NURSING INFORMATICS: THE TEACHING AND LEARNING OF BASIC NURSING / MIDWIFERY EDUCATION IN COLLEGE OF NURSING AND MIDWIFERY, JALINGO TARABA STATE NIGERIA

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Abstract
Information and communication technology nowadays is wifely acceptable in almost every profession, nursing and midwifery profession is inclusive. The rapid development in computer technology and wide availability of personal computers together with the internet has become an integral part of health care. The World Bank (2012) defined ICT as "the set of activities that facilitate the capturing, storage, processing, transmission and display of information by electronic means". Ebijuwa (2015) defined ICT as "tools used for collection, processing, storage, transmission and dissemination of information". The importance of ICT to people in general and nursing profession in particular cannot be overemphasized. This is so because ICTs facilitate quick and access to a wide range of information resources worldwide. The provision and use of ICT by nursing and midwifery students is being considered to know the extent they put into use in their studies. Upon gaining admission into the college, students have varied level of competence in the use of computers. The nursing and midwifery curriculum provides mandatory courses in nursing informatics/skill and entrepreneurship in midwifery for basic computer skills. This College is linked to the internet to help departments, staff and students gain access to all sorts of updated information that is relevant to their learning and research activities in the college. All departmental members and students have easy and free unrestricted access to computers and internet.

Key words: Nursing informatics, Teaching and learning and Basic Nursing and Midwifery

Introduction

ICT plays a vital role in our information and communication process and their outcomes, as played by other technologies in making our life comfortable and purposeful. ICT in education has tremendous potential to serve and help the people connected with the process and product of education in many ways.

Nursing informatics technologies are for information storage, information retrieval, and information display and information transmission by means of electronics. The use of technology in education has made both students and tutors to achieve new possibilities because of the inherent advantages which range from support of conventional classroom work, design, development of learning materials to accessing virtual libraries. Coupling these benefits places a great deal of demand on both the tutors and students to improve the teaching-learning and experience.

The use of ICT in teaching and learning cannot be over stated. Adeosun (2020) highlighted some ways in which ICTs have

been harnessed in education to include supporting conventional classroom work, design and development of learning materials. Furthermore, ICT aids in gaining access to electronic teaching materials such as e-book, journals, accessing virtual libraries or providing access to a plethora of resources especially in electronic form. Access and availability of computers connected with the internet in the college has greatly influenced on the use of electronic resources, with this, the students were able to surf the net to find and materials they are looking for.

Nursing information and communication technologies have given rise to new modes of organizing the educational environment in schools and new concepts in the educational process.

Information Communication Technology (ICT) is a process of transmitting media data from a source to a destination through electronic means. Nursing service delivery in the present dispensation demands a combination of nursing science, computer science and information science in relation to the diagnosis and treatment of human response to health & illness which has been defined as Nursing Informatics [NI] (Tellez, 2012). Nurse educators are vested with the responsibility of producing the crop of nurses who have the capabilities to fit into the current trend of nursing practice.

Shortliffe& Blois (2001) affirmed that healthcare informatics is an umbrella terminology, which describes the "capture, retrieval, storage, presenting, sharing & use of biomedical information, data & knowledge for providing care, problem solving and decision making".

Importance of Nursing Informatics, Teaching and Learning Process

ICT in education has tremendous potential to serve and help the people connected with the process and product of education in many ways.

i. ICT can bring the existing educational system in alignment with the knowledge-based, information-rich society by providing services of sophisticated tools, techniques and methods at its disposal.

ii. Use of ICT can bring about a paradigm shift in traditional views and methods of teaching and learning process. Some of the changes are as follows:

- ✓ It will in transitioning from broadcast model of learning to interactive learning, thus making the students active and participate in the teaching-learning process i.e. student centered learning.
- ✓ Helps in the process of transitioning from teacher-centered instruction to learner-centered instruction. Student becomes self-reliant and self-directed in acquisition and application of knowledge and skills.
- ✓ Shifts emphasis from teaching to self-learning thereby creating a more interactive and engaging learning environment for both teachers and students.
- ✓ Changes the role of teachers from a mere knowledge-

transmitter to that of a learning-facilitator, knowledge guide or navigator and an active co-learner along with students.

