal writing and formal consent received from the authors prior to its use for data collection. The second is an interview schedule comprising eight (8) questions with semantic probes employed for gathering information from key informants; also used during the assessment/exploration cycle. The third is a focus group discussion (FGD) question guide that explores the students' and the teaching staff experience during the piloting of the developed blended e-learning model, while the fourth instrument is a pre- and post-evaluation survey used for assessing the effectiveness of the developed blended e-learning at achieving set learning goals; both employed at the testing cycle of the study.



The aforementioned four instruments were employed after a careful weighting of their merits and demerits. For instance, questionnaire is noted to be one of the most affordable way of gathering information (cost-efficient); simple to administer; they are practical; speedy results; permits greater sense of anonymity by respondents and thus may yield more honest responses; may not require research assistants; can be posted, e-mailed or faxed; scalability (allows information to be gathered from a large audience); allows greater amount of data covering a broad range of topics; representative sample possible; user's anonymity (allows respondents to remain anonymous); no prior arrangement needed; prevents embarrassment on the part of the respondents; and eliminates interviewer bias. As useful as questionnaire is, it nonetheless has its own disadvantages which include: design problems; dishonesty; cannot be used with illiterate respondents; historically low response rate; time delay while waiting for responses to be returned; several reminders may be required; questions may be misunderstood; no control over who completes it; responses not spontaneous and independent of each other; and problems with incomplete questionnaire (Debios, 2016; Du Plooy-Cilliers & Cronje, 2014: 148).

Interview similarly has its own pros and cons, some of which are outlined below. The merits include being suitable for both literates and illiterates; can be conducted with varying degrees of flexibility; the rate of response are always higher than that of questionnaire; permits collection of in-depth information; facial response of participants can be observed by the interviewer; clarification of questions can be provided; responses are not premeditated as respondents do not know what other questions will follow; captures verbal and non-verbal cues; captures emotions and behaviours; and keep focus. The demerits include – can be expensive; limit sample size; the interviewer may inadvertently influence the respondents; analysis of open ended data is more difficult and time-consuming (Wyse, 2014; Bell, 2005).

The third tool, the focus group discussion, which uses the principle of small group dynamics, is a more formal way of getting individuals from similar background and experiences to deliberate on selected issues together. Just like the other aforementioned tools, it also has its strengths and limitations. Some of the strengths are: very useful data collection method in action research; very cost effective; produces quick result; flexible and diverse; may generate more information; data produce can be easily understandable and thus may provide more insight; allows researcher to clarify contradictory responses. Its limitations include: groups may be difficult to assemble; groups can influence the responses of individuals; the quality

and quantity of data collected is dependent on the skills of moderator; the small numbers in groups can limit the extent to which the results can be generalised; data generated more difficult to analyse than quantitative data (Strydom & Bezuidenhout, 2014).

The questionnaire employed consists of four (4) sections: A – D. Section A comprising 10 items explored participants' demographics. Section B is a modified version of Elder and Koehn (2009) computer assessment tool with the number of items reduced from 50 to 40. The 40 item multiple choice questions that have one correct option each, assesses participants' computer knowledge/literacy. The correct option attracts 1 point while the incorrect option attracts zero (0) point. An aggregate score of '0 – 15' (Below 40%) in this section is categorised as low computer literacy; '16 – 27' (40 – 69%) as moderate computer literacy; while '28 – 40' (70% and above) is classified as high computer literacy.

Section C explores participants' computer skills/competencies and e-learning experiences. It is divided into two subsections. The first subsection which is a modified version of Elder and Koehn (2009) computer competencies survey, requests participants to rate their computer skills on a scale of '0 – 5' where '0' signifies no experience and '5' interpreted as expert. Computer skills listed include, printing, file saving, downloading documents, etc. There are 16 items in this first subsection. Maximum point obtainable is '80' and minimum score '0'. The median score is 40. A zero score is classified as 'No skill', '1 – 19' adjudged as 'Novice', '20 – 39' 'Little skill', '40 – 59' 'Moderate skill' '60 – 74' 'High skill' while a score of 75 – 80' rated as 'Expert'. The second part of this section is a 5 item scale that examines participants' exposure and experiences of e-learning. Like the first subsection, it also requests participants to indicate how often, if ever, they have used or been involved in e-learning activities such as online discussion forum and video-conferencing. Options of answers are 'several times', 'once', 'never' and 'never heard of this' ranked as '2', '1', '0', and '0' respectively. Maximum score obtainable is '10' with '0' as the minimum score. A zero score is labelled as 'No experience', '1 – 4' as 'Little experience', '5 – 7' 'Moderate experience', while 8 – 10' is regarded as vast experience.

The last section (section D), an added section, utilizes a Likert scale format to explore participants' perception of e-learning. Meyers, Guarino, and Gamst (2005) describe the Likert-type scale as a bipolar scaling technique that measures positive or negative responses to a statement. The section encompasses 23 psychometric items that are rated on a five-point scale, ranging from 5 for 'I totally agree' to 1 for 'I totally disagree'. Items 1, 3, 4, 5, 7, 9, 12,

14, 18, and 23 of the scale are however scored in the reverse order making it possible for the responses to be summed into a single scale. Maximum score obtainable is 115 and minimum score 23. A score of '23 – 57' is categorised as 'Negative perception', '58 – 86' as 'Positive perception', while '87 – 115' indicates 'Very positive perception'. The last item on the questionnaire is an open ended question that seeks participants' suggestion(s) about how nursing institutions could support students in their use of ICT in learning.

Elder and Koehn (2009), both of whom have extensive teaching experience in computer skills and data management courses, reported that the reliability of their instrument was established using a KR 20 alpha measure. They also stated that textual concepts from their basic computer course were used for establishing the content validity. However, since there is that possibility, for an instrument to be valid in one situation and not valid in another (Burns & Grove, 2009: 381), the adapted questionnaire was subjected to validity and reliability tests. The validity of the adapted questionnaire was established by face and construct validity criteria. The face validity was established by giving the questionnaire to my colleagues both at the School of Nursing, UKZN, Durban, and the Department of Nursing Science, OAU, Ile-Ife, to check whether it rings through and appear generally meaningful. A few of the items that were identified as clumsy were modified.

Construct validity, as Burns and Groove (2009: 380) note, include content and predictive validity. In their words 'content-related validity evidence examines the extent to which the method of measurement includes all major elements relevant to the construct being measured'. The content validation began with extensive literature search and concept analysis, both of which helped to crystallize what is to be measured (the domain of the construct). Building on Elder and Koehn (2009) work, a blueprint or specification matrix that outline items and content area domains covered was then developed. This was followed by critical review of the questionnaire by a three man expert committee (My supervisor, a professor of nursing education, who doubles as the dean of teaching and learning; an associate professor of computer engineering; and a senior lecturer in the field of test and measurement). All questions in each section of the questionnaire were examined critically for lexical content, clarity, accuracy, representativeness, user-friendliness and relevance to the phenomenon of interest. Sequel to the feedback from the panel, the questionnaire was reviewed and few changes effected. Section B was pruned down from 50 to 40 questions and a number of items in the other sections revised. After the committee's recommendations have

been fully implemented, the modified questionnaire was again resubmitted to them for perusal, following which it was adjudged suitable for data collection.

The validated questionnaire was piloted for reliability (the extent to which its items consistently measure the construct) among nephrology nurses at Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife. Ten of these nurses had the questionnaire administered on them. The choice of the nephrology nurses was informed partly by the sizeable number of this group undergoing undergraduate studies; and for reasons of proximity and suitability for the study. Adopting the homogeneity test, the Cronbach's alpha score was calculated for each section of the questionnaire: 0.77, 0.94, and 0.76 for sections B, C, and D respectively. Burns and Groove (2009) states that the homogeneity the test computes the variances of all individual's scores for each item and then add these variances across all items with score ranging from 0 to 1. Bruning and Kintz (1997) points out that a reliability coefficient of 0.7 and above is adjudged reliable.

The loosely structured interview schedule comprising 8 items with semantic probes, borrowed a few concepts from 'Learning Technology Readiness Assessment Tool' under the Creative Commons Attribution-Noncommercial-ShareAlike 3.0 Licence. The schedule asked questions about the mode of delivery of nursing education in Nigeria, whether there have been changes and what these changes are. It also sought participants' opinions about contextual factors and antecedents necessitating the application of e-learning; their assessment of nurses' computer literacy and readiness to adopt e-learning; and the stage of development of e-learning in nursing education in Nigeria. Furthermore, it explored their concerns and perception of e-learning (in terms of what it is, quality of learning, ease of use, relevance, strength, weaknesses, and suitability for deploying nursing education) and what factors they perceive as inimical to its development and use in nursing education. The last item on the schedule solicits for suggestions from participants as to the design, content, and implementation of the proposed blended e-learning model for nursing education in Nigeria.

The third tool is a focus group discussion (FGD) question guide, adapted after due consultation with the research team from 'Learning Technology Readiness Assessment Tool' (under the Creative Commons Attribution-Noncommercial-ShareAlike 3.0 Licence). Krueger and Casey (2008) cited in Cottrell and McKenzie (2011: 237) describes a focus group as:

*not just a group of people convened but a special type of group in terms of purpose, size, composition and procedures. The purpose of focus group is to*

*listen and gather information. It is a way to better understand how people feel or think about an issue, product, or service. Participants are selected because they have certain characteristics in common that relate to the topic of the focus group.*

The FGD also served as a reflective discourse session. It explored the students' experiences of the blended e-learning model in terms of classroom education, clinical education, informal learning and workload (course and outside employment). A few of its items sought the students' learning preferences; their experience using computer (work, personal, and education); level of access to computers within the school, clinical setting, and at personal level; and the students perspective of the distinction between the blended e-learning mode and their previous mode of learning. Included also in the FGD guide were questions aimed at eliciting students experience in terms of social, teaching and cognitive presence; access to personal electronic devices; and their assessment of the reliability of the provided customized tablets with regards to functionality, ease of use, durability, quality of internet connection and speed. Lastly, it inquired from participants that if given a choice, will they have still preferred the blended learning approach to the erstwhile face-to-face mode of learning.

The faculty FGD questions were quite different. The goal was to explore the faculty experiences with using the developed blended e-learning model. It contains questions that probed the faculty's perspective on the developed blended e-learning model in terms of its effectiveness at achieving set learning objectives; ease of use; quality of learning; suitability for facilitating nursing skills; challenges associated with its use; and benefits to using it.

The fourth instrument is a pre- and -post-test survey developed in conjunction with subject experts of the two modules selected for piloting the developed e-learning model. It comprised of multiple choice questions with only one correct option. It was administered on students offering selected modules prior to commencement of facilitation and on completion of the modules. The students' pre- and -post-test scores were then compared. It should also be noted that the interview schedule, FGD question guides, and the pre- and -post-test survey, all of which were adapted from standardised instruments, were equally assessed for face and construct validity before being employed for data collection. Each of the instruments was scrutinised for clarity, coverage and appropriateness by my supervisor and two other scholars with wealth of experience in research from my home institution in Nigeria. Besides, since many of the questions raised in the different schedules were asked across different

participants, that affords the principal investigator the opportunity to verify responses from different perspectives and thus further reinforcing the validities of the instruments.

#### **4.8 ETHICAL CONSIDERATION**

In every research, especially those conducted among human subjects, ethical issues are of paramount concern. Its importance in researches which entails working with individuals, groups, or community using both quantitative and qualitative approaches as obtainable in this study cannot be over-emphasised. Merriam (2009: 231) observe that the data collection techniques of interviewing and of observation in qualitative research present their own dilemmas. Yet 'part of ensuring for the trustworthiness of a study – its credibility – is that the researcher himself or herself is trustworthy in carrying out the study in as ethical a manner as possible' (Merriam, 2009:234). In the light of this, ethical issues that pervade research were handled in this study in the following ways:

##### **4.8.1 Institutional and gatekeeper Permission**

Consequent on the development and presentation of the research proposal to the School of Nursing, UKZN, a formal application for ethics clearance was made to the UKZN Humanities and Social Sciences Research Ethics Committee. The research protocol received formal approval on 27<sup>th</sup> March, 2012 (Protocol reference number: HSS/0228/012D). Formal permission to collect data for the study was also obtained from Department of Nursing Science, OAU, Ile-Ife; Nursing and Midwifery Council of Nigeria; and the National Association of Nigerian Nurses and Midwives, through its Osun state wing. In addition, preliminary visits were made to all institutions selected for the study to explain the purpose and method of the study and to ask for permission to interact with their staff members. Permission for the use of the instruments were also obtained from the appropriate authorities.

##### **4.8.2 Ethical Principles**

The key principles that guide ethical conduct of research were adhered to as follows:

- **Respect for Persons** – This principle holds that human beings are autonomous agents who have the right to conduct their lives as they choose without external controls (Burns & Grove, 2009: 188). This individual right to make own choices and decision was protected in this study by briefing participants about the purpose and method of the study following the institutional buy in. Participants were informed that participation in the study is voluntary and they are at liberty to terminate their participation at any time without penalty. They were equally given the opportunity to ask questions and clarify

information about the study. Further, a simple informed consent that clearly spelt out the study title, purpose, and participants' rights within the study was read out and supplied to all participants, following which a written informed consent was obtained. The consent form was approved by the UKZN Humanities and Social Sciences Research Ethics Committee. No participant was forced, compelled, cajoled, coerced, or tricked into participating in the study.

- **Confidentiality and Anonymity** – Participants were assured that all information provided will be kept private and that even though the study may be published in peer-reviewed journals, no data that reveals them as the source of the information will be disclosed. In pursuant of this, the administered questionnaire does not request for participants name, address, and some very personal information. Also to prevent a breach of confidentiality and mitigate the chances of unauthorized persons gaining access to participants' information, collected data were stored as pass-worded documents on investigators personal computer only. While it may be true that nature of FGDs cannot guarantee absolute confidentiality and anonymity as rightly pointed out by Tollich (2009), the use of codes and pseudonyms for data analysis to a great extent helped in concealing identity of the participants to the outside world.
- **Beneficence** – The term beneficence refers to maximizing potential benefits while minimizing anticipated/potential risk (Burns & Grove, 2009: 188). The outcome of this study holds great promises for the generality of nurses in Nigeria by enhancing access to university/higher nursing education and its associated benefits. In the immediate, no foreseeable harm is expected to result from this study whether to individual nurses or society at large. However, because of the risks and benefits associated with interviewing, such as respondents feeling that their privacy is being invaded, embarrassed at certain questions, or letting out something they never plan to reveal (Stake, 2005; Merriam, 2009: 231), it is not impossible that there may be unanticipated long term effects. Invading an individual's privacy, Burns and Grove (2009: 195) notes, could result in loss of dignity, friendships, or unemployment, or create feelings of anxiety, guilt, embarrassment, or shame. To minimize such unanticipated risks, key informants and FGD participants were pre-informed that their responses will be tape recorded and transcribed verbatim for research purposes only. Beyond that, only codes and pseudonyms were used during analysis to ensure participants' anonymity.

- **Principle of Justice** – All participants, irrespective of their position, educational status, ethnicity, and creed were treated fairly and equally throughout the conduct of the study. Although, purposive sampling was adopted at some point in the study, the selection of participants was based firmly on the set criteria. Ground rules were mutually set and unanimously accepted by FGD participants before commencement of FGDs. The research team were also briefed on the terms of reference.

### **4.8.3 Data Management and Storage**

Data collected were kept and used solely for the purpose of this study. All documents pertaining to the research work were password-protected on the principal investigator's personal computer (PC) and backed up on his mass storage device (external hard drive). Recorded audio tapes of key informant interviews and FGD sessions that have been burnt into compact disc (CD) together with the copies of the field notes and transcripts will be kept secure in a locked cabinet at the School of Nursing, UKZN. The hard copies of the questionnaire, in view of its enormous volume were kept in safe custody at the Department of Nursing Science, OAU, Nigeria, where the principal investigator works. All data pertaining to the study will be kept safe for a period of five years after which they will be permanently destroyed.

## **4.9 DATA COLLECTION PROCEDURE**

Creswell (1998) describes data collection as a series of interrelated activities with the intent of answering proposed research questions. In this study, preparation for data collection actually dated back to May 2011 when the principal investigator first presented his idea at the School of Nursing, University of KwaZulu-Natal's (UKZN) faculty seminar. The seminar helped to critique the investigator's raw idea; assess the feasibility of the study and its claim to generating new knowledge; and to recast/refine study title. However, actual data collection did not commence until early April 2012 when full ethics approval for the study was received from the UKZN Humanities and Social Sciences Research Ethics Committee. Details of the sequence of the project activities and data collection process are as summarised below:

### **4.9.1 Preliminaries including Application for Ethical Approval**

Sequel to feedback received from faculty seminar, the principal investigator heightened effort at developing a detailed proposal for the study. A comprehensive literature search on the problem area was embarked upon and regular consultations were made with my supervisor who doubles as the Dean of Teaching and Learning, College of Health Sciences, UKZN. That



effort yielded a positive result with the formal presentation of the research proposal to faculty members late November 2011. Areas identified by the faculty as needing correction were worked on; the study title fine-tuned; and application for permission to conduct the study made to the UKZN Humanities and Social Sciences Research Ethics Committee. Prior to ethics application, contacts were made with heads of relevant institutions, agencies and organizations concerned with nursing education in Nigeria and meetings held to facilitate the obtainment of gatekeeper's letter. These institutions include: the Nursing and Midwifery Council of Nigeria, some University Teaching Hospitals, the National Association of Nigerian Nurses and Midwives, OAU, and a few hospital-based nursing schools in Nigeria. Initial response was received from the UKZN Humanities and Social Sciences Research Ethics Committee asking for modification of informed consent early February 2012. That was done and final approval received 27<sup>th</sup> March, 2012.

#### **4.9.2 Building the Project Team**

While awaiting response to the ethical application, the principal investigator started shortlisting eligible candidates for the research team. Soon as full approval was granted for the study, all shortlisted candidates were contacted on a one on one basis, with the principal investigator sharing his vision and asking for their involvement in the project. Membership of the team was voluntary and it was only those who accepted to be part of the team that were finally selected. Selected members were subsequently briefed on the terms of reference and responsibilities. The team comprised the principal investigator who coordinated the activities of the team; the Head, Nursing Science Department, OAU; the Part-Time BNSc Coordinator; 2 lecturers from the Department of Nursing Science, OAU; 1 Senior faculty with wealth of teaching experience in programming from Computer Science Department, OAU; 1 education specialist; and 1 nurse practitioner with extensive experience in clinical care from the OAUTHC, Ile-Ife.

#### **4.9.3 Sourcing and Adapting Relevant Instruments for Data Collection**

A structured self-administered questionnaire, a loosely structured interview schedule, and FGD question guides adapted for the study were obtained through literature search and networking, with input from the research team and my supervisor. As earlier stated, the validity and reliability of all instruments employed for the study were established prior to final administration for data collection.

#### 4.9.4 The Research Process

The study consists of three sequential cycles with each cycle comprising a continuing spiral of sequential steps of planning, acting, observing, reflecting and re-planning. To enhance understanding of the research process, the details of events that happened in each cycle of the study is hereby presented below:

##### *Cycle 1 (Assessment/Exploration)*

- **Planning** – The study commenced with development of the research proposal; sourcing and adapting research instruments; securing institutional support or buy in including the need to sustain the periodic training and retraining of academic staff on e-teaching which had commenced since 25th May, 2009. This was followed by application for gatekeeper’s letter, ethical clearance, and formation of research team who acted in consultative capacity. Upon obtainment of ethical clearance, adapted research instruments were piloted first week of June 2012 and their validity and reliability established. At the conclusion of the pilot study, the principal investigator in consultation with the research team drew up the blueprint for the rest of the study.
  
- **Acting** – The entire country was stratified along the six geopolitical zones for questionnaire administration. Two or more health institutions were purposefully selected from each zone. Preliminary contacts were made with the Chief Medical Director and the Director of Nursing Services of each participating institutions to establish rapport, explain the purpose of the study, and to obtain permission for the study. Trained research assistants travelled a couple of times to each of the selected institutions to administer and retrieve questionnaire on a random sample of nurses. On each occasion, prior to data collection, an informed consent was supplied and read to the hearings of every participant. Participants were allowed to ask questions and clarifications were made before written informed consents were given. Completed questionnaires were only retrieved when participants indicate that they are done.

As questionnaire administration was ongoing, purposively selected key informants were also being interviewed. Like the participants for questionnaire administration, each interviewee also gave a written informed consent. Appointments for interview were booked ahead and interview sessions and were held one on one at preferred place, date and time of the key informants. Interview sessions lasted between 13 and 25 minutes. All were audio-recorded with permission of the interviewee and transcribed verbatim.

- **Observing** – Collected data were analysed with the aid of quantitative and qualitative data analysis software. Questionnaire analysed with Statistical Package for Social Sciences (SPSS) version 21 and transcripts of field interviews uploaded into NVIVO 10 for qualitative analysis. Both descriptive statistics and inferential statistics were run on the quantitative data. Relationships were tested with Chi square and Kruskal-Wallis non-parametric equality of populations rank test. After a prolonged engagement and concurrent scrutiny of uploaded qualitative data, emergent themes began to unfold and findings contextualized. Results from the quantitative data and the qualitative findings were then integrated into a meaningful whole.
- **Reflecting** – Initial inferences were presented to research team. Through a series of consultation and brainstorming sessions, initial inferences were probed/interrogated for trustworthiness (credibility, dependability, transferability and confirmability), careful thinking through and holistic interpretation.

### *Cycle 2 (Development)*

- **Planning** – Contrary to the initial timeframe, the assessment/exploration cycle span over 18 months. Experience from working with research team in the exploration cycle also showed that it is difficult to gather academics together because of their busy schedule. Consequently, the initial drawn out plan or blueprint of research activities was reviewed. Slight modifications were made and a workable time line for further research activities generated.
- **Acting** – The ongoing literature search was intensified. Existing e-learning and e-enhancement models available from literature and learning theories were selected for in-depth study. Findings were progressively presented to the research team for critical reviews of their strength, weaknesses, and suitability for a resource-constrained environment. Learning outcomes were defined; teaching learning activities were identified; instructional strategies (synchronous, asynchronous, what percentage of face-to-face will be required, and in what combination) and delivery systems (Internet, Intranet, CD/DVD) selected; and assessments format designed. Using information gathered from the ongoing literature search together with findings from the need assessment cycle, a theoretical blended e-learning model was developed.

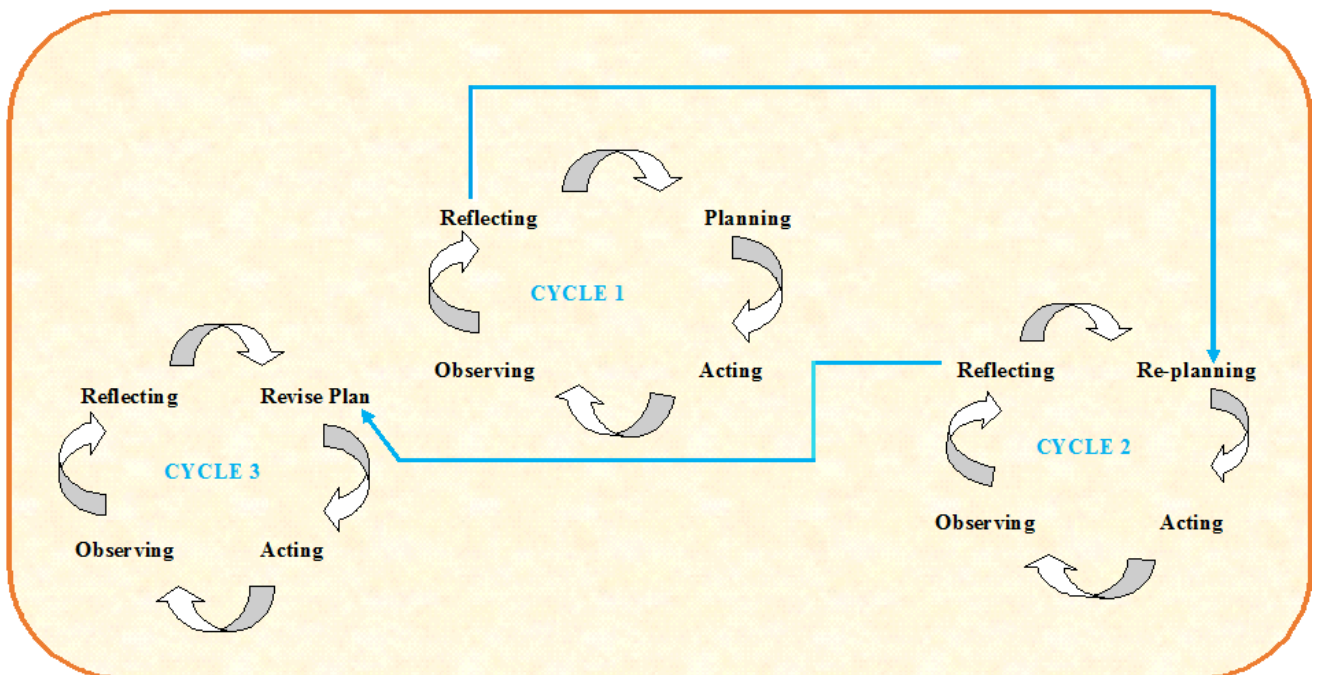
- **Observing** – The evolving blended e-learning model was subjected to extensive critical review by the principal investigator and his team to further refine some of its concepts, identify its adaptability for deploying nursing education, its strength and potential weaknesses.
- **Reflecting** – The emergent blended e-learning model was progressively refined in the light of the identified strength and weaknesses in readiness for piloting.

### *Cycle 3 – Testing/Implementation*

- **Planning** – Here efforts were made to ensure that all resources needed for a successful testing/implementation of the model are in place. Two courses/modules selected by purposive sampling technique were earmarked (one nursing intensive year four module and one year one module that is of a more general application). The lecture materials for each of these courses were jointly worked on to be e-compliant by the principal investigator and the respective teaching staff of the courses. In addition, four teaching staff who worked alongside the principal investigator in the facilitation of the modules were selected. The years one and four Part-Time BNSc classes were also selected and prepared ahead of the implementation. Customised tablets and other logistics required were provided by the OAU, Distance Learning Centre. Schedules of meetings and briefings with both students and teaching staff including the pre- and the -post-test survey and the FGDs were rolled out before commencement of the pilot/trial.
- **Acting** – The newly developed blended e-learning model was used to administer the two selected modules of the part-time BNSc programme, OAU, over a period of one semester in 2015. The two modules were previously taught mainly by face-to-face mode. A pre-test survey was administered on the students at the commencement of the implementation and a post-test on completion of the module to assess cognitive presence. A post course FGD, utilizing the principles of small group dynamics, was also conducted (one among nursing students and the other among the teaching staff) to explore the participants' experiences about teaching and social presence. Besides, the FGDs provide opportunity to gather thick and rich information about the performance of the developed model. It also avails the principal investigator the opportunity to witness non-verbal communications and reflections which are not feasible with the survey.
- **Observing** – The implementation of the developed blended e-learning model was progressively monitored. Scores of the pre- and post-test survey were compared to

evaluate the effectiveness of the model at achieving set learning goals. Experiences with using the model were analysed and barriers to implementation identified.

- **Reflecting** – A ‘think thank’ meeting was organised with research team to share the findings, refine the model further, document lessons learnt, make recommendations, and suggest ways for effective dissemination of findings. Data collection and development of the blended e-learning model was concluded in 2015.



**Fig 4.4: Schematic Presentation of the Research Process**

#### 4.10 TECHNIQUES OF DATA ANALYSIS

Data analysis is a complex process of making sense out of data and it involves many coordinated steps (Merriam, 2009: 177). Making sense out of data, Merriam (2009: 178) explained, involves consolidating, reducing, interpreting what people have said and what the researcher has seen, read, and gathered; moving back and forth between concrete bits of data and abstract concepts, between inductive and deductive reasoning, between description and interpretation. The process of data analysis in this study started right from the conception of the research design and the choice of the various instruments employed the data collection. The study is essentially action research but employed mixed methodology. The choice of the mixed method design entails a collection of quantitative and qualitative data which

necessitates conducting both quantitative and qualitative data analysis. The subsequent sections therefore present a synopsis of the steps involved in both the quantitative and the qualitative analysis of the study.

#### **4.10.1 Quantitative Analysis**

The plan for analysis of the quantitative aspect of this study commenced from the point of choosing the research design and the instruments for data collection. It actually took a while to arrive at what specific instrument to use. When the decision was finally taken, Elder and Koehn's (2009) questionnaire was chosen. That was immediately followed with a formal request in April 2011 for the use of the tool including the format for analysis of data collected with it. That request was promptly granted. The format sent by the authors was studied and the questionnaire was adapted in the light of this study's objectives (outlined in chapter 1). Modifications were made in consultation with one of the UKZN School of Nursing and Public Health biostatistician who offered useful guidance on the scales and measures adopted in the final adapted questionnaire. Counsels were equally sought on how to assess the validity and reliability of the adapted questionnaire, preparation of codebook, and what statistical techniques will be appropriate for conducting the analysis.

Data collection also took a relatively long period of time. On conclusion of the quantitative aspect of the data collection, all completed questionnaires were gathered and manually sorted into 6 groups reflecting the geopolitical zones from which they originated. In preparation for data entry, a codebook was developed. The codebook contains among others, the variables of interest, their definitions and unique labels; how responses to the open ended and close ended questions should be coded including their assigned number(s). When coding was completed, the principal investigator with assistance of research assistants commenced data entry. Data was nonetheless screened and cleaned before analysis begun. As Pallant (2010) rightly points out, this basic step is very essential in view of the ease with which mistakes could occur in data entry. Her submission that some errors can completely mar the outcome of certain studies, underscores the importance of this to any research. At the end of the data screening exercise, identified errors like missing data, duplications, out-of-range responses, and logical inconsistencies were corrected, and where not amenable removed from the data file, thus setting the stage for statistical analysis.

Data analysis was done by two independent analysts using two different quantitative analysis software packages. The software packages employed are the Statistical Package for Social

Sciences version 21 (SPSS 21); and Stata. Both software works with '*numbers*' **not** '*words*'. Griffith (2010), states that SPSS is a piece of software that takes raw data and combines them into new statistics that can be used as predictors. Today, the product which was originally developed by Nje, Hull, and Bent in the late 1960s, to analyse a large volume of social science data, has gained a wide range of usage in the research world. Griffith (2010) states further that the name was momentarily changed in 2008 to Predictive Analysis Software (PASW) but was however renamed IBM SPSS by IBM when the corporation acquired it in 2009. Stata, the second quantitative software package used, is equally a fast, easy to use data analysis software, with complete, integrated up-to-date statistical package, smart data management facilities, and graphics (<http://www.stata.com/why-use-stata/>; <http://data.princeton.edu/stata/programming>). Results from the two independent analysts were compared and found congruent.

Prior to running the statistical analysis, the normality of the distribution of the data set was run. The result showed that data was skewed. That informed the decision to use non-parametric tests (Pearson's chi-square and Kruskal-Wallis non-parametric equality-of-populations rank test) for determining whether any relationship exists between selected categorical variables. Descriptive statistics especially frequencies were first run for all the demographic variables. This was followed by computation of individual participants' scores for computer literacy/knowledge, computer competency/skill, e-learning experience, and perception before cross-tabulation among variables of interest were done. Relationships were tested with Pearson's chi-square ( $\chi^2$ ) and Kruskal-Wallis tests at P value (level of significance) of 0.05 and inferences drawn.

#### **4.10.2 Qualitative Analysis**

Qualitative research is dynamic and interactive (Davies, 2007; Merriam, 2009; Snape & Spencer, 2003). De Vos, Strydom, Fouché, and Delport (2011) asserts that the goal of qualitative data analysis is to gain an understanding of the subjective experiences of participants; but unlike the quantitative studies, qualitative research yields textual and narrative data; sometimes massive and exasperating; and data collection and analysis is usually an ongoing and iterative process. That is, data collection, processing, analysis and reporting are intertwined, and not merely a number of successive steps (Bezuidenhout & Cronje, 2014: 230; Merriam, 2009: 169; Nieuwenhuis, 2013: 99). The process, for De Vos, et al. (2011: 397), is systematic and rigorous, but typically involves 'reducing the volume of

raw information, sifting significance from trivia', identifying significant patterns and constructing a framework for communicating the essence of what the data reveals. The bottom line is making sense of the data. Although approaches to analysing qualitative data analysis abound in literature, Nieuwenhuis (2013: 99) states that qualitative analysis is usually based on an interpretative philosophy that aimed at examining meaningful and symbolic content of qualitative data and must be guided by the rigour and procedures of the specific paradigm adopted in a study. These approaches include: Phenomenological analysis, Grounded theory, Ethnographic analysis, Case Studies, Analytic induction, Narrative analysis, Hermeneutics, Content analysis (Qualitative and Quantitative content analysis), Discourse analysis, Conversation analysis, Multimodal conversation analysis, and Semiotic analysis (Bezuidenhout & Cronje, 2014: 233; Nieuwenhuis, 2013: 101; Merriam, 2009: 197).

The present study employed the qualitative content analysis and case methodological approach. These approaches are believed to be most compatible with the study paradigm. They are also believed to be more suitable for attaining the objectives of the study, which among others are to: assess the current modes of delivery of nursing education; establish perception of e-learning; explore contextual factors and antecedents necessitating e-learning application in nursing education; and develop a blended e-learning model for nursing education in a resource-constrained educational setting. Merriam (2009: 203) observe that since a case study is an intensive, holistic description and analysis of a single, bounded unit, conveying an understanding of the case is the paramount consideration in analysing the data. She subsequently suggested that all information needs to be brought together – interview transcripts, field notes, reports, records, the investigator's own documents, physical traces, and reflective memo.

Qualitative content analysis on the other hand has been defined as a research method for subjective interpretation of the content of text data through systematic classification of content (coding) and identification of themes and recurring patterns (Hsieh & Shannon, 2005: 1278). Zhang and Wildemuth (2009) citing Hsieh and Shannon (2005) state that rather than being a single method, its current applications reveals three distinct approaches (conventional, directed, or summative); the major differences being the coding schemes employed, origin of codes, and threat to trustworthiness. The authors explained further that in conventional content analysis, categories are derived directly and inductively from the raw data (the approach often used in grounded theory research) while in directed content analysis,



initial coding starts with a theory or relevant research findings, but as data analysis continues, the researcher(s) immerse themselves in the data and allow themes to emerge from the data. The principal investigator finds the directed content analysis more attuned to this study and hence its use as the major technique of analysis. Relevant concepts and ideas borrowed from the study's theoretical framework provided initial guidance on coding and categorisation of data. The summative content analysis which involves counting and comparisons nonetheless was employed for describing the study sample in terms of their demographics.

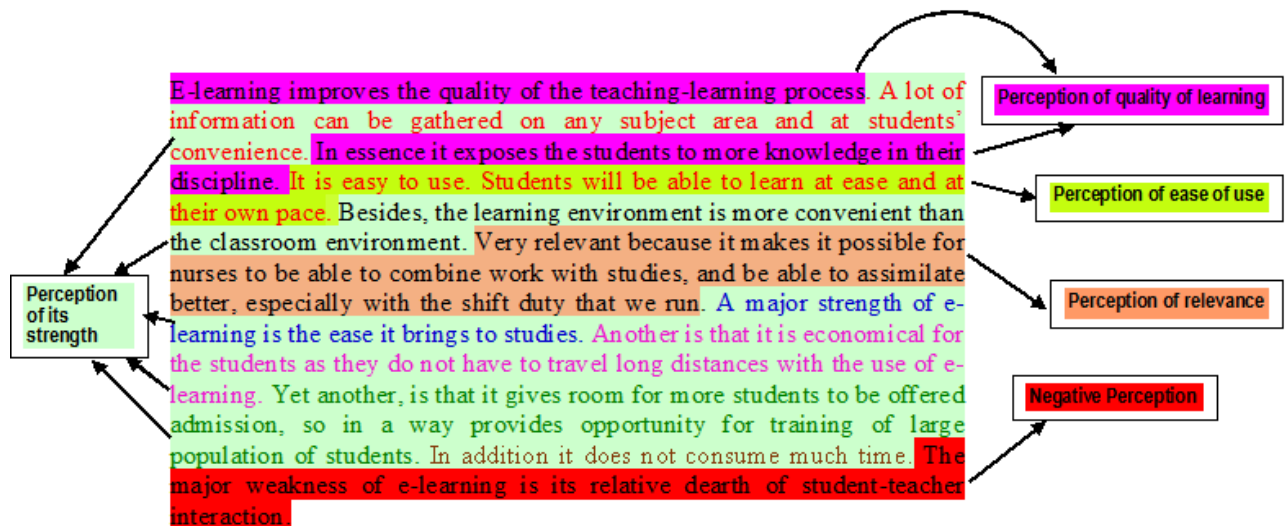
The step-by-step process of qualitative analysis employed in the study followed Zhang and Wildemuth (2009) eight steps process of qualitative content analysis. The steps are as follows:

**Step 1: Preparing the Data** – Narrative data from the key informant interviews and FGDs that have been audio-recorded was transcribed verbatim and type-written by the principal investigator. That allowed the investigator to capture the non-verbal cues and gain insight into some of the things that were not said in words. It also enhances better knowledge of the data as the transcripts were read severally and hunches that cropped up with each reading jotted down (memoing). This memoing continued till the close of the data analysis. The resultant note served as reminder of thought and valuable hints in the course of analysis.

**Step 2: Defining the coding unit to be analysed** – The transcribed data was uploaded into NVivo 10 qualitative analysis software package. The software, developed by QSR International, provides a ready platform for organising and analysing content from interviews, FGDs, surveys, audio, social media, videos and webpages ([http://www.qsrinternational.com/products\\_nvivo.aspx](http://www.qsrinternational.com/products_nvivo.aspx)). Writing on Computer Assisted Qualitative Data Analysis Software, Merriam (2009: 194) states that these programmes offer an organised filing system for data and analysis as data is sorted into categories, filled, and easily retrieved, thus saving time and effort that might otherwise be expended on boring clerical works. With eyes on the theoretical framework and research questions, files were set up for emerging codes/categories/themes. To borrow NVivo parlance, nodes and sub-nodes (folders and sub-folders) or coding units were created.

**Step 3: Developing categories and a coding scheme or conceptual framework** – The entire transcript were read carefully again with an intent of identifying and bringing

together related coding units or categories (concept mapping). After a thoughtful consideration of the entire data, the identified codes and categories were defined systematically, labelled and organised into a conceptual framework. Codes were organised on the basis of the research questions.



**Fig 4.5: Sample Snapshot Screen of Sentence by Sentence Coding and Categorization**

**Step 4: Testing the developed coding scheme** – Having developed the coding scheme, its clarity and consistency was double-checked by test running it on a section or sample of the transcript. Sequel to this exercise, the coding scheme was slightly refined. The outcome was that codes become more responsive to research purpose, exhaustive, conceptually congruent and mutually exclusive.

**Step 5: Coding all text** – The entire transcript was re-read closely again, fractured and cluster into chunks of data based on pre-identified codes. Adopting a combination of selective coding (selection of core or essential codes that closely correspond with the phenomenon that has been observed in the field) and thematic coding (a process of identifying and formulating themes), all pieces of data that are relevant to the research questions were identified, isolated, contextualised and labelled accordingly (Bezuidenhout & Cronje, 2014: 240; Lindseth & Norberg, 2004).

**Step 6: Assessing the coding consistency** – On completion of coding, the consistency with which the coding was conducted was re-evaluated.

**Step 7: Drawing conclusions from the coded data (interpreting the data)** – Inferences were drawn from the identified themes by thinking about them (reflection) in the light

of the context of the study. This switching into a speculative mode of thinking is what Merriam (2009: 188) describes as ‘theorising’. Making reference to the work of LeCompte, Preissle, and Tesch (1983), she defined theorising as ‘the cognitive process of discovering or manipulating abstract categories and the relationships among those categories’. Here, the principal investigator engages meta-cognition, high level abstraction and visualization of how the identified categories work together, augmenting it with inputs from reflective journal, teaching-learning and model development documents.

**Step 8: Reporting the methods and findings (Writing the report)** – The report encompasses a synopsis of the methods employed for data analysis and the salient findings thereof. Both the qualitative findings and the results of the quantitative analysis were first reported separately and later thoughtfully blend together, refined further and linked together to provide a basis for understanding the evolving blended e-learning model.

#### **4.11 Qualitative Rigour**

The aim of every research is to produce valid and reliable data in an ethical manner. Researchers and writers believe that this goal does not come cheaply. Merriam (2009: 209) attests that ‘validity and reliability are concerns that can be approached through careful attention to a study’s conceptualization and the way in which the findings are presented’. Put differently, attaining trustworthiness of research require some degree of rigor in the conduct of the study. Guba and Lincoln (1985) suggest four criteria for ensuring the trustworthiness of qualitative studies. They are: credibility, dependability, transferability and conformability; substitutes for internal validity, reliability, external validity and objectivity.

##### ***4.11.1 Credibility or Internal Validity***

Internal validity, according to Merriam (2009: 213) deals with the question of how research findings match reality; that is, how congruent are findings with reality. She agrees with Ratcliffe (1983) impression of reality as holistic, multidimensionality and dynamic, against the quantitative research view of reality as a single, fixed, objective phenomenon waiting to be discovered, observed, and measured. She concluded among other things that ‘validity’, then must be assessed in terms of something other than reality itself (which can never be grasped); and that something other than reality itself, she claimed, is Lincoln and Guba’s (1985) notion of ‘*credibility*’. Or what Wolcott (2005) refers to as correspondence between

research and the real world. Creswell (2009); Merriam (2009: 215); and Botma, Greeff, Mulaudzi, and Wright (2010) suggest a number of strategies to increase the trustworthiness of research findings, viz: Triangulation (multiple methods, multiple sources of data, multiple investigators, or multiple theories to confirm emerging findings); Peer debriefing and member checking (Peers and respondent validation); Adequate engagement in data collection such that data become saturated (may include the use of negative or discrepant case analysis); and Researcher's reflexivity.

In this study, multiple sources of data and multiple methods of data collection were used. Data was collected from all categories of nurses (nursing students, nurse clinician, nursing administrators, nurse academics, and nurses from NMCN). Collecting data from nurses in different categories helps in capturing the different perspectives of the reality. It also makes it possible to compare and cross-check data collected. Also, the use of multiple methods of data collection (Questionnaire, Interview, FGDs, and Documents) not only helps to generate rich thick information, but also engender the authentication of the information gathered. Further, all interview transcripts were presented to some of the interviewees for verification of the accuracy of the accounts (to check whether or not the account accurately depicts their perspectives). The ample time invested on data collection equally allows sufficient engagement with the data. Perhaps, it is good to reiterate here that, interviews were only stopped when it became obvious that no new data was forthcoming (Data saturation). This together with the researcher's reflexivity throughout the conduct of the study helped to enhance credibility.

#### ***4.11.2 Reliability or Dependability***

The concept of reliability (the extent to which research findings can be replicated) Merriam (2009: 220) writes, is problematic in social sciences because human behaviour is never static. According to her, reliability in a research design is based on the positivist's assumption of the existence of a single reality and that studying it repeatedly will yield the same result. Her persuasive argument that human experiences are diverse and there can be numerous interpretations of the same data underscores the futility of expecting the same result repeatedly in qualitative studies. In her opinion, the more important question for qualitative research is whether the results are consistent with the data collected. This is what Guba and Lincoln (1994) describes as '*dependability*' or '*consistency*'; that is, the stability of research data. Some of the strategies that have been suggested by authors to ensure dependability of

research findings include: thick description of study setting, specification of data collection plan and procedure, triangulation, peer review, researcher's reflexivity, and the audit trail (Creswell, 2009; Guba & Lincoln, 1994; Merriam, 2009; Shenton, 2004).

As earlier stated, this study employed embedded mixed methods design (multiple sources of data and multiple methods of data collection). In addition data derived from the quantitative and the qualitative methodology were integrated and consolidated at the discussion stage of the study. These sources, methods and data triangulation to a large extent enhance the consistency and dependability of data collected (Creswell, 2009). Beyond that, a rich description of the study setting; the data collection methods and procedure; techniques of data analysis; and how inferences were drawn, is also presented. This makes it possible for readers to follow the sequence of the research process and authenticate the findings (audit trail). The study at various points, gleaned also from the expertise of my research team during reflective sessions and that of my supervisor, who has a wealth of experience in qualitative research methodology, to ensure dependability of its findings.

#### ***4.11.3 External Validity or Transferability***

This is the extent to which the findings of one study can be applied to other situations i.e. how generalizable are the findings of the study (Merriam, 2009:223). Merriam (2009: 224) observe further that the non-feasibility of the use of generalizability in qualitative research in the sense of the experimental and correlational designs, informs its operationalization in ways appropriate with the qualitative philosophical underpinnings. This explains why qualitative researchers subscribe to Lincoln and Guba (1985) idea of '*transferability*', translated as the application of the study to the context in which data were derived or other contexts, depending on how it fits between contexts. Building on the works of other writers, Merriam (2009: 227) offered the following approaches to enhancing the transferability of qualitative research: (i) The use of rich, thick description ('providing enough description to contextualize the study such that readers will be able to determine the extent to which their situations match the research context, and, hence, whether findings can be transferred'); and (ii) Giving careful attention to selecting the study sample ('purposefully seeking variation or diversity in sample selection to allow for a greater range of application of the findings by consumers of the research').

To enhance transferability of this study, a detailed description of the setting and context is presented. As suggested by scholars in the field of qualitative research, careful attention was

given to the selection of study participants using a combination of cluster and purposive sampling techniques. Besides, the details of the sampling procedure, including what informed the choice of one technique over the other, were provided.

#### ***4.11.4 Objectivity or Confirmability***

This is simply a measure of how well research findings are supported/corroborated by the data collected or the extent to which findings are free of researcher's biases. Confirmability in this study was ensured partly by its use of multiple methods and multiple sources of data collection; the recording and verbatim transcription of interview and FGD sessions; and by the principal investigator getting immersed in the data. It was majorly achieved by peer review examination (the research team); audit trail; and researcher's reflexivity.

## **CHAPTER FIVE**

### **5.0 RESULTS OF THE ASSESSMENT CYCLE**

This chapter presents a quick layout of the results of the need assessment cycle, comprising the quantitative (findings from cross sectional survey) and the qualitative (findings from field interview among nursing stakeholders) results. The results of the quantitative data are first presented and discussed as a separate entity, followed by those of the qualitative data. In a bid to have a full picture of the context and to further entrench the reliability/trustworthiness of findings, both the quantitative and qualitative findings were then integrated into a meaningful whole. A journal article titled ‘Towards Developing a Blended E-learning Model for Nursing Education in a Resource-Constrained Setting: Preliminary Findings’, extracted from this chapter is currently undergoing review for possible publication in the next edition of the journal ‘CIN: Computers, Nursing, Informatics’ (A copy of the article is included as annexure).

## 5.1 THE QUANTITATIVE FINDINGS

The quantitative findings are presented in the following order:

- 5.1.1 Demographic characteristics of the participants.
- 5.1.2 Perception of e-learning as a mode of teaching and learning among nursing stakeholders: (a) nursing students (b) nurse academics (c) nurse practitioners (d) nurse administrators and nursing leaders.
- 5.1.3 Nurses' computer literacy levels, computer skills and e-learning experiences.
- 5.1.4 Relationship between computer literacy, computer skill, e-learning experience and perception of e-learning among nurses.

### 5.1.1 DEMOGRAPHIC CHARACTERISTICS OF STUDY PARTICIPANTS

Four hundred and sixty four nurses returned the survey instrument (questionnaire) for this study but only 402 that were completed satisfactorily were selected for analysis. Survey result showed that the nurses' age ranges from 21 to 56 years with a mean of  $31.2 \pm 12.8$ . Table 5.1 presents a summary of the demographic characteristics of the nurses.

**Table 5.1: Demographic Characteristics of the Nurses**

Variable	Frequency	Percentage
<b>Age in years</b>		
16-25years	46	11.4
26-35years	145	36.1
36-45years	123	30.6
46years and above	88	21.9
Total	402	100.0
<b>Gender</b>		
Male	113	28.1
Female	289	71.9
Total	402	100.0
<b>Educational Qualification/Literacy Level</b>		
Diploma	279	69.4
Bachelor Degree	98	24.4
Postgraduate Qualifications (PGD, Master's Degree & PhD)	25	6.2
Total	402	100.0
<b>Marital Status</b>		
Married	258	64.2
Single	135	33.6
Divorced	2	0.5
Widowed	2	0.5
Missing	5	1.2
Total	402	100.0

Over a third of the nurses (36.1%) were between 26 and 35 years of age, 30.6% were 36 – 45 years of age while those who were 16 – 25 years recorded least percentage (11.4%). This is not surprising because the 6-3-3-4 system of education that is in operation in Nigeria now ensures that the learner is kept in school for a minimum of 14 – 18 years before qualifying or



graduating as a professional. The leanness of the older age group (46 years and above) is equally understandable. In Nigeria today, the retirement age for civil servants and academicians has been reduced to 60 and 65 years respectively except for professors whose retirement age still stands at 70 years.

As typical of nurses all over the world, a majority (71.9%) of the participants are females. Many (64.2%) are married. As regards their educational qualifications, a majority (69.4%) holds only professional diploma qualifications in nursing; a marginally significant number 98 (24.4%) reported possessing bachelor degree while a few (24) had postgraduate qualifications. The fewness of nurses with bachelor and post graduate qualifications compared to those with professional diploma certificates could be attributed to the historical location of nursing education under the ministry of health which is yet to be fully realigned with the country's education system. The net result is the protracted zigzag educational ladder for Nigerian nurses.

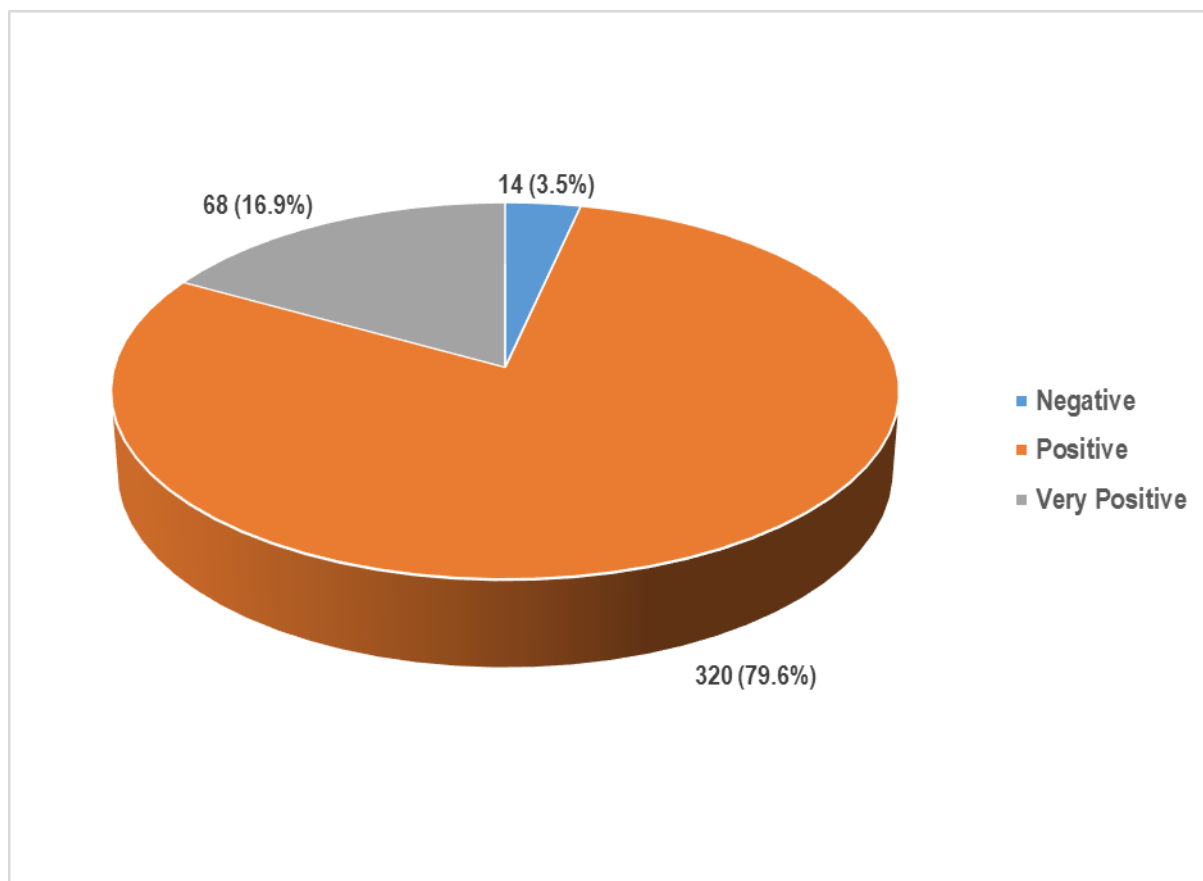
**Table 5.2 Distribution of Nurses by Geopolitical Zones, Job Status and Years of Experience**

Variable	Frequency	Percentage
<b>Geopolitical Zone</b>		
South West(Oyo & Osun)	76	18.9
South East (Abia & Enugu)	70	17.4
South South (Rivers & Bayelsa)	71	17.7
North Central (Kogi & FCT Abuja)	73	18.1
North West (Sokoto & Katsina)	71	17.7
North East (Borno & Bauchi)	41	10.2
Total	402	100.0
<b>Distribution by Cadre/Job Status</b>		
Nursing Students	58	14.4
Nurse Academics	36	9.0
Nurse Practitioners	264	65.7
Nurse Administrators	44	10.9
Total	402	100.0
<b>Length of Service/Years of Experience</b>		
1-10years	248	61.7
11-20years	74	18.4
21-30years	58	14.4
31years and above	7	1.7
Missing	15	3.7
Total	402	100.0

As glaring from Table 5.2, there is a fairly good spread of participants (nurses) across the six geopolitical zones of Nigeria except for the North-East geopolitical zone (the centre of Boko Haram insurgency) that recorded a slightly lower figure (10.2%). The distribution of the nurses by job status/designation reveals that a large percentage (65.7%) are nurse practitioners/clinicians, 14.4% are nursing students (qualified nurses still schooling at the time of data collection), while nurse academics constituted the least percentage (9%). It should be noted that the term nurse academics is used here in an all-encompassing sense as it includes those who neither possess a bachelor nor higher degree in nursing but are functioning as nurse tutors having completed a one year education programme for nurses. Also as obvious from the table, a majority (61.7%) have had 1 – 10 years of work experience. There is however a progressive decline in the frequency of the nurses as the years of experience increase.

### 5.1.2 PERCEPTION OF E-LEARNING AS A MODE OF TEACHING AND LEARNING AMONG NURSING STAKEHOLDERS

The views/opinion of the nurses about e-learning were explored by section D of the survey instrument. Analysis of the nurses' responses reveals a generally positive perception of e-learning as a mode of teaching and learning among Nigerian nurses. Further details about the nurses' perception of e-learning are as depicted on Figure 5.1.



**Fig. 5.1: Perception of E-Learning as a Mode of Teaching and Learning among Nigerian Nurses**

As reflected on Figure 5.1, a majority of the nurses 320 (79.6%) have positive perception about e-learning as a mode of teaching and learning, 68 (16.9%) have very positive perception, while only 14 (3.5%) exhibited negative perception.

Pearson Chi-square and Kruskal-Wallis non parametric equality-of-populations rank test were used to investigate the relationship between the nurses' perception of e-learning and selected demographic variables. Table 5.3 below presents the salient findings.

**Table 5.3: Relationship between Nurses' Perception of E-Learning and Selected Demographic Variables**

Demographic Variables	Nurses' Perception of E-Learning							
	Negative	Positive	Very Positive	Total	Pearson Chi-square (X <sup>2</sup> ) p-value <sup>i</sup>	Fisher's Exact p-value	Median (IQR <sup>i</sup> )	p-value <sup>ii</sup>
<b>Nurses Designation/Job Status</b>								
Nursing student	2	50	6	58			75 (70 – 83)	
Nurse academics	2	22	12	36			81 (70 – 89)	
Nurse practitioner/clinician	8	210	46	264	0.069	0.053	75 (68 – 84)	0.336
Nurse administrator	2	38	4	44			75 (68.5 – 82)	
<b>Total</b>	<b>14</b>	<b>320</b>	<b>68</b>	<b>402</b>				
<b>Age in years</b>								
16 - 25yrs	3	42	1	46			76 (71-82)	
26 - 35yrs	2	116	27	145			74 (68-84)	
36 - 45yrs	4	90	29	123	0.013	0.004	76 (70-86)	0.496
46yrs+	5	72	11	88			75 (66-82.5)	
<b>Total</b>	<b>14</b>	<b>320</b>	<b>68</b>	<b>402</b>				
<b>Educational &amp; Professional Qualification</b>								
Diploma	10	226	43	279			75 (68-83)	
1st Degree	4	77	17	98	0.264	0.316	75 (69-84)	0.027
Postgraduate	0	17	8	25			82 (74-88)	
<b>Total</b>	<b>14</b>	<b>320</b>	<b>68</b>	<b>402</b>				
<b>Geopolitical Zones</b>								
Oyo & Osun	3	53	20	76			78 (69.5 – 87)	
Abia & Enugu	2	53	15	70			76 (72 – 86)	
Rivers & Bayelsa	1	61	9	71			77 (69 – 84)	
Kogi & FCT	3	58	12	73	0.008	0.011	75 (66 – 82)	0.010
Sokoto & Katsina	0	61	10	71			73 (66 – 82)	
Bauchi & Borno	5	34	2	41			73 (68 – 82)	
<b>Total</b>	<b>14</b>	<b>320</b>	<b>68</b>	<b>402</b>				
<b>Sex/Gender</b>								
Male	2	93	18	113			74 (69 – 84)	
Female	12	227	50	289	0.459	0.538	76 (68 – 84)	0.688
<b>Total</b>	<b>14</b>	<b>320</b>	<b>68</b>	<b>402</b>				

i: Interquartile range (IQR)

ii: Kruskal-Wallis non-parametric equality-of-populations rank test

**Designation/Job Status:** Results shows no significant relationship between nurses' perception of e-learning as a mode of teaching and learning and nurses' designation/job status (p-value for both Chi-square and Kruskal-Wallis non parametric equality-of-populations rank test greater than 0.05).

**Age:** Although preliminary analysis with Pearson Chi-square reveals a significant relationship between nurses' age and their perception of e-learning, result was rejected

because one of the cardinal assumptions of Chi-square which states that expected frequency of less than five should not exceed 20% of the cells (large tables) was violated (Munro, 1997: 102). Further testing with Kruskal-Wallis rank test yields no statistically significant result ( $p > 0.05$ ).

**Education/Professional Qualification:** There was a statistically significant association between nurses' educational/professional status and their perception of e-learning ( $p < 0.05$ ). The more educated the nurse is, the greater the tendency to perceive e-learning positively. Chi-square result was equally rejected because it has violated one of its basic assumption that states that the total number of frequency count of less than five should not exceed 20% of the cells (Munro, 1997: 102).

**Geopolitical Zones:** As obvious from the table, some zones exhibited more positive perception of e-learning than others. Nurses in the South-West (Osun/Oyo), South-East (Abia/Enugu), South-South (Rivers/Bayelsa), and North-West (Sokoto/Katsina) geopolitical zones have more positive perception of e-learning than those in the North-Central (Kogi/FCT) and North-East (Bauchi/Borno) zones. When subjected to statistical analysis, the observed difference in perception of e-learning across the six geopolitical zones was found to be statistically significant ( $p < 0.05$ ).

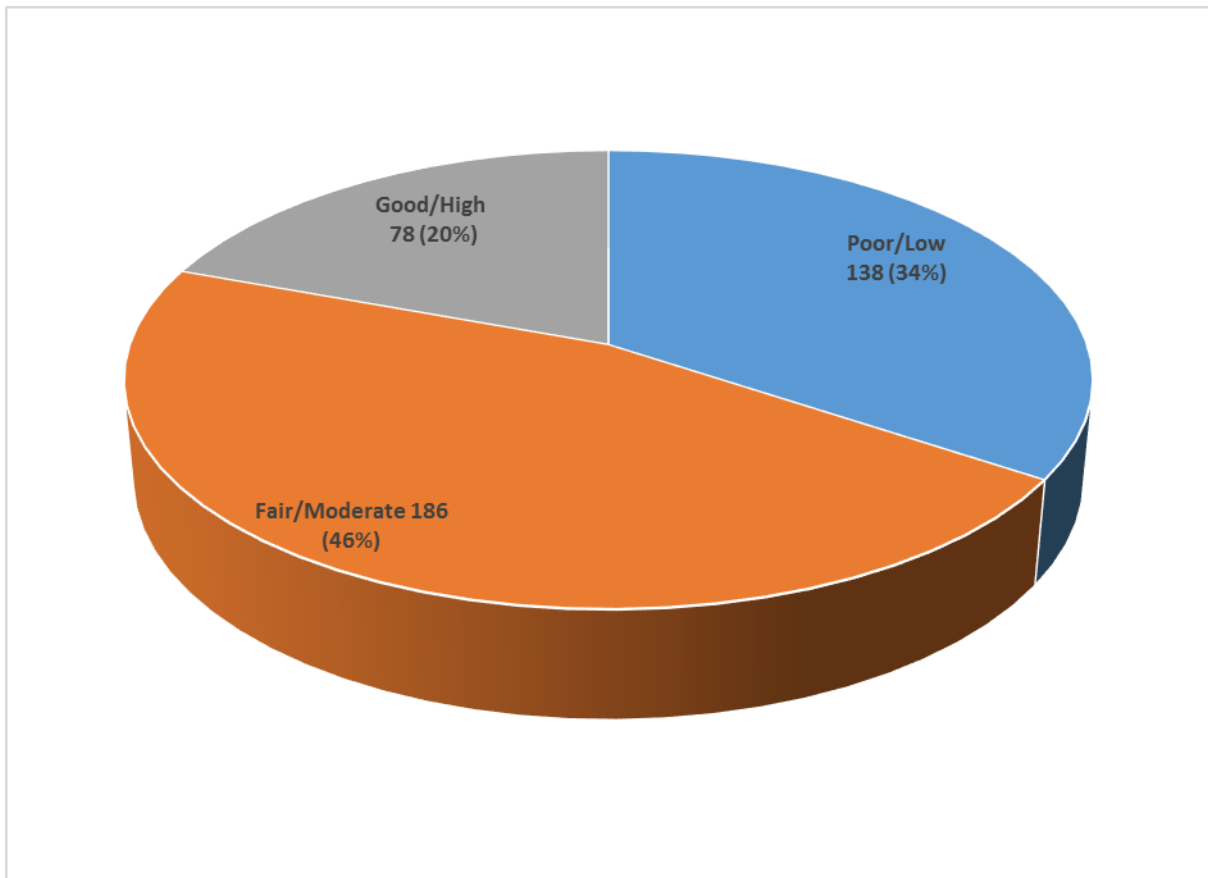
**Gender:** Concerning gender and perception, no statistically significant difference was found between the male and female nurses' perception of e-learning ( $p > 0.05$ ).

### 5.1.3 NURSES' COMPUTER LITERACY, COMPUTER SKILLS AND E-LEARNING EXPERIENCES

The assessment of the nurses' computer literacy, computer skills and e-learning experiences was accomplished with statistical analysis of the nurses' responses to section B and C of the survey instrument. The results were quite instructive.

#### 5.1.3.1 Distribution of Nurses by Computer Literacy

Distribution of the nurses by computer knowledge shows that many of the nurses 186 (46%) possess fair/moderate knowledge of computer and 78 (20%) display good/high knowledge (See figure 5.2). While that looks seemingly good, the number of nurses (138) representing 34% of the sample size that has poor/low computer knowledge is rather substantial and a cause of concern.



**Fig. 5.2: Nurses Computer Literacy Categorized**

Investigations into possible relationship between computer literacy and some demographic variables yielded some interesting results. Details are as presented in Table 5.4 below.

**Table 5.4: Relationship between Nurses' Computer Literacy and some Demographic Variables**

Demographic Variables	Nurses' Computer Literacy							
	Poor / Low	Fair / Moderate	Good / High	Total	Pearson Chi-square (X <sup>2</sup> ) p-value <sup>i</sup>	Fisher's Exact p-value	Median (IQR <sup>i</sup> )	p-value <sup>ii</sup>
<b>Nurses Designation/Job Status</b>								
Nursing student	28	24	6	58			21 (17 – 26)	
Nurse academics	8	21	7	36			23.5 (20 – 27.5)	
Nurse practitioner/clinician	86	119	59	264	0.084	0.090	23 (17 – 29)	0.129
Nurse administrator	16	22	6	44			22.5 (15 – 27)	
<b>Total</b>	<b>138</b>	<b>186</b>	<b>78</b>	<b>402</b>				
<b>Age in years</b>								
16 - 25yrs	19	23	4	46			21.5 (15 – 26)	
26 - 35yrs	59	58	28	145			21 (16 – 27)	
36 - 45yrs	35	56	32	123	0.034	0.035	24 (19 – 30)	0.05
46yrs+	25	49	14	88			23 (17 – 27)	
<b>Total</b>	<b>138</b>	<b>186</b>	<b>78</b>	<b>402</b>				
<b>Educational &amp; Professional Qualification</b>								
Diploma	112	119	48	279			21 (15 – 27)	
1st Degree	18	56	24	98	0.004	0.002	25 (21 – 29)	0.0004
Postgraduate	8	11	6	25			23 (17 – 28)	
<b>Total</b>	<b>138</b>	<b>186</b>	<b>78</b>	<b>402</b>				
<b>Geopolitical Zones*</b>								
Oyo & Osun	18	35	23	76			24.5 (20 – 31)	
Abia & Enugu	20	31	19	70			25 (19 – 30)	
Rivers & Bayelsa	17	42	12	71			24 (20 – 27)	
Kogi & FCT	36	27	10	73	0.002		20 (14 – 25)	0.0001
Sokoto & Katsina	50	30	11	71			21 (15 – 26)	
Bauchi & Borno	17	21	3	41			21 (16 – 23)	
<b>Total</b>	<b>138</b>	<b>186</b>	<b>78</b>	<b>402</b>				
<b>Sex/Gender</b>								
Male	39	58	16	113			23 (17 – 27)	
Female	99	128	62	289	0.212	0.206	22 (16 – 29)	0.478
<b>Total</b>	<b>138</b>	<b>186</b>	<b>78</b>	<b>402</b>				

\* Fischer's Exact could not be calculated (exceeded maximum enumerations)

i: Interquartile range (IQR)

ii: Kruskal-Wallis non-parametric equality-of-populations rank test

**Nurses Designation versus Computer Literacy:** Result shows no correlation between the nurses' designation and computer literacy ( $p > 0.05$ ).

**Age and Computer Literacy:** Contrary to the well-known pattern of the younger generation being more computer literate than the older (Mastrian, et al., 2011), results revealed an unusual pattern: older nurses more computer literate than the younger nurses. Table 5.4

shows that as age increases, computer literacy increases among the nurses. The Chi-square test revealed a significant relationship between nurses' age and computer literacy ( $p < 0.05$ ). This is bizarre but could be attributed to three factors. The first is the economic depression ravaging economy of most developing world causing the gap between the rich and the poor to continue to widen with resultant widening of the digital divide. So it is not unlikely that majority of these young nurses do not have access to computer during their growing years, let alone owning a personal computer. The second is that in Nigeria computer appreciation had not been incorporated into the basic schools of nursing curriculum as at the time majority of these young nurses are undergoing their nursing training. The introduction of computer literacy into the curriculum of basic and post basic schools of nursing is a very recent development. The third is that it is very likely that some of the older nurses had enrolled or completed a degree programme during which they would have been exposed to computer appreciation courses.

**Educational Status and Computer Literacy:** As outlined on table 5.4, results established a statistically significant relationship between nurses' educational status and computer literacy. This may mean that the more educated the nurses are, the higher their computer knowledge ( $p < 0.05$ ). The hitherto non-inclusion of computer appreciation course in the curriculum of basic and post-basic nursing schools and the well documented digital divide are rational explanations for this trend.

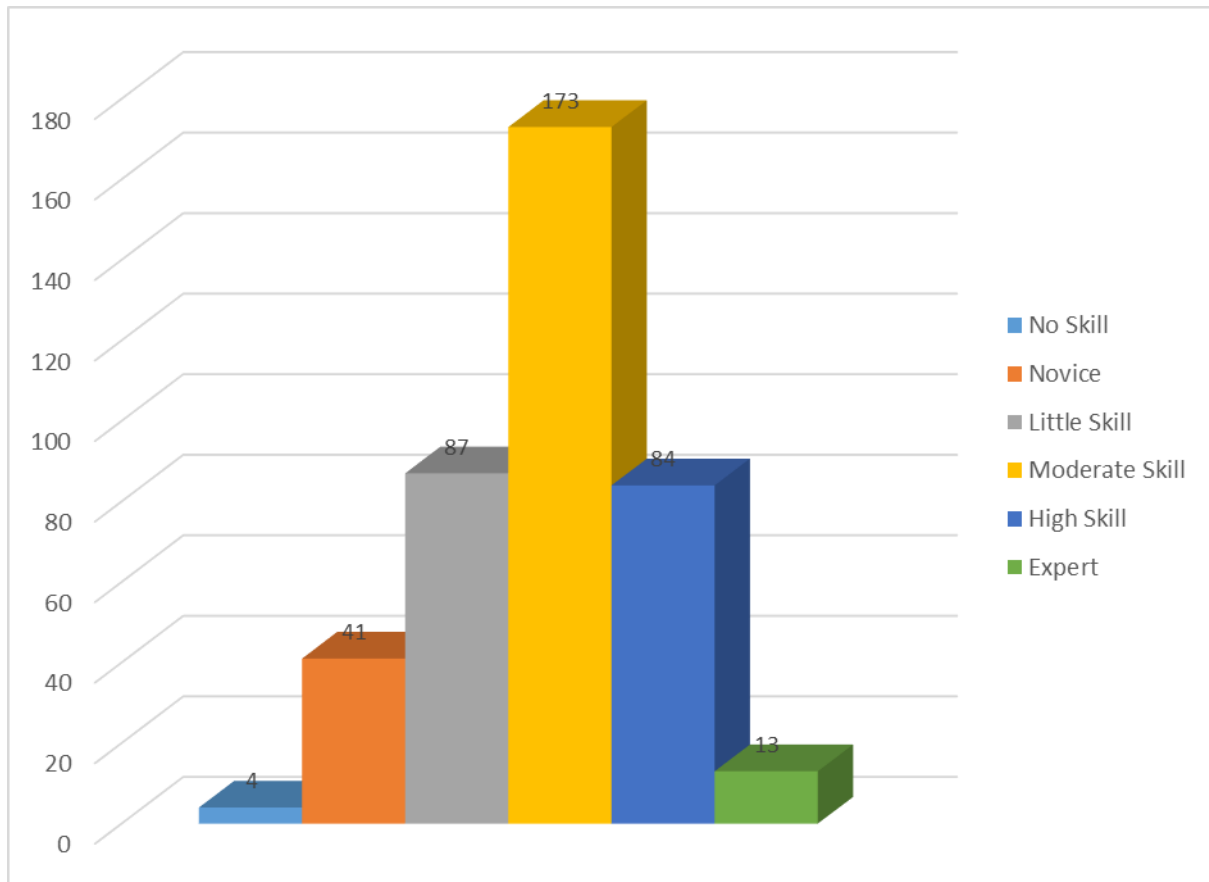
**Geopolitical Zones and Computer Literacy:** Nurses from the South-West (Oyo/Osun), South-East (Abia/Enugu) and South-South (Rivers/Bayelsa) geopolitical zones were found to be more computer literate than their counterparts from the North-Central (Kogi/FCT), North-West (Sokoto/Kaduna) and the North-East (Bauchi-Borno) zones. Both Chi-square and Kruska-Wallis test performed, revealed that the observed difference in the nurses' computer literacy across the six geopolitical zones is statistically significant ( $p < 0.05$ ).

**Gender and Computer Literacy:** Assessment result revealed no statistically significant association between gender and computer literacy among the nurses in Nigeria ( $p > 0.05$ ). This suggests that male and female nurses do not seem to differ in their knowledge of computer. Taking this further, it means that gender seem not to exert any influence on nurses' acquisition and retention of computer knowledge.



### 5.1.3.2 Classification of Nurses by Computer Skills

The results of the assessment of the nurses' computer skills are equally thought provoking. Figure 5.3 is a graphic representation of the distribution of the nurses by computer skills.



**Fig. 5.3: Distribution of Nurses by Computer Skills**

As depicted on Figure 5.3, a majority of the nurses (173) rated themselves as possessing moderate computer skill while only a few (13) adjudged themselves as proficient in the use of computer (expert). However, when the number of nurses who rated themselves as either having no computer skill or being novice or possessing little skills was put together, the total was somewhat substantial (132).

The influence of various demographic variables on nurses' computer skills was also tested. The results are as presented in Table 5.5 below.

**Table 5.5: Influence of some Demographic Variables on Nurses Computer Skills**

Demographic Variables	Nurses' Computer Skills							Pearson Chi-square (X <sup>2</sup> ) p-value <sup>i</sup>	Fisher's Exact p-value	Median (IQR <sup>i</sup> )	p-value <sup>ii</sup>
	No Skill	Novice	Little Skill	Moderate Skill	High Skill	Expert	Total				
<b>Nurses Designation/Job Status*</b>											
Nursing student	1	1	9	29	16	2	58			50 (43 – 60)	
Nurse academics	1	1	5	13	11	5	36			59 (46 – 69.5)	
Nurse practitioners	2	31	61	112	52	6	264	0.002		49 (30 – 59)	0.0001
Nurse administrator	0	8	12	19	5	0	44			42.5 (31 – 51.5)	
<b>Total</b>	<b>4</b>	<b>41</b>	<b>87</b>	<b>173</b>	<b>84</b>	<b>13</b>	<b>402</b>				
<b>Age in years*</b>											
16 - 25yrs	1	4	10	22	8	1	46			48 (36 – 58)	
26 - 35yrs	1	10	23	62	41	8	145			53 (40 – 63)	
36 - 45yrs	2	11	30	52	24	4	123	0.036		49 (32 – 59)	0.001
46yrs+	0	16	24	37	11	0	88			45 (28 – 56)	
<b>Total</b>	<b>4</b>	<b>41</b>	<b>87</b>	<b>173</b>	<b>84</b>	<b>13</b>	<b>402</b>				
<b>Educational &amp; Professional Qualification</b>											
Diploma	4	34	65	117	52	7	279			48 (32 – 59)	
1st Degree	0	3	18	45	28	4	98	0.094	0.056	53 (41 – 63)	0.010
Postgraduate	0	4	4	11	4	2	25			53 (32 – 59)	
<b>Total</b>	<b>4</b>	<b>41</b>	<b>87</b>	<b>173</b>	<b>84</b>	<b>13</b>	<b>402</b>				
<b>Geopolitical Zones*</b>											
Oyo & Osun	0	3	16	38	16	3	76			50.5 (39.5 – 60)	
Abia & Enugu	0	2	15	29	20	4	70			52.5 (40 – 65)	
Rivers & Bayelsa	2	12	25	29	3	0	71			36 (23 – 52)	
Kogi & FCT	1	14	15	28	15	0	73	0.000		47 (28 – 59)	0.0001
Sokoto & Katsina	0	7	8	31	19	6	71			56 (46 – 63)	
Bauchi & Borno	1	3	8	18	11	0	41			52 (36 – 60)	
<b>Total</b>	<b>4</b>	<b>41</b>	<b>87</b>	<b>173</b>	<b>84</b>	<b>13</b>	<b>402</b>				
<b>Sex/Gender</b>											
Male	0	8	16	54	26	9	113			54 (42 – 61)	
Female	4	33	71	119	58	4	289	0.002	0.003	48 (31 – 58)	0.0004
<b>Total</b>	<b>4</b>	<b>41</b>	<b>87</b>	<b>173</b>	<b>84</b>	<b>13</b>	<b>402</b>				

\* Fischer's Exact could not be calculated (exceeded maximum enumerations)

i: Interquartile range (IQR)

ii: Kruskal-Wallis non-parametric equality-of-populations rank test

**Nurses' Designation and Computer Skills:** It is a truism that skill acquisition has more to do with practice than mental knowledge. It is not all that surprising that the study established that nursing students and nurse academics whose work necessitate a more regular use of computer were adjudged as possessing better computer skills than the nurse practitioners and nurse administrators. The Chi-square and the Krukal-Wallis tests equally established a significant relationship between nurses' designation/job status and computer skills ( $p < 0.05$ ).

**Nurses' Age versus Computer Skills:** Results similarly revealed a significant relationship between the nurses' age and their computer skills ( $p < 0.05$ ). The younger nurses (16 – 25 and the 26 – 35 years of age) were found to be more computer savvy than the older nurses. The well-known adventurous nature of the younger generation, popularly regarded as the '*Net Generation or Digital Natives*' (born between 1980 and 1995), and their predisposition to engage in trial and error is one possible explanation for this pattern. Another rational explanation is the observed phobia for technology among the older ones (Techno-phobia) that makes them to be hesitant to work with computer.

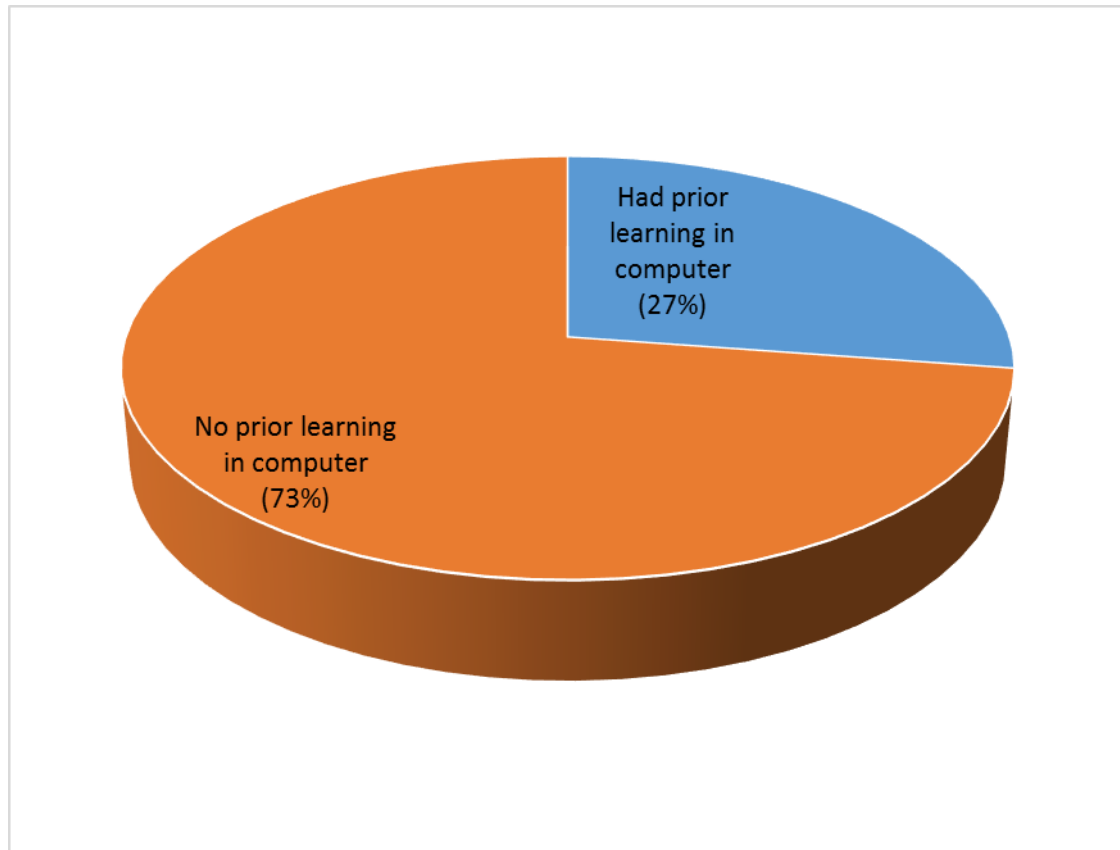
**Educational/Professional Qualification and Nurses' Computer Skills:** The study has also established some form of correlation between educational status and nurses' computer skills ( $p < 0.05$ ). Those who had university education were found to exhibit higher computer dexterity than those with only professional diploma qualifications in nursing. The Chi-square p-value is jettisoned in favour of the Kruskal-Wallis p-value because 50% of the cells have frequency count of less than 5 (Munro, 1997: 102).

**Geopolitical Zones and Nurses' Computer Skills:** There was a marked variation in nurses' computer skills across the six geopolitical zones of Nigeria. The observed difference in the nurses' computer skills was equally found to be statistically significant ( $p < 0.05$ ).

**Gender and Nurses' Computer Skills:** Results showed that the percentage of male nurses who are moderately skilful, highly skilful or proficient (expert) in the use of computer are higher than those of the female nurses. Statistical analysis suggests a significant relationship between gender and computer skills among nurses ( $p < 0.05$ ). Whether this has to do with male ego or the male courageousness and prowess at trying out things, is a matter beyond the scope of this study.

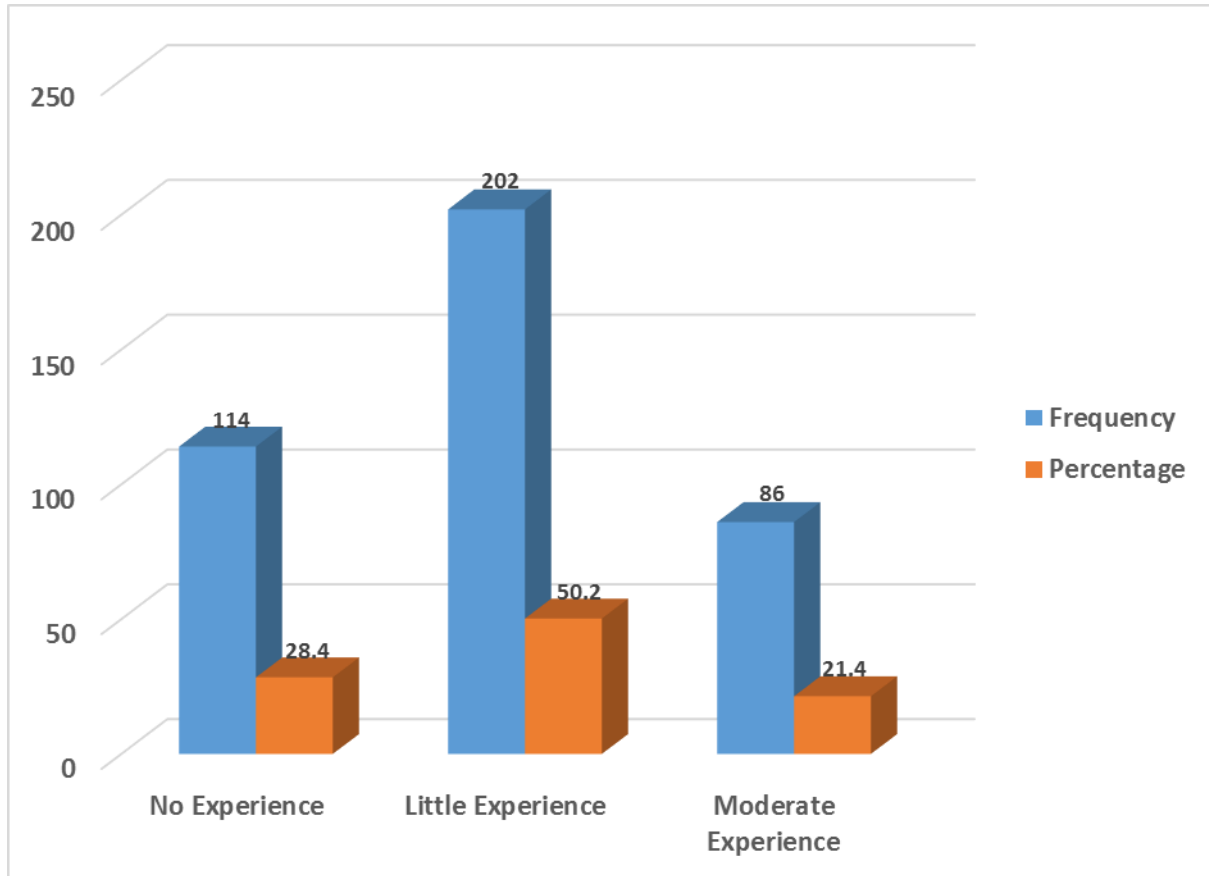
### 5.1.3.3: E-Learning Experiences among Nigerian Nurses

Enquiry into the nurses' exposure to computer or ICT-moderated learning prior to enrolment in schools of nursing showed that a majority of the nurses had no prior learning experience in computer as illustrated in Figure 5.4 below.



**Figure 5.4: Graphical Representation of Nurses' Prior Computer Learning Experience**

Further investigation into the e-learning experiences of these nurses revealed a relative dearth of exposure and involvement in e-learning programmes (See figure 5.5 below for details).



**Fig 5.5: Nurses E-Learning Experiences Categorized**

As obvious from Figure 5.5, about a third 114 (28.4%) of the nurses sampled had never been through any e-learning programme, including academic support and advice by a teacher by e-mail. Half the sample 202 (50.2%) recorded little e-learning experience while just a small fraction 86 (21.4%) have moderate e-learning experience.

When the e-learning experiences of the nurses were cross tabulated with selected demographic variables, there were virtually no significant findings save for geopolitical zones that had a significant result (See table 5.6 below for details).