- ✓ Enables students to become more responsible about their learning as they seek out relevant information and knowledge through their own efforts, synthesize and share their knowledge with others. It makes them realize their educational potentials.
- ✓ ICT helps students to think critically and creatively and to reflect on their own learning process. They even set their individual goals for growth and development of their potentials.

iii. ICT prepares teachers to meet challenges of the teaching-learning task of modern age. It helps teachers in proper execution of their multi-dimensional responsibilities in various areas of education.

iv. ICT can be beneficial not only to teachers for their own education and training but also to use it creatively for accelerating the educational growth of their students.

v. Colleges, schools or students that have no access to computer devices like PCs, laptops, tablets or smart-phones can especially utilize ICT in the form Radiobroadcasts and Telecast. There are specific educational programmes such as Gyanvani and gyandarshan hosted by Akashvani and Doordarshan respectively to cater for the subjects of a college or school curriculum. For such students, traditional ICT tools such as pictures, charts, models, graphs, blackboard, newspapers, educational visits, excursions or educational fairs and exhibitions can be utilized for learning and applying school subjects.

vi. In schools, or students that have access to computer but no internet connection:

- ✓ Pre-recorded CDs and DVDs containing useful content may be used.
- ✓ Various word processing programmes such as MsWord can be used by both teachers and students alike. Teachers can prepare their lesson plans, write questionnaire, and prepare evaluations and diagnostic test to check performance of the students. Students can make their assignments using MsWord using creative designs and templates.
- ✓ Ms Excel can be used by teachers in middle and primary school for data collection, analysis and presentation. It is especially important in teaching students the importance of data collection and representation in the form of bar charts, graphs, pie charts, histograms etc.
- ✓ PowerPoint presentation can be prepared by teachers as well as students using Ms PowerPoint application to present and demonstrate their lessons in effective and efficient manner.
- ✓ Interactive whiteboard (IWB) also known as smart-boards are

electronic and digital boards that help in showing what's presented on a computer desktop with the help of a projector. It helps to control the computer with the help of a pen to conduct a lecture in an interactive manner.

- ✓ Software such as Interactive Geometry Software, Instructional Software, Simulation, Gaming and recreational software provides for rich alternative source for teaching and learning. They can help to remove fear and phobias related to study of a subject at the same time providing those opportunities to learn while playing or engaging in virtual applications of the principles and processes of a subject. Intelligent software while interacting with students in tutorial may tell where an error was made on the part of the student while solving problems and offer suggestions for reaching a correct based specifically on the student's incorrect answer.

vii. In case of students who have computer services in school with internet facilities, the amount of information available to them is immeasurable.

- ✓ World Wide Web (www) is updating the knowledge warehouses for students, teachers and scientist due to enormous progress of ICT. Anybody can refer the latest information and research every day.
- ✓ Open universities and distance education through ICT are new openings for working people to acquire knowledge to study at home also.
- ✓ The manpower, the human mistakes can be avoided by online examination. It maintains objectivity of examination. And requires minimum time even examination can be conducted on demand Maharashtra state board is conducting online examination for Information Technology subject XII standard. Maharashtra Knowledge Corporation (MKCL) also conducts online examination for MSCIT course and the result is declared as soon as student clicks the end exam button.