**Table 5.6: Relationship between Selected Demographic Variables and Experiences of E-Learning among Nigerian Nurses**

Demographic Variables	Nurses' E-Learning Experiences							
	No Experience	Little Experience	Moderate Experience	Total	Pearson Chi-square ( $X^2$ ) p-value <sup>i</sup>	Fisher's Exact p-value	Median (IQR <sup>i</sup> )	p-value <sup>ii</sup>
<b>Nurses Designation/Job Status</b>								
Nursing student	16	30	12	58			8.5 (5 – 10)	
Nurse academics	9	15	12	36			9 (5.5 – 11)	
Nurse practitioners	78	132	54	264	0.659	0.701	7 (5 – 10)	0.2604
Nurse administrator	11	25	8	44			8 (5.5 – 10)	
<b>Total</b>	<b>114</b>	<b>202</b>	<b>86</b>	<b>402</b>				
<b>Age in years</b>								
16 - 25yrs	16	18	12	46			7.5 (5 – 11)	
26 - 35yrs	33	75	37	145			8 (6 – 11)	
36 - 45yrs	33	66	24	123	0.147	0.140	7 (5 – 10)	0.1115
46yrs+	32	43	13	88			7 (5 – 9)	
<b>Total</b>	<b>114</b>	<b>202</b>	<b>86</b>	<b>402</b>				
<b>Educational &amp; Professional Qualification</b>								
Diploma	88	132	59	279			7 (5 – 10)	
1st Degree	17	59	22	98	0.078	0.063	8 (6 – 10)	0.1178
Postgraduate	9	11	5	25			9 (5 – 10)	
<b>Total</b>	<b>114</b>	<b>202</b>	<b>86</b>	<b>402</b>				
<b>Geopolitical Zones*</b>								
Oyo & Osun	9	52	15	76			8 (7 – 10)	
Abia & Enugu	10	43	17	70			8.5 (6 – 10)	
Rivers & Bayelsa	33	28	10	71			6 (5 – 9)	
Kogi & FCT	26	31	16	73	0.000		7 (5 – 9)	0.0039
Sokoto & Katsina	23	27	21	71			8 (5 – 11)	
Bauchi & Borno	13	21	7	41			8 (5 – 10)	
<b>Total</b>	<b>114</b>	<b>202</b>	<b>86</b>	<b>402</b>				
<b>Sex/Gender</b>								
Male	27	55	31	113			8 (5 – 10)	
Female	87	147	55	289	0.145	0.152	7 (5 – 10)	0.1069
<b>Total</b>	<b>114</b>	<b>202</b>	<b>86</b>	<b>402</b>				

\* Fischer's Exact could not be calculated (exceeded maximum enumerations)

i: Interquartile range (IQR)

ii: Kruskal-Wallis non-parametric equality-of-populations rank test

#### 5.1.4: RELATIONSHIP BETWEEN COMPUTER LITERACY, COMPUTER SKILL, E-LEARNING EXPERIENCE AND PERCEPTION OF E-LEARNING AMONG NURSES

Investigation into possible relationship between computer literacy, computer skills and experiences of e-learning among Nigerian nurses also employs the Chi-square and the Kruskal-Wallis non-parametric equality-of-populations rank test. Results are as presented on tables 5.7 and 5.8 below.

**Table 5.7: Cross Tabulation of Computer Literacy and Experiences of E-Learning with Perception of E-Learning among Nurses**

Computer Literacy	Nurses' Perception of E-Learning							
	Negative	Positive	Very Positive	Total	Pearson Chi-square ( $\chi^2$ ) p-value <sup>i</sup>	Fisher's Exact p-value	Median (IQR <sup>i</sup> )	p-value <sup>ii</sup>
Poor / Low	6	121	11	138			73 (66-79)	
Fair / Moderate	5	151	30	186	0.0001	0.0001	75 (69-83)	0.0001
Good / High	3	48	27	78			82.5 (73-89)	
<b>Total</b>	<b>14</b>	<b>320</b>	<b>68</b>	<b>402</b>				

Experiences of E-Learning	Nurses' Perception of E-Learning							
	Negative	Positive	Very Positive	Total	Pearson Chi-square ( $\chi^2$ ) p-value <sup>i</sup>	Fisher's Exact p-value	Median (IQR <sup>i</sup> )	p-value <sup>ii</sup>
No Experience	2	95	17	114			76 (70 – 84)	
Little Experience	11	163	28	202	0.020	0.028	74 (67 – 83)	0.0487
Moderate Experience	1	62	23	86			78 (71 – 87)	
<b>Total</b>	<b>14</b>	<b>320</b>	<b>68</b>	<b>402</b>				

i: Interquartile range (IQR)

ii: Kruskal-Wallis non-parametric equality-of-populations rank test

Both the Chi-square test and the Kruskal-Wallis test showed a significant relationship between computer literacy and nurses' perception of e-learning ( $p < 0.05$ ). The higher the nurses' computer literacy/knowledge level, the higher the likelihood of having positive perception of e-learning. A similar statistically significant relationship was observed between the nurses' perception of e-learning and their e-learning experiences ( $p < 0.05$ ). The more exposed and involved in e-learning the nurses are, the higher the likelihood of positive perception of e-learning.

**Table 5.8: Correlation between Nurses' Computer Literacy and Computer Skills**

Computer Skill	Computer Literacy							
	Poor / Low	Fair / Moderate	Good / High	Total	Pearson Chi-square ( $\chi^2$ ) p-value <sup>i</sup>	Fisher's Exact p-value	Median (IQR <sup>i</sup> )	p-value <sup>ii</sup>
No Skill	3	1	0	4			16.5 (12.5 – 19)	
Novice	22	14	5	41			17 (12 – 24)	
Little Skill	34	45	8	87			22 (16 – 26)	
Moderate Skill	55	88	30	173	0.0001		22 (17 – 27)	0.0001
High Skill	20	31	33	84			27 (20 – 33)	
Expert	4	7	2	13			23 (19 – 28)	
<b>Total</b>	<b>138</b>	<b>186</b>	<b>78</b>	<b>402</b>				

Fischer's Exact could not be calculated (exceeded maximum enumerations)

i: Interquartile range (IQR)

ii: Kruskal-Wallis non-parametric equality-of-populations rank test

Table 5.8 above shows that, a positive correlation exists between computer literacy and computer skills among the nurses ( $p < 0.05$ ). As the computer literacy level of the nurses increases, their computer skill also increases. Stated differently, the higher the nurses' computer knowledge is, the higher the probability of possessing enhanced computer skills.



## 5.2 THE QUALITATIVE RESULTS

It may be useful to reiterate here that the qualitative data analysis was done using the eight steps process of qualitative content analysis (conventional and summative content analysis) described by Zhang and Wildemuth (2009). As discussed in the previous chapter, the audio recorded field interviews were transcribed verbatim and then analysed. In view of the large volume of data collected, data ordering was achieved by use of codes (nodes) and sub-codes (sub nodes). Data were coded descriptively or interpretively using concepts derived from the study objective and its theoretical framework. Upon data reduction, all pieces of data that were relevant to the research questions were identified, isolated, contextualised and labelled accordingly (Bezuidenhout & Cronje, 2014: 240; Lindseth & Norberg, 2004). Inferences were drawn from the identified themes by thinking through them (reflection) in the context of the study.

The themes and sub-themes are presented here in narrative text and supplemented with verbatim quotes from participants, graphic displays (such as diagram and histogram) and table(s), as are needful to substantiate or buttress the discourse. Codes, 'HO' symbolising health organisation that participants work with and not their real names are used and verbatim quotes are italicised. It is equally important to note that summative content analysis which involves counting and comparisons was particularly used to categorise, compare and display the participants' demographics in a tabular form. The emerging themes and the sub-themes are therefore presented as follows:

5.2.1 Description of key informants in terms of demographics.

5.2.2 Modes of delivery of nursing education in Nigeria.

5.2.2.1 Dominant mode of delivery of nursing education in basic schools of nursing and universities in Nigeria.

5.2.2.2 Subtle paradigm shift.

5.2.3 State of development of e-learning and ICT application in nursing education in Nigeria.

5.2.3.1 Under developed e-learning system.

5.2.3.2 Challenges

5.2.4 Perception of e-learning as a mode of teaching and learning in nursing

5.2.4.1 Positive Perception of e-learning and intervening conditions.

5.2.4.2 Issues of concern.

- 5.2.5 Nurses/nursing students' computer literacy and readiness to adopt e-learning.
  - 5.2.5.1 Nurses/nursing students' computer literacy.
  - 5.2.5.2 Nurses and nursing students' readiness to adopt and use e-learning.
- 5.2.6 Antecedents for e-learning application in nursing education in Nigeria.
  - 5.2.6.1 Development and Globalization.
  - 5.2.6.2 Technological Advancement.
  - 5.2.6.3 The Internet Revolution.
  - 5.2.6.4 Policy Issues and Directives
- 5.2.7 Contextual factors necessitating e-learning application in nursing education in Nigeria.
  - 5.2.7.1 Massive Demand for University Nursing Education
  - 5.2.7.2 Growing Dissatisfaction of Nigerian Nurses with their Diploma Professional Qualification
  - 5.2.7.3 Baccalaureate ODL Nursing Related Demands
  - 5.2.7.4 Ready Opportunity for Learning for those who cannot quit their Job or Secure a Study Leave
  - 5.2.7.5 The Ease that E-learning brings into the Teaching-Learning Process and its Transformative Potential
  - 5.2.7.6 The Drive for Continuing Professional Development as desirable in the 21st Knowledge Society
  - 5.2.7.7 Existence of a Massive Need and a Ready Market
  - 5.2.7.8 Status Symbol and the Need to move with the Wind of Change
- 5.2.8 Perceived constraints to the development and use of e-learning in nursing education in Nigeria.
- 5.2.9 A rare display of hope/optimism in the face of daunting challenges.
- 5.2.10 Suggestions for building an e-learning model for a resource-constrained educational setting in terms of the:
  - 5.2.10.1 Design
  - 5.2.10.2 Content
  - 5.2.10.3 Implementation

### **5.2.1: DESCRIPTION OF THE KEY INFORMANTS**

A total of 16 purposively selected individuals, considered as information rich sources with regards to nursing education and practice in Nigeria formed the sample. All are registered nurses with the NMCN and all except four are veteran nurse educators with wealth of teaching experience. Of the four, three are seasoned nurse clinicians and teachers who have risen through the ranks to the post of Assistant Director and Deputy Director of Nursing Services (one, formerly a chief nurse tutor before being appointed director, Hospital Management Board; and the remaining two have over time been involved in the teaching of nursing students on part-time basis). The last two were once teachers in the schools of nursing before taking up the job of administrator with the NMCN and at the moment work in the education department of the Council. Although the original plan was to interview 18 of such individuals but by the time the 16th person was being interviewed, data saturation had already set in.

The mean age of the participants was 49.1 years, indicating that a majority of the participants were over 50 years of age. The participants' years of experience range from 8 to 27 years with a mean of 19.2. A majority (10) has equally had 10 – 20 years of work experience, either as a nurse clinician, nurse administrator or nurse educator. Similarly, a majority of the participants (12) holds a master's degree. This combination clearly underscores the study's attempt at having a good mixed of information rich sources whose wealth of knowledge and experience could be brought to bear in the development of the proposed blended e-learning model for a resource-constrained educational setting. Table 5.9 below presents further details about the key informants' demographic features.

**Table 5.9: Demographic Characteristics of Key Informants**

Demographic Variable	Frequency ( n = 16)
<b>Age in years (Mean age – 49.1yrs)</b>	
35 – 39	2
40 – 44	1
45 – 49	3
50 – 54	6
55 – 59	4
<b>Sex/Gender</b>	
Male	4
Female	12
<b>Highest Educational Attainment</b>	
1 <sup>st</sup> Degree in Nursing or Nursing-Related Course	1
Master’s Degree in Nursing (M.Sc.)	12
Master’s Degree in Law (LM)	1
Doctor of Philosophy (PhD.)	2
<b>Designation/Position</b>	
Senior Nurse Tutor	2
Principal/Vice Principal, School of Nursing	3
Director/Deputy Director/Assistant Director, Clinical Nursing Services	3
Director/Deputy Director, Nursing Education	3
Lecturer/Senior Lecturer/Associate Professor (Nursing) in a University	2
Head, Department of Nursing in a University	1
Administrator (Senior Assistant Registrar), NMCN	2
<b>Years of Experience</b>	
1 – 10	2
11 – 20	4
21 – 30	10
<b>Place of Work</b>	
Schools of Nursing	7
Clinical Services Department, University Teaching Hospital	2
Hospital Management Board	1
Federal Universities	3
Nursing & Midwifery Council of Nigeria (NMCN)	2
<b>Geopolitical Zones</b>	
North-West	2
North-Central	2
South-South	2
South-West	10

## **5.2.2: MODES OF DELIVERY OF NURSING EDUCATION IN NIGERIA**

This theme seeks to investigate the modes of delivery of nursing education in Nigeria and whether there have been changes down the years.

### **5.2.2.1: Dominant Modes of Delivery of Nursing Education in Basic Schools of Nursing and Universities in Nigeria**

The study showed that the dominant mode of delivery of nursing education in Nigeria over the years has been the traditional face-to-face didactic teaching, clinical demonstration in laboratories and hands-on practice in the clinics/hospitals. This is evident from typical participants' comments like:

*Nursing education has primarily been face-to-face programme; students have to be on ground in the schools or university where the programme takes place [HO 1].*

Data sources further revealed that the mode of instruction is confined to a 'brick and mortar' school setting where teachers are seen as subject experts or conveyor of knowledge, who transmit this knowledge to learners that are seen as passive recipients. Informants also noted that teaching and learning are done in three main ways. The first is the theoretical aspect [classroom-based]; second, is the self-study and research aspect [library-based] and the third, is the hands-on [laboratory-based] which mainly takes place at clinics and hospitals. This helps to equip students as they work under the supervision of a practicing nurse. Participants noted that amidst this, e-learning facilities were lacking. The comment below attest to this fact:

*Actually the mode of teaching has been face to face interaction, teacher and students in the classroom. The modern facilities were not there, so it was mainly physical interaction between teacher and students in the classroom, then after classes they now move to the library for any reference that is given to them. For the practical aspect, demonstrations are done in the school clinical demonstration rooms before they move to the hospital for application of what they have learnt in the school where they are supervised by the nurses in the clinical area and the teachers that follow them [HO 11].*

### **5.2.2.2 Subtle Paradigm Shift**

While the traditional face-to-face classroom teaching, demonstration in laboratories and hands-on practice in the hospitals have been the mainstay of delivery of nursing education in Nigeria, evidence suggests that there have been subtle changes down the years. The gradual transition from the block unit system to semester system in some basic schools of nursing (SON), the commencement of part-time and other outreach nursing programmes in some universities, inculcation of ICT into the basic SON curriculum; ad hoc use of PowerPoint

presentations in classroom teaching, electronic course registration and results, web based assignments, are some of these changes. For example, a participant said:

*Nursing education had over time been taking place in the SON and also in the university. It has primarily been face-to-face programme; students have to be on ground in the schools or university where the programme takes place. However over time, we have had another mode of face to face, so we've transited from full time face-to-face programme to having another form, where we have students come on weekends. It's like some kind of part-time programme, but it is still face-to-face [HO 1].*

This view is corroborated by other participants as follows:

*While the mode of teaching has been predominantly face-to-face interaction, teacher and students in the classroom, there have been changes nowadays because of the technological advancements. We now have some teaching aids that help in facilitating learning. Like now we use PowerPoint to teach which is faster than making notes or giving hand-outs to students. At the same time we now have computers which are connected to the internet which when students logged onto provide them opportunity to browse and get more information on whatever subject area [HO 10].*

*Well, there have been changes in the delivery of nursing education. (1) I can say during our time when we were undergoing basic nursing training, there was nothing like ICT programme in nursing education (teaching and learning), but nowadays you find even in the curriculum the issues of computer and computer literacy and what have you. (2) And again in the conventional SON, not the University, there was nothing like semester system but now we have issues of semester system coming into play [HO 7].*

### **5.2.3 STATE OF DEVELOPMENT OF E-LEARNING AND ICT APPLICATION IN NURSING EDUCATION IN NIGERIA**

In this theme, the state of development of e-learning and ICT application in the teaching and learning of nursing in Nigeria is x-rayed.

#### **5.2.3.1 Under-Developed E-learning System**

Opinions about state of development of e-learning and ICT application in nursing education in Nigeria are mixed but the overarching evidence from interview data indicates that the use of e-learning in nursing education in Nigeria is still largely at infantile level. In addition, teachers and students engagement with ICT in the teaching-learning process has been mainly at instructivist level. Excerpts of comments from participants speak volume to this:

*Majorly we have the face-to-face classroom teaching in nursing; it's just recently, I think about 2 years ago, that the issue of online nursing education came up in part-time nursing programme in my university and that is still largely at infancy level [HO 1].*

*The mode of nursing education in Nigeria has been majorly classroom teaching with limited use of audio-visuals and nurse tutor interaction, but over the years, there has been some injection of ICT into the lecture method and this has been upgraded to a reasonable extent [HO 2].*

This sentiment is however not shared by all as few informants voiced that it is even non-existent in the delivery of nursing education in Nigeria. The few dissenting voices contends whatever ICT applications that are ongoing are implemented on ad hoc basis and mainly used to supplement the face-to-face mode and as such are just mere figments of e-learning. It is thus apparent that there has been no real and consistent adoption of e-learning in nursing education in Nigeria. This is reflected in the texts of participants' conversation below:

*I will say there is nothing like real e-learning yet in our institution here. The closest we have come to e-learning over the years is an improvement in our teaching aids especially audio-visual aids (projectors, laptops, television) [HO 4].*

*Although the council (referring to NMCN) has given directive that all schools should embrace ICT and that indexing and registration for examinations be done online, the response rate has been low [HO 7].*

*ICT as a mode of education is still in the preliminary stage; it's just starting off. Although the university as a whole has introduced electronic registration for students and we also have electronic input of student results, but this is just taking off [HO 1].*

### 5.2.3.2 Challenges

While computer studies have been inculcated into the curriculum of schools of nursing and a number of schools have commenced computer appreciation programmes, evidence suggests a lack of continuity in the students' use of computers post course examination. The challenge according to some of the participants is that some of the teachers themselves are not even computer literate. Since computer skills are slippery, such lack of continuity in computer use will not nurture e-learning application and may be contributory to the observed poor adoption of e-learning among nurses in Nigeria. Other challenges uncovered by participants include: a lack of policy on e-learning in nursing, low/poor computer literacy of tutors and students; technophobia; institution-related factor (Hospital-based basic SON); resistance to change tagged 'the Nigerian factor'; and instructivist-led ad hoc engagement with e-learning. The excerpts of participants' comments below aptly buttress this:

*At present, some of the tutors are not vast in the use of computer, not to talk of the students. You might even find some of the students being afraid of touching the computer [HO 11].*

*At the moment, new students are introduced to basic computer operations and are examined on it during their first year examination. After the exams, no other ICT-related activity is undertaken by the students. Some of the teachers have basic skills of computer operation while others do not. This challenge I think may be partly associated with the nature of my institution that is a hospital-based basic school of nursing. Other challenges include: inaccessibility to computers, poor internet connectivity, non-availability of power supply, security of technology equipment in all educational institutions [HO 8].*

*In Nigeria, change is not something we embrace easily and on time; so this might have contributed to the slow uptake of e-learning in nursing education in Nigeria [HO 7].*



#### **5.2.4: PERCEPTION OF E-LEARNING AS A MODE OF TEACHING AND LEARNING IN NURSING**

This theme explores the key informants' opinion about e-learning in terms of the quality of learning obtainable through e-learning, its ease of use, its relevance, strengths and suitability for nursing education. Emerging from the data are two distinct sub-themes: Positive perception of e-learning; and Issues of concern.

E-learning was seen by the generality of the participants as delivery and acquisition of knowledge through the use of ICT, particularly the computer and other electronic gadgets and the internet. A participant from HO 10 offered this view:

*E-learning involves the learner and the teacher using an electronic medium such as computer to teach, learn and facilitate learning.*

##### **5.2.4.1 Positive Perception of E-learning and Intervening Conditions**

Data reflected an overwhelming positive perception of e-learning and an aura of optimism that is almost palpable, about the feasibility of the use of e-learning in nursing education in Nigeria. All the participants spoke glowingly of the wonders of e-learning and the dividends derivable from its use. This positive perception is further unpacked under the following subthemes: (a) Improved quality of teaching and learning, (b) Ease of use, (c) Reduction of expenses and (d) Relevance and readiness to adopt e-learning.

Improved Quality of Teaching and Learning: All the participants spoke glowingly of the wonders of e-learning and the dividends derivable from its use in Nigerian nursing education sector. It emerged from data that e-learning is valued as having the potential to improve the quality of teaching and learning by inculcating the culture of deep learning as against the superficial learning that occurs in the conventional face-to-face mode. Informants reported that this deep learning is facilitated through inquiry-based learning; discovery learning; self-directed learning; student-centred learning; co-constructivism (incorporating cognitive and social aspects of learning); and community of inquiry approach. This is evident from the following excerpts:

*When we talk about e-learning, I think of it is a good thing; and we need to know that there is no way we can compare the knowledge that student can gather through e-learning with that of the old method of teacher-student contact (referring to the face-to-face mode of delivery) .... [HO 5].*

*E-learning enables learners and instructors to conveniently gather vast quantity of information on any subject area. It facilitates independent learning and provides a broad-base knowledge because learners can browse to get more information and enrich the content of lecture notes and/or to do assignment, an opportunity which classroom learning do not readily offer [HO 3].*

The participants were however apt to point out that the purported improvement in quality of teaching and learning associated with e-learning assumes a level of excellence in: the organization of the whole e-learning system; quality of the modules; and the process of facilitating learning (Intervening conditions). For instance, when asked about the quality of learning achievable through e-learning, a participant retorted, *the quality of learning depends on how it is organised [HO 1]*. Another participant takes this further;

*Yea, if it is properly done, if the modules are properly built, so it depends on the quality of the module that is built. If the modules built are of good quality, then the quality of learning is enhanced [HO 1].*

Ease of Use: Many sees e-learning as easy to use. According to some of the participants, the ease it brings to learning is unparalleled. The ease that e-learning brings to the teaching-learning process is viewed variously as follows: potential for self-pace learning (opportunity for students to learn at own pace); greater educational opportunities for students; enhancement of learners control over content; unlimited access to teachers and learning materials (referring to e-learning inherent capacity to make learning materials available twenty-four seven); convenience; offers a way out of time and spatial constraint. This is well encapsulated by the excerpts of the participants' conversation below:

*The ease it brings to teaching and learning is unparalleled as it enables students to study at their own pace as well as have access to their teachers and learning materials in the comfort of their homes [HO 9].*

*It is much easier, both for teachers and learners. The point is that I can stay in here and still have students from all part of Nigeria. What that portend is that distance is no longer a barrier in terms of how many students I can work with. And for the learners themselves, they can manage their time and determine what time of the day do they want to study and can combine it with work [HO 1].*

Further analysis however suggests that the 'ease' is not unbridled as it is dependent on computer literacy and competency of the teacher and learner. According to a participant, *the ease it brings will depend on the students' knowledge and skill in the use of computer and their internet surfing skill [HO 12]*. What is probably not said in words is that without adequate computer knowledge and skill, working with e-learning can be frustrating, if not a nightmare. Also related to the ease is adequacy of power and Internet. The quote below epitomizes the general feeling among participants:

*It is easier to use than face to face where there is regular electricity and a good internet service, because sometimes students have to travel long distances to receive lectures [HO 1].*

Reduction of Expenses: E-learning is generally perceived as cost-effective. In the words of an informant, *it is economical for the students as they do not have to travel long distances with the use of e-learning [HO 3]*; a view held by all.

Strengths: The reduction of expenses incurred on transportation and other cost reductions that are available with e-learning platform; the flexibility and ease it brings to teaching and learning; as well as increased access in terms of university enrolment for more nurses and improved access to learning resources; were described as some of the strong points of e-learning. Others that got mentioned especially by participants in HO 2, 4, 7 and 8 include: the opportunity to track students' learning activities that e-learning offers; its potential to enhance independent learning; its inherent capacity to make learning resources available twenty-four seven; its propensity to save time; its tendency to enhance cross fertilization of idea between learners and learners, learners and instructors, and among colleagues from all over the world. To yet a few others, the strengths of e-learning in the Nigerian context are simply inexhaustible. Some of these notions are well captured by the excerpts below:

*If well-coordinated e-learning can have several advantages including reduction in the cost of learning and resources, ability to track learning activities, learning at one's pace, availability of learning materials at all times [HO 8].*

*Its strength lies in students being able to access learning materials widely and at their own pace [HO 3].*

*The strength is that it can accommodate more students, instead of having 40-50 students, you can have up to 100, 200 students receiving lectures at the same time in different places [HO 1].*

Relevance and Suitability: E-learning is seen by many as relevant and suitable for deploying nursing education in Nigeria. The popular conviction is that e-learning holds the potential to open access for further studies for generality of nurses who by virtue of their work, family commitment and limited university spaces would not have been able advance their education. This notion is exemplified by comments like this:

*I think for us in Nigeria, it is very relevant, because we have many nurses who currently hold diploma professional qualification(s) in nursing but who are yearning for university education. This category of nurses, majority of who are already employed may not be able to leave their work for economic and career reason..... Even the universities (the mortal and brick school) that we have cannot accommodate*

*one-tenth of the population of these nurses. So for us distance learning education using electronic learning has become very relevant [HO 1].*

*It is very relevant because it makes it possible for nurses to be able to combine work with studies, and be able to assimilate better, especially with the shift duty that we run (talking about nurse clinicians). It is also very relevant looking at what is obtainable all over the world and our present age of development and besides, quite suitable for deploying nursing education [HO 7].*

#### **5.2.4.2 Issues of Concern**

As enthusiastic as nurses are about e-learning, there are however deep-seated concerns regarding its suitability for teaching affective and psychomotor content (discipline related demands). An informant expressed that:

*When we look at nursing, our major fear is that nursing is not just about the cognitive processes. We have some other areas like the psychomotor and the affective domains. I personally feel the affective, the behaviour, the attitude cannot be handled well through e-learning because there are still some level of mentoring that teachers do even in the process of trying to pass across information and all that have always been helpful. So I don't know how we can input this into e-learning so that it can also take care of it [HO 5].*

Others drew attention to the likelihood of reduced interactivity between student and teacher and between co-students, the low computer literacy level of nurses that could hinder utilization, issues of resistance to change and vulnerability of e-learning to abuse and sharp practices like impersonation and 'contract cheating' (hiring people to write assignments and examinations for one). These are better appreciated in their words:

*The only snag I see there is that it limits the lecturer-student interaction. [HO 2].*

*Change is not something we embrace easily and on time in Nigeria [HO 7].*

*You know one fear that people have always expressed have to do with how are you sure that the person who has registered for a course, is actually the one that is taking the course [HO 1].*

## **5.2.5: NURSES COMPUTER LITERACY AND READINESS TO ADOPT E-LEARNING**

This theme reports on participants' assessment of the nurses/nursing students computer knowledge and skills and their readiness to embrace e-learning.

### **5.2.5.1 Nurses Computer Literacy**

It emerged from data sources that the computer literacy and competency of many nurses/nursing students leave much to desire. While some have argued that nurses and nursing students are increasingly becoming computer literate, the majority opinion is that nurses/nursing students computer knowledge and skill are largely inadequate. This is reflected in many of the participants' comments:

*Nurses and nursing student in Nigeria are just beginning to use the computer. Although many will claim to be computer literate, they are only so on the dexterity of their use of cell phones to connect to the social networks/media [HO 6].*

*In my opinion, both the students and nurse tutors in the diploma nursing schools are lagging behind in terms of computer literacy. Some tutors in fact still have phobia for using computers [HO 8].*

*I must say that what we have on ground is that the percentage of nurses that are computer literate is very small [HO 5].*

This observed deficiency might explain efforts by some organisations at boosting the computer knowledge and skills of their nurses. A participant who happens to be the Deputy Director, Clinical Nursing Services, of a renowned university teaching hospital in Nigeria narrated her department's effort in that direction:

*The continuing education committee of my department keep on organising laptop acquisition projects through which nurses have been able to procure laptops and efforts at making them proficient in the use of computer with regards to nursing practice is still ongoing [HO 2].*

Further analysis of the rich plexus of participants' opinions suggests that the perceived deficiency in computer knowledge and skill among the nurses is partially related to age. Many of the informants are of the opinion that the younger nurses and nursing students are better than the older ones as far as computer knowledge and skills are concerned; a phenomenon they readily attributed to technophobia commonly experienced by the older folks. The following excerpts speak to this:

*From our experience with our full-time students, perhaps, students are even more computer literate and more e-learning-ready than some teachers. I mean some old teachers who over time have developed phobia for this new form of technology [HO 1].*

*Currently because the whole thing about e-learning is just coming up, many nurses are still not competent in e-learning and the area of using computers. In my recent interaction with nurses in one of the university teaching hospitals in the North-Central part of Nigeria on the NANDA NIC-NOK project that we are running, I discovered that most of the older nurses are not computer literate, but the younger ones are [HO 1].*

Similarly nurses who have undergone university education are seen as possessing better computer competency than those who have not. This view is supported by comments like this:

*I observe that both the students and nurse tutors in the diploma nursing schools are lagging behind in terms of computer literacy but it is pertinent to note that most lecturers and students of departments of nursing in the universities are computer literate [HO 8].*

It is important to clarify here that the observed seemingly contradictory evidences from quantitative and qualitative findings as regards the age factor in this study may not be unrelated to a lack of agreement in the conceptual definition of old age. While the quantitative study defines the nurses' age in a series, the key informants who themselves are relatively old (Mean age 49.1yrs) would most likely be referring to the oldest of old, hence the observed disparity.

#### **5.2.5.2 Readiness to Adopt E-learning**

Narratives from field interview equally showed that nurses are eager to adopt e-learning. It was however noted that the nurses' enthusiasm for e-learning can be attributed to a number of factors: (1) Nurses have come to the realisation that computer has come to stay; (2) The move by some hospitals to commence electronic record keeping (Technological development in practice setting); (3) The need to lessen the stress occasioned by combining work with studies; and (4) The need to move with wind of change that is fast engulfing the entire world.

The following excerpts lend support to this:

*Adopting e-learning may be welcomed because nurses already know that computers and its use have come to stay, however, there will be a lot of resistance to learning the rudiments [HO 6].*

*Nurses are facing the reality particularly in the sense that many hospitals want to go into electronic health record and they have discovered that for them to be functional, they have to learn the whole process of computer literacy, their ability to study online and to use their knowledge online [HO 1].*

*I feel that virtually all the nurses and nursing students will be willing to embrace e-learning because from my observation, combining part-time face-to-face weekend classes with work has been very strenuous for many of them [HO 3].*

## **5.2.6: ANTECEDENTS FOR E-LEARNING APPLICATION IN NURSING EDUCATION IN NIGERIA**

A number of factors/conditions came up as antecedents or conditions that set the stage for consideration of e-learning in the delivery of nursing education in Nigeria. Each of these events/conditions and their supporting extracts are presented below:

### **5.2.6.1 Development and Globalization**

This duo were observed by many of the informants as strong antecedent for application of e-learning in the teaching-learning process. The excerpt of account from one of the informants lend credence to this: ....*the world is becoming a global village.... and most other professions are embracing e-learning, so for nursing not to be left behind, we have to embrace it [HO 2]*; a position shared by many.

### **5.2.6.2 Technological Advancement**

A number of participants reported technological breakthrough, its ravenous growth and impact on all sectors particularly the healthcare system has necessitated the use of high tech devices and electronic record keeping in the management of patients. A participant put it this way:

*Today the use of computer has become a necessary adjunct in the management of patients. Unlike what obtains in the past, the present age is witnessing increased use of electronic record keeping, telemedicine, telenursing etc.... [HO 11].*

### **5.2.6.3 The Internet Revolution**

Data indicates that we are in the knowledge era and in this era, the internet has made available and is still making available a vast amount of information. Since e-learning is a veritable tool for exploiting the opportunity provided by the internet, the internet revolution is thus seen as one of the things that has heralded the adoption of e-learning in the education, training and development industry. The comment below loosely illustrate this;

*In this 21st century, I can study online and get certificated, even when I do not need to get certificated. One of the things we build into our students as professionals is that they must update their knowledge on a daily basis to improve their practice because new knowledge must inform what we do [HO 1].*

### **5.2.6.4 Policy issues and directives**

The fairly recent policy and strategic direction of the NUC and the Ministry of Health in Nigeria constitutes yet another antecedent for the adoption and use of e-learning in nursing education. This is well captured by one of the participants' responses below:

*Due to the new policy that stipulates that nurses without a university degree should not be promoted to the directorate cadre, many nurses in the service area who holds only diploma qualifications in nursing are now agitating to come back to class and they run in their thousands. For any university to absorb them, there must be e-learning programme. Yet related is the policy direction of the NUC that recognized the place of ODL in achieving lifelong education and set lifelong education as the basis of the country's education policy. Arising from that policy direction is the instruction to transform all part-time and sandwich courses to full distance learning [HO 1].*



### **5.2.7. CONTEXTUAL FACTORS NECESSITATING E-LEARNING APPLICATION IN NURSING EDUCATION IN NIGERIA**

Emanating also from the interview data are a number of contextual factors. They include:

#### **5.2.7.1 Massive Demand for University Nursing Education**

The demand for university nursing education in Nigeria that has perennially outstripped the available education resources was identified by almost all participants as a formidable factor necessitating adoption of e-learning in the delivery of nursing education in Nigeria. A participant particularly gave a bird's eye view of the magnitude of this problem;

*The numbers of Schools of Nursing in Nigeria today is such that if all universities begin to offer degree programmes in nursing, we will still not be able to meet the need of the people and nurses who need university nursing education in Nigeria [HO 1].*

#### **5.2.7.2 Growing Dissatisfaction of Nigerian Nurses with their Diploma Professional Qualification**

The increasing dissatisfaction of Nigerian nurses with the diploma status of their professional qualification (RN/RM) that lacks required currency for educational advancement and upward career mobility as desirable was yet another factor that attracted intensive discussion among participants. Presented here is an excerpt:

*Many nurses are getting more and more dissatisfied with the title RN, RM, and the likes, which does not readily allow for educational advancement and career mobility. So there is an increased thirst for degree education in nursing which the few conventional universities offering nursing at degree level cannot meet [HO 9].*

#### **5.2.7.3 Baccalaureate ODL Nursing Related Demands**

Data sources revealed that it is becoming increasingly clear that to make students learning experience rich, comprehensive and wholesome, there is a need for integration of e-learning in the teaching-learning process of the existing baccalaureate nursing distance learning programmes that at present utilize majorly the face-to-face mode of delivery. Associated with that was the need to alleviate the burden occasioned by frequent long distance journey that nurses undertaking the various distance learning programmes undergoes. This is well projected in the comments of some participants:

*With the distance learning programme that is being introduced into baccalaureate nursing programme, it has become highly expedient for e-learning to be introduced because most of the people enrolled in the programme are working-class who do not have all the time in the world to stay in a class to interact with the lecturer, so they need e-learning to supplement and augment whatever the lecturer has taught them in the class [HO 2].*

*Combining part-time face-to-face weekend classes with work has been very strenuous for many of them (referring to nurse clinicians) [HO 3].*

#### **5.2.7.4 Ready Opportunity for Learning for those who cannot quit their Job or Secure a Study Leave**

Many informants equally contend that the e-learning platform opens learning opportunities to those nurses who by reason of job or family responsibilities cannot pursue a full-time university programme. This assertion is strengthened by such comments as:

*Furthermore, a number of nurses may not be able to quit their job or obtained a lengthy leave of absence for economic reasons and yet desirous to upgrade their knowledge [HO 3].*

*Majority of nurses are not well educated even in nursing and am sure they are interested in updating themselves, if they have the opportunity to keep their job and still continue to learn as students, have a certificate and still keep their job [HO 5].*

#### **5.2.7.5 The Ease that E-learning brings into the Teaching-Learning Process and its Transformative Potential**

This is another contextual factor that enjoyed so much publicity among participants. It was argued that with e-learning, information dissemination and knowledge acquisition, is relatively easy, as it allows some hitherto complicated subjects to be presented in simplified form. This can be well appreciated in comments like:

*Sure, there are. Had e-learning been in place, there would have been many things that it would have helped to simplify as far as delivery of lecture content is concerned especially in courses like Anatomy and Physiology, Pharmacology, Pathology [HO 3].*

*Of course there are factors..... For nursing education to attain international standard in Nigeria, there is need to make learning friendly to students. This can be achieved partly by the adoption of e-learning in nursing education [HO 8].*

#### **5.2.7.6 The Drive for Continuing Professional Development as desirable in the 21st Knowledge Society**

Also standing out from interview transcript as a circumstance engendering the development and use of e-learning in nursing education is the need for the 21<sup>st</sup> century Nigerian nurse to regularly update themselves in order to stay abreast of new developments not just in nursing but in the entire healthcare delivery system. The direct quotes that follows perfectly epitomise this:

*The world is not static, new knowledge are being discovered from time to time. Nursing is a profession and one quality of a profession is that her members must possess new knowledge and regularly update themselves in order to meet the changing needs of the world. As such, nursing education must be current and that entails being open to new knowledge and new ways of doing things. This to my*

*knowledge is perhaps the most cogent factor that necessitates e-learning in nursing education [HO 4].*

*Looking at the nature of nursing education in the world now, that is what is in practice in almost all part of the world. And you know what, nursing education is not about the basic education you acquire in your first level of education. Nursing education is about learning every day [HO 1].*

#### **5.2.7.7 Existence of a Massive Need and a Ready Market**

Analysis of various submissions from participants indicates that there a great and genuine need for ODL in nursing that uses e-learning as an instrument per excellence. In addition, the existence of a ready market for ODL nursing makes it an irresistible option for universities that have what it takes to successfully run such programme. This is reflected in the words of one of the participants:

*We started the part-time programme base on request from nurses in clinical practice. The National Association of Nigerian Nurses and Midwives (NANNM) actually made a request to the department and that was one of the things that informed our working on the part-time programme. So looking at it from our own context, it is a need [HO 1].*

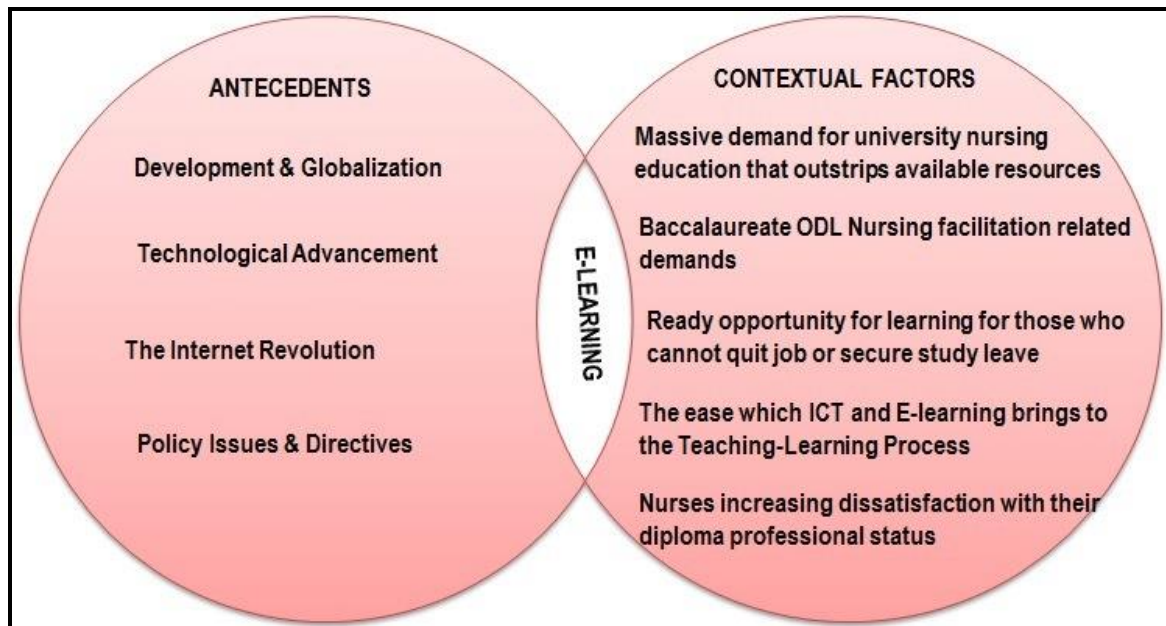
#### **5.2.7.8 Status Symbol and the Need to move with the Wind of Change**

Implicit the participants' conversation is the mindset of status symbol; *e-learning is adopted by other professions making it an order of the day in the community of education; nursing education should therefore not be an exemption [HO 7].* Others are of the opinion that embracing e-learning demonstrates a commitment to move with the wind of change. This according to them has become necessary in order not to be left behind and become irrelevant;

*First and foremost, I must say that when you look at every other profession or every other discipline, they are embracing e-learning and I don't think it will be of any advantage to us as nurses to be left behind [HO 5].*

*The world is changing and everyone is embracing e-learning. It's a new trend and we have to move along. It's like a change and we have to move with the change and time or else we become irrelevant [HO 8].*

The aforementioned findings point to one and only direction; the need for nursing profession in Nigeria to take advantage of e-learning in the training and professional development of nurses. To drive the point further home, the antecedents and contextual factors are presented, in no particular order, in Figure 5.6 below:



**Figure 5.6: Contextual Factors and Antecedents necessitating E-learning Application in Nursing Education in Nigeria**

## **5.2.8: PERCEIVED CONSTRAINTS TO THE DEVELOPMENT AND USE OF E-LEARNING IN NURSING EDUCATION IN NIGERIA**

Just as there exist many antecedents and contextual factors, so also are the factors considered as inimical to the development of e-learning for nursing education in Nigeria. Data sources reflect a range of these factors which span from local matters to national issues/challenges. The participants, by their responses, demonstrated an in-depth understanding of how the various issues raised can adversely affect the development of e-learning for nursing education in a resource-constrained environment like Nigeria. Outlined below are some of the perceived constraints, hurdles or obstacles:

### **5.2.8.1 Erratic power supply and Internet connectivity problem**

Erratic power supply and internet connectivity problem were the duo that got most mentioned by the participants. This is evident from excerpts of the participants' comments below:

*The constraints are legion: (i) Most schools of nursing do not have the internet facilities, and those that have may not have adequate numbers of computer. ....  
(ii) Power supply/electricity; this is very essential as the quality and regularity of power supply we have presently leave much to desire as far as e-learning is concerned.*

*In my own opinion, the following are likely obstacle to the adoption of e-learning in nursing education in Nigeria: poor electric power supply..... [HO 8].*

*..... Beyond that, there are logistics problems such as erratic power supply, connectivity problem and inadequate number of cybercafé [HO 3].*

### **5.2.8.2 Poverty/Inadequate funding**

Poverty/inadequate funding at household and national level also feature prominently in the interview transcript. This can be well appreciated in the words of some of the participants:

*Affordability can sometimes serve as a constraint because of the level of poverty in the country [HO 10].*

*The possible high cost of implementation of e-learning at start off point is yet another hurdle I see as plaguing the development and use of e-learning in nursing education in Nigeria [HO 3].*

*Another factor that I foresee as inimical to the development and use of e-learning in nursing education in Nigeria is lack of fund; inadequate funding of nursing education, especially in state owned schools where politics is the order of the day. You know what I mean ..... To put e-learning model on ground and implement it effectively will involve training of personnel which not all schools may be able to afford. [HO 8].*

### **5.2.8.3 Lack of Infrastructure/Poor Infrastructural Facility (at National and Institutional Level) and Inadequate Access to ICT Facilities**

This is another factor that came out clearly from the participants' interview as a major limitation to the development and use of e-learning for nursing education in Nigeria. The excerpts of the participants' conversation below speak volume to this:

*The factors inimical may not be nursing oriented alone. It is a global problem looking at Nigerian landscape as a macrocosm now. It is the inability of the Nigerian government or institution to deploy the necessary infrastructure that would make it easily accessible to everybody [HO 2].*

*..... Another challenge is lack of infrastructure or obsolete infrastructure in most institutions of higher learning in the country [HO 6].*

*So many factors: (i) Limited accessibility to computer and ICT services; (ii) Connectivity problems; ..... [HO 10].*

### **5.2.8.4 Lack of Awareness of the Benefits of E-Learning/Ignorance Related Issues**

This also was well published by participants as constraints to the use of e-learning for nursing education in Nigeria by the participants. The excerpts below aptly corroborate this:

*E-learning is laden with a number of hurdles: (i) Lack of awareness; so to implement e-learning we need to do a lot of sensitization and awareness campaign as well as capacity building; ..... [HO 4].*

*The issue of misconception about computer that computer is difficult that I earlier spoke about is another obstacle [HO 10].*

### **5.2.8.5 Low Computer Literacy and E-Learning Competencies among Nurses/Capacity Building Related Issues**

The observed low computer literacy and e-learning competency of nurses/capacity related issues is another cardinal factor seen as inimical to the adoption and use of e-learning for nursing education in Nigeria. The extract from the interview transcript bears eloquent testimony to this:

*Poor computer knowledge and skills on the part of some nurses could also be an obstacle to using e-learning; a lot of nurses and nurse tutors out there lacks basic knowledge about e-learning [HO 4].*

*..... Inadequate e-learning skills of the teachers (referring to nurse tutors) and limited availability of electronic resources in schools [HO 8].*

### **5.2.8.6 Politics and Policy Related Issues**

Politics and policy related issues stand out as yet another factor considered as constraint to the adoption and use of e-learning for nursing education in Nigeria by participants. This is well substantiated by the narrative below:

*One of the factors is **policy**. What I mean is, if the present leadership of the council (NMCN) has a different belief about e-learning and makes another policy that is contrary to what is on ground, it may not really make e-learning model for nursing education to work. Then **politics**; what I mean by politics is change of hands or leadership which can affect the directive being given to schools to adopt and implement e-learning model for nursing education. You know what I am talking about; to conduct admission exercise is politics, even students' promotion examination involves politics. So when e-learning is about to be implemented too, it may have political undertone in those schools which may not be favourable to the implementation of e-learning model [HO 8].*

*Then the system itself; most of the time you discover that the priority of the system might not be the priority of a particular department and the department cannot run without the system because it is the system that feeds the department with necessary instrument and facilities to make the department run..... [HO 2].*

#### **5.2.8.7 Attitudinal Issues/the Nigerian Factor**

Emerging also from the participants' response on the foreseeable hurdles to adoption and use of e-learning for nursing education in Nigeria is the perceived negative attitudes of nurses, likelihood of resistance to change, poor receptivity of e-learning on the part of the nurses and what the participants tagged as the Nigerian factor. This evidenced from the excerpts below:

*You cannot rule out the fact that attitudinal change might be a factor; people not wanting to change, want to continue the old way they are used to and that they feel is convenient for them [HO 2].*

*Our nurses have a negative attitude to adopting new things; therefore there may be resistance to change [HO 6].*

*Another thing is the Nigerian factor. By Nigeria factor, I mean when something is new, naturally there are usually opposition to the new concept. It happens like that and this may not make the new model to work [HO 8].*

#### **5.2.8.8 Lack of Existing E-Learning Model for Nursing Education in Nigeria**

Another factor that emerge from the participants' discourse of the perceived hurdles to adoption and use of e-learning for nursing education in Nigeria is the lack of an existing e-learning model for nursing education in Nigeria. The account of a participant from HO 6 and a number of other participants aptly buttresses this:

*I may be ignorant here, but permit me to say that I am yet to know of any e-learning model in Nigeria. If my assumption is the case, then it may be challenging for nursing to start a model that does not predicate on one that is already in use. [HO 6].*

It is thus obvious that the challenges/constraints/hurdles/obstacle to the adoption and use of e-learning for delivery of nursing education are enormous but the good thing is that the

participants seem not to be overwhelmed by enormity of these challenges. This rare display of hope in the face of obvious challenges is explored further in the subsequent sub-theme.



### 5.2.9 A RARE DISPLAY OF HOPE/OPTIMISM IN THE FACE OF DAUNTING CHALLENGES

Despite the multiplicity of the challenges confronting the adoption and use of e-learning as a mode of delivery of nursing education in Nigeria, an overwhelming majority of the participants exudes an aura of optimism that is almost palpable as regards the feasibility of its use for nursing education. Virtually all participants interviewed expressed that the challenges are not insurmountable, provided we have a mind to put it to work. This typifies the popular axiom – ‘where there a will, there is a way’. Some of the participants even went further to offer advice on what could be done to address some of the identified constraints and make e-learning to work for nursing education in Nigeria. The following participants’ comments prove to this serendipitous finding:

*I don't foresee any challenges if we make up our mind and we all agree. It is true that the problem of inadequate electricity supply is real, so also that of unsteady internet access, but we have a way of sorting things out even at household levels. In my house for instance, I get just few hours of power supply every day, so I switch over to using generator. What I am saying is that if we can make up our mind, it is achievable; we can do it [HO 8].*

*I think the first challenge is the poor receptivity of e-learning by the older nurses. You know older people have this phobia about use of computer, use of internet, especially those at the decision making level. The moment you can convince them about its applicability and relevance to adopting distance learning and improving nursing education, then the better the acceptance. I think that is the main challenge. All the other challenges as regards facilities to run e-learning, learners to be able to learn as appropriate, those are things we can manage one way or the other. Be that as it may, we cannot use that limitation as a basis for folding our arms and doing nothing [HO 1].*

While the possibility of resistance to change cannot be ruled out and though the computer literacy level and competencies of Nigerian nurses leave much to desire, the message that has come out clearly from the in-depth interviews is that of an unbelievably high readiness to adopt e-learning. The rational thing for nursing profession in Nigeria then, is to catch in on this high level of hope, enthusiasm and goodwill among nurses to develop a blended e-learning model for the delivery of nursing education.

## **5.2.10 SUGGESTIONS FOR BUILDING AN E-LEARNING MODEL FOR A RESOURCE-CONSTRAINED EDUCATIONAL SETTING**

The study garnered a wide range of counsels, propositions, and advices on the design, content and implementation of an e-learning programme for nursing education in Nigeria. A handful of the suggestions are way out of the world, some not too relevant, while others are very germane and paramount to the task at hand (developing a blended e-learning model). The array of suggestions given are broadly categorised into these three sub-themes:

### **5.2.10.1 Design**

It was suggested that there is a need to: conform to regulations as specified by the National Universities Commission (NUC) as there are minimum standards, guidelines and benchmarks; look at what our capacity and facilities can handle for now; and factor in the cost of building it and its implementation into the design. These counsels are evident from the words of some participants.

*We must look at the prescriptions of the regulatory body; needs to conform to regulations as specified by the NUC. I think that is the first thing that must inform what we are going to do and how we are going to do whatever we have to do. ....I think we also need to look at what are our capabilities and facilities for now. You know one of the reason why I said the other time that we are going to be adopting the asynchronous mode most of the time again is because of the nature of our environment; electricity..... [HO 1].*

*....we also need to factor in the cost of implementation and make use of specialist in developing the model [HO 3].*

Further analysis revealed that adherence to policies instituted by regulatory bodies is adjudged essential partly because of the need to avert being on the wrong side of the law and majorly for reasons of quality assurance and accreditation purposes. It is an open truth that without accreditation, an educational programme will have no legal foothold and cannot commence the business of admitting students let alone teaching and learning. The guidelines and benchmarks give direction on what to be done and what should be in place for smooth running of a programme. Assessing institutional capacity equally forms a cornerstone in the preparation for effective take off of any programme. Of course, ‘no soldier goes to war without counting the cost’, so counting the cost will not only engender good budgetary practice but will help to prevent embarking on a white elephant project.

A number of participants discussed the need for the model to: be culturally oriented to foster acceptability and be adaptable to a resource limited environment; be easy to understand and utilize (i.e. learner and teacher friendly); take into account that the prospective learners are

likely to be workers who may be using their free time to run the course; and take into cognisance the peculiar nature of Nursing (Discipline-related demands). This underscores the importance of giving due thought to the context, peculiar challenges associated with resource-constrained settings, types of learner and the goal of the education/training in the development of the proposed blended e-learning model. It gives direction on the what delivery model to employ, what approach will be more appropriate (synchronous, asynchronous delivery of content, or a combination of the two) and what steps including choice of learning materials and equipment should be taken to mitigate some of the peculiar challenges of resource-constrained environment like erratic power supply, inadequate internet coverage. Presented below are highlights of the participants' suggestions:

*The following factors should be put into consideration: simplicity; the need to make it learner and teacher friendly; the challenges of electricity and the cost of electronic devices such as computers; man power; and existing curriculum [HO 8].*

*It is important that we recognise that students who are going to be running the courses are workers who would be using their own time as may be convenient for them. That automatically informs which approach to adopt more; synchronous or asynchronous. Again the nature of nursing itself speaks to the fact that we cannot have 100% online education, because when learners have to acquire skills, there must be ways in which we can ensure that we can monitor their progress over time and get people who can help them to improve their skills and that's the bit about having preceptors who are going to be helping students to learn [HO 1].*

*My suggestions: make the e-learning model adaptable to a resource limited environment; let the model be very simple to understand and easy to utilize; ensure the model is culturally oriented to foster acceptability; software engineers that will write the programme must be home-grown to allow for ease of regular maintenance and repairs; and make available all relevant components and infrastructure to its usability [HO 6].*

The above comments are instrumental to the choice of the blended e-learning approach that can guarantee learning and the monitoring of learning in the cognitive, affective and psychomotor domains. These data also give guide on the mode of delivery of the clinical aspect of the education, hence the wisdom in the plan to train and employ clinical preceptors who will monitor the students' learning while on clinical attachment. Data further point in the direction of asynchronous mode as the major mode of delivery. These information also informed the search for customised tablet with fairly long battery talk time.

Also inherent in the participants advices are issues bothering on curriculum; how to build in learner-teacher interactivity; how to ensure sustainability (the software engineers that will write the programme must be home-grown to allow for ease of regular maintenance and

repairs); the need for alternative sources of power such as the use of standby generators, solar panels and inverters; and the imperative of providing internet access with or without collaboration with non-governmental organisations (NGOs). The proposition of one of the participants ties this up nicely;

*If we are to embark on the e-learning model for nursing education in Nigeria, we need to do some 'out of the box thinking' on how to integrate and sustain learner-learner and learner-teacher interactivity by utilizing the freely available mediums of communication like whats app, e-mail and so on; and at the same time structure out a way by which learners' access to lecture materials will not internet dependent. In addition, we should think of creative way of generating alternative sources of energy even if it means securing a buy in from NGOs [HO 9].*

### **5.2.10.2 Content**

Presented here is a summary of the various suggestions from the participants as regards the content of the proposed e-learning model: upgrade course content to e-modules; review curriculum and align it with the objectives to meet up with learners' requirements, national and global minimum standards; make the content to be comprehensive and to cover all aspects of the discipline of nursing; collaborate with instructional designers; ensure that emerging model can guarantee the delivery of content taught in three domains of learning (cognitive, psychomotor and affective domain); break content into small bits that can be taught within an hour or two each; and last but not the least, involve all the stakeholders (nurse academics, nurse clinicians, and even students) in the design, content and piloting of the emerging e-learning model. This according to them is with a view to make the emerging model rich, relevant, and functional. These are reflected in some of the participants' statements:

*Talking about content, you know Nigeria has minimum standards, NUC has benchmark. When you want to run a degree programme in Nigeria, you can't just run anything. Your content must meet up with the minimum required content. I also think that anybody that wants to run nursing programme in any country now needs to relate it to available international standards, the needs of nursing as a profession, and societal expectation of the roles and responsibilities of a nurse [HO 1].*

*Nursing and Midwifery Council of Nigeria curriculum could serve as guide but the curriculum should be modified to suit the society, the objectives, and learners' requirements [HO 3].*

*I think most of those who are vast in computers especially the lecturers, should come together to design it. And every area of nursing: clinical, education, community health, maternal and child health should be covered. Even students should be co-opted in the design, content, and implementation of the e-learning model. This is because, these are people that will eventually make use of it. In essence, all*

*stakeholders must be carried along in order to make the emerging model rich, relevant, and functional [HO 4].*

### **5.2.10.3 Implementation**

Data sources equally revealed a multitude of opinion on how to go about the implementation of the emerging blended e-learning model. While some asserted that any move at developing e-learning for nursing education in Nigeria should of necessity come from the regulatory bodies (NUC and NMCN), others are of the opinion that the regulatory bodies could help with the implementation by formulating policies that makes it mandatory for every nursing student and nurse educator to undergo computer training for a specified minimum period of time. This, according to informants, has become necessary in view of the perceived relationship between computer literacy and adoption of e-learning. Related to that is the call for organisation of e-learning awareness campaign to boost nurses' awareness and drive for e-learning. The following excerpts aptly illustrate this:

*Any attempt at adopting e-learning for nursing education in Nigeria, must start from the NMCN. The council will work on the curriculum in conjunction with the Schools of Nursing and the Departments of Nursing in our universities to ensure uniformity and synchronism [HO 8].*

*We should try as much as possible to formulate a policy that stipulates that every student nurse and nurse educator should have computer training for a specified length of time. The policy should also stipulates that students should have elements of computer education in their curriculum and teachers that are not computer literate should be allowed to go for computer training [HO 10].*

Four quick lessons emanating from the above submissions are: (1) The need for policy and strategic direction; (2) The role of the regulatory bodies in shaping or moulding nursing education in Nigeria; (3) The imperative of inculcating computer appreciation programme into the existing nursing education curriculum; and (4) The need for capacity building, especially computer literacy for tutors and instructors.

Others advised that e-learning facilities/infrastructure in all schools (Basic Schools of Nursing and University-based Departments of Nursing) should be developed; computers, laptops and tablets be made available at affordable cost; and that all relevant components and infrastructure (electricity, internet connectivity, human resource) necessary for maximal utility of the emerging e-learning model be made available. There were also proposals about the need to put in place students/learners support unit, ensure interactions between the instructors and students (possibly through the use of virtual learning environment like Moodle), provision of learners with hard copies of lecture materials as back-up in case of

interconnectivity failure, and a need for a monitoring team to ensure that quality is sustained (Quality assurance committee). The following extracts from the interview transcript lend support to this:

*There should be adequate facilities, constant power supply, and connectivity should always be available. There should be facilities to guide the students, they should not be left on their own. There should also be sessions to provide interactions between the teachers and the students [HO 11].*

*I would look at implementation from the perspective of facility-needs preparation, human resource need, supporting learning for learners, monitoring things that are going on, ensuring that quality is sustained and monitoring things that people are doing to ensure that they are doing it right. I will also look at it from the point of regular evaluation of the progress that we are making; how well we are achieving what we set out to achieve, because we must have 'set objectives' as to why we are doing e-learning and build our methods around the objectives that we want to achieve [HO 1].*

It was equally suggested that the developed model be first piloted in a school, starting with one area of specialization before embarking on a nation-wide implementation. This according to this school of thought will assist in early diagnosis of any problem and prompt resolution of such problem(s). Yet others counselled that individuals that will be involved in the implementation of the model should be specially trained and must have attained a certain level of expertise. Furthermore there were suggestions that the country should not only assign study centres but should provide also laboratories specifically for nursing education and nursing practice nationwide to avert students travelling long distances:

*Pilot it in one or two schools possibly one in the north and another in the south. Any flaw detected should be corrected before calling for a widespread use [HO 3].*

*As regards the implementation, the suggestion I have is that the nation should be able to assign study centres specifically for nursing education and the country should also be able to provide laboratories for nursing practice, so that students wouldn't have to travel too far before they get to their laboratories of learning [HO 1].*

### 5.3 THE CONTEXT: A SUMMARY

As rightly noted by Haythornthwaite and Andrews (2011), e-learning is more than just an environment or site for conventionally conceived learning, rather it is a new practice that calls for a new theoretical perspective. This together with Shea and Bidjerano (2009) observation that designers of online courses, faced with a growing number of disciplines and an ever changing array of new media, are often confused about how to integrate these technologies into online learning environments in ways that will enhance student learning of diverse content, underscore the importance of theory and model development in the field of e-learning. This study was undertaken primarily to fill this gap and promote the use of e-learning in the delivery of nursing education in a resource-constrained setting. However, in a bid to properly situate the model; optimize its capacity, acceptance and usage; a need assessment was carried out among nurses in Nigeria. Yu, Chen, Yang, Wang and Yen (2007) indicated that needs assessment is strongly recommended at the preparatory stage of e-learning programme. Other studies have equally established a correlation between perception, attitude and behavioural intention/willingness to imbibe or adopt a new decision, be it an invention or technology (Ajzen & Fishbein, 1980; Ajzen, 1991; Yarbrough & Smith, 2007; Yusof, Kuljis, Papazafeiropoulou & Stergioulas, 2008).

The present study preliminary findings have shown that the computer literacy and computer skills of Nigerian nurses are largely fair, but the 34% and 32.8% that recorded poor computer literacy and competency respectively is quite substantial. This though represents a slight improvement over the 37.8% reported to be IT novice in Irinoye, Ayandiran, Fakunle, and Mtshali (2013) study among nurses in a Teaching Hospital, South West Nigeria, is still a cause for concern. Narratives from field interview buttress this inadequacy and the associated concern as touching the proposed adoption and use of e-learning for nursing education in Nigeria. Studies elsewhere have however provided an indication that this may not be peculiar to Nigerian nurses. McNeil, Elfrink, Bickford, Pierce, Beyea, Averill, et al. (2003) for instance reported significant gaps related to knowledge and skills for computer use and application of information literacy among nurses in their United States of America (USA) survey. Wilbright Haun, Romano, Krutzfeldt, Fontenot and Nolan (2006) established similar results among nurses and nursing support staff in an urban university hospital, USA. In yet another US study, McNeil, Elfrink, Pierce, Beyea, Bickford and Averill (2005) discovered that a majority of nurse educators are primarily at the novice or advanced beginner level as far as use of informatics tools and informatics skills are concerned. These authors

subsequently advocated for inclusion of informatics concepts, informatics skills and use of informatics tools in professional nursing practice within nursing curricula across the US.

In a fairly recent study conducted in the United Kingdom (UK), Moule, Ward and Lockyer (2011) equally observed that e-learning remains at the periphery of education delivery in nursing and health sciences. Earlier study (2010) by the same authors had also established that engagement of e-learning in the education of nursing and healthcare students has been mainly at instructivist level. The result of this study buttress this relative dearth of exposure and involvement in e-learning among nurses. Findings further showed that the dominant mode of delivery of nursing education has been the traditional face-to-face didactic teaching, clinical demonstration in laboratories and hands-on practice in the clinics/hospitals. This may explain the observed paucity of studies on the extent to which Nigerian health sciences students use the computer and the internet reported by Ajuwon (2003). Fetter (2009) similarly established in Australia that little is known about nursing students' experiences with IT in clinical practical.

The study qualitative findings also revealed that over time, nursing education in Nigeria has witnessed and is still witnessing a gradual paradigm shift with inculcation of computer appreciation programme in the curriculum of basic nursing schools, slight improvement in the use of audio-visual aids, but there has been no structured or formalised e-learning system. Like Moule, Ward and Lockyer (2011) observed in their UK study, there is limited experimentation with e-learning and teaching use, linked to key centres of excellence and the efforts of champions. These and other qualitative findings have helped to further unpack the possible implications of the relatively low computer literacy of nurses for the development and use of e-learning in nursing education in a resource-constrained setting like Nigeria. Flowing out from that discovery is the call for inculcation of a short term computer appreciation programme in the evolving blended e-learning programme for nurses in Nigeria. The study findings therefore corroborates Moule, Ward and Lockyer (2011) subsequent suggestion that a more systematic approach to development and funding is required to achieve enhanced use of e-learning.

Another important finding of the study is the revelation of an absolute necessity for the use of e-learning for nursing education in the Nigerian context and the availability of a ready market for it. What that implies is that embarking on such a venture is a worthwhile exercise. Besides, the high display of optimism and the generally positive perception of e-learning



among these nurses give assurance of the feasibility of the programme. The qualitative data provided a balanced view of the nurses on e-learning education in nursing. These findings were loosely congruent with the results of a Taiwanese study by Yu, Chen, Yang, Wang and Yen (2007) that concluded that e-learning is a feasible and valuable learning model that is worth making generally available to public health nurse, and indeed, to all health care professionals. Previous studies have equally demonstrated that majority of nurses display positive attitude and perception to IT (Irinoye, Ayandiran, Fakunle, et al. 2013).

Aside the positive perception and attitude, other contextual factors for e-learning in nursing education in Nigeria established by this study include: massive demand for university education in nursing; growing dissatisfaction with diploma professional nursing qualifications among nurses; the need to enrich the learning experience of nurses undergoing ODL baccalaureate nursing programme while at the same time lessening the burden experienced by those enrolled in the programme; the ready opportunity for learning that e-learning presents for those who cannot quit their job or secure a lengthy study leave; the ease that e-learning brings into the teaching-learning process and its transformative potential; the drive for continuing professional development as desirable in this 21<sup>st</sup> century knowledge society; and status symbol cum need to move with the wind of change. The study equally identified a number of antecedents. These include: development and globalization; technological advancement; the internet revolution; as well as policy issues and directives from the NUC that all part-time programme and other outreach programmes should be upgraded to full distance mode programme and the newly reactivated policy that stipulates that nurses without a university degree should not be promoted to the directorate cadre.

While the aforementioned are no doubt key drivers to the development and use of e-learning in nursing education, participants cautioned that the acclaimed dividends of e-learning particularly the purported improvement in quality of learning assumes a level of excellence in the: organisation of the whole e-learning programme; the quality of the modules; and process of facilitating learning. This reinforces Greenagel (2002) notion of the illusion of e-learning and why we are missing out on the promise of technology. The author contends, though possibly controversially, that the effectiveness of a course is less dependent upon the enabling technology than on the skill with which developer uses the available technology to construct learning experiences appropriate to the trainee and to the topic. Of note also is the understanding that the supposed ease that e-learning brings to learning is not absolute, as it is

dependent on certain intervening variables. These factors include: level of computer knowledge and competency of the teacher and the students alike; electricity supply; and internet coverage. An immediate lesson is that all these have to be factored in when making decisions on the best way to engage e-learning in a resource-constrained setting.

Yet significant is the unearthing of some constraints/hurdles and challenges to adoption and use of e-learning for nursing education in a typical resource-constrained environment. The constraints which are legion include: inadequate power supply; poor coverage and strength of internet signals; poverty/inadequate funding at household and national level; lack of infrastructure/poor infrastructural facility (at national and institutional level); lack of awareness of the benefits of e-learning/ignorance related issues; and low computer literacy and e-learning competencies among nurses/capacity building related issues. Others that got unfolded are: policy related issues; the lack of an existing model of e-learning for nursing education in Nigeria; negative attitudes and envisaged likelihood of resistance to change; poor receptivity of e-learning (acceptability issue); and politics/leadership related issues. These findings are consistent with results from other studies such as Childs, Blenkinsopp, Hall, and Walton (2005) that identified requirement for change, costs, poor designed packages, inadequate technology, lack of skills, need for component of face-to-face teaching, time intensive nature of e-learning and computer anxiety as the main barriers to effective e-learning among health professionals. Al-Senaidi, Lin and Poirot (2009) documented lack of ICT/computing equipment, lack of institutional support, unbelief in ICT benefits, lack of confidence and lack of time as perceived barriers to adoption of ICT in Oman higher education sector. Ali and Magalhaes (2008) reported fairly similar findings in their Kuwaiti study.

The perceived challenges, some of which are discipline-related (e.g. the concerns about the suitability of e-learning for teaching affective and psychomotor contents) and others environmental-related factors include: the possibility of reduced interactivity between student and teacher and between co-students; and resistance to change. This no doubt, has provoked some thinking through on the best way to engage the e-learning platform in a resource-constrained setting. An immediate outcome of this rethinking and exploration is the consideration of a blended e-learning approach for the education and training of nurses in Nigeria.

In conclusion, the study has revealed a generally positive perception of e-learning and a high feasibility for its adoption in the education of nurses in a resource-constrained setting. It has also provided the much needed insight into context and the possible challenges of employing the e-learning platform in the education and training of professional nurses in Nigeria. Furthermore, the outcome of the study has provided some guide on the development and what could be done to ensure a successful implementation of blended e-learning programme for nursing education in a resource-constrained setting.

## **CHAPTER SIX**

### **6.0 THE MODEL DEVELOPMENT CYCLE**

This chapter chronicles the steps, events and activities culminating in the development of the blended e-learning model following the cyclic action research process of planning, acting, observing and reflecting. It also highlights the essentials for the development of e-learning for nursing education in a resource-constrained setting.

#### **6.1 THE STRATEGY AND PROCESSES IN THE MODEL DEVELOPMENT**

The project is essentially fluid in nature. As a result, the steps/phases are overlapping and interwoven. However, for clarity of thought, attempt has been made to isolate each of the steps in the development cycle and discuss them as separate entities.

#### **6.2 PLANNING**

In view of the time and capital intensive nature of the project, planning had begun soon after commencement of data collection in the assessment/exploration cycle. As earlier stated in chapter four, the initial time frame had to be reviewed when it became obvious that data collection will last longer than earlier anticipated. As data collection progresses, the principal investigator thought it necessary to bring on board the research team, the Director and Deputy Director, Centre for Distance Learning (CDL), OAU (the research setting for the development and testing cycles of the project). Consequently, appointments were booked with them for November 2012 to specifically share with them the purpose of the study, what the university stands to gain from the outcome of the study and of course solicit for their support and that of the university. They were subsequently informed that the research team will be honoured to have them as members. Securing their cooperation appeared much easier than anticipated probably because the study falls in the mainstream of the university's policy and strategic direction and the message appeared to well received.

##### **6.2.1 Securing Institutional Support**

Preliminary findings from the assessment cycle of the study showed that nurses want e-learning. Data sources also established a strong need for adoption of e-learning in Nigerian nursing education if the problem of access to higher education and the goal of preparing nurses that are fit for a knowledge society is ever going to be accomplished. The second quick lesson emerging from the preliminary data was that there is a ready market for it. These two immediate findings made the job of persuading the management of the CDL, OAU, of a

sure return on investment easy. The other factor that helped with securing institutional support was the strategic direction from the ministry of education and the NUC (the body that regulates higher education in Nigeria) that has over the years recognized the place of Open and Distance Learning in achieving lifelong education and has made lifelong education (using ICT as an instrument per excellence) the basis of the nation's education policy (A copy of the NUC Guideline for Open and Distance Learning is included as annexure).

### **6.2.2 Think Thank Meetings (Harnessing the Dividends of Teamwork/Collaboration in deciding what E-learning Platform to be Employed and other Related Issues)**

A number of think thank meetings were held by the research team between 2013 and 2015 to deliberate on the proposed e-learning programme; select an e-learning platform; and to strategize and re-strategize for its successful implementation. All meetings were held at the CDL, OAU, Ile-Ife. The first meeting held January 2013 afforded the principal investigator the opportunity to expatiate on why we need to go the e-learning way, share his vision, roll out the terms of reference for the group and solicit for members support and unalloyed cooperation, explaining that this may call for their time and free sharing of their hard earned knowledge and expertise. The second meeting held four months later saw the principal investigator presenting the details of the findings from the assessment cycle of the study. The findings provoked intensive discussion on: the need for institutional readiness and support (financial, moral, logistics); resource mobilization; training and retraining of staff; type or category of students to be trained through the e-learning medium; e-learning design or model and the prototype of the delivery system to be adopted; and issues of sustainability. The agenda for the third meeting was to primarily brainstorm on what model of e-learning platform would be appropriate for a resource-constrained setting. Building on the conceptualized findings from the assessment cycle, particularly issues revolving around inadequate power, internet coverage and other constraints; discipline specific demands and other issues of concern; and the organization (OAU) goal; it was unanimously agreed that the blended e-learning with multiple but integrated platform otherwise called the hybrid e-learning model is the way to go.

### **6.2.3 Training and Retraining of Staff (National and Local Efforts)**

The training of staff members for e-learning and e-tutoring or what is popularly regarded as facilitation of online learning commenced in OAU, Ile-Ife through the visionary leadership of its Centre for Distance Learning (CDL), long before the initiation of the national effort through the country's apex regulatory body for higher education (NUC). As reflected in

chapter four, the training of selected academic staff dated back to 25th – 27th May, 2009 when the CDL, OAU, organised its first workshop on e-learning course development. That workshop afforded the principal investigator and four other members of the research team to have a first-hand experience on e-learning course development. In December 2009, 7 – 9th to be precise, OAU in compliance with the NUC directive sponsored eight academic staff of the institution, three of whom including the principal investigator are members of the Department of Nursing Science, for a three days national training tagged the ‘Train the Trainer Workshop on E-Teaching for Academic Staff of Distance Learning Centres in Nigeria’ held at the Virtual Library, NUC, Abuja. The workshop that was organised by the NUC in collaboration with the British Council had in attendance resource persons from the Open University of the United Kingdom led by one of its ODL erudite professors.

The principal investigator and four of the research team members were again privileged to attend another follow up workshop on e-learning and e-teaching, 5th – 9th April, 2010, organised by the CDL, OAU, Ile-Ife. That workshop had also in attendance facilitators from the Open University of the United Kingdom as resource persons. This was followed by yet another NUC sponsored E-Learning Train the Trainer Workshop in collaboration with Schulportals Technologies at Maryland, Lagos between 21st and 25th June, 2010. Between 2011 and 2013 that the current project (facilitation of the development of blended e-learning for a resource constrained educational setting) actively begun, in house ad hoc training covering every aspect of e-learning (learning and teaching with online and mobile technologies, designing a module to include appropriate ICT, developing study guide, computer-based assessment, use of Blackboard, Moodle and other virtual learning environment) were organised for academic staff by the CDL in readiness for the take-off of its e-learning programme.

#### **6.2.4 Resource Mobilization and System Development**

It is an open truth that developing and adopting e-learning platform is capital intensive at start-off point. With the lean resources at the disposal of universities in Nigeria, a problem that appears to have no end in sight in the immediate and near future, owing to global economic recession and depreciation in the value of the Nigerian currency (the Naira). It is thus doubtful, if any public university in a resource-constrained African setting will be able to have the required financial muscle within a relatively short time frame to commence and sustain a solid e-learning programme. It is perhaps the realisation of this bitter truth that made

the CDL management, OAU to sign a memorandum of understanding with her technical partner, Venture Garden Group, Nigeria Limited (VGG) to float her e-learning programme. The immediate benefit of that public-private partnership is that it allows CDL, OAU, access to lump sum of money with mutually agreed affordable repayment plan and ready technical support for the development of her e-learning programme.

While it is true that the university (OAU) stands out as the leading university in ICT in Nigeria and unarguably the number one choice for Computer-Based Test of the Unified Tertiary Matriculation Examination, video-conferencing, and a number of other IT activities because of its INTECU and telepresence centre, large computer laboratories, e-libraries, relatively good intranet and internet network in all offices, availability of Wi-Fi in most part of the campus, the CDL is located miles away from the centre of the campus and so had to develop its own infrastructure. Today, the centre can boast of four large purposefully built lecture theatres for face-to-face teaching and examinations, two rotundas for group discussions and meetings, an ultra-modern office complex that houses among other things a robust ICT unit, a studio for recording of lectures and up-to-date conference room. Dedicated mobile/cell phones and lines for students support services are equally in place as well as dedicated student e-mail addresses (for student related enquiries) with personnel whose responsibilities it is to keep them running hired.

As the physical facilities were being developed, the human capital was also receiving deserved attention, especially the learning and learner support team and the ICT team. The new look ICT unit not only engaged more hands but also enjoyed periodic staff training with support from Edutech software solutions Limited (the educational arm of Venture Garden Group, Nigeria Limited). The same goes for the learner support unit where more online tutors were employed and trained with periodic up-skilling. The roles and responsibilities of the learning and learner support unit include: following up with electronic video recording of lectures by instructors; working with instructors to facilitate online teaching and assessment of learners (both formative and summative assessment); providing information, feedbacks and guidance to learners; posting comments, questions, learning support documents on bulletin board; helping learners to resolve registration problems and learning related issues.

In a bid to ensure that the learners are not only good theoretically but are also well grounded clinically; and for reasons of meeting the profession/discipline related demands or to mitigate any shortfall in clinical training consequent on increasing

conviction that not all contents can be learnt remotely; an annual clinical preceptors' training programme was also put in place. Minimum standards were set. The minimum requirement to be a preceptor is a good first degree in nursing and a vast level of clinical experience, however preference is given to individuals with higher nursing qualifications (Postgraduate diploma, M.Sc.). The Department of Health, CNO Directorate, United Kingdom (2010) defines a preceptor as 'a registered practitioner who has been given a formal responsibility to support a newly registered practitioner through preceptorship'. The Department further describes preceptorship as 'a period of structured transition for the newly registered practitioner during which the individual is supported by a preceptor, to develop confidence as an autonomous professional, refine skills, values and behaviours and to continue the journey of life-long learning'.

Adapting the Department of Health, UK, preceptorship framework, the roles and responsibilities of the preceptors were identified as follows: receive preparation for the role; develop others professionally to achieve potential; serve as exemplary role model; supervise and follow up learners at clinical sites and provide timely feedback. Subsequently, preceptors for the programme were shortlisted from all parts of the federation in order to achieve the goal of a wide coverage. The idea is to have students do their concentrated clinical experience under the watchful eyes of these preceptors in a reputable hospital closest to where they stay.

### **6.2.5 Material Development**

As early as September 2012, a refresher writing workshop and training was organised for course developers and instructors. That workshop presented the teaching staff/instructors with the opportunity to clarify issues about content ownership, copyright issues, remuneration, in-house style, and deadline for conversion of lecture materials to e-modules among other things. Deadlines were set but only a small fraction of the instructors were able to meet the set target date for submission of developed study guidelines and modules. Reasons given by instructors for their inability to meet target date was majorly busy schedules. Consequently, a writing retreat, sponsored by the CDL and its technical partner, VGG was organised. Instructors were camped for three days in a serene holiday resort away from their busy work schedules. The three days were dedicated to nothing else than developing study guides and e-modules for the e-learning courses.

At the onset of the writing retreat, instructors were again taken through the rituals of developing an e-module with emphasis on writing in conversational style before starting to



work on their own. They were equally taken through and given a template that specifies the components of a learning engagement with students, the sequence of the components, the acceptable duration and the minimum and maximum number of slides adjudged appropriate. Where a course and/or module is handled by a crop of lecturers/instructors, the team were encouraged to work together to prepare their module. While this yielded some fruits, it was soon discovered that the three days was too short to conclude the development of rich e-modules. However, because of the prohibitive cost involved, the retreat could not be extended beyond the three days. That left us with only one rational option; that of using the learners support team to follow up instructors with the principal investigator performing the oversight function. Thus far, the first phase of the module development by subject experts has been concluded and video recording/capturing of lecture presentation done in series, starting first with the first and second year courses.

Again, confronted with the stark reality that our students are scattered round the country and with some residing in neighbourhoods where power/electricity supply and internet coverage are inadequate, it became expedient to pre-empt these teething problems. To this end, meetings were held with a view to avert or at worse minimise the effect of these problems on students' learning. Prominent among the several innovative ideas considered, was the novel proposal of employing a customised tablet for content delivery. Consequently, the VGG through its education arm came up with the 'Vigitab' that is specifically built for Africa and its peculiar needs (unstable power supply and inadequate internet access). The android OS upgradable Vigitab has an incredible battery talk time of up to ten hours and its Quad-core CPU (Central Processing Unit) facilitates relatively quick browsing over the internet. Besides, it has a self-interactive user-friendly interface. Lecture materials in form of voice over PowerPoint slide video are uploaded into these IPS LCD, capacitive touchscreen tablets in such a manner that learners are guaranteed a twenty-four seven access to course materials.

In order to ensure that the ensuing lecture materials meet minimum standards, a quality assurance committee headed by the Deputy Director, CDL, was inaugurated. The eight-man committee has as its terms of reference: (1) to ensure that course materials being developed by instructors/lecturers satisfy minimum academic standards as for equivalent conventional programmes in the university; (2) to ensure that course materials conform with standard and best practice Open and Distance Learning format; (3) to guarantee readability and clarity of thought [appropriate language and content written in conversational style]; and (4) to send

periodic progress reports to the implementation committee through the Director, CDL. The committee has since begun its work, appraising lecture materials in terms of adequacy of content, quality of recording, appropriateness of delivery technique, etc. Materials that are found deficient in one way or the other are reported to the Director CDL for revision and recapturing.

### **6.3 ACTING**

This report on steps/activities either singly performed by the principal investigator or jointly carried out with members of research team in the development of the model. These include: the ongoing systematic literature search; model conceptualization and theorising.

#### **6.3.1 Systematic Review of Literature**

Armed with the empirical findings from the early stages of the study, the principal investigator continued with the ongoing systematic search of research literature, policy, and published accredited education and ICT-related articles and books. Search terms employed include: e-learning; blended learning; e-learning and blended learning models; model/theory development; nursing education; learning theories; pedagogy and andragogy; technology enhanced learning; ICT and nursing informatics; community of inquiry (CoI); perception, acceptance and use of e-learning, particularly among nurses and other health professionals. Successive searches with search terms, employed singly or in combinations using Boolean operators yielded 3,597 hits of potentially relevant documents. A quick screening of the retrieved documents revealed that 189 were duplicated and hence excluded, bringing down the total to 3408 documents.

In view of the rather large volume of the documents and the need to choose the most relevant ones for the study, an inclusion/selection criteria was formulated. The selection criteria has it that the article/book chapter title must: (1) reflect e-blended/e-learning, ICT and/or CoI related, with or without education; (2) be peer reviewed; and (3) be written in English; in order to be selected. When applied, only 187 articles and book chapters were found relevant. When the abstracts were reviewed and selection delimited to articles and book chapters that address blended and e-learning use in the education of health professionals and those that describe e-learning theories, instructional designs, CoI and e-learning models, the number dropped further down to 102. Quick scanning of the introductory paragraphs and some sections of the body of the remaining documents resulted in elimination of over fifty percent of the documents. At the conclusion of the exercise, only 43 articles, book chapters inclusive,

were deemed crucial for the conceptualization and development of the blended e-learning model.

### **6.3.2 Model Conceptualization and Theorising**

Furnished with innovative ideas from selected relevant literature, the numerous quantitative and qualitative data collected for the study, the collective experience of research team and stakeholders, the intuitive tendency that comes with being deeply immersed in a course of action; and the trough of reflectivity, a mental conceptualization of the blended e-learning model for a resource-constrained educational setting began to unfold. Miles and Huberman (1994: 261) cited in Merriam (2009: 188) described this as ‘a process of moving up from the empirical trenches to a more conceptual overview of the landscape’. In their words, ‘we are no longer just dealing with the observables, but also with unobservables and are connecting the two successive layers of inferential glue’; what Merriam (2009: 189) rightly caption as switching into speculative mode of thinking. The same idea was echoed by Fawcett (2005: 2) though slightly differently when she stated that conceptual models are made up of highly abstract concepts, which are words describing mental images of phenomena and propositions (statements expressing the relations between concepts).

Fawcett (2005: 2) contends that conceptual model and synonymous terms such as conceptual framework and conceptual system are global ideas about the individuals, groups, situations, and events of interest to a discipline. Borrowing a leave from Lippitt (1973) and Reilly (1975), she submits that a conceptual model is only an approximation of or simplification of reality, a representation of the world that includes only those concepts which the model builder considers relevant and as aid to understanding. Similar to that is Pearson and Vaughan (1995: 1-14) remark that the term ‘model’, though used in everyday language, is something which is not the real thing, but which matches or represents it as closely as possible. Taking this further, Pearson and Vaughan (1995) liken conceptual model to the three dimensional models constructed by architects to represent buildings but stressed that unlike the building models whose raw materials are mini-bricks, metal and plastic, practice models have as their raw materials ideas, beliefs, knowledge and other less tangible building bricks. According to these authors, practice models are made up of three basic components namely: (1) the beliefs and values on which the model is based (philosophical assumption and stances); (2) the goals of practice or what the practitioner aims to achieve; and (3) the knowledge and skills the practitioner needs to develop in order to achieve these goals.

It is thus clear that scholars over the years have paid noteworthy attention to how models evolve. Fawcett (2005: 4) makes this point that model evolves from empirical observations and intuitive insights of scholars and/or from deductions that creatively combine ideas from several fields of inquiry. Implicit in this is that models can be polarised into two groups, based on how they evolve viz: inductive models and deductive models. In her words 'a model is inductively developed when generalizations about various observed events are formulated and is deductively developed when specific situations are seen as examples of other, more general events'. Another taxonomy of models given by the same author are: developmental models; system models; and interaction models.

Graham, Henrie and Gibbons (2013: 13-14) takes the discourse of models a little further, by bringing attention to the debate surrounding the definition and the interchangeable use of the terms model and theory. The duo assert that the terms model and theory are two ends of a continuum. Gleaning from the works of Whetten (1989), they argue that good social science theory is built upon: (1) the what (variables/factors); (2) the how (relationship between variables/factors); (3) the why (underlying rationale justifying the what and how; and (4) the who, where, when (context in which the theory is applicable). The authors remark that what could rather be regarded as a distinction between a model and a theory lies in the strength of its argument (the why) and evidence supporting the claims (relationship between the what and how), stressing that as research data accumulate and arguments become more robust, researchers are more willing to refer to a model as a theory. This loosely compliments Pearson and Vaughan (1995: 10) earlier assertion that theories are proposals which give a reasonable explanation to an event.

Meleis (2012) writing on the same subject adopted a more philosophical approach to explain the term theory. This is astonishingly simplified by her analogy:

*A metaphor that could be adopted is that of a painting that requires a coherent vision of an end result, the right canvas to translate that vision, the painter to execute his or her vision, the tools to make the painting happen, the viewer who perceives the painting based on his or her context, the public who may not value the painting, and the media that may make or break the artist or painting. Theory is the coherent vision of the context, process and outcome. Theory is the goal of all scientific work; theorizing is a central process in all scientific endeavours, and theoretical thinking is essential to all professional undertakings. However, the painter (the nurse/theoretician), the viewer (the student of theory and the translating clinician), the public (including the patient, other professions, the public at large, and the researchers) have their*

*own perspectives and interpretations of the theory. The media (all constituencies) may promote or obstruct the use of theory.*

Just like models, Pearson and Vaughan (1995: 10) classified theories on the basis of how they emerged as either deductive or inductive theory. However unlike Pearson and Vaughan (1995: 10) classification, Graham, Henrie and Gibbons (2013: 13-14) categorised theories broadly into technological (or design) and scientific. Taking a cue from the work of other scholars, the authors explained that though both the design fields (engineering, business, education, architecture) and the sciences often focus on the same system, they sort to solve different problems and generate different kinds of theory. Adopting Gibbons (2013) submission, they declare that ‘scientific theory is analytic (used to construct an understanding of the forces that drive natural human-made phenomenon) while design theory produces a body of synthetic principles which can be used to design, to plan, to prescribe, to devise, to invent, to create and to otherwise channel natural forces for accomplishment of human purposes’. They therefore sum up the distinction between these two fields and their theories as follows: ‘in science, they are trying to understand how and why things happen; and in technology and design-related fields like education, they are trying to discover how to influence things to happen’. Of course, other taxonomy of theories exists such as descriptive, explanatory and predictive theory given by Fawcett (2005:19) however that is not the priority of this section.

Coming back to the issue at hand; it may be useful to reiterate here, that the present study seeks to design and develop a blended e-learning model for a resource-constrained educational setting. This squarely puts the study and its emerging model/theory in the forefront of the design research enterprise. In Gibbons and Bunderson (2005) parlance (cited in Graham, Henrie and Gibbons, 2013), the present study and the ensuing model/theory seek to address three major issues: (1) How do I achieve this outcome? (2) Describes interventions for teaching targeted outcomes; and (3) Describes operational principles that make an intervention or design work. Still consistent with Gibbons and Bunderson (2005) thesis, it describes intentional structuring of artefacts and intervention plans to increase the likelihood of particular outcomes (increase access to university nursing education; create a platform for upward educational mobility of practicing nurses who may not be able to leave their job for a full-time study; promote deep and lifelong learning as desirable of a 21<sup>st</sup> century nurse). It is equally worthwhile to state that the action research approach employed permits experimentation of intervention and subsequent revisions until the targeted outcome is

achieved (Blended learning model suitable for deployment of nursing education in a resource-constrained educational setting that does not compromise on the richness of educational experience and the expected knowledge uptake).

Developing the blueprint for the model actually starts with engaging in a number of decisions. The first decision was to establish the philosophical assumptions and stances, the context, essential prerequisites, key drivers, main concepts and the goal of the model. The second is mapping out the strategy. Next to that is determining the teaching-learning process/pedagogical framework, taking care to note the intervening conditions and relationships between the concepts and sub concepts en route the outcome (intended and unintended outcomes).

### **6.3.2.1 Philosophical Assumptions and Stances**

The word philosophical stances is a combination of two words; philosophy and stance. The Encarta dictionary (2009) defines philosophy variously as “the branch of knowledge or academic study devoted to systematic examination of basic concepts such as truth, existence, reality, causality and freedom; a particular system of thought or doctrine; a set of basic principles or concepts underlying a particular sphere of knowledge; a precept, or set of precepts, beliefs, principles, or aims, underlying somebody’s practice or conduct”. The word ‘stance’ on the other hand, connotes an attitude or view that somebody takes about something. When put together in this study, it means a set of beliefs and values about the world of nursing education.

A philosophy of nursing education makes statement about: nursing, learner (client), knowledge and society. Consequently, the beliefs and values underpinning this model development is looked at from these four perspectives. As I began to conceptualize the model, a number of questions flood my mind: Why do we need this change? What kind of change do we seek? What kind of nursing education experience do we want (Hospital-based diploma programme or university nursing education programme)? What kind of learning do we seek (pedagogy, andragogy, co-constructivism)? Who are our learners (the Mature/X-generation or the Net generation/digital natives; full-time or part-time students)? The questions are endless. In the multitude of this thought came some specific beliefs which when integrated with the philosophy of the Department of Nursing Science, OAU, Ile-Ife formed the model’s philosophical stances (outlined below).

The nursing faculty believes that: (1) We live in a changing world (our values, our thinking, reasoning and way of learning are all undergoing changes); (2) Not only do we have changing generation of learners with uniquely different characteristics but are also bequeathed with learners with different learning styles; (3) Technological advancement has made available a vast array of innovative teaching and learning tools that readily facilitate knowledge construction and transfer; (4) Emphasis is currently shifting from the erstwhile notion of the teacher as a transmitter of information to the teacher as a facilitator of learning, culminating in a gradual paradigm shift from the instructivist approach to co-constructivism and the use of community of inquiry; (5) The 21<sup>st</sup> century knowledge economy desires a professional nurse who is abreast of new developments not only in his/her field but also demonstrates an understanding of other broader issues; (6) The nursing profession should have the greatest concern for service through high standards of scholarship and personal character, the ultimate purpose being the advancement of public welfare and culture through wider and deeper knowledge, finer skills, and broader appreciation of human values; (7) The responsibilities of the nurse are constantly being affected by time and location and consequently a professional nursing programme should assist the learner in analysing the change process, in deciding on change which is desirable, possible, probable, or impossible and in accepting and effecting change; (8) That preparation of professional nurses should consist of liberal and professional education leading to a bachelor's degree; and (9) That the learner should be assisted in learning to solve problems by analysing component and contributory factors, selecting relevant principles and exercising judgement in their application.

### **6.3.2.2 The Context**

The word context generally depicts the circumstances, events, forces at work, or surrounding conditions that form the environment within which something exists. The context here is basically that of a resource-constrained setting where demands for university nursing education outstrips available human and material resources and where other aforementioned factors/forces established inter alia in the assessment cycle are at work. Nigeria, a developing nation with a massive population is confronted with a plethora of economic, developmental and infrastructural challenges. Having inherited a conservative system of diploma nursing education from her British colonial master, the country now has a massive population of nurses with diploma qualification in nursing who are not only willing but yearning to continue their education in the university. This development amidst human, structural and

infrastructural constraints calls for an innovative approach to meeting the educational needs of the Nigerian nurse, hence the need for this model.

### **6.3.2.3 Key Drivers**

The key drivers of the model many of which are context related include: the thirst for e-learning; massive demand for university nursing education; growing dissatisfaction with diploma professional qualification; baccalaureate ODL nursing-related demands; ready opportunity for learning that e-learning presents; the ease that e-learning brings to teaching-learning process; its transformative potential; and the drive for continuing professional development as desirable in the 21st Knowledge society.

### **6.3.2.4 Essentials of the Model**

With the benefit of hindsight, the essential prerequisites include:

1. *An eye that sees possibilities* – It is only an eye that can see possibilities in midst of obvious challenges occasioned partly by inadequate resources that can envision the development of a blended e-learning model in a resource-constraint setting like Nigeria.
2. *Institutional readiness* – There is a minimal amount of institutional readiness that is required to kick start such a project like this. Although the zeal and enthusiasm of the principal investigator cannot be relegated, but the success or failure of a model of this magnitude ultimately rest on the preparedness and the will power of relevant institutions as demonstrated by this study.
3. *Support at different levels (individual, institutional, national)* – This project has enjoyed a whole lot of human and material support. First and foremost, it is a capital intensive venture; so it would have remained in the realm of dreams without financial support in form of seed fund from OAU, Ile-Ife through the TETFUND programme; the College of Health Sciences, UKZN scholarship scheme; and the money expended on training and retraining of academic staff on e-learning by the CDL, OAU, Ile-Ife. The enabling environment provided by the CDL; the policy formulation and directives from the National University Commission (NUC); individual's cooperation, moral support and encouragement enjoyed in the course of the study, were all pivotal to the successful development of the model.
4. *Collaboration (Holistic teamwork)* – It will be difficult, if not impossible for a single individual to embark and complete a massive project like this. This project had taken



advantage of the collective strength and divergence of ideas that teamwork offers right from its inception to its concluding phase. Teamwork it is, even at adoption and use of the model. It is a central tenet in the co-constructivism which is one of the pillars in the teaching-learning process advocated by the model. The instructors/facilitators will of necessity need to collaborate with the tutors and the same goes for the learners who have to collaborate with each other using the community of enquiry approach among learners.

5. *360 Degree feedback* – The study by its action research approach comprising three sequential cycles with each cycle made up of inter-connected steps of planning, acting, observing and reflecting readily make allowance for feedback and subsequent revision of the blended e-learning model until it attained an acceptable standard. The importance of feedback played out more eminently again while piloting the model.
6. *Robust project management* – Management which is the engineering of resources towards the actualization of organizational objectives is yet another crucial ingredient in the development, adoption and use of the blended e-learning model. As novel as the idea of developing and adopting a blended e-learning model is and as enthusiastic as the nurses are towards its development, even with an institutional support that is unparalleled, it will end up a mirage without a sound project management. In a nutshell, developing and adopting a hybrid e-learning of this nature in a resource-constrained setting requires good planning, organising, directing, coordinating, staffing, controlling and budgeting.
7. *Policies and strategic direction* – The policy thrust of any organisation or nation gives direction to the organisation or nation’s activities. In fact, at the core of any progressive system is a vibrant policy thrust. Policy then can be likened to the engine or driving force of any sustainable development. The Nigerian national policy for information technology captioned ‘USE IT’ and the NUC’s guidelines for open and distance learning in Nigerian universities (both attached as annexure) provided veritable ground for the take-off of this initiative.

#### **6.3.2.5 The Goal of the Model**

As soon as the context was established and key drivers identified, questions that bother on the purpose of the planned education and the kind of educational experience that could attain the purpose started budding/evolving. Since the prospective students are largely nurses who had

completed the basic professional diploma education in nursing and who cannot quit job or secure a lengthy study leave, the goal of the model is articulated as follows: to develop a model that is context specific, requiring less of the brick and mortar form of schooling, but committed to delivering quality nursing education in a way that existing human and structural constraints would pave way for the needed quality of training that nursing profession deserves.

### **6.3.2.6 The Concepts of the Model**

Concepts are basic ideas which are generally abstract and universal rather than concrete and specific but which are used to classify together things sharing one or more common properties (Krausz & Miller, 1974). The authors further view concepts as basic building blocks that captures the essence of a thing. Just like the physical building, a number of concepts and sub-concepts form the basis of conceptual models and theories. The same goes for this model. The major concepts of this model include: *facilitation, change, blended e-learning/hybrid e-learning, teaching-learning process, nursing education, resource-constrain, development, and collaboration.*

*Facilitation:* The concept facilitation could be described at two levels. First, in terms of working with a consultative research team to seek nurses' views about e-learning and using those views to inform decision making as touching the design and development of a blended e-learning model suitable for delivery of nursing education. Second, in terms of wearing the toga of a facilitator i.e. assisting individuals in their own online learning experiences through synchronous and asynchronous communication as oppose to the expository learning or the face-to-face teaching/lecturing.

*Change:* Change is a common phenomenon in the world today. We live in a fast changing world; a world characterised largely by unpredictability and spontaneity. Thus change is a common trait in all businesses and industry; and the education industry is no exception. In addition, the peculiarity of challenges orchestrated by resource-constrained plus the need to guarantee the provision of quality education to individuals and the community as a whole, has made imperative, the need to replace or substitute the traditional face-to-face teaching with a dual mode approach; herein referred as the blended e-learning approach.

*Nursing Education:* Nursing education, no doubt, is a broad concept as it involves different traditions and approaches. In this model, it is operationalised as technology-assisted teaching

and learning of nursing, using a blend of both synchronous and asynchronous mode of communication in a way that existing structural constraints would pave way for the needed quality of training that the nursing profession deserve.

*Resource-Constrained:* Existing human, material and structural constraints or a state of ‘relative lack’ of manpower (faculty with masters and doctoral qualifications in nursing) and infrastructure (electricity supply, broad band internet) needed for meeting the higher education needs of a teaming and widely dispersed population like Nigeria.

*Development:* Development is a broad concept but in this model it is operationalised as: (i) a planned sequence of activities specifically designed for building a context-specific hybrid/blended e-learning model that is suitable for the academic and professional development of nurses in Nigeria; and (ii) the planned systematic upgrading of infrastructures and the building up of capacity of human capital in preparation for a successful hosting of an e-learning programme.

*Blended / Hybrid E-Learning:* As stated in the early chapters of this thesis, the term/concept blende/hybrid is used to convey a sense of mixture of different things or components. It is therefore conceptualised in this model as seamless fusion of ICT (which ranges in complexity, sophistication, application, capacity, and flexibility), within an organized and structured context integrating innovative pedagogical techniques with invigorating collaborative quest for knowledge through online learning communities or community of inquiry (Conrad, 2000; Garrison & Anderson, 2003; Engelbrecht, 2003; McPherson, 2005; Meyer, 2007; Alobiedat, 2010) to facilitate nursing education.

*Collaboration:* In ordinary day to day English, collaboration means the act of working together with one or more people (teamwork) in order to accomplish a goal/task. In this study and model, it is not any different save that it is restricted to the working together of all stakeholders involved in organisation and administration of nursing education in the study setting (the students, instructors, tutors, administrators and the school management) to foster learning among learners or snowball into a lifetime of personal and professional development.

*Teaching-Learning Process:* This is more or less or a construct as it comprises a number of concepts. To start with, the term ‘process’ gives a notion that there are a number of inter-related steps involved. For this model, the teaching-learning refers activities purposefully

constructed in an integrated manner, to facilitate the learning of nursing knowledge and skills. They include a short-term computer appreciation programme and a variety of education strategies suitable for the learning of the theoretical knowledge (outcome based education, expository learning, discovery learning, inquiry-based learning and co-constructivism) and clinical/practical skills (short term real time demonstration in laboratories; simulation; clinical follow-up and monitoring by preceptors; and experiential learning). Bartels (2008:112) describes experiential learning as ‘the activity of connecting what one knows with what one’s action; an active learning, purposefully constructed, and practiced so that the learner experiences a seamless connection between thinking and doing’. The model hopes to achieve this through a combination of learning modes such as reflective learning, problem-based learning, case-based learning and cooperative learning).

### **6.3.3 The Strategy**

As earlier stated, the second decision in the development process has to do with mapping out the strategy. The decision on what strategy, posed little difficulty, as the action research approach employed for the entire study with its sequential cyclical steps of planning, acting, observing and reflecting and subsequent revisions readily provides an invaluable opportunity for the design and piloting of the evolving model. Although a bit rigorous and time consuming, the revisions help in further fine-tuning the original thought and raw ideas into what eventually became the developed blended e-learning model for nursing education in a resource-constrained setting.

### **6.3.4 The Process**

The next decision has to do with establishing the teaching-learning process/pedagogical framework. This was done in collaboration with the research team such that their collective experience in the teaching-learning business could be harnessed in putting in place a robust instructional design and prototype delivery system for the e-learning programme. To this end and to maximize the benefits of instructional design which include: time and cost effectiveness; learning effectiveness; training evaluation effectiveness; consistency; the team scheduled and held a number meetings. The team found Clark and Mayer (2008) writing on the development of e-learning as a useful resource and deliberated on some of the issues raised by the authors as crucial to the e-learning development process. These are:

Training Need Analysis: The team examined the education needs of the prospective students and considered it against the academic requirements for the award of the bachelor of nursing

science in Nigeria. In line with Mayer and Clark (2008) work, the team classified the e-learning goals into two broad groups: the inform goal which has to do with providing information and to build up knowledge (cognitive activities); and the perform goal designed to build specific skills such as nursing procedures (psychomotor and affective content).

Defining E-learning Content: The OAU bachelor of nursing science curriculum which has become the gold standard for nursing education in Nigeria serve as useful guide in the determination of the e-learning content. The curriculum specifies a five year duration for the completion of courses leading to the award of a bachelor degree in nursing. The courses run from year one to five beginning with the basic medical sciences like human anatomy, human physiology, medical biochemistry, computer appreciation course and a number of social sciences courses in the first two years of the programme. These courses are developed in modular forms with varying weightings and are taught by scholars in the respective fields (subject experts) of study. The team requested from the subject experts, a comprehensive copy of their course outline and study guide. These were studied and used as a tool for evaluating each of the developed courses in terms of relevance, coverage, clarity and adequacy of content. Findings were documented and recommendation conveyed to subject experts for further action.

Defining Instructional Methods and Media Elements: This involved a number of stages. The first was a review of course objective and instructional technique (lecture, lecture discussion, demonstration, role play, simulation, interactive session, assignment) highlighted by the authors in the study guide. This is with a view to determine their appropriateness. The second was determining which mode (synchronous or asynchronous) is most feasible for delivery of each of the course/module content. Due to the peculiar challenges of a resource-constrained environment (power issue, internet coverage), it was decided that the asynchronous mode would be the major mode of delivery with minimal use of the synchronous mode mainly for the instructor-learner interactive sessions. The third was deciding which prototype delivery system will guarantee flexible learning without jeopardising the learners' existing commitments (such as work and family). Since majority of the prospective students of the programme are the working class group, the pragmatic perspective became a rational option. Kaur (2013) describes the pragmatic perspective as follows:

*Courses that are taught both in the classroom and at a distance, and that use a mix of different pedagogic strategies (combine various pedagogical approaches such as constructivism, behaviourism, cognitive learning*

*approaches to produce an optimal learning outcome with or without the use of instructional technology; combine any form of instructional technology such as CDs, films, web-based learning with face-to-face instructor-led programming; mix instructional technology with actual job tasks in order to create a harmonious effect in terms of learning and working).*

The fourth stage was determining the media element; the audio and visual techniques used to present words and illustration (text, narration, photographs/pictures, animation, virtual reality). The argument here was that since the prospective students hail from different socio-cultural background and are unique individuals, it is not unlikely that they will have varied learning styles. This consideration informs the decision to adopt a holistic approach i.e. the use of multiple sensory modality (visual, auditory, kinaesthetic?). Lastly, the committee deliberated on what proportion of the learning content should be taught face-to-face and what proportion should be delivered via e-learning. To do this, the team embarked on an in-depth review of the module contents analysing the nature (practical or theory) against the possible existing commitments of the prospective students. At the end of that discussion, it was agreed that the programme should be 70% e-learning and 30% face-to-face. The face-to-face sessions were mainly earmarked for the laboratory practicals, clinical experience and examinations.

Defining the Mode of Assessment/Evaluation: Three kinds of assessment were suggested by the team: Diagnostic; Formative; and Summative assessment. It was recommended that diagnostic assessment should be given at the commencement of each module to establish the students/learners' baseline knowledge. The formative to be given midway into the teaching and learning of the module while summative assessment are to be given at the end of the module. The format of the assessments could vary widely from online quizzes with computer-generated feedbacks or model answers or tutor marked assignments with clear and prompt feedbacks. Like Clark and Mayer (2008) counselled, suggestions were made as to the need to use real life situations or scenarios in the construction of the assessments/assignments as well as the need to align them with learning objectives.

At the end of this phase, the team deemed it fit to put in place a template to serve as a guide for instructors in their courses. The template is presented below:

- ◆ Introduction and course objectives
- ◆ Pre-test / Diagnostic assessment
- ◆ Advanced readings and chatting

- ◆ Lectures sandwiched with online interactive activities
- ◆ Formative assessment
- ◆ Clear and prompt feedback on assessment / online forum
- ◆ Concluding portion of lectures
- ◆ Online interactive revision sessions
- ◆ Summative assessment

### **6.3.5 The Outcome of the Model**

The outcome of the model is looked at from two perspectives: Intended outcome and the unintended outcome.

The intended outcomes are:

1. Flexible education and training solutions
2. Deep learning
3. Computer aided learning
4. Increased computer literacy and skills
5. Integration of collaboration with self-study
6. Becoming a more critical learner; and
7. Improved clinical skill & interaction skills.

The unintended outcomes are:

1. Reduced interactivity
2. High failure rate
3. Low motivation;
4. High attrition rate.

Whatever outcome eventually unfolds is however contingent on the intervening conditions.

### **6.3.6 Intervening Conditions**

A number of factors/conditions can make or mar successful implementation of the model and the outcome thereof. These include: organisation of the whole e-learning system; the quality of the modules; level of computer knowledge and skills of teachers and learners; degree and quality of interactivity; the quality and regularity of assignments; adequacy of power supply; speed and stability of internet connectivity.

With the arsenal of information from the assessment cycle, the fruitful brainstorming sessions, prolonged reflectivity and inductive reasoning, the principal investigator was able to come up with a template of the blended e-learning model presented diagrammatically below:



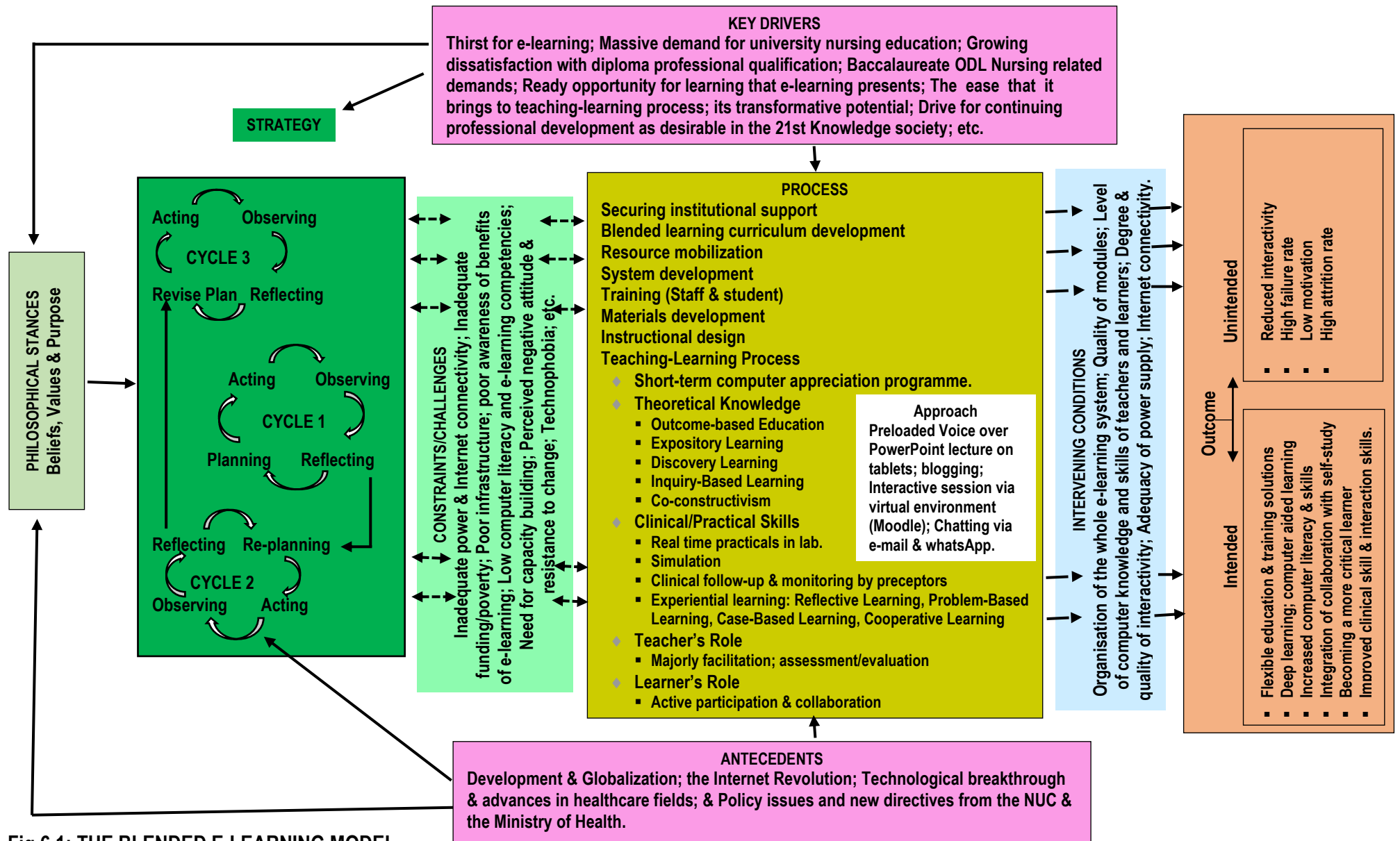


Fig 6.1: THE BLENDED E-LEARNING MODEL

#### **6.4. OBSERVING**

The emerging blended e-learning model was presented to the research team at her next meeting for a critical appraisal. A few of the concepts and constructs were re-defined and relationship between the concepts examined. For instance, the positive and negative outcome that appear on the initial sketch by the principal investigator was substituted with intended and unintended outcomes). The intervening conditions were also streamlined to reflect only what the collected data depict.

#### **6.5 REFLECTING**

Suggestions made in the previous meeting with the research team were thoughtfully incorporated in the light of new and emerging literature on e-learning model development. This revision and subsequent modifications results in successful fine-tuning of the model into the final product that was piloted.

## **CHAPTER SEVEN**

### **7.0 MODEL TESTING, SUMMARY AND CONCLUSION**

Chapter seven, the grand finale chapter reports on the events and activities of the testing cycle of the project. It discusses the details of the piloting and the outcome thereof. It also sheds light on the contributions of the study; limitations encountered and how they were handled to ward off their possible negative impact on the study. Lastly, the chapter outlines some recommendations for effective utilization of the blended e-learning model in resource-constrained settings.

#### **7.1 PILOTING THE MODEL AND REFLECTING ON ITS EFFECTIVENESS**

The developed blended learning model was piloted for a whole semester (15 weeks) among bachelor of nursing science students running the open and distance learning (ODL) programme of the Department of Nursing Science, OAU, Ile-Ife. As planned, two modules in the Bachelor of Nursing Science (BNSc) curriculum were purposively selected to pilot the model; a year one course that is relatively of a more general knowledge and a year four course that is generically nursing. In line with this criteria, a social science course titled ‘Wealth and Poverty of Nations’ (SSC 102) that is offered in year one of the bachelor of nursing programme; and a generic nursing course, ‘Advanced Medical Surgical Nursing’ (NSC 431/432) were chosen. These two modules like other courses in the BNSc ODL programme were hitherto taught through the face-to-face mode.

However prior to commencement of classes (facilitation/tutorials) in the earmarked courses, a two-day computer appreciation programme was organised and held for the students. This is against the finding of a weak computer background established among Nigerian nurses in the assessment/exploration cycle. All the students were also given the preloaded customised tablets at subsidized rate and a demo on how to navigate through the tablet held prior to commencement of lectures.

For the purpose of educational diagnoses (i.e. to identify the student/learners’ knowledge baseline and their area of deficiencies) and evaluation of the effectiveness of the developed model, a pre-test covering virtually all aspects of the course content was administered by subject experts on the students in the selected classes (Years 1 & 4). This was followed by a carefully developed post-test covering the essential course content at the tail end of the semester (end of semester examination). The interpretation of the students’ performance in the pre-test and post-tests were based on the Nigerian university grading system, which incidentally is being used in OAU, Ile-Ife. The grading system classifies a score of 70% and above as ‘excellent knowledge’, 50 – 69% as ‘good knowledge’, 40 –

49% as ‘fair knowledge’, while any score below 40% is regarded as ‘poor knowledge’. Ijadunola, Ijadunola, Esimai and Abiona (2010) adopted the same grading system to evaluate knowledge of maternity unit workers in their article titled ‘New paradigm old thinking: The case for emergency obstetric care in the prevention of maternal mortality in Nigeria’. Table 7.1 below presents a simple comparative analysis of the students’ performances pre and post administration of the developed blended e-learning model.

**Table 7.1: Knowledge of the 1st Year ODL BNSc Students in SSC 102 Pre and Post Administration of the Developed Blended E-learning Model**

Level of Knowledge	Pre-Administration (n=298)	Post-Administration (n=274)
	Freq. (%)	Freq. (%)
Poor	281 (94.3)	2 (0.7)
Fair	17 (5.7)	47 (17.1)
Good	0 (0)	204 (74.5)
Excellent	0 (0)	21 (7.7)
<b>Total</b>	<b>298 (100)</b>	<b>274 (100)</b>

Two hundred and ninety eight students sat for the pre-test but only 274 wrote the post-test. Six students reported sick during the post-test and the remaining 18 students for reasons best known to them did not make themselves available for the post-test. As obvious from the table, a majority of the ODL BNSc students (94.3%) recorded a poor knowledge in the pre-test and none had good or excellent knowledge. On the contrary, the post-test shows a swift improvement in the students’ performances as evidenced by the majority (74.5%) exhibiting good knowledge and only two recording poor knowledge.

Similarly, Table 7.2 below presents the outcome of the assessment of the effectiveness of the blended e-learning model at assessing knowledge gained in ‘Advanced Medical Surgical Nursing among the fourth year BNSc students.

**Table 7.2: Knowledge of 4th Year ODL BNSc Students in NSC 431/432 Pre and Post Administration of the Developed Blended E-learning Model**

Level of Knowledge	Pre-Administration (n=114)	Post-Administration (n=114)
	Freq. (%)	Freq. (%)
Poor	90 (79.0)	0 (0)
Fair	21 (18.4)	6 (5.3)
Good	3 (2.6)	106 (92.9)

Excellent	0 (0)	2 (1.8)
<b>Total</b>	<b>114 (100)</b>	<b>114 (100)</b>

Table 7.2 above shows clearly differences in the ODL BNSc students' knowledge in the 'Advanced Medical Surgical Nursing' (NSC 431/432) pre and post administration of the developed blended e-learning model. This goes a long way to attest to the effectiveness of the model at effecting cognitive presence.

In addition, two separate FGDs were conducted on conclusion of the course; one among the ODL BNSc students and the other among the lecturers/instructors to explore participants' experiences as regards teaching and social presence with the developed blended e-learning model. The sample for the students FGD was made up of 7 mature students (4 from the first year class and the other 3 from the fourth year class) of the ODL BNSc programme of OAU, Ile-Ife. Four lecturers actively employing the blended e-learning model in the selected two courses make up the instructors/lecturers' FGD. Each of the two FGD sessions conducted has the principal investigator as the moderator, a trained research assistant as the note taker. Both sessions were audio recorded and transcribed verbatim. The transcription was read back to the participants for verification. The subsequent subsections present a summary of the students' and instructors' opinions on the blended e-learning model collected in their separate FGD sessions.

### 7.1.1 Students Reflections on the Blended E-learning Model

The following issues were raised and clarified during the students' FGD:

**Teaching Presence:** Teaching presence (the instructors' design choices, organization of instruction, facilitation of discourse, and direct instruction). Although there were little shades of differences, the overriding/dominant conception among the students was that of a good and well organised instructional design; dynamic and effective facilitation that sensitizes active participation on the part of the students; and the direct instructions that are very insightful, educative but challenging. A few however felt that though the lectures are preloaded, there are too many assignments with too close deadlines for submission making the workload rather heavy for the students.

Participants also reported that supervised concentrated laboratory-based practicals are done in the school laboratories towards the end of each contact period (semester) for about 1 – 2 weeks for the first and second year students. Similarly, four-week supervised clinical practice overseen by trained clinical preceptors are carried out at the close of the session by students in their third to fifth year at

designated hospitals and approved places of employment of the students. The following excerpts from the students' FGD speak further to this:

*The organisation of the instructional material was sequential and logical. Teachers were in close touch with us through the various media (Whats App, Facebook and the virtual learning environment – blackboard). Students in turn brought to class their questions and sought clarifications on subject matters. The 'carrot and stick' (reward/incentive) technique employed during facilitation helps motivate students who naturally are passive listener to be active in their interaction online. As a student of this mode of learning, it benefitted me more than the face-to-face mode.*

*The teaching was well organised, learning materials were adequate and made available timely. That enhances comprehension of subject matter. Most of the instructors were able to read us (referring to students) correctly, diagnose our areas of weakness and deficiency as well as areas of strength that need to be reinforced. Many of us except those who are not computer friendly were kept on track of the core discourse in the courses.*

*It is more or less of do it yourself kind of study. I had to work hard to meet up with the assignments and online contribution deadlines. There were no serious direct or face to face lectures except for the laboratory practicals. It was however a worthwhile exercise as many of the things we learnt are applicable to real life situations.*

**Social Presence:** The students/learners reported that it was a splendid experience as the classes were essentially participatory and encourages cross fertilization of ideas. They added that they were able to project themselves emotionally as real people. This is substantiated by such statements as:

*The blended mode enhances socialization to a large extent. It gives me opportunity to communicate with some of my colleagues, know their names and even learn from their contributions. But I sometimes get frustrated or even perplexed by poor/weak internet connectivity and by non-consistent use of the online discussion board by a few the instructors.*

*Prior to commencement of this mode of learning, I had no functional Facebook account but had to get one as soon as we started classes in order to keep pace with others on the discussion board and to respond to non-educational issues as well. I became more frequent internet user as I had to interact more regularly with other members of my class. The occasional commendation by tutors and instructors and their efforts at stream-lining the discussion further helps to engender learning.*

**Cognitive Presence:** The students talk highly of the ability of the blended e-learning model to elicit acquisition of higher-order knowledge through exploration of ideas, sustained reflection and critical discourse. It was generally expressed that with the use of the model, their cognitive reasoning becomes sharpened. This notion is validated by utterances like:

*The way the whole thing is organised sensitizes us to read and prepare ahead as it involves our active participation. So it forces us to put on our thinking cap as we respond to issues raised knowing fully well that a wrong response may arouse further questioning from other members and such may impact negatively on one's score.*

*The mode enhances better understanding of concepts. We actually understood what was being taught. Those who initially do not understand a concept develop clues as they ask questions and keep track of the discussions. I particularly became more knowledgeable about things posted by reading through the different individuals' views. That in a way makes me to see issues from broader perspective and sensitises me to study more.*

**Informal Learning:** There were several comments that established the efficacy of the blended e-learning mode at entrenching informal learning. For instance a student commented that “We are able to search for materials and study on our own, form groups and learn among ourselves. In fact, I had to regularly read up to keep abreast of the events in the online student-instructor interactions” (self-directed learning). Another said that “this mode prompts me to regularly discuss with my classmates, colleagues at work and to rub mind and clarifies issues with experienced practitioners outside of instruction arena”. Yet another states that “the self-directed exploration engendered by this method is excellent. It enables students to develop themselves”.

**Workload:** As regards the workload associated with the blended e-learning model, there were basically two schools of thought. While some were of the opinion that using this mode has been somehow burdensome, others expressed that it has eased the workload. Below are a few of the students' comments epitomising the two schools of thought:

*With this online mode of teaching, learning and coping with work is made easier. I interact online without disrupting my work schedule. The work load was not too much to bear. It even made our work easier.*

*The workload is easier and better (comparing it with the erstwhile face-to-face mode). It is an easier way of learning; it does not disturb my other work activities. I say the workload is light because one can decide to read the course material later or when less busy.*

*Well, I personally feel that the workload is a bit cumbersome and time-consuming. It is very demanding..... One has to be up and doing, read materials online, download documents and upload finished assignment.*

*Frankly speaking, the workload is much using the blended method but it's worthwhile as it is the primary essence of the course. While the workload is not much looking at the course as a separate entity however when combined with other courses, it was stressful getting online all the time.*

**Access to Computer and Experience using Computers:** There are several statements in the FGD that indicated that overwhelming majority of the students have ample access to personal computers. However access to computers at workplaces and clinical settings leave much to desire. To many of the students, their computer experience has been an exciting one as exemplified by following comments:

*My experience with personal computer has been wonderful. I use computer to do many things on a day to day basis. However, my level of access to computer in clinical setting is poor; I mean I hardly have access to computers at work.....*

*Currently, there is no computer in my workplace/clinical setting but I have personal computer which allow me to have easy access to internet, online textbooks and other resources available online..... Using computer personally has broaden my knowledge and has allowed me to have easy access to valuable materials on the internet and my online lecturer.*

*Access to computer within our clinical setting is poor and the network here (talking about internet signals) is not only unstable but very weak and sometimes unavailable making browsing on the net a herculean task.*

### **Participants' (students) Assessment of the Customized Tablet in terms of Functionality, Ease of Use, Durability, Quality of Internet Connection and Speed**

Participants believe that the customized tablet is robust enough, easy to navigate, durable and that the internet connectivity speed is moderate. The only setback is the weak and unstable internet signal in many parts of the country.

*At the initial stage of the course, operating the customized tablet was like a battle as everything looks complex but as at the time we concluded the demo, navigating through the tablet has become easy and with repeated use I found that the tablet is strong and could run without external power for a minimum of 8hours.*

**Comparing the Blended E-learning Mode with the Traditional Face-to-Face Mode:** The students recalled with excitement their experience using the blended e-learning model. In the words of one of them, “although, we don’t see the lecturers physically save for during our orientation programme, but we were able to clarify and share ideas among ourselves as the bulk of the course content has been preloaded on our tablets”. Consistent with that are other comments like:

*I am privileged to operate both face-to-face and online mode of learning at one time or another. The experience is great. The online learning was better understood, less stressful and saves time than other form of learning (making reference to the face-to-face mode). Given a choice, I would prefer the online mode intersperse with face-to-face mode for high tech medical practicals.*



*The current mode is better than the face-to-face one in the sense that it helps to facilitate self-directive learning; saves time; guarantees twenty-four seven access to information (I don't have to come to class before I can get information or be taught); and above all less stressful. I think I will prefer this method to the face-to-face approach.*

*The benefit of this mode is that it enables me to read and develop myself but sometimes getting a chance to ask questions or clarify information can be pretty difficult because of inadequate internet connectivity. Nonetheless, I prefer this blended e-learning approach because it eases the burden of physical class attendance that is typical of the face-to-face mode and would have loved it the more if the lecturer(s) will give us more time to read and make contributions, putting it mind that we are workers and do not have that luxury of time.*

### **7.1.2 Instructors' View of the Blended E-learning Model**

Unlike the students' FGD, the staff FGD explored the staff impression of who the students are; their preparation and experience in instructional design; their assessment of both the school internet service and those of the privately owned network service they use; what a typical day looks like in the life of a faculty since the commencement of the blended e-learning approach; the major challenges and benefits they see with using the blended e-learning model; their assessment of the model implementation in terms of its effectiveness at achieving set learning objectives, ease of use, the quality of learning, what works, what did not work and what needs to be done differently.

**Student Characteristics:** Participants put the age range of the students at 25 – 50years with about 65% below 35years of age. A majority (80%) are females and their technology literacy level as was described below average but their access to technology was adjudged okay. The students' level of motivation was equally described as slightly above average. Class workload was adjudged appropriate for class level and the students' attitude described as though averagely positive but still requires gradual change. One of the participants described the student as follows:

*The students are of varying age ranging from those in their early twenties to those in their late fifties; comprises both male and female but with more females. A large number of them are not computer literate. As touching access to technology, they were provided with tablets, power bank and SIM card but weak internet connectivity may hinder maximal use. Many displays good motivation. Their motivation may be seen as arising from two sources: (i) eagerness to become degree holders, especially now that degree certificates are being used as a criterion for promotion to certain level; and (ii) opportunity for upward educational mobility as enjoyed by their peers in the university. As per the workload, I will say the workload is light and appropriate for class level. Their attitude though largely positive may however require gradual change.*

**Staff's Preparation and Experience in Instructional Design:** It was evident from the participants' responses that many had undergone some level of training in instructional design, module

development and e-tutoring/e-moderating. Participant's utterances such as: "I have participated in workshops organised for online course design and have recorded one of my courses; and this has been uploaded online for the students"; "I have been opportune to attend a number of train the trainer workshops on e-learning and have been taught how to use the learning management system (LMS) such as Moodle and Blackboard"; readily compliment this assertion.

**Assessment of Quality of Internet Service:** Despite the effort of the school at improving the internet and intranet services within the campus, participants still complained of sub-optimal services particularly with regards to online facilitation (student-tutor/instructor interaction on the virtual learning environment). According to them the school (OAU) internet speed is fair when you connect with cord but the Wi-Fi is weak and slow in many parts of the campus and that has forced some of them to result to using private internet provider which is equally not too stable. This predicament is well depicted by statements like: "The school Wi-Fi is really bad; it's as if no connectivity at all, so I use my own modem which speed is just fair".

### **A Picture of a Typical Day in the life of Faculty since inception of the Blended E-learning Approach**

A typical day for a faculty since commencement of the blended e-learning was described as simply busy. A participant even paint a gloomier picture of what a typical day looks like. In her words, "More work and having to contend with unstable internet connectivity and inadequate power supply (electricity) makes one's day really cumbersome".

**Major Challenges Observed with the Blended E-learning Model:** The following were identified by the instructors as major challenges: (i) Internet connectivity and associated issues; (ii) Tablet related issues; (iii) Constraints with student-to-student and student-to-instructor interactivity; (iv) Manpower particularly inadequate number of tutors that are supposed to be working with the subject experts to facilitate learning. For instance, an instructor stated that:

*I have issues with Internet connectivity and cannot understand why I should be spending my hard earned income on procuring data for student's facilitation. Seriously speaking, I think CDL should look into this. Again, at the moment, I personally feel the LMS serves more or less like a repository rather than an interactive and learning platform due to the internet palaver I earlier spoke about.*

**Benefits accruing from the Use of the Blended E-learning Approach:** The consensus among participants was that the blended e-learning approach offers numerous benefits but the immediate ones include: (i) Students can access instructional material wherever they are; (ii) Saves students/learners

the trouble of travelling long distances to receive lectures with its associated risks; (iii) Liberate the instructors from the burden of coming to class every weekend; (iv) The recorded materials could be re-used in future; (v) Opens the door for more students to be enrolled i.e. improves access to university nursing education; (vi) It in a way deepens students' understanding of course content and improves the quality of learning; (vii) Offers room for improvement as course contents and proposed teaching methodology are evaluated by the quality assurance committee before being recorded and loaded on students tablets and individual lecturers have the opportunity to revise their courses in future.

**Instructors' View of the Blended E-learning Model being Piloted:** The instructors viewed the blended e-learning model from different perspectives but on the whole the following stand out as the prominent views: (i) The blended e-learning model is adjudged as largely effective; (ii) The model is believed to be easy to use except for the challenge earlier identified; (iii) The quality of learning derivable with its use was rated as good; (iv) The model was equally ranked high in terms of suitability for facilitating nursing skills but with a caveat that students must have hands on experience with life patients too.

**Instructors' Submission on what works, what did not work, and what needs to be done differently with the Blended E-learning Model**

The general feeling among participants is that the developed blended e-learning model has performed creditably well despite the few hitches and teething problems encountered during the piloting. With this approach, students had a twenty-four seven access to lecture material without having to embark on long journeys as it was the case with the erstwhile face-to-face mode, they declared. With its use, there has equally been an increased involvement in students' active participation in their own learning as well as an increase in informal learning. It was also said that the approach has aided the use of multiple teaching-learning approaches in the academic preparation of the baccalaureate nurses. The participants however noted certain lapses with the model. The following excerpts from the participants' conversation aptly attest to this:

*It works in the sense that students have easier access to the pre-recorded instructional materials but it has not worked well in the area of the instructors having to interact with the students on the LMS. Instructors need to be well trained on LMS usage and be motivated by providing them with good internet service.*

*The model/new approach has no doubt been very helpful but the poor network is making it difficult for students to have quality interaction during the course(s). Provision of a better network provider will be of greater benefit.*

## 7.2 SUMMARY

The study adopting educational action research approach explored contextual factors and antecedents (preconditions) for e-learning in Nigeria with a view to design, develop, implement and evaluate a blended e-learning model for deployment of nursing education in a resource-constrained educational setting in Nigeria. It specifically assessed the current modes of delivery of nursing education and stage of development of e-learning in nursing education at both the basic schools of nursing and universities in Nigeria; the perceptions of e-learning as a mode of teaching and learning among nursing stakeholders (nursing students, nurse academics, nurse practitioners, nursing administrators and nursing leaders). It investigated the nurses' computer literacy level, their computer skills and e-learning experiences; the contextual factors and antecedents (preconditions) necessitating the use of e-learning in nursing education in Nigeria; and the essentials for developing and testing a blended e-learning model in the Nigerian context. Lastly, it piloted the developed model for effectiveness at achieving set objectives and identified barriers to its implementation.

In order to ensure that the blended e-learning model emerging from this study generates the collaborative, cohesive and critical discourse, and other benefits inherent in e-learning rather than just being technology-led; the theoretical underpinning for the study was sought from an interplay of the Khan Framework for E-Learning; and the Garrison and Anderson's Community of Inquiry Model. This approach provided the opportunity for a perfect fusion of technology, pedagogy, context and process-related issues in the development, deployment, and evaluation of the new model, hence their consideration for this study.

The study philosophical stance is pragmatism and it utilized a combined quantitative/qualitative method of data collection. The entire study comprises three serial cycles (the assessment/exploration, development and the implementation/testing cycle), reminiscent of action research. Each cycle was a complete mini study and consisted of an iterative cyclical loop of sequential steps of problem identification, planning, acting, observing, and reflecting that necessitated the concurrent use of quantitative and qualitative research designs.

Cycle 1 (the assessment/exploration cycle) employed a complimentary quantitative/qualitative data collection approach. Quantitative data were collected with the aid of an adapted structured questionnaire administered on a cluster sample of 402 nurses selected across the six geo-political zones of Nigeria, and qualitative data gathered through key informant interviews of 16 purposively

selected information-rich nursing leaders. Nurses were drawn from both the clinical settings and the academia with virtually all cadres represented. Data analysis was done with the aid of SPSS 21 for quantitative data and NVIVO 10 for the qualitative data. Quantitative analysis employed both descriptive (Frequency count, percentage, mean) and inferential statistics (such as Pearson Chi-square and Kruskal-Wallis non parametric equality-of-populations rank test), while qualitative analysis employed content analysis technique. Both quantitative and qualitative finding were then compared before being integrated.

The development cycle (Cycle 2) utilised majorly qualitative design. Majority of the actions in the cycle revolve around critical reflection and synthesis of findings from the preceding needs assessment/exploration cycle, the use of reflective journal, brainstorming and consultation sessions with research team, the use of documentary evidences/literature and a consideration of the context (research focus, institutional readiness, available resources) to develop the theoretical blended e-learning model as well as identifying the essentials of blended e-learning model. The evolving model was critically reviewed and progressively refined before piloting.

The final cycle, the implementation/testing cycle (Cycle 3), adopted a case methodology design to pilot the developed blended e-learning model among two purposively selected arms (1st and 4th year) of the part-time bachelor of nursing science students. Two nursing courses/modules previously taught by face-to-face mode were administered using the newly developed blended e-learning model over a period of one semester. To evaluate the effectiveness of the developed model, a pre- and post-test survey was administered (Quantitative data). Focus group discussions (one among the nursing students and the other among the teaching staff) were also conducted to assess its suitability for deploying nursing education, its effectiveness, flaws and barriers to its implementation (Qualitative data). The FGDs were transcribed verbatim and analysed separately, before being combined/integrated with the quantitative data.

Results showed that the nurses' age ranges from 21 – 56yrs with a mean of  $31.2 \pm 12.8$ . There was a preponderance of females. A majority (69.4%) holds only professional diploma qualifications in nursing. The computer literacy and computer skill of the nurses were largely fair but the 34% that had poor computer literacy and the 32.8% that exhibited poor computer skill is a cause for concern, especially with the proposed adoption and use of e-learning for nursing education. Enquiry into the nurses' exposure to computer or ICT-moderated learning prior to enrolment in schools of nursing equally showed that a majority (73%) of the nurses had no prior learning experience in computer,

hence the need for inculcation of a computer appreciation programme into the proposed blended e-learning model. Analysis of the nurses' responses however revealed a generally positive perception of e-learning as a mode of teaching and learning among Nigerian nurses (79.6%). The study established a significant relationship between computer literacy and nurses' perception of e-learning ( $p < 0.05$ ). A similar statistically significant relationship was observed between the nurses' perception of e-learning and their e-learning experiences ( $p < 0.05$ ).

Results from field interviews were consistent with the quantitative findings except that a few of the key informants expressed scepticism at the possibility of using e-learning as a 'stand-alone' to gain a mastery of the affective and psychomotor domains of learning. The study qualitative data also revealed that though over time, nursing education in Nigeria has witnessed and is still witnessing a gradual paradigm shift including the inclusion of computer appreciation programme in the curriculum of the basic Schools of Nursing, slight improvement in the use of audio-visual aids, but no structured or formalised e-learning system exists. The discovery of an absolute necessity for the use of e-learning in the Nigerian nursing education system and the availability of a ready market for blended e-learning is yet another important finding of this study. This when tied with the rare display of optimism about the feasibility of blended e-learning for deploying nursing education as established in this study is quite reassuring that embarking on such venture holds great promises.

Besides, the study identified certain antecedents and contextual factors for adoption and use of e-learning for nursing education in Nigeria. The antecedents include: development and globalization; technological advancement; the internet revolution; as well as policy issues/directives from the NUC that all part-time programme and other outreach programmes should be upgraded to full distance mode programme and the newly reactivated policy that stipulates that nurses without a university degree should not be promoted to the directorate cadre. Massive demand for university education in nursing; growing dissatisfaction with diploma professional nursing qualifications among nurses; the need to enrich the learning experience of nurses undergoing ODL baccalaureate nursing programme while at the same time lessening the burden experienced by those enrolled in the programme; the ready opportunity for learning that e-learning presents for those who cannot quit their job or secure a lengthy study leave; the ease that e-learning brings into the teaching-learning process and its transformative potential; the drive for continuing professional development as desirable in this 21st century knowledge society; and status symbol cum need to move with the wind of change; stand out as some of the contextual factors.

While the aforementioned are no doubt key drivers to the development and use of e-learning in nursing education, participants cautioned that the acclaimed dividends of e-learning particularly the purported improvement in quality of learning assumes a level of excellence in the: organisation of the whole e-learning programme; the quality of the modules; and process of facilitating learning. Of note also is the understanding that the supposed ease that e-learning brings to learning is not absolute, as it is dependent on certain intervening variables. These factors include: level of computer knowledge and competency of the teacher and the students alike; electricity supply; and internet coverage. Yet significant is the unearthing of some constraints/hurdles and challenges to adoption and use of e-learning for nursing education in a typical resource-constrained environment. The constraints which are legion include: inadequate power supply; poor coverage and strength of internet signals; poverty/inadequate funding at household and national level; lack of infrastructure/poor infrastructural facility (at national and institutional level); lack of awareness of the benefits of e-learning/ignorance related issues; and low computer literacy and e-learning competencies among nurses/capacity building related issues. All these have provoked some thinking through and were factored in, in the development of the blended e-learning for nursing education in a resource-constrained setting.

The study further established the following as the essentials for developing and testing a blended e-learning model in a resource-constrained educational setting: an eye that sees possibilities, institutional readiness; good planning; support at different levels (individual, institutional, national); collaboration (holistic teamwork); 360 degree feedback, robust project management, policies and strategic direction. The developed blended e-learning model for nursing education in a resource-constrained educational setting was piloted for a whole semester (about 4months). The result of the piloting showed that the developed model was not only found suitable by both learners (students) and the instructors but largely effective at achieving learning objectives. This is entrenched by the swift improvement in knowledge recorded by the students in the post-tests; and the endorsement of its applicability and usefulness received in the conducted FGDs. It was asserted that with its use, there has been an increase students' involvement in their own learning as well as an increase in informal learning. In addition, it was said to have engender the use of multiple teaching-learning approaches in the academic preparation of the nurses. It was however not all a story of success as certain hitches were recorded. These hitches were inadequate student-student interaction and teacher-student interaction on the discussion board mainly attributable to unstable and weak internet connectivity; tablet-related issues; and need for further training of instructors on e-moderating/tutoring.

### **7.3 CONTRIBUTIONS OF THE STUDY**

The development of a blended e-learning model for a resource-constrained educational setting is a feat hitherto thought impossible in many quarters. This study has proven that it is not only feasible but doable. The study has provided baseline data on antecedents, contextual factors, the essentials and constraints associated with the development and use of a blended e-learning model in a resource-constrained educational setting in Nigeria.

The study has demonstrated in a practical way how blended e-learning could be implemented in a resource-constrained educational setting. The model when carefully implemented carries the potential of increasing access to university nursing education while at the same time lessening the burden associated with pursuance of bachelor degree in nursing in a geographically dispersed population like Nigeria. It offers the advantage for instructors and tutors to grow and become more proficient in the online teaching and learning of nursing. It equally holds the potential of facilitating life-long learning among nurses.

A long term benefit of this model is its tendency at alleviating the problem of over-enrolment at universities offering nursing in Nigeria. It has also brought about, though at a micro level, a paradigm shift from the traditional teaching-learning approach hitherto being used for deploying nursing education in the research setting to a blended pedagogical approach. It is hope that the information proffered by this study will be useful resource to policy makers on the way forward for higher education in Nigeria.

### **7.4 LIMITATIONS OF THE STUDY**

The study encountered the following limitations:

1. Working with people as it is the case in an education action research like this takes much more time than can ever be imagined, especially when working with busy individuals like lecturers. This slowed down the pace of completion of the project.
2. Related to that is the initial failure to see the bigger picture on the part of some lecturers/instructors and nurses with subsequent lack of cooperation in the course of data collection, design and testing of the developed blended learning model. Such encounters are strong enough to break even a strong spirit but for the perseverance of the principal investigator and the support and commitment of the stakeholders.



3. The Boko Haram insurgence and terrorist attacks in the North-Eastern part of Nigeria, particularly Borno, Yobe and Bauchi States, affected data collection from that part of the country. The principal investigator had to recruit and train indigenes of this part of the country who are very conversant with the terrain to collect the data from that part of the country. Despite this ingenuity, the number of participants from that region of the country still fall short of the initial number earmarked the region, thereby negatively impacting (though very minimally) on the representativeness of the sample.
4. With the benefit of hindsight, it takes much more than share brilliance and determination and resources but support at all levels (individual, institutional and nationally) to get things accomplished in a project of this magnitude and that sometimes may not come at perfect timing. That in a way rub off on the timely conclusion of this project.
5. Lastly, it was discovered that some faculty (subject experts) were not skilled in online course material development and neither were they skilled in online tutoring. As a result, course materials had to be rewritten severally and video capturing/recording repeated many times.

#### **7.5 DELIMITATION OF THE STUDY**

The study is delimited to bachelor of nursing science students enrolled in open and distance learning programme of the Department of Nursing Science, Obafemi Awolowo University, Ile-Ife and other Nigerian resource-constrained educational settings with identical characteristics.

#### **7.6 CONCLUSION**

In conclusion, the study has not only provided some guide on the development of a blended e-learning model but has successfully piloted one in a resource-constrained educational setting in Nigeria and in the process unearthing some factors that could hinder its successful adoption in the education of nurses.



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## **APPENDIX**

Appendix 1: Ethics Approval

Appendix 2: Letters Requesting Permissions / Permission Letters from Institutions

Appendix 3: Informed Consent Form

Appendix 4: Permission letters for Instruments

Appendix 5: Instruments

Appendix 6: Published Works from the Thesis and Works under Review

Appendix 7: Guidelines for Open and Distance Learning in Nigerian Universities

**APPENDIX 1**  
**ETHICS APPROVAL**



UNIVERSITY OF  
KWAZULU-NATAL  
INYUVESI  
YAKWAZULU-NATALI

Research Office, Govan Mbeki Centre  
Westville Campus  
Private Bag x54001  
DURBAN, 4000  
Tel No: +27 31 260 8350  
Fax No: +27 31 260 4609  
snymanm@ukzn.ac.za

27 March 2012

Mr EO Ayandiran (209541294)  
School of Nursing

Dear Mr Ayandiran

Protocol reference number: HSS/0228/012D  
Project title: Facilitation of the Development of Blended E-Learning Model for Nursing Education in a Resource Constrained Educational setting in Nigeria

In response to your application dated 20 February 2012, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number. Please note: Research data should be securely stored in the school/department for a period of 5 years.

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

Yours faithfully

.....  
Professor Steven Collings (Chair)  
Humanities & Social Science Research Ethics Committee

cc Supervisors: Professor NG Mtshali  
cc Academic Leader: Professor M Mars  
cc Mrs Caroline Dhanraj

1910 - 2010  
100 YEARS OF ACADEMIC EXCELLENCE

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville



**APPENDIX 2**  
**LETTERS REQUESTING PERMISSIONS / PERMISSION LETTERS FROM**  
**INSTITUTIONS**

School of Nursing,  
Howard College,  
University of KwaZulu-Natal,  
Durban, South Africa  
12th Dec, 2011.

The Deputy Registrar,  
Nursing and Midwifery Council of Nigeria,  
Abuja.

Dear Ma,


**APPLICATION FOR PERMISSION TO COLLECT DATA**

I, Emmanuel Olufemi Ayandiran, a lecturer in the department of Nursing Science, OAU, Ile-Ife, currently undergoing a doctoral programme in Nursing at the University of KwaZulu-Natal, South Africa, hereby solicit for your permission and support to collect data from members of your organization in support of my thesis titled – **Facilitation of the Development of Blended E-Learning Model for Nursing Education in a Resource Constrained Educational Setting in Nigeria**. The research is part of an ongoing effort to improve access to quality nursing education, facilitate capacity building, and enhance overall standard of nursing practice.

As the only legal, administrative, corporate, and statutory body saddled with the responsibility of maintaining standards in nursing education and practice in Nigeria, your views/input and those of members of your organization will go a long way in achieving this lofty objective. The information provided will be used for none other than the research purpose. I will therefore be grateful if you will kindly give me the necessary permission and support as required for a successful data collection. Attached is an abridged proposal of the study.

Thank you for your kind consideration and assistance.

Yours faithfully,



Ayandiran, E.O.

*RN, RPHN, BNSc, (Ife) MSc(N)(Ife)*

E-mail: [olufeman@yahoo.com](mailto:olufeman@yahoo.com); [oluayan@gmail.com](mailto:oluayan@gmail.com); [oluayan@oauife.edu.ng](mailto:oluayan@oauife.edu.ng)



(Established by Nursing & Midwifery Registration; Etc, Act. Cap. 143, Laws of the Federation of Nigeria, 2004)

## NURSING & MIDWIFERY COUNCIL OF NIGERIA

*...Promoting and Maintaining Excellence in Nursing Education and Practice*

Plot 713, Cadastral Zone, Life Camp, Gwarimpa, Abuja.

P. M. B. 21194 Ikeja, Lagos. Tel: 234-1-7746248; Website: [www.nmcnigeria.org](http://www.nmcnigeria.org), e-mail: [info@nmcnigeria.org](mailto:info@nmcnigeria.org)

*All correspondence should be addressed to The Secretary General/Registrar*

N&MCN/EDU/27/Vol.V/356

16<sup>th</sup> December 2011

**Lagos Office**

Murtala Mohammed Way,  
Central Medical Library  
Compound, Opp. Yaba  
Terminus, Yaba, Lagos.

**Bauchi Zonal Office**

20, Yakubun - Bauchi Way,  
Opp. Deputy Governor's  
Residence, Bauchi,  
Bauchi State.

**Enugu Zonal Office**

10B, Amawbia Close,  
Opposite New Haven  
Police Station, Enugu,  
Enugu State.

**Port Harcourt Zonal Office**

9, Wami Street, Oroworukwo  
Beside Oroworukwo Town  
Hall, Port Harcourt,  
Rivers State.

**Kaduna Zonal Office**

Federal Govt. Secretariat  
3rd Floor, Room 320-322  
Kaduna, Kaduna State.

**Sokoto Zonal Office**

Shehu Kangiwa State  
Secretariat, Block 4, Suite 3,  
Room 203, Sokoto,  
Sokoto State.

Ayandiran E.O  
School of Nursing,  
Howard College,  
University of KwaZulu-Natal  
Durban, South Africa

**RE: PERMISSION TO COLLECT DATA FOR RESEARCH WORK TITLED-  
FACILITATION OF THE DEVELOPMENT OF BLENDED E-LEARNING  
MODEL FOR NURSING EDUCATION IN A RESOURCE CONSTRAINED  
EDUCATIONAL SETTING IN NIGERIA**

With reference to your letter dated 30<sup>th</sup> November 2011 on the above subject, I am directed to commend your effort to undergo a doctoral programme in Nursing at this crucial time when the country is in dire need of manpower to sustain higher education in Nursing. Your request to collect data for your research work is hereby granted.

The Council wishes you success in all your future endeavours.

  
K. O. Koyejo (Mrs.)

for: Secretary General/Registrar

**Chairman: DAME (MRS) REBECCA EHOBHAYI AIKHOMU, FWACN, MJF, NLCF**  
**Secretary General/Registrar: O. A. OLANIPEKUN (MRS.)**

School of Nursing,  
Howard College,  
University of KwaZulu-Natal,

Durban, South Africa  
30th Nov, 2011

The National President,  
National Association of Nigerian Nurses and Midwives,  
Abuja.

Dear Sir,

**APPLICATION FOR PERMISSION TO COLLECT DATA**

I, Emmanuel Olufemi Ayandiran, a lecturer in the department of Nursing Science, OAU, Ile-Ife, currently undergoing a doctoral programme in Nursing at the University of KwaZulu-Natal, South Africa, hereby solicit for your permission and support to collect data from members of our noble association in support of a study titled – Facilitation of the Development of Blended E-Learning Model for Nursing Education in a Resource Constrained Educational Setting in Nigeria. The study is part of an ongoing effort to improve access to quality nursing education, reduce the stress associated with capacity building among members, and above all enhance overall standard of nursing practice.

As the umbrella professional organization for nurses that is committed not only to the welfare of its members but also the continual development of professional nursing, the views/input of our members will go a long way in achieving this lofty objective. The information provided will be used for none other than the research purpose. I will therefore be grateful if you will kindly give me the necessary assistance and support as required for a successful data collection. Attached is an abridged proposal of the study.

Thank you for your kind consideration and assistance.

Yours faithfully,

Ayandiran, E.O.

*RN, RPHN, BNSc,(Ife) MSc(N)(Ife)*

 E-mail: [olufeman@yahoo.com](mailto:olufeman@yahoo.com); [oluayan@gmail.com](mailto:oluayan@gmail.com); [oluayan@oauife.edu.ng](mailto:oluayan@oauife.edu.ng)

# NATIONAL ASSOCIATION OF NIGERIAN NURSES & MIDWIVES

Obafemi Awolowo University Teaching Hospitals Complex Branch  
Ile-Ife, Osun State, Nigeria.  
nannmoauthc@yahoo.com

*Chairman*  
**OSUNMAKINDE BUKOLA T.**  
*Secretary*  
**JAYEOLA IBITAYO O.**  
*Treasurer*  
**MRS. OGUNDEJI MARGARET O.**



*Bankers*  
First Bank Nig. Plc., Ile-Ife, Nigeria.  
Guaranty Trust Bank, Ile-Ife, Nigeria.  
Wema Bank, Ilesa, Nigeria.

*Our Ref:* \_\_\_\_\_

*Your Ref:* \_\_\_\_\_

*Date:* \_\_\_\_\_

10th December, 2011

*Vice Chairman*  
**ADEYERA  
ABIMBOLA O.**

Mr Ayandiran, F.O.,  
School of Nursing,  
Howard College,  
University of KwaZulu-Natal,  
Durban, South Africa

*P.R.O.*  
**ADEDEJI  
ADENIYI I.**

Dear Sir,

Re: FACILITATION OF THE DEVELOPMENT OF BLENDED E-LEARNING  
MODEL FOR NURSING EDUCATION IN A RESOURCE CONSTRAINED  
EDUCATIONAL SETTING IN NIGERIA: Permission to Collect Data

*Financial Secretary*  
**MRS. OWOADE  
ALICE A.**

With reference to your letter dated November 30th, 2011 on the above subject matter, I write to inform you that permission has been granted for you to collect data among nurses in relation your study titled "Facilitation of the Development of Blended E-Learning Model for Nursing Education in a Resource Constrained Educational Setting in Nigeria".

*Auditor I*  
**OLWOOKERE  
OLUWABENGA A.**

I hope the result of this study will move nursing forward in Nigeria.  
With best wishes

*Auditor II*  
**MRS OLALUWOYE  
OLUWASAYO A.**

Yours faithfully,  
  
Mr Osunmakinde Bukola T  
Chairman

All correspondence to the Secretary - Mental Health Dept. W. G. Hospital, Ilesa.

School of Nursing,  
Howard College,  
University of KwaZulu-Natal,  
Durban, South Africa.  
30th Nov, 2011

The Director,  
Centre for Distance Learning,  
Obafemi Awolowo University,  
Ile-Ife.

Dear Sir,

**APPLICATION FOR PERMISSION TO CONDUCT STUDY**

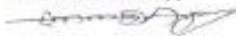
I, Emmanuel Olufemi Ayandiran, a lecturer in the department of Nursing Science, OAU, Ile-Ife, currently undergoing a doctoral programme in Nursing at the University of KwaZulu-Natal, South Africa, hereby solicit for your permission and support to conduct my study in our renowned institution. The study which is part of my PhD work is titled – **Facilitation of the Development of Blended E-Learning Model for Nursing Education in a Resource Constrained Educational Setting in Nigeria.**

E-learning is gaining an educational foothold all over the world due to a multiplicity of factors ranging from its pervasive effect on the development and transmission of knowledge worldwide, increasing inadequacy of traditional methods of education, its cost effectiveness, to mention a few. In Nigeria, the articulation of bachelor degree as the basic level of professional practice has led to many nurses with basic certification for nursing practice opting for degree programme in Nursing. This massive demand for university nursing education though ensures a ready market for higher educational institutions however has overstretched the lean nursing educational resources in the country. The immediate effects are high Student-Teacher-Ratio, etc. The challenge thus for us as institution of higher learning is that of guaranteeing access to quality nursing education pre-service and post qualification through innovative technique. The outcome of this study will give guide on how e-learning can be effectively deployed to achieve this lofty objective in a resource constrained setting and geographically dispersed population like Nigeria. The result of the study also holds the potential of bridging the digital divide, cushioning the effect of brain-drain, and above all providing a road map for nursing education and practice in Nigeria.

In essence, by this study the effort of the department of Nursing Science in conjunction with the Centre for Distance Learning to improve access to quality nursing education, facilitate capacity building, enhance overall standard of nursing practice, as well as ensuring good economic returns for our institution will receive a boost. I will therefore be grateful if you will kindly give me the necessary permission and support as required for a successful conduction of the study. Attached is an abridge proposal of the study.

Thank you for your kind consideration and assistance.

Yours faithfully,



Ayandiran, E.O.

*RN, RPHN, BNSc, (Ife) MSc(N) (Ife)*

E-mail: [olufeman@yahoo.com](mailto:olufeman@yahoo.com); [oluavan@gmail.com](mailto:oluavan@gmail.com); [oluavan@oauife.edu.ng](mailto:oluavan@oauife.edu.ng)

School of Nursing,  
Howard College,  
University of KwaZulu-Natal,  
Durban, South Africa.  
30th Nov, 2011

The HOD,  
Department of Nursing Science,  
College of Health Sciences,  
Obafemi Awolowo University,  
Ile-Ife.

Dear Ma,

**APPLICATION FOR PERMISSION TO CONDUCT STUDY**

I, Emmanuel Olufemi Ayandiran, a lecturer in the department of Nursing Science, OAU, Ile-Ife, currently undergoing a doctoral programme in Nursing at the University of KwaZulu-Natal, South Africa, hereby solicit for your permission and support to conduct my study in our renowned institution. The study which is part of my PhD work is titled – **Facilitation of the Development of Blended E-Learning Model for Nursing Education in a Resource Constrained Educational Setting in Nigeria.**

E-learning is gaining an educational foothold all over the world due to a multiplicity of factors ranging from its pervasive effect on the development and transmission of knowledge worldwide, increasing inadequacy of traditional methods of education, its cost effectiveness, to mention a few. In Nigeria, the articulation of bachelor degree as the basic level of professional practice has led to many nurses with basic certification for nursing practice opting for degree programme in Nursing. This massive demand for university nursing education though ensures a ready market for higher educational institutions however has overstretched the lean nursing educational resources in the country. The immediate effects are high Student-Teacher-Ratio, etc. The challenge thus for us as institution of higher learning is that of guaranteeing access to quality nursing education pre-service and post qualification through innovative technique. The outcome of this study will give guide on how e-learning can be effectively deployed to achieve this lofty objective in a resource constrained setting and geographically dispersed population like Nigeria. The result of the study also holds the potential of bridging the digital divide, cushioning the effect of brain-drain, and above all providing a road map for nursing education and practice in Nigeria.

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Thank you for your kind consideration and assistance.

Yours faithfully,



Ayandiran, E.O.

*RN, RPHN, BNSc, (Ife) MSc(N) (Ife)*

E-mail: [olufeman@yahoo.com](mailto:olufeman@yahoo.com); [oluyan@gmail.com](mailto:oluyan@gmail.com); [oluyan@oauife.edu.ng](mailto:oluyan@oauife.edu.ng)

**OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA**

**Our Ref:**

**Website: [oauife.edu.ng](http://oauife.edu.ng)**

**Your Ref:**

**E-mail:**

**Telephone: +234(0)8131048742**

**Date: 1 December, 2011**

Mr E.O. Ayandiran  
School of Nursing  
Howard College  
University of KwaZulu- Natal  
Durban, South Africa

**Re: FACILITATION OF THE DEVELOPMENT OF BLENDED E-LEARNING MODEL FOR NURSING EDUCATION IN A RESOURCE CONSTRAINED EDUCATIONAL SETTING IN NIGERIA: Permission to Collect Data**

Your request for permission to collect data in the course of conducting your study on "Facilitation of the Development of Blended E-Learning Model for Nursing Education in a Resource Constrained Educational Setting in Nigeria" is acknowledged. I also receive the proposal attached to the letter.

We do recognize that your work is an area of interest to us considering all our efforts in supporting distant learning education especially for nurses in clinical practice. Findings from your study should contribute to the efforts of the department and the University to advance nursing education through alternate models of education beyond the one adopting the face-to-face approach only. Working with the Centre for Distance learning of the University, I write to confirm that you are granted permission to collect relevant data through the department as may be desirable for the completion of your study.



Dr Omolola Irinoye  
Associate Professor and Acting Head of Department  
[omololaoni@gmail.com](mailto:omololaoni@gmail.com)



**APPENDIX 3**  
**INFORMED CONSENT FORM**

**UNIVERSITY OF KWAZULU-NATAL**  
**School of Nursing and Public Health**

Dear Respondent,

This informed assent form has two parts:

- Information Sheet (gives you information about the study)
- Certificate of Assent (this is where you sign if you agree to participate)

You will be given a copy of the full Informed Assent Form

**Part I: Information Sheet**

**Name of Project:** PhD Research Project

**Researcher:** Emmanuel Olufemi Ayandiran (+27 732 918 700; +234 803 3123 609)

**Supervisor:** Prof. N.G. Mtshali (+27 726 535 041)

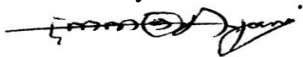
I Emmanuel O. Ayandiran, a PhD student of the School of Nursing and Public Health, University of KwaZulu-Natal, hereby invite you to participate in a research project entitled: Facilitation of the Development of Blended E-learning Model for Nursing Education in a Resource Constrained Educational Setting in Nigeria.

The research project aims at facilitating the development of a blended e-learning model for nursing education in Nigeria. You are being asked to participate because you are a nurse and because education is so essential to our development as individuals and collectively as a corporate entity. You will be asked about your knowledge of computer and e-learning experiences as well as your concerns and perception of e-learning. Through your participation I also hope to understand some contextual factors and antecedents necessitating the application of e-learning in nursing education in Nigeria. The result of this survey is expected to provide information that will be useful for the development of a blended e-learning model for nursing education in Nigeria.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain for participating in this research project. No personal details of yours will be published in the final report nor will any cross-references be made that can link the results of the questionnaire to you. Confidentiality and anonymity of records identifying you as a participant will be maintained by the School of Nursing and Public Health, UKZN.

If you have any questions or concerns about participating in this study, please contact me or my supervisor through the phone numbers listed above. It should take you no more than 30 minutes to complete the questionnaire. I hope you will take the time to complete the questionnaire.

Sincerely,



05 – 06 – 2012

**Investigator's signature & Date**

*This page is to be retained by participant*

**UNIVERSITY OF KWAZULU-NATAL**  
**School of Nursing and Public Health**

**Part 2: Certificate of Assent**

**Name of Project:** PhD Research Project

**Researcher:** Emmanuel Olufemi Ayandiran (+27 732 918 700; +234 803 3123 609)

**Supervisor:** Prof. N.G. Mtshali (+27 726 535 041)

I \_\_\_\_\_ (full names of participant)  
hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

\_\_\_\_\_  
**Signature of Participant**

\_\_\_\_\_  
**Date**

*This page is to be retained by researcher*

**APPENDIX 4**  
**PERMISSION LETTERS FOR INSTRUMENTS**

----- Forwarded Message -----

**From:** Olufemi Ayandiran <olufeman@yahoo.com>  
**To:** "bbbrieger@yahoo.com" <bbbrieger@yahoo.com>  
**Sent:** Sat, April 16, 2011 6:32:23 AM  
**Subject:**

Dear Sir,

Greetings. Delivered your message to Prof/Dr Olagoke Akintola. Though have not been able to see but said he is in the school of Psychology. The school of psychology is located on a different campus from mine. Actually, UKZN is made up of five campuses; Howard College which houses the School of Nursing, Engineering, Law, Political Science & so on is just one of them.

Sir, I need your help. You know, I told you I'm here for my PhD. My area of research interest is in the development of e-learning model for professional development of nurses in Nigeria. I am about rounding off my proposal but then run into brick wall in the area of instruments to use for answering some of my research questions. The research questions are:

- (1) What are the contents of existing continuing education programme for nurses and the modes of delivery in Nigeria?
- (2) How knowledgeable are Nigerian nurses about e-learning as a mode of learning for educational & professional development?
- (3) To what extent is e-learning mode accessible and acceptable to nurses for continuing education and professional development in Nigeria?
- (4) To what extent is a regular continuing education programme used in a face-to-face teaching or learning mode adaptable to a e-learning programme?

I have been searching on the net but have not been lucky to get any that could be adaptable for the study and all the information addressed by the questions are vital to developing an acceptable and workable model. While still ruminating on the task of developing new instruments, I just remember that it is very possible that a guru like you in health education and communication is most likely to have useful hints. It is to this end that I will appreciate if you can come to my aid sir. Thank you for your understanding and kind consideration.

Sincerely,  
[Emmanuel Olufemi Ayandiran](#),  
[School of Nursing, Howard College](#),  
[University of KwaZulu-Natal, Durban, 4041, South Africa.](#)

**From:** William Brieger [mailto:bbbrieger@yahoo.com]  
**Sent:** Saturday, April 16, 2011 8:02 AM  
**To:** Linda Bruce; Andy Lentz; Sukon Kanchanaraksa; Brian Klaas; James BonTempo; Udaya Thomas; Peter Johnson  
**Subject:** Fw: e-learning

Hi - a colleague who is doing his dissertation in South Africa wants help on identifying existing study instruments exploring e-learning needs for nurses - any references or links would be most appreciated  
- Thanks, Bill

William Brieger

<http://www.malariafreefuture.org/blog/>  
Senior Malaria Specialist, JHPIEGO -  
<http://www.jhpiego.org/whatwedo/malaria.htm>  
Professor, Health Systems Program, Department of International Health  
The Johns Hopkins Bloomberg School of Public Health  
[http://faculty.jhsph.edu/Default.cfm?faculty\\_id=90](http://faculty.jhsph.edu/Default.cfm?faculty_id=90); malaria updates at:  
<http://twitter.com/bbbrieger>

**From:** James BonTempo <[jbontempo@jhpiego.net](mailto:jbontempo@jhpiego.net)>  
**To:** Emmanuel Olufemi Ayandiran <[olufeman@yahoo.com](mailto:olufeman@yahoo.com)>; Bill Brieger <[bbbrieger@yahoo.com](mailto:bbbrieger@yahoo.com)>  
**Cc:** Linda Bruce <[lbruce@jhsph.edu](mailto:lbruce@jhsph.edu)>; Andy Lentz <[alentz@jhsph.edu](mailto:alentz@jhsph.edu)>; Sukon Kanchanaraksa <[skanchan@jhsph.edu](mailto:skanchan@jhsph.edu)>; Brian Klaas <[bklaas@jhsph.edu](mailto:bklaas@jhsph.edu)>; Udaya Thomas <[uthomas@jhpiego.net](mailto:uthomas@jhpiego.net)>; Peter Johnson <[pjohnson@jhpiego.net](mailto:pjohnson@jhpiego.net)>  
**Sent:** Saturday, April 16, 2011 2:47 PM  
**Subject:** RE: e-learning

Emmanuel & Bill,

You may find the Learning Technology Readiness Assessment tools we developed to be of some use – <http://linearityofexpectation.blogspot.com/2009/03/jhpiegolearning-technology-readiness.html>. At this point, we've used them to do assessments in about twenty institutions in 6 different countries across sub-Saharan Africa.

James

**From:** Olufemi Ayandiran [mailto:olufeman@yahoo.com]  
**Sent:** Saturday, April 16, 2011 10:45 AM  
**To:** James BonTempo  
**Cc:** Bill Brieger  
**Subject:** Re: e-learning

Dear Sir,

Thank you for this valuable resource. I have downloaded it and already going through it. I will definitely get back to you for permission to use the instrument. Thank you once again for this prompt response and assistance.

Emmanuel O. Ayandiran  
School of Nursing, Howard College,  
University of KwaZulu-Natal, Durban, South Africa.

FROM: [James BonTempo](#)  
TO: [Olufemi Ayandiran](#)  
CC: [Bill Brieger](#)  
[Message flagged](#)  
Saturday, April 16, 2011 4:59 PM

Emmanuel,

The tools are licensed w/a Creative Commons Attribution-NonCommercial-ShareAlike license which means you are free to use, redistribute and modify them as long as you attribute them to Jhpiego, use them only for non-commercial purposes, and apply the same license if you share them w/others. So, there's no need to ask for permission—you already have it!

I look forward to hearing whether or not they're useful, how they get applied (if they do) and the outcomes of your dissertation.

James

Dear Colleague,

We are attaching the requested files regarding our instrument for the computer competencies that was the source for our article: Elder, B. L. & Koehn, M. L. (2009) Assessment Tool for Nursing Student Computer Competencies, Nursing Education Perspectives 30(3), pg 148-152.

You may use the instrument for educational purposes. We request that you cite us whenever using the instrument for publication and/or research purposes. The assessment tool is in an excel format which we uploaded into our Blackboard course management testing system. The questions are categorized as nursing/non-nursing related and for the type of compute skill being tested. Students took the exam in a proctored format.

Reliability for the instrument was established using a KR 20 alpha measure as described in the article. Both of us have extensive experience teaching both computer skills courses and data management, but used textual concepts from the basic compute course for content validity.

Attachments are the:

1. Computer competencies survey
2. Computer assessment tool

We thank you for your interest in our project. We hope this will be of some assistance in your program. Please contact us if you have any questions regarding use of the instruments.

Sincerely,

Betty L. Elder, Ph.D., RN  
Associate Professor  
Betty.elder@wichita.edu

Mary L. Koehn, Ph.D., RN, ARNP  
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**APPENDIX 5**  
**INSTRUMENTS**

## E-LEARNING QUESTIONNAIRE

### SECTION A: SOCIO-DEMOGRAPHIC VARIABLE

1. Sex: Male  Female
2. Marital Status: Married  Single  Divorced   
Widow  Widower
3. Age at Last Birthday in Years: \_\_\_\_\_
4. Educational/Professional qualifications – tick all that apply  
RN  RM  RPHN  RPN  BSc/1<sup>st</sup>Degree   
Master's Degree  Postgraduate Diploma  Ph.D.   
Others (please specify) \_\_\_\_\_
5. For how many years have you been practicing? \_\_\_\_\_  
Or year when first began service: \_\_\_\_\_
6. State of Origin: \_\_\_\_\_ 7. Nationality: \_\_\_\_\_
8. Name of your Hospital/Organisation/Institution: \_\_\_\_\_  
\_\_\_\_\_
9. In what department, unit or ward do you currently work? \_\_\_\_\_
10. What is your official job title? \_\_\_\_\_

### **SECTION B: ASSESSMENT OF COMPUTER LITERACY AND SKILLS**

**Instruction:** Kindly circle the most appropriate option or rank the options as requested.

1. You are trying to insert a footnote on a paper on myocardial infarction. You hit insert - Footnote and Endnotes - Footnote. The screen splits into two screens. What should you do?
  - (a) Alt - Control - Delete because you will have to reboot the computer.
  - (b) Select normal view because you are in print view and the commands did not work right.
  - (c) Click on the text where you have been typing and try the commands again.
  - (d) Type your footnote because this is what should occur in normal view.
2. You are publishing a paper on renal failure and the editor tells you that you cannot exceed 4,000 characters. How would you know that you have met this?
  - (a) Click on Word Count and it will give you the characters.
  - (b) Once all words are spelled correctly, click on spell check and it will automatically come up each time.
  - (c) Set the document defaults to give you the character count every 20 minutes.

- (d) Do nothing; it will come up every time you save a document.
3. If you wanted to insert a picture of a heart monitor into your document, but wanted the text to surround the picture. Which of the following commands does this?
- (a) Right justify – select text.
  - (b) Left justify – insert text.
  - (c) Theme – picture – autoformat.
  - (d) Format – picture – select text style for wrap.
4. When the text is solid on both margins at both right and left side of the paragraph, this means that the document is formatted to be:
- (a) Centered.
  - (b) Justified.
  - (c) Aligned right or left.
  - (d) In columnar view.
5. You are completing a paper using APA format. APA requires a hanging indent for references. Which of the following describes a hanging indent?
- (a) The top line is moved to the right 5 spaces.
  - (b) The top line is aligned with all of the lines of the paragraph.
  - (c) The top line is indented to the right one inch.
  - (d) The top line is moved to the left 5 spaces.
6. You are charting your patient's activity for the day. Which of the following indicates you have misspelled a word?
- (a) The word converts to italics.
  - (b) The word changes to bold lettering.
  - (c) A red wavy line appears under the word.
  - (d) A question mark in a yellow box appears after the word.
7. Which of the following situations would use of thesaurus be useful?
- (a) To check the spelling of a word you don't know how to spell.
  - (b) To look for a synonym to a word you know.
  - (c) To look for a word and replace it through find - replace.
  - (d) To determine the reading level of the document.
8. You are making a drawing of departments that interact with your nursing unit and need to draw the lines to connect them. Which is the correct method of connecting your boxes with unit names?
- (a) Autoshapes – Flowchart – Arrow.

- (b) Draw – Autoshapes – Lines – Connect.
  - (c) Select the line function at the bottom and pick the one with an arrow.
  - (d) This can't be done in Microsoft Word.
9. To move text from one document to another, one must:
- (a) Hold down on the right mouse button, highlight the text, then perform a copy and paste.
  - (b) Hold down on the left mouse button, then click paste, move to the other document and click cut.
  - (c) Highlight the text, then press delete, move to the next document and undo delete.
  - (d) Hold down on the left mouse button, highlight the text, then perform a cut and paste into the new document.
10. You need to place some words into the header on a word processing document. A header is:
- (a) The first line of typing in the text.
  - (b) A line(s) above the text for page numbers and titles.
  - (c) The line of text that contains numbers down the side of a document.
  - (d) The line of text at the bottom of the page for storing footnotes.
11. When changing a bulleted list to a numeric list, press the icon on the toolbar with the numbers followed by dashes.
- (a) True.
  - (b) False.
12. Which of the following best describes a spreadsheet? It is a computer program THAT:
- (a) Is useful in creating letters and school papers.
  - (b) Stores data in locations similar to file folders.
  - (c) Assists in gaining access to the internet.
  - (d) Is helpful in tracking money and calculating numeric values.
13. Your unit manager wishes to track expenses incurred by nurses which are not charged to patients. Which of the following would be most efficient for this process?
- (a) Word processor.
  - (b) Database.
  - (c) Spreadsheet.
  - (d) Publishing program.
14. Which of the following would be the most efficient method for tracking the expenses in a project to teach school children about brushing their teeth?
- (a) Keep file folders with the receipts for each category in the file.
  - (b) Create a worksheet that categorizes the types of expenses such as mileage, wages and supplies.

- (c) Implement a form for each nursing student to total all expenses and have them submit one for each place attended to the funding agency.
  - (d) Use an adding machine to add totals for each type of expense and then submit the totals to the grant funding agency.
15. Your unit wishes to purchase a bladder scanner. You will have to make monthly payments for a \$12,000 machine. The company finances for 2 years at 5%. Which of the following would allow you to calculate this?
- (a) Format - Cells - Payment Key and fill in the blanks.
  - (b) Insert - Fx (function) - Financial - PMT (payment) and fill in the blanks.
  - (c) Insert - Table - Fx (Function) - Calculate - PMT (payment), then fill in the blanks.
  - (d) This is not a problem that can be easily calculated on a spreadsheet, so you will have to create cells and formulas for each number.
16. A program that is organized into tables for recording income, expenses, loan payments and other statistical information is:
- (a) Word processor.
  - (b) Presentation.
  - (c) Database.
  - (d) Spreadsheet
17. Which is true about the different sheets within a spreadsheet? (Note at the bottom of the boxes the sheet1, sheet2, sheet3, etc).
- (a) These are all unique files and are saved separately into different files when you save.
  - (b) These are sheets that can be used to cut and paste data from one to another within a file and are saved together when you save.
  - (c) These are sheets that cannot contain the same data, but are saved together when you save.
  - (d) These are sheets that cannot contain the same data and are saved in separate files when you save.
18. You are searching a patient database. When entering the search codes, it is essential to do which of the following?
- (a) Remember that the information is case sensitive.
  - (b) Remember that only nursing has access to patient information.
  - (c) Change the patient's name to hide the identity.
  - (d) Remember that searching is only performed on the patient's identification number, other searches are not possible.

19. Selecting patient name for a unique identifier in a database has problems, which of the following represents a problem using name?
- (a) Patients can have the same names and it would be difficult to keep the records straight.
  - (b) Patients are more likely to respond to their name.
  - (c) Most names are spelled in a specific manner so it would be easy to find the patient.
  - (d) Patients rarely use nicknames and so we could always find them under their real names.
20. You want to generate a list of names and addresses of the staff working on your nursing unit so you can mail out notices with updates and reminders. The program that is most efficient for this process is:
- (a) Database.
  - (b) Spreadsheet.
  - (c) Word processing.
  - (d) Presentation.
21. When developing a slide presentation on drawing up insulin for a diabetic, you can select to have the computer design your slides. Which command would achieve this?
- (a) File – Format – Create template.
  - (b) Tools – Customize – Template
  - (c) View – Slide Sorter – Create Master.
  - (d) Right click on slide – Apply design template.
22. Transition and animation that have been applied to a slide can be viewed in which of the following?
- (a) Print view.
  - (b) Slide show.
  - (c) Master slide.
  - (d) Slide sorter.
23. When giving a presentation, which of the following does NOT move you to the next slide?
- (a) Left click on mouse.
  - (b) Right click on mouse.
  - (c) Pressing the enter key.
  - (d) Pressing the page down key.
24. Which of the following represents a professional search engine for nursing literature?
- (a) Medline.
  - (b) Yahoo!

- (c) Google.
  - (d) Metacrawler
25. Which of the following best describes chat?
- (a) Posting at your leisure and responding to others that have left items for viewing.
  - (b) Sending an email of your answers to all the other students in the class.
  - (c) Posting at the same time that others are posting and responding to their answers.
  - (d) Viewing discussion questions that your instructors have posted and then responding later.
26. Your boss sent you an email regarding an in-service on a new ventilator for your unit. What is email?
- (a) Messaging that is sent through office mail.
  - (b) A program that allows messaging over both intranets and the Internet.
  - (c) A program to track your appointment calendar.
  - (d) Messages that can only be sent to one person at a time.
27. When attaching a document to an email. Selecting an attachment usually means clicking on what icon?
- (a) The paper clip.
  - (b) The yellow box with the question mark.
  - (c) The red letter A in the task bar.
  - (d) The picture of a floppy disk.
28. You are emailing your boss, bigboss@yourhospital.net. Which is the user name?
- (a) bigboss.
  - (b) Yourhospital.
  - (c) .net.
  - (d) The user name is not there.
29. Which of the following commands is used to duplicate the entire contents of one diskette to another diskette?
- (a) Copy disk.
  - (b) Write disk.
  - (c) Format disk.
  - (d) Change disk.
30. You wish to transfer a file you are typing to another computer. Which of the following steps would be appropriate?
- (a) Save the file - pop out the CD or disk and insert in another computer.

- (b) Save the file - close the file -pop out the CD or disk and insert in another computer.
  - (c) Use the copy - paste features of the software.
  - (d) Use the mouse to highlight the file contents - cut and paste onto the new computer
31. At the end of your shift, you are printing your report for the next shift. How do you select your printer from Microsoft Word?
- (a) File – Exit – Print.
  - (b) Tools – Print.
  - (c) File – Print.
  - (d) View – Print.
32. When printing a file or document, the property of landscape means:
- (a) The page will print from right to left.
  - (b) The page will be upside down when it prints.
  - (c) The page will print with the long side of the page going down.
  - (d) The page will print with the long side of the page going across.
33. Selection of landscape as a printing option does which of the following?
- (a) Highlights the rows and columns to be printed.
  - (b) Changes the margins of the page.
  - (c) Prints out the actual numbers and formulas, not the answers.
  - (d) Prints the spreadsheet across the widest part of the page.
34. You need to store or save patient data. Which of the following is not a storage device?
- (a) Hard disk drive.
  - (b) Monitor.
  - (c) Flash disk.
  - (d) CD-ROM-R.
35. Which of the following would best describe Windows?
- (a) A program that functions to provide word processing.
  - (b) A program that provides a graphics user interface for maneuvering through other programs.
  - (c) A program that is commonly used to store patient database information.
  - (d) A program that provides spreadsheet information.
36. When accessing a program for Windows, which of the following will not allow access?
- (a) a single click on the icon.
  - (b) A double click on the icon.
  - (c) Start-Programs-Select Program.



- (d) All of the above allow access.
37. Which of the following is an output device?
- (a) Keyboard.
  - (b) Mouse.
  - (c) Printer
  - (d) Touch Screen.
38. Rank the following with 1 being what you chose to do first, second, etc.:
- (a) Open a file.
  - (b) Turn on computer.
  - (c) Enter your password.
  - (d) Select program.
39. Your nursing unit is implementing the use of PDAs for bedside care. What are PDAs?
- (a) Personal protective equipment to protect from radiation.
  - (b) Personal Data Appliances for checking shift schedules.
  - (c) Personal Device Accessories for checking equipment.
  - (d) Personal Digital Appliances for entering data.
40. How do you save patient data to a floppy disk from a Microsoft Office Program?
- (a) File – Save – File Name.
  - (b) File – Save – Change Directory – File Name.
  - (c) File – Save As – Select A – File Name.
  - (d) File – Save As – Select Desktop – File Name.

### SECTIONS C: COMPUTER COMPETENCIES AND E-LEARNING LITERACY

**Instruction:** Please rate your skills with computers to the best of your abilities. Rate 5 for expert decreasing experience to 1 would indicate novice while 0 would be no experience or does not apply.

	Expert			Novice No Experience		
Rate your overall computer skills for						
Printing	5	4	3	2	1	0
File saving	5	4	3	2	1	0
Downloads	5	4	3	2	1	0
Using disk drives, etc	5	4	3	2	1	0
Rate your skills for the following word processing skills:						
Creating a document	5	4	3	2	1	0
Adding headers and footers	5	4	3	2	1	0
Bold or italics	5	4	3	2	1	0

Inserting page number automatically	5	4	3	2	1	0
Rate your skills spreadsheets	5	4	3	2	1	0
Rate your skills for database programs	5	4	3	2	1	0
Rate your email skills						
Sending emails	5	4	3	2	1	0
Adding attachments to email	5	4	3	2	1	0
Rate your skills for presentation software						
Developing a presentation	5	4	3	2	1	0
Adding animation or sound	5	4	3	2	1	0
Rate your skills for Internet use						
Using search engines	5	4	3	2	1	0
Finding reputable sources	5	4	3	2	1	0

Have you taken a computer course prior entering nursing school? \_\_\_\_\_

Please indicate how often, if ever, you have used or been involve in the following (mark one option per program)

Items	Several times	Once	Never	Never heard of this
A course with a website with interactive features, such as assessment, online tasks or learning materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online discussion forum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video-conferencing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Virtual learning environment such as WebCT or Blackboard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Academic support and advice from a teacher by e-mail.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### SECTION D: PERCEPTION OF E-LEARNING

**Instruction:** Please tick the relevant boxes/cells to indicate your level of agreement with the following:

Items	I totally agree	I mostly agree	I mostly disagree	I totally disagree	I do not know
Learning with ICT is demanding and very time-consuming.					
Online learning allows one to be able able to ask questions from experts and relevant people, no matter where they are.					
Good access to a tutor requires face to face contact.					
Quality information is hard to find on the web (WWW).					
E-learning/Online learning is complicated.					
E-learning allows for effective sharing of experiences.					
Traditional education method (face-to-face lecture) enhances students' understanding more than e-learning.					
E-learning will improve the quality of content and delivery of nursing education.					
Online courses, small-group learning is prone to					

Items	I totally agree	I mostly agree	I mostly disagree	I totally disagree	I do not know
disorganisation.					
Application of e-learning in nursing education will improve students' performance and competence.					
Online learning will save students' travel time and expenses.					
Online learning is lacking in 'human' interaction, since there is no face to face contact.					
E-learning fosters interactivity among learners,					
E-learning lacks the properties of being both reflective and entrenching critical discourse.					
E-learning allows graduates easier access to continuous professional development.					
E-learning widens the range of sources of information and knowledge available to students.					
Online learning enables students from remote geographical regions and developing countries to access higher education more easily.					
Application of online computer-based training will produce computer-dependent dummy nurses.					
E-learning will aid the development of a more autonomous and learner-centred approach in nursing education.					
Online learning enhances more effective and systematic feedback from students on quality of learning and teaching.					
E-learning helps in developing employability skills such as teamwork, problem-solving, self-learning capability, presentation skills, etc.					
Application of e-learning will help fill the gap of personnel shortage in nursing education.					
E-learning will not facilitate higher-order learning.					

Lastly, do you have any suggestions about how nursing institutions should support students in their use of ICT in learning?

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Thank you very much for your help.  
Your views will contribute to our insight into the best way to use ICT in learning and teaching.

## INTERVIEW SCHEDULE

### Major Interview Questions

- (1) Can you please give us a short profile of yourself (Professional status, place of work, current position etc)?
- (2) Nursing education no doubt has come a long way in Nigeria. From your experience what has been the mode(s) of delivery of nursing education in Nigeria? Have there been changes? If yes, can you share with us some of these changes?
- (3) Could you please describe the stage of development of ICT applications/e-learning in the education of nurses in your institution/organization?
- (4) What is your perception of e-learning in terms of what it is, quality of learning, ease of use, relevance, strength, weaknesses, and suitability for deploying nursing education?
- (5) In your judgment, to what extent are nurses and nursing students are (a) computer and e-learning literate, and (b) ready to adopt the e-learning solutions?
- (6) Are there contextual factors and antecedents necessitating the adoption of e-learning in nursing education in Nigeria? If yes, can you shed more light on these factors?
- (7) What factor(s) do you foresee as inimical to the development and use of e-learning model for nursing education in Nigeria?
- (8) If we are to embark on developing an e-learning model for nursing education in Nigeria, what specific suggestion do you have, in terms of design, content, and implementation?

## **FOCUS GROUP DISCUSSION (FGD) QUESTION GUIDE – FACULTY**

1. Can you describe your students in terms of:
  - a. Age
  - b. Gender
  - c. Technology literacy
  - d. Access to technology
  - e. Motivation
  - f. Workload (course & outside employment)
  - g. Attitudes towards change
2. Can you share with us any instructional design preparation and/or experience that you have.
3. How would you describe the quality of our internet connectivity in terms of speed and reliability (the school network and your privately owned network service)?
4. What is a typical day like in the life of a faculty since the introduction of the blended e-learning approach?
5. What are the major challenges that you see with using the blended e-learning model?
6. Describe any possible benefits to using the blended e-learning model.
7. How would you describe the blended e-learning programme that has just begun in terms of:
  - a. Its effectiveness at achieving set learning objectives
  - b. Ease of use
  - c. Quality of learning
  - d. Suitability for facilitating nursing skills (procedural & clinical decision-making)
  - e. Attitudes
8. Using the blended e-learning approach what will you say works; what did not work; and what do we need to do differently?

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## FOCUS GROUP DISCUSSION QUESTION GUIDE (STUDENT)

1. Can you describe your experience as a student in your current program of study with regards to:
  - a. Teaching presence (the instructors' design choices, organization of instruction, facilitation of discourse, and direct instruction).
  - b. Social presence
  - c. Cognitive presence
  - d. Informal learning (e.g., self-directed exploration, discussion with peers, etc.)
  - e. Workload (course & outside employment)
2. How is your current programme of study different from your previous experiences of learning?
3. How would you describe the methods the faculty use to assess your development?
4. Can you please shed some light on your level of access to computers within the:
  - a. School
  - b. Clinical setting
  - c. Personal
5. Please describe your experience using computers:
  - a. Work
  - b. Personal
  - c. Education
6. In your judgment, how reliable is your customized tablet in terms of functionality, ease of use, durability, quality of internet connection and speed?
7. Describe your experience and level of access to personal electronic devices:
  - a. Mobile phones
  - b. MP3 players
  - c. Television
  - d. DVD players
  - e. CD players
8. With the benefit of hindsight, compare and contrast your current mode of learning with the traditional face-to-face mode.
9. Supposing you are given a choice, would you have still preferred this blended approach to the erstwhile face-to-face mode?

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**APPENDIX 6**  
**PUBLISHED WORKS FROM THE THESIS AND WORKS UNDER REVIEW**

Emmanuel Olufemi Ayandiran\*, Omolola Oladunni Irinoye, Joel Olayiwola Faronbi, and Ntombi G. Mtshali

## Education Reforms in Nigeria: How Responsive is the Nursing Profession?

**Abstract:** Education in the twenty-first century and educational reforms are subjects of interest and discourse worldwide because of the link between education and development. What appears not to have been fully explored in the Nigerian context is the responsiveness of various professions, especially nursing, to the consistently changing educational system. Yet innovative advances in health care system in the twenty-first century demands that Nursing as a profession should prepare practitioners who are well equipped to meet the challenges of care within the context of a complex milieu. This paper, therefore, examines the Nigeria educational system, its reforms and current status of nursing education in Nigeria. Some of the challenges in the emergence of professional nursing in Nigeria and the progress made so far to advance professional as well as university education for nurses are articulated with propositions of possibilities and the gains for the Nigeria nation.

**Keywords:** Education reforms, nursing education, nursing practice, nursing profession

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### Introduction

Knowledge in the twenty-first century world is driven by information and communications technology (ICT) that results in rapid technological advancement and resolution of myriads of everyday challenges. The knowledge trend in a globalized world makes it difficult for any country to hold on to obsolete knowledge and ways of doing things. Traditionally accepted ways of doing things become obsolete so rapidly that the educational systems have to rapidly

respond to new knowledge and methods of doing things in a consistently dynamic globalised world. Advances in knowledge and rapid access to information from all parts of the world are also informing and changing the norms and values of people as well as the demands of the public on various professions. Knowledge explosion particularly has significantly influenced the education of the health professions and health care delivery system. Better understanding of the human nature and diseases, new discoveries in drug therapies, changing trend in disease patterns, changing nature of consumers of health care are all making challenges for educational reforms. In addition, market-driven economic policy, dramatic technological developments, changing demographics, and knowledge explosion are rapidly changing healthcare and educational institutions as well as creating a climate of continuous rapid change (Oermann, 1994; Lindeman, 2000; Heller, Oros, and Durney-Crowley, 2000).

With the advent of telemedicine, distance learning, e-learning, expanding diversity, emergence of better informed consumers, and increased complexity of care in a more complex environment than what was obtainable in the past, the healthcare system in the twenty-first century has also become more complex and challenging and consequently needs an educated nursing workforce who are better prepared for the expanding role of the nurse, the accelerating health care delivery changes, and the ever increasing need for community-based care (American Association of Colleges of Nursing, 2000; American Organization of Nurse Executives, 2008). All these have culminated into changing environment of nursing education and practice that have continued to influence the delivery of health care.

The implication of this is that nurse educators have to work in a world of high technological healthcare environment and must groom nurses who are committed to remaining intellectually alive in an environment of ambiguity and change (Lindeman, 2000). Consistent with this is the submission by Heller, Oros, and Durney-Crowley (2000) that the millennium has become the metaphor for the extraordinary challenges and opportunities available to the nursing profession and to those academic institutions responsible for preparing the next generation of



nurses. In their words, signal change is all around us, defining not only what we teach, but also how we teach our students. This observation is also relevant to how people learn.

It is equally pertinent to note that nursing as a practice-based discipline is also undergoing reforms all over the world such as the emergence of new theories of practice, utilization of evidence-based practice, use of e-learning in professional development of nurses, and other emerging trends in teaching and learning. Beyond this, innovative advances in health care demands that Nursing as a profession should prepare practitioners who will meet the challenges of health care within the context of a complex milieu. These observations are pertinent to taking nursing education to the university as a global agenda. Although evidence abounds of the positive impacts of university nursing education on nursing practice, there is nonetheless increasing conviction among nursing scholars that to practice as competent and confident graduate nurse, students must not stop at developing the theoretical knowledge and clinical skills, but must embrace lifelong learning as a norm. Within these emergent contexts, the twenty-first century Nigerian nurse must, therefore, learn within the dynamics of changing learning modes pre-service and in practice as her roles expand beyond being a care provider, an educator, a collaborator, a manager/supervisor, a researcher among others.

It is also important to note that reforms of professional education are products of the general education systems the world over. The dynamic nature of the education of the nurse and reforms in nursing education in Nigeria thus needs to be viewed within the context of the general education reforms of the country as well as the extent to which the progress made may be deemed sufficient for the level of professional evolution of nursing knowledge and modes of education of the nurse the world over. Besides, the multifarious nature of nursing education and the multipronged nature of entry into nursing in Nigeria make demand for its alignment with the educational system of the country. The need for a creative and innovative approach to meeting the continuing education needs of nurses especially in specialty areas of nursing practice through the instrumentally of ICT constitutes yet another driving force for reforms in nursing education in Nigeria. This paper, therefore, takes a look at reforms in Nigeria educational system and placement of nursing education; the evolution of nursing and challenges of reforms in nursing education in Nigeria; as well as the emerging issues and lessons learnt.

## Reforms in Nigeria educational system and placement of nursing education

Nigeria, the world most populous African country is a federation of 36 states and a Federal Capital Territory in Abuja. The country which became a nation in 1914 through the amalgamation of the Northern and Southern protectorates is home to various distinct cultural, ethnic, and linguistic groups, such as the Oyo, Benin, Nupe, Hausa, Fulani, Igbo, Ibibio, Tiv, etc (Nigeria Demographic and Health Survey [NDHS], 2008). With a total landmass of 923,768 square kilometres, 774 constitutionally recognized local government areas, about 374 identifiable ethnic groups and over 500 indigenous languages/dialects (NDHS, 2008), the country is obviously a multiethnic, multi-religious, multi-cultural and multi-linguistic nation. This massive diversity and complexity exert considerable influence on many aspects of the nation's indigenous cultures, including approaches to education (Federal Ministry of Education, 2005).

From the dynamics of socialization, every community in the pre-colonial Nigeria had its traditional patterns of education that ensured inter-generational transmission of cultural heritage and development of intellectual and economic capabilities. With the advent of Islam, the northern parts of the country assimilated Islamic education into the indigenous educational system while areas with strong Christian influence (the southern parts of the country) readily embraced western education (Federal Ministry of Education, 2005). The colonial education system was, however, heavily criticized as lacking in vitality and relevance (Fafunwa, 1974; Adamu, 2003; Gusau, 2008; Okonjo, 2008). This informs the series of reforms that ensued in the country's educational system; changing from the 8-6-2-3 system (i.e. eight years of primary, six years of secondary, two years of higher school certificate and three years of university) to the 6-5-2-3 system in 1954 (Gusau, 2008).

Nigeria attained independence in 1960. The new government in pursuance of a functional and quality education system that can serve as a springboard for socio-economic growth and industrial development, restructured the educational system to a new 6-3-3-4 system in 1983 (six years of primary, three years of junior secondary, three years of senior secondary and four years of university education; though professional courses like Nursing, Pharmacy, Dentistry and Medicine that are run in the university takes much longer). Twenty five years after the introduction of the

6–3–3–4 system, another reform tagged the Universal Basic Education (UBE) was introduced. The UBE that ensures that every child is kept at the elementary school for nine year, followed by three years of secondary school and four years of higher education (9–3–4), was conceived in furtherance of the attainment of the Millennium Development Goals (Charles & Adebisi, 2008; Uwaifo & Uddin, 2009).

At present Nigeria runs a three-tier system of government comprising local, state and federal governments with each tier assigned specific responsibility. In line with the constitutional provisions, the local governments have statutory managerial responsibility for primary education, with the federal and state governments exercising appropriate oversight functions (in terms of policy formulation, coordination and monitoring). Secondary schools (except “Unity Schools” and “Technical Colleges” that are administered by the federal government) are under the jurisdiction of the state governments and are run through the apparatus of the State Ministry of Education. Higher education (Colleges of Education, Polytechnics, and Universities) are regulated by the federal and state governments. The federal institutions are run by the federal ministry of education except for a few health and healthcare-related educational institutions such as the schools of nursing that are under the ambit of the ministry of health. Similarly, the state through the State Ministry of Education also administers health and healthcare-related educational institutions with a replication of control of state schools of nursing by the state ministry of health. The mission owned Schools of Nursing are, however, administered by their respective religious institutions through their hospitals. It is necessary to stress that in almost all instances, these schools are controlled by other health professions.

From the foregoing, the genuine intention and ambitious dream of successive administrations in the country to use education as an instrument par excellence for sustainable national development is quite obvious. What perhaps remains contentious is the level of achievement attained in this direction and the place of basic nursing education in the Nigerian hierarchical education system. Virtually all documents from the Federal Ministry of Education (the apex body that statutorily takes responsibility for the regulation and management of education in Nigeria) are silent on the place of hospital-based nursing programmes in the Nigeria education system; meaning that the placement of the basic nursing education programmes were not contextualized either in the previous educational systems including the 6–3–3–4 or the newly introduced 9–3–4 system. This is rather not surprising as the administration of basic nursing education from the

outset was placed under the ministry of health as against the ministry of education.

In the national educational framework, all programmes are considered within the technical and professional subgroups with appropriate recognition of placement of different levels of programmes. For examples, the ordinary national diploma (OND) awarded as the first level certificate of polytechnic education is appropriately recognized and linked with the higher national diploma (HND) in the technical sub-grouping in the educational framework. Similarly the National Certificate of Education (NCE) is a recognized professional course that has a direct link with degree programme in education in the National education framework. The nursing situation is like an antithesis of this, as the status of the hospital based basic nursing programme is neither defined nor the face value of its certificate quantified.

Within the purview of general educational reforms and the challenges in Nigeria, all professional programmes with the exception of hospital-based basic nursing evolve and still ensure growth while striving to meet international standards. The basic nursing programme still continues to face peculiar challenges orchestrated by historical antecedents of its placement in the ministry of health which is largely believed to have been a clog in the wheel of its realignment with national and international educational reforms. The aftermath is the rather slow pace of academic progression of many of these hospital-based basic nursing programme graduates. Although record has it that some other health professions in the country shared a similar background, but almost all had been mainstreamed into the educational structure of the country with members graduating with bachelor degrees that are academically recognized both locally and internationally. One cannot but then ask why the issue of nursing education in Nigeria has been that recalcitrant to change?

## Evolution of nursing and challenges of reforms in nursing education in Nigeria

Following the colonial inheritance of Nigeria, organized nursing education has passed through stages of getting people who were to practice nursing to be able to recognize equipment (“the gallipot nurses”) and obey instructions of physician (“the yes doctor” nurses), to the “technical nurses” that carry out routine tasks based on

over learnt procedures without thinking through. It has, however, evolved over time transiting from that apprenticeship, on the job, basic skills training that in the past produced the generally called “gallipot nurses” to becoming an organized school based programme with curricula that produce practitioners who are awarded certificates and university graduate nurses. In essence, Nursing and nursing education in Nigeria though started off through a non-formalized structure; ad hoc institutions to feel a vacuum (meet hospital need for trained nurses; generate additional funds for hospitals; etc) has come of age, especially with significant input from the Nursing and Midwifery Council of Nigeria (NMCN).

The NMCN is the regulatory organ for nursing and midwifery in Nigeria. The council has as its mandate: to ensure high quality of nursing and midwifery education in Nigeria, maintain high standard of professional practice and to enforce discipline within the profession. Specifically, the roles of the NMCN are related to those of designing; implementing and evaluating various nursing educational programmes; indexing; conducting examination; promoting and sustaining quality nursing care for individuals, families, as well as the society at large. Other include: monitoring standards of nursing practice in the country; registration; certification and licensure of professional nurses. In pursuance of these lofty objectives, the NMCN in 2010 articulated the structure of nursing–midwifery education that only allows for the same entry point for the various categories of programmes that ultimately guarantees every nurse the required entry point for university education. The standards finally provided the needed information to confirm the direction of nursing education in the country and also affirm the recognition of the part-time alternative for nurses who are already in practice.

While this may be no mean achievement, the placement of the hospital-based nursing programmes within the context of the Nigeria educational system has been an obvious challenge. Ndatsu (2002), the erstwhile secretary general/registrar of the NMCN for instance noted that despite the improvement in our curricula, nursing education has remained majorly hospital-based and nursing qualification has remained Registered Nurse (RN) or Registered Midwife (RM), making upward academic progression an uphill task for nurses. Ndatsu (2002) cited the experience of a number four (4) nurse of the nation who had to go through a zigzag route to obtain a higher qualification to buttress his point. He recalled that at every workshop/seminar organized by the Council, nurses have always asked for a re-examination of their professional qualifications/certificates and that many

have left the profession out of frustration and dissatisfaction because the qualifications RN, RPN, RM etc have no ready currency for entry into the general education courses in the universities, despite the quantum of knowledge acquired and the length of years invested into obtaining them. This apparent lack of face value of the nursing certificates, the tortuous academic ladder and the obvious lack of upward career mobility for nurses made the need for change and restructuring of Nigerian nursing education imperative.

Over the years, attempts to resolve this imbalance through the gateway of affiliation, assimilation, or integration of the basic schools of nursing into university degree programmes by concerned nursing leaders and successive administrations of the NMCN have yielded little or no fruitful result. The poor result is attributable to a multiplicity of factors such as stringent conditions given by universities for affiliation or assimilation, grossly inadequate number of nurses with commensurate qualification for teaching in the university, to mention a few. This possibly informs the current strategy adopted by the NMCN to link up with the National Board for Technical Education for quantification of the Nursing Certificates. Interestingly, that has yielded some positive results and basic schools of nursing have been mandated to upgrade to monotchnics.

There are, however, concerns over this move and these concerns are well intended. With the benefit of hindsight, quantification of nursing certificates though has no doubt helped to improve the face value of nursing certificates as well as the job placement of nurses at start-off point of taking jobs, it has still not provided the appropriate base for scholarly classification of nursing education, considering the evolving body of knowledge and the expected level of professional practice of nurses for the twenty-first century. Beyond the challenge of lack of a platform for upward mobility in conformity with career pathways as seen with other health professions, the demand of genuine commitment to scholarship for twenty-first century practice to meet the care needs of a highly sophisticated society and health care system makes university education the rational option for nurses.

It is, however, saddening to note that despite the obvious limitations and shortcomings of the hospital-based nursing education programmes; it has continued to wax stronger, with almost every Teaching Hospital and Federal Medical Centre within the country competing to have their own. State Governments and Missionary organizations are not left out either. As at October 2009, the NMCN puts the number of accredited basic and post basic

schools of nursing at 185. This high number of basic and post basic schools of nursing under the management of different owners again poses additional challenge for institutional dynamics and professional education of the nurse. This middle level education that produces middle level technical resource that was needed at a point in our history to meet institutional hands on needs of hospital care should have been a short-range human resource plans as university education of the nurse is the long term cost effective goal that could provide ready answer to the problem of poor access to professional and quality care for a large population of Nigerians.

It is noteworthy that the first university based nursing education in Nigeria actually dated back to 1965 when the University of Ibadan, Ibadan Nigeria began bachelors' degree in nursing. That programme was specifically designed to produce nurse educators and nurse administrators and has now outlived its relevance and it is being phased out. The need for phasing out the programme arose from two forces of change. The first is the policy directive from National University Commission (NUC) (2010) making generic nursing programme the benchmark for the nation. The second, and perhaps more fundamental reason, is the realization that nursing education at the university level should begin at the basic level, in order for it to impact more directly on the quality of nursing care and meet up with the demands of health care needs of more sophisticated and informed consumers of nursing care of the twenty-first century.

In 1973, Obafemi Awolowo University, Ile-Ife, introduced the generic bachelor of nursing science programme that has now become the gold standard for nursing education in Nigeria today. The school defined Nursing as an art as well as a science of caring and nurturance emanating from the interpersonal relationship amidst socio-cultural and value system between the care recipient and the formal caregiver. The nursing science connotes the theoretical explanation of the art of nursing and the methodological process of attaining knowledge in nursing discipline. The programme offers a broad range of courses from the humanities, social and basic sciences to courses covering all aspects of Nursing Science that culminates into the award of Bachelor of Nursing Science (BNSc).

The BNSc curriculum prepares the nurse to think effectively, to communicate thoughts, to make judgments and to discriminate among values. It prepares the nurse not only to be abreast of the psychosocial and physical factors involved in the promotion, maintenance and restoration of health but also to be able to translate these factors into meeting health needs of the people as

appropriate across the life span. Consequently, the graduate nurse from the programme will be capable of performing nursing skills contributory to resolving health problems in a variety of settings and therapeutically assisting individuals with diverse backgrounds. The BNSc. degree programme, therefore, prepares competent polyvalent nurse practitioners who can function effectively within the health care delivery system of the nation and who are guaranteed of rewarding and flexible careers in the nation's health care industry (hospital, community, and educational settings, as well as within government and non-governmental organizations).

Over time, with the involvement of private organizations in higher education in Nigeria, more universities have commenced nursing programmes to meet the challenge of university education for nurses. This put the figure of accredited universities running the full-time BNSc degree programme to 14, but in addition to this, new focused university programmes that target the graduates of the basic schools of nursing have been introduced in response to the peculiar challenge faced by the products of these basic schools who have started working and cannot afford to engage in full-time studies that requires taking a full leave of absence from job.

The two new approaches to improve access to university education for the products of these basic schools that have emerged in the last few years are from the National Open University of Nigeria programme and the BNSc part-time programme introduced by the Obafemi Awolowo University (OAU), Ile-Ife in 2004. Adebajo and Olubiyi (2008) documented that NOUN had 3,750 students in the nursing programme across the 35 study centres all over the country. The OAU programme adopting the part-time approach employs a combination of the face-to-face mode on weekends and e-learning mode to get the basic nurse graduates to earn the BNSc degree without having to quit their job. The programme that started in the 2003/2004 session has graduated the first two sets of graduate nurses totalling 150 and now has 541 students in the enrolment.

While the two approaches have been helpful, they still fall short of meeting the massive education need for continuing education and professional development of nurses post qualification. Reason being that the demand for higher and professional education in nursing in Nigeria still far outstrips the supply. As Ojo (2010) rightly observed, this presents a daunting challenge to capacity building as well as to the development and utilization of evidence-based practice and best practices in nursing in Nigeria. Akin to this is the obvious increasing inadequacy of traditional methods of education and training at

ensuring radical improvement in scope and scale of learning, and the stress that many of our geographically dispersed students in the Part-Time BNSc programme go through (many of whom have to travel long distances with its associated risks to receive lectures on a weekly basis) made the need to switch to full distance learning mode an imperative option. In response to these challenges and the new directive of Nigeria's government to promote distance learning (Abdulrahman, 2009), OAU in 2010, therefore, commenced the process of conversion of the part-time BNSc programme to full blended e-learning programme using ICT and innovative pedagogies. That process though has gone some reasonable length and is still on-going.

## Issues and lessons learnt

Nursing education in Nigeria has evolved through the observed changes in the educational set-up with first set of indigenous trained nurses who perhaps may have started their nursing training with basic education of standard six and gradually to graduates of "modern schools". This trend might explain the variation in entry requirements into various nursing curricula for nurses and for midwives. These historical antecedents also create burdens of justifying the demand for university education for nurses in Nigeria and the need for a strong science base for students opting for nursing. Entry requirements into schools of nursing that had varied from time to time and from place to place in Nigeria was also contributory to the placement of graduates of the basic schools of nursing. This is, however, not to underplay the role of Nursing and Midwifery Council of Nigeria that had not only moderated standards and established unified entry requirements into all schools of nursing in the country but had also align the entry point into schools of nursing with that of the university programmes. This removes the erstwhile assumption that schools of nursing are meant for college graduates that are not necessarily good in science and who are not also qualified to have university degrees, especially within the context of university education for professionals. Also, the unification of entry point makes advancement to degree and postgraduate programmes in nursing easy for graduates of basic schools of nursing as well as making it possible to plan professional programmes that would readily be approved by university academic organs.

Currently in Nigeria, the average nurse that passes through the basic schools of nursing spends a minimum

of seven years to earn a degree in the university unlike the university counterpart that spends five years and sit for three professional examinations that qualifies her to practice as a general nurse, a midwife and a public health nurse. This is not cost effective in any way for the products of basic schools of nursing and for the nation. While the reforms in nursing education has made it possible for the products of basic schools of nursing to gain admission into the university, the paltry number of students that gain admission into the university nursing programmes yearly continues to make many young people who ordinarily would have preferred to continue their nursing education in the university to opt for post basic nursing programmes. Yet significant is the fact that the post basic programme though offers the young nurses an opportunity to spend relatively short time to acquire certificates that can get them to work and earn money, it does not satisfy their yearning for university education especially when confronted with the stark reality of limitation in career progression without university education. The best option, therefore, appears to be that of harmonizing both the challenge and the benefits through well-designed, well organized and cost-effective distance learning programme.

Many lessons have, however, been learnt transiting from generic degree programme planned primarily for college (secondary schools) graduates to accommodating graduates of basic schools in the second year. One important lesson was the benefit of not taking the education that graduates of basic schools of nursing already have for granted as to just give blanket credits for courses already taken in previous schools. A comparative study of performances of college graduates and graduates of basic schools of nursing in the BNSc degree programme in OAU within the full-time and the part-time programme will provide an objective assessment of the performances of students with different entry points. One benefit that stands out is that it provides a ready avenue for the exposure of the graduates from the basic schools of nursing to alternative methods of learning that eschew self-motivation and self-directed learning, exploratory learning, critical reviews, intra and intergroup collaborative learning even with other professionals in the health team.

While nursing education has responded and appropriately getting realigned, though very slowly, to Nigeria's national educational structure, providing university nursing education for nurses are not without challenges. One critical challenge is harmonizing the integration of the basic nursing programme into university based education such as to reduce the number of years that graduates

spend to get the degree. Another challenge is the relative shortage of manpower in almost all the nursing university programmes. There is also the issue of university education for nurses for what? What is the ultimate goal? Is it only a status symbol or is it for a complete change that would assure high quality nursing care and better access to healthcare? After becoming a graduate nurse, what next? How do we ensure that graduate nurses are fit for purpose? Efficient and effective use of the reforms for maximal benefits thus makes demand for:

- Commitment to educational reforms that seek to meet crucial healthcare challenges with concomitant improvement in health status of the people.
- Educational reform that seeks to enhance the competence, professional relevance, and advanced practice of nurses to meet the needs of the consumers of healthcare.
- Utilization of nurses with higher education to promote critical thinking; and increased use of evidence based nursing practice. The ultimate gain of university education for the nurse is to guarantee an improved overall quality of care for consumers of healthcare. In the west, faculty–clinician roles facilitate easy transference of knowledge to practice. In Nigeria, unlike what obtains in other health professions where consultancy for faculty allows for direct supervision of care in clinical practice, healthcare institutions have always denied faculty members in nursing department the opportunity to give leadership to evidence based practice.
- The use of clinically based mentors and preceptors who have undergone higher education in nursing as students' primary role models, in order to encourage students, and where appropriate to help students

analyse and respond flexibly to individual patients' needs.

- The development of acceptable and sustainable e-learning model for furtherance of nursing education both at the undergraduate and postgraduate levels such as to facilitate continuing professional development while reducing the cost of having university degrees.
- Supported postgraduate training to enhance capacity building for academic staff to meet the standards set by the National University Commission of Nigeria.

## Conclusion

Nursing education in Nigeria has slowly moved from programmes not appropriately quantified within the context of the national educational policy and reforms to a university based programme. This discourse though lack details on the pains, inconsistencies, and confusions associated with Nigeria's educational reforms, has not only chronicled the events necessitating educational reforms in the country but has also given an insight into the long and tortuous journey of nursing education in Nigeria. It contends that while the response of nursing has been largely palpable, it needs to key into the new national orientation and develop efficient distance learning and online programmes that will guarantee access to and improve education of nurses and the nursing practice. Lastly, given the tremendous pressures facing higher education and the nature of the crisis facing the nursing profession suggestions that could reposition nursing education on the pedestal of greatness were highlighted.

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**Computers, Informatics, Nursing**  
**TOWARDS DEVELOPING A BLENDED E-LEARNING MODEL FOR NURSING**  
**EDUCATION IN A RESOURCE-CONSTRAINED SETTING: PRELIMINARY**  
**FINDINGS**  
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# TOWARDS DEVELOPING A BLENDED E-LEARNING MODEL FOR NURSING EDUCATION IN A RESOURCE-CONSTRAINED SETTING: PRELIMINARY FINDINGS

## ABSTRACT

E-learning is gaining an educational foothold all over the world. Although its growth has been phenomenal, evidence abounds that many educational institutions in resource-constrained environments are yet to take advantage of its transformative potential on the teaching and learning process. This paper reports the preliminary findings of the need assessment cycle of an educational action research geared towards building a blended e-learning model for a resource-constrained setting. The study employed a complimentary quantitative-qualitative data collection approach. Results showed that the dominant mode of delivery of nursing education in Nigeria has been the traditional face-to-face didactic teaching, clinical demonstration and hands-on practice in hospitals. There is nonetheless a generally positive perception of e-learning with 79.6% and 16.9% possessing positive and very positive perception. Results from field interviews were not only consistent with the quantitative findings but suggest a rare display of optimism for use of e-learning as a mode of teaching and learning in nursing in spite of daunting challenges. There are however concerns about the possibility of using e-learning as a 'stand-alone' to gain a mastery of the affective and psychomotor domains of learning. These findings are instructive for the development and implementation of a blended e-learning model for resource-constrained environments.

**KEY WORDS:** Computer literacy; Computer competency; Perception of e-learning; Nursing education; Resource-constrained.

## INTRODUCTION

E-learning is gaining an educational foothold all over the world.(Chikte & Khondowe, 2010; Frehywot et al., 2013; Glen & Cox, 2006; Gunasekaran, McNeil, & Shaul, 2002; Kushniruk, 2011; Ruiz, Mintzer, & Leipzig, 2006; Vaona et al., 2015) Literature is replete of its extensive use and its impact on distance learning as well as its transformative potential on the teaching and learning process.(Punie, Zinnbauer, & Cabrera, 2006; Rossett, 2002; Welsh, Wanberg, Brown, & Simmering, 2003) The multiple benefits e-learning learning which include its flexibility; convenience; great adaptability to learners' needs; cost effectiveness; increased accessibility to information; efficient transfer of knowledge anywhere and anytime, regardless of subject matter; improved quality of learning,(Manir, 2009; McPherson, 2005; Oye, Salleh, & Iahad, 2010; Ruiz et al., 2006) greater educational opportunities for students while simultaneously enhancing faculty effectiveness and efficiency;(Frehywot et al., 2013) its' potentiality to facilitate simultaneous independent, collaborative and lifelong learning experience,(Garrison & Kanuka, 2004) makes it one of the most suitable means by which distance learning is deployed in many parts of the world. Consequently, building competencies of professional practitioners through distance learning mode without moving them away from their workplaces, and supporting care through the use of Information and Communications Technology (IT) have become plausible within the context of e-learning (Ayandiran, Irinoye, Olayiwola Faronbi, & Mtshali, 2013).

However, despite the phenomenal growth of e-learning and its transformative potential on the teaching and learning process, scholars have observed that its influence in traditional educational institutions has been weak – in reality, little more than an enhancement of current practices (Britain & Liber, 2004; Garrison & Anderson, 2000; Laurillard, 2002). One factor that has been clearly implicated in this trend is the dearth of e-learning theory. Anderson, Corbett, Koedinger and Pelletier (1995) hit the

nail on the head when they declared that there are really no models of e-learning, what is rather available are e-enhancements models of learning. In more recent writings, Graham, Henrie and Gibbons (2013) making reference to the works of other scholars (Drysdale et al., 2013; Graham, 2013) decry limited efforts invested on understanding the development and use of theory in the domain of blended learning research. Ravenscroft (2001) suggests that this has made education technology-led rather than theory-led. Yet developing models and theories are essential to our perceiving and understanding of self and the world as well as the knowledge creation process.

The challenge, thus, is to develop a blended e-learning model that takes advantage of the inherent interactive and transactional capacity of the e-learning mode to drive the teaching-learning dynamic, taking cognizance of various specific contextual needs and contingencies (e.g., discipline, developmental level, and resources) without denigrating on the richness of the learning content and the attainment of higher-order learning. At the moment, no such e-learning model is in existence for nursing education in Nigeria and many resource-constrained environments. Anderson, Anderson, Borriello, and Kolko (2012) defines resource-constrained environments in terms of a range of conditions, including material issues (such as limited electricity, low-income communities, environments where power and network connectivity are scarce and expensive etc.) as well as societal conditions such as low literacy, cultures where people are not familiar with or afraid of technology broadly etc. This definition loosely depicts the situation in many low- and middle-income countries and hence its use for this study.

The observed slow pace of diffusion and assimilation of e-learning and its sub-optimal impact in resource-constrained environments like Nigeria and a number of other developing countries, (Adomi & Kpangban, 2010; Ololube, Ubogu, & Egbezor, 2007; Oye et al., 2010; Vaona et al., 2015) may therefore not be unrelated to a combination of these factors, especially the dearth of e-learning theory and e-learning implementation guiding framework. This study was primarily undertaken with a view to fill this gap and promote the use of e-learning in the delivery of nursing education in a resource-constrained setting. However, in a bid to properly situate the model; optimize its capacity, acceptance and usage; a need assessment was carried out among nurses in Nigeria. Yu, Chen, Yang, Wang and Yen (2007) indicated that needs assessment is strongly recommended at the preparatory stage of e-learning programme. Other studies have equally established a correlation between perception, attitude and behavioural intention/willingness to imbibe or adopt a new decision, be it an invention or technology (Ajzen, 1991; Ajzen & Fishbein, 1980; Yarbrough & Smith, 2007; Yusof, Kuljis, Papazafeiropoulou, & Stergioulas, 2008). This paper therefore reports some of the salient findings of the need assessment cycle.

## METHODS

### Setting

The study was conducted in Nigeria, a country with a massive landmass of 923,768 square kilometres. The 2006 Population and Housing Census puts the population at 140,431,790, with a national growth rate estimated at 3.2 percent per annum.(National Population Commission, 2014) The country's nursing education has passed through many challenging stages, some planned and predetermined and others occasioned by forces of change and serendipity, resulting in a population relatively bereft of graduate nurses. As at July 2015, there are only 21 accredited Departments of Nursing in the Nigerian universities with only four hosting postgraduate nursing programmes. This has made demands for higher education in nursing to persistently outstrip the supply.

## Ethical Consideration

Ethical clearance was obtained from the Humanities and Social Sciences Ethics Committee, Research Office, University of KwaZulu-Natal, Durban. Gatekeeper's permission was also obtained from the Nursing and Midwifery Council of Nigeria (NMCN) and authorities of institutions where data collection was done. In addition, a signed informed consent was obtained from all nurses that participated in the study.

## Instrument

Two major instruments were used for data collection. The first was a semi-structured questionnaire adapted (with permission) majorly from Elder and Koehn 'Assessment Tool for Nursing Student Computer Competencies', (Elder & Koehn, 2009) and the second was a self-developed interview schedule comprising seven (7) questions with semantic probes patterned after the 'Learning Technology Readiness Assessment Tools', licensed under the Creative Commons. The questionnaire consists of four (4) sections: A – D. Section A, developed by the investigators explores participants' demographic variable; section B assesses their computer knowledge; section C investigates their computer skills/competencies and e-learning experiences; while section D, also developed by the investigators assesses participants' perception of e-learning. The interview schedule among other things asks questions about current modes of delivery of nursing education in Nigeria; the stage of development of e-learning in nursing education in Nigeria; nurses' computer literacy and readiness to adopt e-learning; and perception of e-learning (in terms of what it is, quality of learning, ease of use, relevance, strength, weaknesses, and suitability for deploying nursing education).

## Participants and Procedure

This need assessment cycle of the study comprised two segments; the quantitative and the qualitative segments. All nurses that are registered with the NMCN formed the target population. Statistics from the NMCN showed that as at 30th June, 2011, the country has 142,422 general nurses; 97,587 midwives; 5,057 public health nurses; 3,189 nurse educators; etc. This, no doubt, is a large population, hence Cochran (1963) formula for calculating sample size for large population and the generalized scientific approximation of sample sizes presented by Sekaran and Bougie (2003) were used. Adopting Cochran (1963) the sample size for the quantitative segment (nationwide questionnaire survey) was determined to be 385, however to make room for possible incomplete response to survey questions, the sample size for the quantitative segment was estimated at 402. To select participants, the entire country was stratified into 6 regions using geopolitical zones as the basis of stratification. Two states were then randomly picked from each zone and participants selected by cluster sampling technique.

The qualitative segment employed 16 purposively selected key informants. Inclusion criteria were that the individual must be a very senior nurse who has risen to the level of a director or deputy director of nursing or the head of department or coordinator of a distance learning programme for nurses. Although the original plan was to have all the six geopolitical zones represented in the key informant interview, only four zones could be covered due to upheavals, particularly terrorist attacks (the Boko Haram insurgency) in the northern part of Nigeria. Data collection though commenced with the cross sectional questionnaire survey, was interlaced with key informant interview. The interview sessions were held one on one at preferred place, date, and time of the key informants. All interview sessions were audio-recorded with permission of the interviewee and transcribed verbatim.

## Analysis

All completed questionnaire were coded and uploaded into Statistical Package for Social Sciences (version 21) for quantitative analysis (SPSS Inc., Chicago, IL, USA). All variables were categorical

and that informs the use of the non-parametric statistical techniques. Individual participants' scores were computed for computer literacy, computer competency, e-learning experience and perception, before cross-tabulation among variables of interest were done. Relationships were tested with Chi square and Kruskal-Wallis non-parametric equality-of-populations rank test at p-value of 0.05 (level of significance).

The qualitative analysis was done using the eight-step process of qualitative content analysis described by Zhang and Wildemuth (2009). The audio recorded field interviews were transcribed verbatim, uploaded into NVivo 10 (QRS International) and then analysed. In view of the large volume of data collected, data ordering was achieved by use of codes (nodes/categories) and sub-codes (sub nodes/subcategories). Data were coded descriptively or interpretively using concepts derived from the study objective and its theoretical framework. Adopting a combination of selective coding (selection of core or essential codes that closely correspond with the phenomenon that has been observed in the field) and thematic coding (a process of identifying and formulating themes), all pieces of data that were relevant to the research questions were identified, isolated, contextualised and labelled accordingly (Bezuidenhout & Cronje, 2014; Lindseth & Norberg, 2004). Inferences were drawn from the identified themes by thinking about them (reflection) in the light of the context of the study.

### Rigour

The study employed multiple sources of data and multiple methods of data collection. Collecting data from all cadres of nurses helps in capturing the different perspectives of the reality. It also makes it possible to compare and cross-check data collected. Also, the use of multiple methods of data collection not only helps to generate rich thick information, but also engender the authentication of the information gathered.

Elder and Koehn (2009), both of whom have extensive teaching experience in computer skills and data management courses, reported that the reliability of their questionnaire was established using a KR 20 alpha measure and that textual concepts from the basic computer course were used for content validity. The adapted questionnaire was nonetheless piloted for validity and reliability among nephrology nurses at Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, with Cronbach's alpha score of 0.77, 0.94, and 0.76 for sections B, C, and D respectively before final administration.

Further, all interview transcripts were presented to the interviewees to check whether or not the account accurately depicts their perspectives. The ample time invested on data collection equally allows sufficient engagement with the data. It is good to state that interviews were stopped only when it became obvious that no new data was forthcoming (Data saturation). Coding of data was done by two researchers until consensus was reached on the emerging theme. This together with the researcher's reflexivity throughout the conduct of the study helped to enhance credibility and trustworthiness.

## RESULTS

### Quantitative Findings

Results showed an age range of 21 – 56yrs with a mean of 31.2±12.8. As typical of nurses all over the world, a majority (71.9%) are females. A majority (69.4%) also holds only professional diploma qualifications in nursing. Analysis of the participants' responses to the questionnaire showed that many 186 (46%) possess fair/moderate knowledge of computer, 78 (20%) display good/high knowledge, while 138 (34%) have poor/low knowledge.

As depicted on figure 1, a majority of the nurses 173 (43%) exhibits fair/moderate computer skill with 84 (21%) being highly skilled and 132 (32.8%) being either novice or possessing little or no computer skill. Nursing students and nurse academics (may be for reasons of use) were found to possess better computer skills than the nurse practitioners and nurse administrators. The Chi-square and the Kruskal-Wallis tests similarly established a significant relationship between nurses' designation/job status and computer skills ( $p < 0.05$ ). Further analysis revealed an association between the nurses' educational status and their computer skills ( $p < 0.05$ ). Those who had undergone university education exhibit higher computer dexterity than those who had only professional qualifications in nursing.

Results equally revealed a significant relationship between the nurses' age and their computer skills ( $p < 0.05$ ). The younger nurses (16 – 25 and the 26 – 35 years of age) were found to be more computer savvy than the older nurses. Data analysis also suggests a significant relationship between gender and computer skills among nurses ( $p < 0.05$ ); male nurses found to be more skilful than their female counterparts.

The assessment of the nurses' perception revealed a generally positive perception with 320 (79.6%) and 68 (16.9%) having positive and very positive perception of e-learning as a mode of teaching and learning (Figure 2). A statistically significant association was also found between nurses' educational status and their perception of e-learning ( $p < 0.05$ ). The more educated the nurse is, the greater the tendency to perceive e-learning positively. Enquiry into the nurses' exposure to computer or ICT-moderated learning prior to enrolment in schools of nursing showed that majority of the nurses had no prior learning experience in computer. Similarly, investigation into the e-learning experiences of these nurses revealed a relative dearth of exposure and involvement in e-learning programmes (Figure 3).

Investigation into possible relationship between computer literacy, computer skills and e-learning experiences among participants yielded a significant relationship between computer literacy and nurses' perception of e-learning ( $p < 0.05$ ). The higher the nurses' computer literacy/knowledge level, the higher the likelihood of having positive perception of e-learning. A similar statistically significant relationship was observed between the nurses' perception of e-learning and their e-learning experiences ( $p < 0.05$ ). The more exposed and involved in e-learning the nurses are, the higher the likelihood of positive perception of e-learning (Table 1). Results equally indicated a positive correlation between computer literacy and computer skills among the nurses ( $p < 0.05$ ). As the computer literacy level of the nurses increases, their computer skill also increases; meaning that the higher the nurses' computer knowledge is, the higher their probability of possessing enhanced computer skills.

### Qualitative Findings

All the key informants (information rich sources on nursing education and practice in Nigeria), except four were veteran nurse educators with wealth of teaching experience. Of the four, two were director and deputy director of clinical nursing services. The last two were formerly teachers in the Schools of Nursing (SON) before being absorbed into the establishment of NMCN.

A number of themes and sub themes emerged from the analysis of the key informant interviews. The themes and sub-themes are presented here in narrative text and supplemented with verbatim quotes from participants as needful to substantiate or buttress the discourse. Codes, 'HO' symbolising health organisation that participants work with and not their real names are used and verbatim quotes are italicised. The major themes include: the dominant mode of delivery of nursing education in Nigeria; subtle paradigm shift; under-developed e-learning system; challenges; positive perception of e-

learning and the intervening conditions/factors; issues of concern; and readiness to adopt the e-learning approach.

#### Delivery of Nursing Education

The study showed that the dominant mode of delivery of nursing education in Nigeria over the years has been the traditional face-to-face didactic teaching, clinical demonstration in laboratories and hands-on practice in the clinics/hospitals. This is evident from typical participants' comments like:

*Nursing education has primarily been face-to-face programme; students have to be on ground in the schools or university where the programme takes place. [HO 1]*

Data sources further revealed that the mode of instruction is confined to a 'brick and mortar' school setting where teachers are seen as subject experts or conveyor of knowledge, who transmit this knowledge to learners that are seen as passive recipients. Informants also noted that teaching and learning are done in three main ways. The first is the theoretical aspect [classroom-based]; second, is the self-study and research aspect [library-based] and the third, is the hands-on [laboratory-based] which mainly takes place at clinics and hospitals. This helps to equip students as they work under the supervision of a practicing nurse. Participants noted that amidst this, e-learning facilities were lacking. The comment below attest to this fact:

*Actually the mode of teaching has been face to face interaction, teacher and students in the classroom. The modern facilities were not there, so it was mainly physical interaction between teacher and students in the classroom, then after classes they now move to the library for any reference that is given to them. For the practical aspect, demonstrations are done in the school clinical demonstration rooms before they move to the hospital for application of what they have learnt in the school where they are supervised by the nurses in the clinical area and the teachers that follow them. [HO 10]*

#### Subtle Paradigm Shift

There have however been some subtle changes in mode of delivery of nursing education down the years. The gradual transition from the block unit system to semester system in some basic SON, the commencement of part-time and other outreach nursing programmes in some universities, inculcation of ICT into the basic SON curriculum; ad hoc use of PowerPoint presentations in classroom teaching, electronic course registration and results, web based assignments, etc. are some of these changes. For example, a participant said:

*....Over time, we have had another mode of face to face, so we've transited from full time face-to-face programme to having another form, where we have students come on weekends. It's like some kind of part-time programme, but it is still face-to-face. Now we have advanced to presenting our lectures using multimedia. Students now register for courses electronically and access results electronically. We are now at that level where we are not only using computers as a way of moderating our teaching-learning session, as the internet has also become a tool of getting our learners to work. [HO 1]*

Another participant noted as follows:

*Well, there have been changes in the delivery of nursing education. (1) I can say during our time when we were undergoing basic nursing training, there was nothing like ICT programme in nursing education (teaching and learning), but nowadays you find even in the curriculum the issues of computer and computer literacy and what have you. (2) And again in the conventional SON, not the University, there was nothing like semester system but now we have issues of semester system coming into play. [HO 7]*

## Under-Developed E-Learning System

Opinions about state of development of e-learning and ICT application in nursing education in Nigeria are mixed but the overarching evidence is that the use of e-learning in nursing education in Nigeria is still largely at infantile level. In addition, teachers and students engagement with ICT in the teaching-learning process has been mainly at instructivist level. Excerpts of comments from participants speak volume to this:

*The mode of nursing education in Nigeria has been majorly classroom teaching with limited use of audio-visuals and nurse tutor interaction, but over the years, there has been some injection of ICT into the lecture method and this has been upgraded to a reasonable extent.* [HO 2]

This sentiment is however not shared by all as few informants voiced that it is even non-existent in the delivery of nursing education in Nigeria. The few dissenting voices contends that whatever ICT applications that are ongoing are implemented on ad hoc basis and mainly used to supplement the face-to-face mode and as such are just mere figments of e-learning. This is reflected in the texts of participants' conversation below:

*I will say there is nothing like real e-learning yet in our institution here. The closest we have come to e-learning over the years is an improvement in our teaching aids especially audio-visual aids (projectors, laptops, television, etc.).* [HO 4]

*Although the council has given directive that all schools should embrace ICT and that indexing and registration for examinations be done online, the response rate has been low.* [HO 7]

## Challenges

While computer studies have been inculcated into the curriculum of SON and some schools have commenced computer appreciation programmes, evidence suggests a lack of continuity in the students' use of computers post course examination due to a number of challenges. Such include: a lack of policy on e-learning in nursing, low/poor computer literacy of tutors and students; technophobia; institution-related factors (Hospital-based basic SON); resistance to change tagged 'the Nigerian factor'; and instructivist-led ad hoc engagement with e-learning. The excerpts of participants' comments below aptly buttress this:

*At present, some of the tutors are not vast in the use of computer, not to talk of the students. You might even find some of the students being afraid of touching the computer.* [HO 11]

*At the moment, new students are introduced to basic computer operations and are examined on it during their first year examination. After the exams, no other ICT-related activity is undertaken by the students. Some of the teachers have basic skills of computer operation while others do not. This challenge I think may be partly associated with the nature of my institution that is a hospital-based basic school of nursing.* [HO 8]

*In Nigeria, change is not something we embrace easily and on time; so this might have contributed to the slow uptake of e-learning in nursing education in Nigeria.* [HO 7]

Other challenges reported by participants are:

*Inaccessibility to computers, poor internet connectivity, inadequate power supply, security of technology equipment in all educational institutions.* [HO 8]

## Positive E-Learning Perception and Intervening Conditions

Data reflected an overwhelming positive perception of e-learning and an aura of optimism that is almost palpable, about the feasibility of the use of e-learning in nursing education in Nigeria. This positive perception is further unpacked under the following subthemes: (a) Improved quality of teaching and learning, (b) Ease of use, (c) Reduction of expenses and (d) Relevance and readiness to adopt e-learning.

### Improved Quality of Teaching and Learning

It emerged from data that e-learning is valued as having the potential to improve the quality of teaching and learning by inculcating the culture of deep learning as against the superficial learning that occurs in the conventional face-to-face mode. Informants reported that this deep learning is facilitated through inquiry-based learning; discovery learning; self-directed learning; student-centred learning; co-constructivism; and community of inquiry approach. This is evident from the following excerpts:

*I think we need to know that there is no way we can compare the knowledge that student can gather through e-learning with that of the old method of teacher-student contact (referring to the face-to-face mode of delivery).... [HO 5]*

*E-learning enables learners and instructors to conveniently gather vast quantity of information on any subject area. It facilitates independent learning and provides a broad-base knowledge because learners can browse to get more information and enrich the content of lecture notes and/or to do assignment, an opportunity which classroom learning do not readily offer. [HO 3]*

The participants were however apt to point out that the purported improvement in quality of teaching and learning associated with e-learning assumes a level of excellence in the organization of the whole e-learning system; quality of modules; and the process of facilitating learning (Intervening conditions). For instance, when asked about the quality of learning achievable through e-learning, a participant retorted, *the quality of learning depends on how it is organised.* [HO 1] Another participant takes this further; *yea, if it is properly done, if the modules are properly built, so it depends on the quality of the module that is built. If the modules built are of good quality, then the quality of learning is enhanced.* [HO 1]

### Ease of Use

The ease that e-learning brings to the teaching-learning process is viewed variously as follows: potential for self-pace learning (opportunity to learn at own pace); greater educational opportunities for students; facilitates learners control over content; unlimited access to teachers and learning materials (referring to e-learning inherent capacity to make learning materials available twenty-four seven); convenience; offers a way out of time and spatial constraint. This is well encapsulated by the following excerpts:

*The ease it brings to teaching and learning is unparalleled as it enables students to study at their own pace as well as have access to their teachers and learning materials in the comfort of their homes. [HO 9]*

*It is much easier, both for teachers and learners. For instance, I can stay in here and still have students from all part of Nigeria. What that portend is that distance is no longer a barrier in terms of how many students I can work with. And for the learners themselves, they can manage their time and determine what time of the day they want to study or work. [HO 1]*



Further analysis however suggests that the 'ease' is not unbridled as it is dependent on computer literacy and competency of the teacher and learner. According to a participant, *the ease it brings will depend on the students' knowledge and skill in the use of computer and their internet surfing skill.* [HO 12] What is probably not said in words is that without adequate computer knowledge and skill, working with e-learning can be frustrating, if not a nightmare. Also related to the ease is adequacy of power and Internet. The quote below epitomizes the general feeling among participants:

*It is easier to use than face to face where there is regular electricity and a good internet service, because sometimes students have to travel long distances to receive lectures.* [HO 1]

#### Reduction of Expenses

E-learning is generally perceived as cost-effective. In the words of a participant from HO 3, *it is economical for the students as they do not have to travel long distances with the use of e-learning; a view held by all.*

#### Relevance and Readiness to adopt E-Learning

E-learning is seen by many as relevant for nursing education in Nigeria. The popular belief is that e-learning holds the potential to open access for further studies for generality of nurses who by virtue of their work, family commitment and limited university spaces would not have been able advance their education. This notion is exemplified by comments like this:

*I think for us in Nigeria, it is very relevant, because we have many nurses who currently hold diploma professional qualification(s) in nursing but who are yearning for university education. This category of nurses, majority of who are already employed may not be able to leave their work for economic and career reason..... Even the universities (the mortal and brick school) that we have cannot accommodate one-tenth of the population of these nurses. So for us distance learning education using electronic learning has become very relevant.* [HO 1]

Narratives from field interview equally showed that nurses are eager to adopt e-learning. It was however suggested that the nurses' enthusiasm for e-learning can be attributed to a number of factors: (1) Nurses have come to the realisation that computer has come to stay; (2) The move by some hospitals to commence electronic record keeping (Technological development in practice setting); (3) The need to lessen the stress occasioned by combining work with studies; and (4) The need to move with wind of change that is fast engulfing the entire world. The following excerpts lend support to this:

*Nurses are facing the reality particularly in the sense that many hospitals want to go into electronic health record and they have discovered that for them to be functional, they have to learn the whole process of computer literacy, their ability to study on-line and to use their knowledge online.* [HO 1]

*I feel that virtually all the nurses and nursing students will be willing to embrace e-learning because from my observation, combining part-time face-to-face weekend classes with work has been very strenuous for many of them.* [HO 3]

#### Issues of Concern

As enthusiastic as nurses are about e-learning, there are however deep-seated concerns regarding its suitability for teaching affective and psychomotor content (discipline related demands). An informant expressed that:

*Our major fear is that nursing is not just about the cognitive processes. We have some other areas like the psychomotor and the affective domains. I personally feel the affective, the behaviour, the attitude cannot be handled well through e-learning because there are still some*

*level of mentoring that teachers do even in the process of trying to pass across information and all that have always been helpful. [HO 5]*

Others drew attention to the likelihood of reduced interactivity between student and teacher and between co-students, resistance to change and vulnerability of e-learning to abuse and sharp practices like impersonation and ‘contract cheating’ (hiring people to write assignments and examinations for one). These are better appreciated in their words:

*The only snag I see there is that it limits the lecturer-student interaction. [HO 2]*

*Change is not something we embrace easily and on time in Nigeria. [HO 7]*

*You know one fear that people have always expressed have to do with how are you sure that the person who has registered for a course, is actually the one that is taking the course. [HO 1]*

### Expected Outcome

In view of the observed flaws of e-learning, the discipline related demands and other limitations of resource-constrained setting, the blended e-learning approach was therefore suggested for nursing education in Nigeria. This is substantiated as follows:

*It is no big deal to run classrooms online. The areas that we think more critically about has to do with the practical side and the affective dimensions of nursing, which has to do with how to help learners to acquire appropriate attitude and also to acquire appropriate skills. To be able to manage that, what people do is to combine e-learning with some level of face-to-face that will allow for one on one interaction. [HO 1]*

### Discussion

Haythornthwaite and Andrews (Haythornthwaite & Andrews, 2011) contend that e-learning is more than just an environment or site for conventionally conceived learning, rather it is a new practice that calls for a new theoretical perspective. Besides, it has been observed that designers of online courses faced with a growing number of disciplines and an ever changing array of new media are often confused about how to integrate these technologies into online learning environments in ways that will enhance student learning of diverse content. (Shea & Bidjerano, 2009) This underscores the importance of theory and model development in field of e-learning.

The present study has shown that computer literacy and computer skills of Nigerian nurses are largely fair, but the 34% and 32.8% that recorded poor computer literacy and competency respectively is quite substantial. This though represents a slight improvement over the 37.8% reported to be IT novice in Irinoye, Ayandiran, Fakunle, and Mtshali (2013) study among nurses in a Teaching Hospital, South West Nigeria, is still a cause for concern. An earlier survey conducted in the United States (US), had equally reported significant gaps in knowledge and skills of computer and information literacy application among nurses. (McNeil et al., 2003) Similar results were established by Wilbright Haun, Romano, Krutzfeldt, Fontenot and Nolan (Wilbright et al., 2006) in their study on computer use among nurses and nursing support staff in an urban university hospital, USA.

The study also established a relative dearth of exposure to and involvement in e-learning programmes among Nigerian nurses. This may explain Ajuwon’s (2003) finding of scarcity of studies on the extent to which Nigerian health sciences students use the computer and the internet. This nonetheless may not be peculiar to Nigeria. For instance, Fetter (2009) established in Australia that little is known about nursing students’ experiences with IT in clinical practical. Our qualitative findings were not only consistent with the quantitative findings but have helped to further unpack the possible

implications of this relatively low computer literacy for the development and use of e-learning in nursing education in a resource-constrained setting like Nigeria. Flowing out from that discovery is the call for inculcation of a short term computer appreciation programme in the evolving blended e-learning programme for nurses in Nigeria.

Another important finding of the study is the revelation of an absolute necessity for the use of e-learning for nursing education in the Nigerian context and the availability of ready market for it. What that implies is that embarking on such venture is a worthwhile exercise. Besides, the high display of optimism and the generally positive perception of e-learning among these nurses give a ray of hope about the feasibility of the programme. Indeed the qualitative data provides a balanced view of the nurses about e-learning education in nursing. These findings were loosely congruent with the results of a Taiwanese study by Yu, Chen, Yang, Wang and Yen (2007) that concluded that e-learning is a feasible and valuable learning model that is worth making generally available to public health nurses, and indeed, to all health care professionals. Previous studies have equally demonstrated that majority of nurses display positive attitude and perception to IT (Irinoye et al., 2013).

Participants were however apt to advise that the acclaimed dividends of e-learning particularly the purported improvement in quality of learning assumes a level of excellence in the: organisation of the whole e-learning programme; the quality of the modules; and process of facilitating learning. Of note also is the understanding that the supposed ease that e-learning brings to learning is not absolute, as it is dependent on certain intervening variables. These factors include: level of computer knowledge and competency of the teacher and the students alike; electricity supply; and internet coverage. An immediate lesson is that all these have to be factored in when making decisions on the best way to engage e-learning in a resource-constrained setting.

Yet significant is the unearthing of challenges that may come with adoption and use of e-learning for nursing education in a typical resource-constrained environment. Some of these challenges are discipline-related (e.g. the concerns about the suitability of e-learning for teaching affective and psychomotor contents) while others are environmental-related such as the possibility of reduced interactivity between student and teacher and between co-students and resistance to change. This no doubt, has provoked some thinking through on the best way to engage the e-learning platform in a resource-constrained setting. An immediate outcome of this rethinking and exploration is the consideration of a blended e-learning approach for the education and training of nurses in Nigeria.

## Conclusion

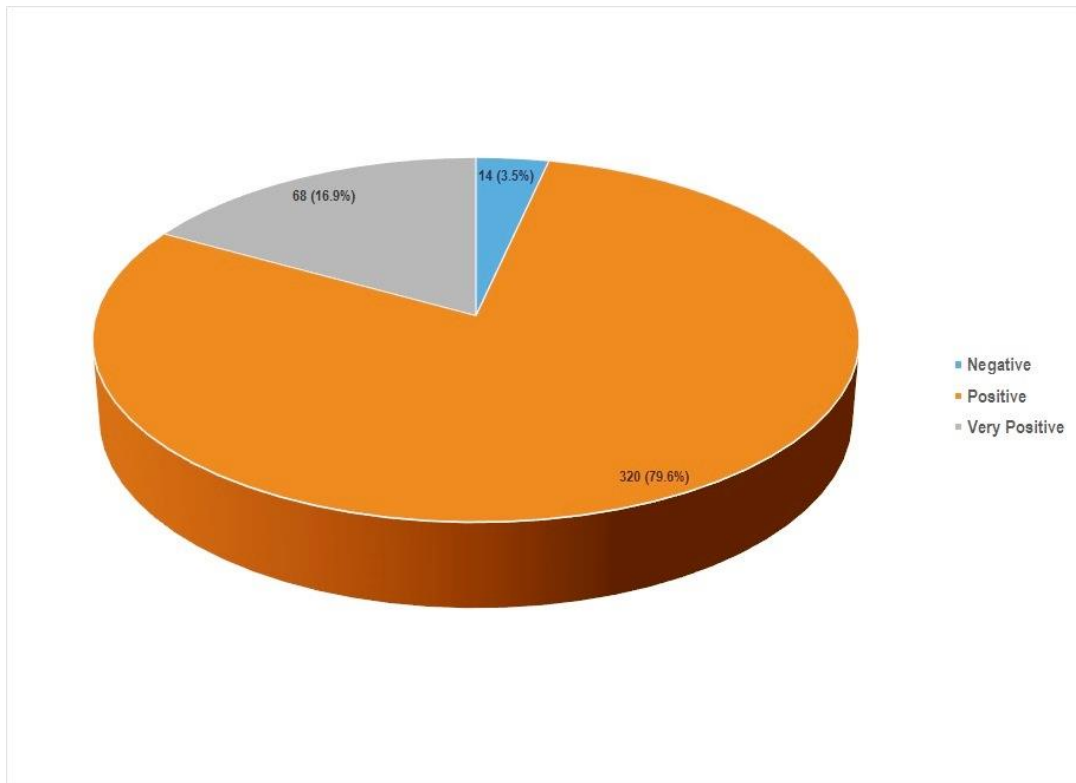
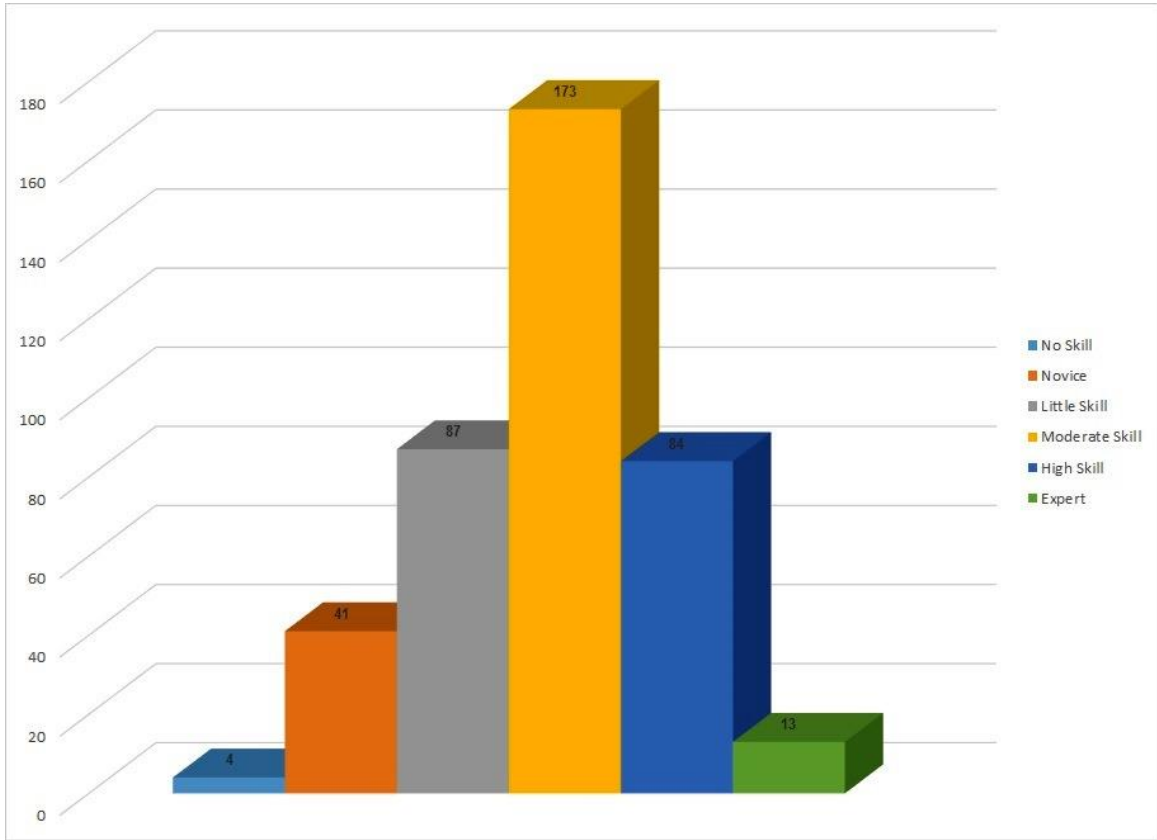
The study has revealed a generally positive perception of e-learning and a high feasibility for its adoption in the education of nurses in a resource-constrained setting. It has also provided the much needed insight into possible challenges of engaging e-learning platform in the education and training of professional nurses. Furthermore, the outcome of the study has provided some guide in development and successful implementation of blended e-learning programme for nursing education in a resource-constrained setting.

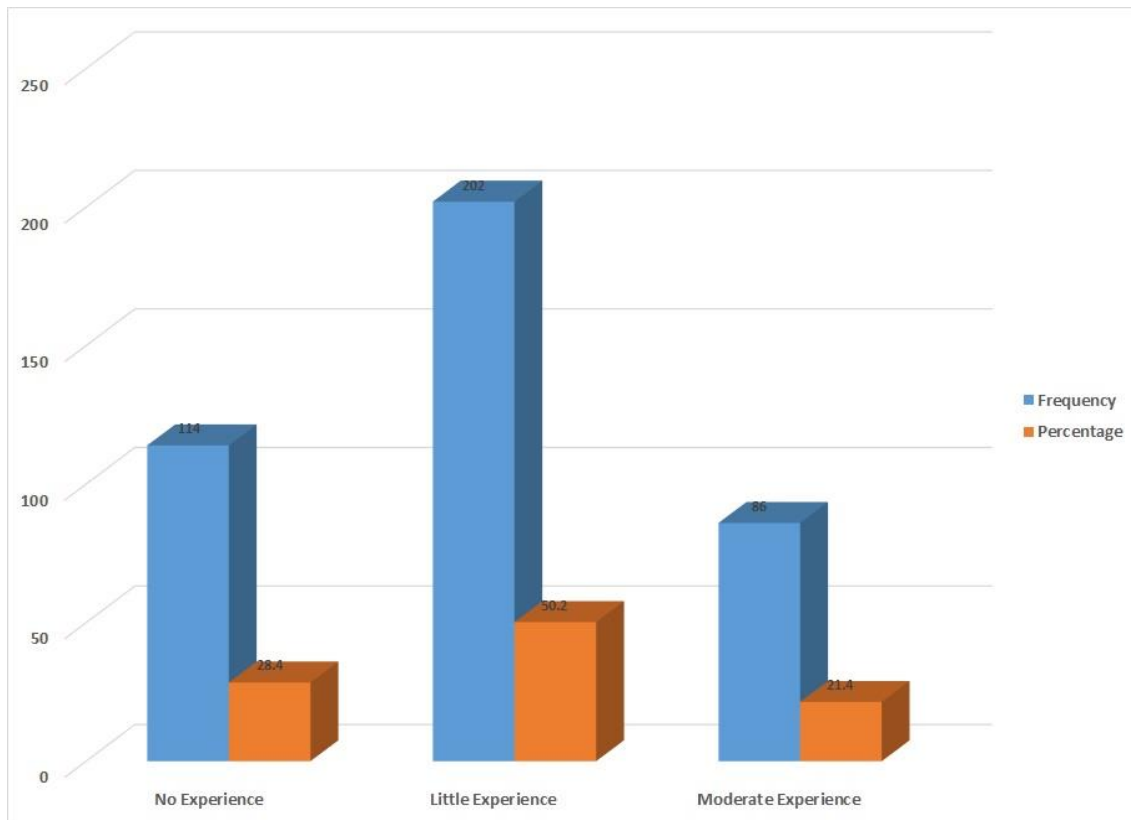
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**Table 1: Cross Tabulation of Computer Literacy and Experiences of E-Learning with Perception of E-Learning among Nurses**

Computer Literacy	Nurses' Perception of E-Learning							
	Negative	Positive	Very Positive	Total	Pearson Chi-square ( $\chi^2$ ) p-value <sup>i</sup>	Fisher's Exact p-value	Median (IQR <sup>i</sup> )	p-value <sup>ii</sup>
Poor / Low	6	121	11	138	0.0001	0.0001	73 (66-79)	0.0001
Fair / Moderate	5	151	30	186			75 (69-83)	
Good / High	3	48	27	78			82.5 (73-89)	
<b>Total</b>	<b>14</b>	<b>320</b>	<b>68</b>	<b>402</b>				
Experiences of E-Learning	Nurses' Perception of E-Learning							
	Negative	Positive	Very Positive	Total	Pearson Chi-square ( $\chi^2$ ) p-value <sup>i</sup>	Fisher's Exact p-value	Median (IQR <sup>i</sup> )	p-value <sup>ii</sup>
No Experience	2	95	17	114	0.020	0.028	76 (70 – 84)	0.0487
Little Experience	11	163	28	202			74 (67 – 83)	
Moderate Experience	1	62	23	86			78 (71 – 87)	
<b>Total</b>	<b>14</b>	<b>320</b>	<b>68</b>	<b>402</b>				

i: Interquartile range (IQR)

ii: Kruskal-Wallis non-parametric equality-of-populations rank test

**GUIDELINES FOR OPEN AND DISTANCE LEARNING IN NIGERIAN UNIVERSITIES**



## NATIONAL UNIVERSITIES COMMISSION



### **GUIDELINES FOR OPEN AND DISTANCE LEARNING IN NIGERIAN UNIVERSITIES**

#### **PREAMBLE**

The Nigerian National Policy on Education has over the years recognized the place of open and distance learning in achieving life long education and affirms that life long education shall be the basis of the nation's education policy. It went further to state that at any stage of the educational process after junior secondary education, an individual shall be able to choose between continuing full-time studies, combining work with study, or embarking on full time employment without excluding the prospect of resuming studies later.

According to the policy document, the goals of open and distance education are to:

- Provide access to quality education and equity in educational opportunities for those who otherwise would have been denied.
- Meet special needs of employers by mounting special certificate courses for their employees at their work place.
- Encourage internationalization especially of tertiary education curricula.
- Ameliorate the effect of internal and external brain drain in tertiary institutions by utilizing experts as teachers regardless of their locations or places of work.(NPE, 2004)

However, a critical appraisal of the scope of open and distance learning practice at any level of education in Nigeria against the backdrop of the long-standing recognition of its potential for increasing access to education for all socio-cultural groups, unfortunately, reveals a glaring mismatch between policy and practice even in the face of obvious and widely acknowledged perennial inadequacies of the conventional face-to-face mode, in meeting the higher educational aspirations of a large number of Nigerians, especially in the university sub-sector.

## **OPEN AND DISTANCE LEARNING IN THE NIGERIAN UNIVERSITY SYSTEM**

### **Situation analysis**

The reality in the Nigerian university system is that there is the need to distinguish between open learning and distance education. True openness especially in terms of entry requirement is to be considered a longer-term objective against the backdrop of the reality in the nation's university education scenario which is characterized by perennial mismatch between the demand and supply side of the access equation. The current situation is that there are thousands of young qualified candidates seeking university admission who cannot be absorbed into the nation's universities.

An analysis of the state of ODL in the Nigerian university system reveals that :

- The National Open University of Nigeria (NOUN) is currently the only Uni-mode university mandated for Open and Distance Learning in the delivery of university education.
- There are about six universities which may be regarded as dual-mode universities with limited capacity to deliver degree programmes by the open and distance learning (ODL) in addition to the conventional face-to-face mode
- All stakeholders agree that the practice of distance learning by these dual mode universities is far below acceptable best practice and that at best, they are in transition from the running of part-time/ sandwich courses to distance learning

## **RATIONALE FOR OPEN AND DISTANCE LEARNING GUIDELINES**

In order to bring the Practice of distance learning up to speed with global practice, it is incumbent on NUC as the statutory quality assurance agency in the Nigerian university system, to streamline the practice of distance learning by stipulating a code of good practice.

Such a document should clearly enunciate performance standards pertaining to the entire gamut of teaching and learning by the ODL mode including learner support which is a critical success factor in open and distance learning;

## **Eligibility to offer degree programmes by the ODL mode**

It is within the purview of the guidelines to stipulate eligibility criteria for Nigerian universities intent on offering degree programmes by the ODL mode..

Effective from the date these guidelines become operational:

- All existing dual mode universities shall apply to NUC for re-validation / accreditation as ODL institutions
- All universities interested in offering degree programmes by the ODL mode shall apply to NUC in writing indicating the academic programmes and the specific academic discipline(s) they intend to offer by the ODL mode.
- Interested universities shall complete the necessary application formats indicating the human and material resources including learner support facilities available to guarantee sustainable teaching and learning
- Such universities shall be evaluated by a panel of ODL experts from within and outside the Nigerian university system for purposes of accreditation to offer ODL programmes.

Only universities accredited to offer degree programmes shall be granted approval to run degree programmes in the specific academic discipline(s) in which they have verifiable competence

### **Scope of ODL activities (academic disciplines to be taught)**

Cognizant of the need to contextualize the applicability of the various ODL delivery modalities, the ODL mode shall not be applicable to academic disciplines in a university that does not have capability for that discipline.

In view of the nation's present technological and infrastructural challenges, the academic disciplines which may be offered by the ODL mode within the short to medium -term (2009-2015) are :

- Education
- Administration /Management Sciences
- Social sciences
- Arts/Humanities
- Sciences and Applied Sciences

The ODL guidelines in the Nigerian university system stipulate as follows:

### **Entry requirements/ students**

- All entrants into degree programmes offered by ODL must meet the minimum national requirements for university registration

### **The nature of ODL**

- For all academic programmes to be taught by ODL, interactive texts shall be at the heart of teaching and learning. These shall be supplemented with other resources such as: CDROM: DVD: or USB sticks to deliver; e-books, simulations, assessment etc
- ODL means that students should not be required to attend classes or have face-to-face contact, unless there are compelling reasons to justify it. Such as Examinations, periodic facilitation and practicum.

## Delivery

- ODL programmes shall be predicated on a pedagogy that is led by resources and not reliant on face-to-face intervention
- students should be able to register to study anywhere in Nigeria or any part of the world with a common standard of service at any study centre
- The study centre system should offer both academic and social support. Study centres should act as the focal points of learning communities and have agreed standards of accommodation in facilities and equipment.
- Collaboration between providers, e.g. in 'university centres' will offer a cost effective means of providing study centres.
- Students should be expected to be able to have access to ICT to assist their learning. For specific programmes, functional internet access would be required for all study centres
- Assessment will include continuous assessment (a minimum of one marked assignment for each 40 hours of study ) as well as summative assessment, e.g. exams , portfolios, that provide for validation of achievement
- It is expected that assessment tasks will occupy a minimum of 10% of study time. The course score should depend on both the continuous and final assessment.
- Effective marking and feedback require rapid return – a target maximum of 3 weeks is appropriate but ICT may allow this to be reduced. Such standards will be necessary to ensure ODL awards have a high reputation.
- Loading on staff may be reduced by the use of automatically marked ICT-based Assignments.

## GENERAL GUIDELINES

The guidelines for best practice in ODL, shall cover the following aspect :

- Philosophy

The Philosophy should include clear statements on :  
Accessibility;  
Flexibility; and  
Lifelong learning

- Objectives

The Objectives of the programme should be well articulated

- Admissions

All entrants into degree programmes offered by ODL must meet the minimum national requirements for university admission

- Curriculum

- The curriculum for each academic programme to be offered by ODL shall be congruent with the approved MAS/ BMAS for the programme. The learning outcomes shall be clearly articulated in terms of competencies, skills and behavioural attributes

- Pedagogy

- Learning objectives should be well defined
- Pedagogy should be appropriate to meet the Learning objectives
- For all academic programmes offered by ODL, well written Study guides should lead study
- Programmes should be updated at appropriate frequency

- Learning resources should :

- Be tailored to ODL, i.e are interactive, comprehensive, accessible, contemporary etc.
- Make appropriate use of media and ICT.
- Meet international quality standards.

- Evaluation and assessment

- Continuous assessment should be well entrenched to promote learning through feedback and should include tutor marked assignments(TMAs )

- and Computer marked assignments(CMAs) appropriate to the programme.
- Evaluation and assessment should include Summative assessment that validate achievement of Learning objectives
  - Evaluation and assessment process should have demonstrable integrity
  - External moderation should be an integral part of the evaluation and assessment process
- Staffing
    - There should be adequate qualified faculty for programme leadership, resource and assessment generation, and tutor monitoring- normally a minimum of 6 academic staff should be associated with each academic programme but staff may also be associated with other programmes
    - Academic staff mix-by-rank should comply with the NUC guidelines of Professorial cadre: Senior Lectureship: Lecturer 1 and below in the ratio of 20:35:45 for comparability of quality and standard.
    - Staff should be appropriately skilled in terms of subject and ODL pedagogy.
    - Student advisers should be available for information, assistance and guidance (IAG)
    - There should be a Minimum of 2 administrative staff for not more than a cluster of four academic programmes.
    - The institution should have the ability to demonstrate technical support ( in-house or outsourced)
    - Each study centre should be staffed in line with national policy (at least a Senior Lecturer) including IT support staff.
  - Academic learner support
    - Each academic programme should have adequate tutor:student ratio, normally 1:50
    - Tutors should be trained or have validated ODL qualifications ( through orientation, seminars, on-line workshops, conferences on ODL programmes).
    - Channels of communication should be diverse and cater for student need, i.e. surface mail, phone, email etc.

- Marking and feedback meet international standards.
  - Feedback on assignments and examinations should be prompt (within 3 weeks and within 10 weeks respectively) and should reflect areas of students' weaknesses, strengths and appropriate corrections
- 
- Information, advice and guidance IAG
    - Facilities for IAG should be consistent with institutional policy and Learner Support Framework that reflect national policy and best practices.
    - Programme specific IAG should be available (including Student counselling services)
- 
- Administration
    - There should be verifiable evidence of strong general logistics to support the academic programmes of the ODL centre.
    - There should be verifiable evidence of availability of special institutional support (e.g. advice, software, power supply) that has particular relevance within the programme
    - There should be a robust Management information System (MIS) that enables programme monitoring
- 
- Efficiency
    - There should be verifiable evidence of input and output of established students enrolled in each of the academic programmes



## Accreditation of ODL Programmes

### Programme accreditation

The Table below lists the programme attributes that would be evaluated with respect to approved ODL programmes at accredited ODL institutions/centres.

These performance indicators concentrate on programme specific concerns including some aspects of institutional accreditation carried forward from the Institutional process.

Attribute	Description	Weight	Comment
Philosophy and Objectives	• Consistency with University policy	1%	
	• Objectives are clearly stated	1%	
	• Clearly stated and consistent with ODL philosophy	1%	
	<b>Sub-total</b>	<b>3%</b>	
Admissions	• Consistent with the national minimum admission requirements	3%	
Curriculum	• Consistent with MAS	5%	
Pedagogy/ Learning Resources	• Learning objectives(LOs ) must be well defined in Self Learning Materials(SLM)	3%	
	• Pedagogy used in SLM is appropriate to meet the LOs	3%	
	• Study guide leads the learner to use the SLM effectively	3%	
	• SL material are updated frequently at least once every 5 years	2%	
	• SLM are tailored to ODL, i.e. interactive, comprehensive,	5%	

	<p>accessible, contemporary, learner friendly.</p> <ul style="list-style-type: none"> <li>• LR reflects the use of ICT. 5%</li> <li>• LR are of international standards. e.g. e-learning 2%</li> <li>• LR relevant to the programme are provided e.g. labs, studios, practice placement 5%</li> <li>• Creativity/innovation in LR provision 2%</li> </ul> <p style="text-align: center;"><b>Sub-total</b> <b>30%</b></p>	
Evaluation and assessment	<ul style="list-style-type: none"> <li>• Continuous assessment that promotes learning through feedback – meets national standards of contact , includes Tutor marked assignments(TMAs ) and Computer marked assignments(CMAs) appropriate to the programme. 3%</li> <li>• Summative assessment that validates achievement of Learning objectives 3%</li> <li>• Process has demonstrable integrity e.g. quality of examiners, examination approval procedures, exam misconduct, etc. 2%</li> <li>• There is evidence of external moderation 2%</li> </ul> <p style="text-align: center;"><b>Sub-total</b> <b>10%</b></p>	
Staffing	<ul style="list-style-type: none"> <li>• Adequate qualified faculty for programme leadership, resource and assessment generation, and tutor monitoring- normally a minimum of 6 associated with programme. Although Staff may also be associated with other programmes. 3%</li> <li>• Faculty appropriately skilled in terms of subject and ODL pedagogy. 2%</li> </ul>	<p>IAG Staff ratio to be determined</p> <p>Some programmes may require additional technical staff – these may be scored under the IAG heading</p>

	<ul style="list-style-type: none"> <li>• Student advisors (IAG) should be available.</li> <li>• Minimum 2 admin staff for a maximum of 4 programmes and ability to demonstrate technical support in-house or outsourced.</li> <li>• Study centres staffed in line with national policy (Leader at least a Senior Lecturer) including IT support staff.</li> </ul>	<p>2%</p> <p>1%</p> <p>2%</p> <p><b>10%</b></p>	
Academic learner support	<ul style="list-style-type: none"> <li>• Adequate tutor: student ratio, normally 1:50</li> <li>• Tutors have relevant ODL training through workshops, conferences, seminars on ODL.</li> <li>• Channels of communication are diverse and cater for student need, i.e. surface mail, phone, e-mail etc.</li> <li>• Marking and feedback meet international standards.</li> <li>• Feedback on assignments and examinations are prompt (within 3 and 10 weeks respectively)</li> </ul>	<p>3%</p> <p>3%</p> <p>3%</p> <p>3%</p> <p>3%</p> <p><b>15%</b></p>	
Information, advice and guidance IAG	<ul style="list-style-type: none"> <li>• Consistent with institutional policy and Learner Support Framework that reflect national policy.</li> <li>• Programme specific IAG available. Including Student counselling service</li> </ul>	<p>5%</p> <p>5%</p> <p><b>10%</b></p>	Learner Support Framework should list the required interactions and IAG capabilities
Administration	<ul style="list-style-type: none"> <li>• Verifiable evidence of strong general logistics to support the academic programmes of the ODL centre.</li> </ul>	<p>1%</p>	

	<ul style="list-style-type: none"> <li>• Availability of special institutional support (e.g. advice, software, power supply) that has particular relevance within the programme.</li> </ul>	2%	
	<ul style="list-style-type: none"> <li>• A robust Management Information System (MIS) that enables programme monitoring</li> </ul>	2%	
	<b>Sub-total</b>	<b>5%</b>	
Efficiency	<ul style="list-style-type: none"> <li>• Verifiable evidence of input and output rates</li> </ul>	4%	
Employer feedback	<ul style="list-style-type: none"> <li>• Feedback from employers of graduates</li> </ul>	3%	
Viability	<ul style="list-style-type: none"> <li>• Assessed through demonstration of provision and efficient utilization of required resources- staff, infrastructure, study centres and funds</li> </ul>	3%	The budget balance is a matter for the university – accreditation should establish commitment to deliver the programme.

**Notes:**

\* To earn **Full accreditation** status, a programme must score **at least 70%** in each of the core areas of:

- Pedagogy/ Learning Resources;
- Academic learner support + Information, advice and guidance IAG (pooled)
- Evaluation and assessment ,
- Staffing

\*\* Detailed scoring schemes and guide to programme evaluators, are to be found in the Programme Evaluation Form for ODL programmes(NUC/ PEF/ ODL).