ICT can be Useful for Teachers in the following ways:

i. It is helpful in the professional development of the teachers. A teacher can learn various language skills with the help of ICT. They can do various certification programs run by the famous educational institutions like Cambridge University, British Council etc. these programs help in enhancing his capacity to teach his subject content easy, economic and more understandable.

ii. A teacher can increase his domain of knowledge with the help of e-journals, e-magazines and e-library that can be achieved only through the use of ICT. He can also participate in discussions and conferences with the experts of his

subject teaching to improve his knowledge and skills through audio and video conferencing.

iii. ICT helps teachers to learn innovative methods of teaching. He can work with the students on various project and assignments. It also helps him in providing teaching contents, home works etc.

iv. He may participate in various in-service training programs and workshops which are essential for his professional development with the help of ICT.

v. ICT helps a teacher to guide his students about the learning materials available on internet, e-books, e-journals, e-magazines and social sites like linked-in which are helpful in better learning of subject skills.

vi. ICT also helps him framing curriculum subjects. He can study curriculums of different countries to study their pros and cons, challenges as well as sociological and psychological issues related to learners. All these things help him in framing a curriculum that leads to achievement of the aims and objectives of subject of teaching.

ICT can be Useful for Students in the following ways:

i. Students can study through online resources. There are different resources through which it will be helpful for students to understand topic. Student can learn from their place and at any time.

ii. Students can meet teachers online and get required knowledge about the subject.

iii. Students can have no limit of time and place.

In this way, there are different apps through which teaching and learning process is becoming easier. These apps help teachers and students to communicate with each other and get knowledge of particular subject. Teachers are also learning different apps use for teaching and students are using learning process. In this way, ICT tools are helpful in this pandemic situation. These tools are helping teachers as well as students.

Current Situation and Importance of ICT Today:

i. Online Education – due to Covid-19, there is no option without online education. As lockdowns don't allow opening schools, colleges, and so online education is only one option through which education can be continued.

ii. Use of Apps – different apps nowadays are used for online education. These apps are helpful for students and teachers to reach. Such types of apps are also used for meetings, online teaching and learning process. Ex. Zoom, Google meet, Webex etc.

iii. Platforms for Online Education – there are different platforms available for online education. Though these platforms, online classes can be taken, videos can be uploaded, recorded videos can be sent. So these platforms are helpful to the students as well as teachers. Ex. Swayam, Webex, Impartus etc.

iv. Use of Different e-Content – due to online education, there is no time limit as well

as place restriction for learning. Anyone can learn from any place and at any time. So many type of education anyone can take. And different e-contents are also prepared for students. These are helpful for them to enrich their knowledge.

v. Tools for teaching – GeoGebra can construct almost every conceivable geometrical object, even in 3D, object drawing is interactive and can be moved around, modified and measured. PHET Simulations are interactive computer programmes which allow a user to change variables and see the effect of the changes on the system. These are very useful in helping students explore the subject, solve problems and can also become a useful self-assessment tool. Using a tool or creating a tool calls for a clear view of the end result which the exact task can be accomplished. Working back from this, the ability to understand the process or procedure of accomplishing the task together with the skill to view the tool is to be gained. Therein lies the challenges, therein lies the fascination.

Needs for the Use of ICT in the Teaching and Learning Process in College of Nursing and Midwifery, Jalingo

The advantage of ICT in education, nursing and midwifery inclusive, is to create a familiarity of how these tools work and how to put them into better use for the optimal benefits of both the learner and the educator (Watson, 2006). In modern times, teachers will need effective and efficient information resources. The use of ICT will aid them to perform their roles much more efficiently and effectively (Adeoye & Popoola, 2011). The information and communication technology revolution has gone viral throughout the world. The information and communication technologies no doubt have introduced new methods of teaching and conducting research and have been brought into education facilities for online learning, teaching and research collaboration.

The internet is a global platform that allows the communication and connections of computer systems for the purpose of information resource sharing among students (Davidson, 2013). There are numerous resources in the internet and the World Wide Web with which users information needs can be met. Resources such as conference proceedings, e-book, preprint services, archived scholarly articles etc are increasingly being made available on the net. ICT provides students with tools they need to discover and own knowledge. ICT give students the hooks and templates they need to fasten information to the long-term memory. There are benefits of using ICT in education as revealed by (Blog, 2010):

i. Motivating benefits – ICT can act as a motivating tool for many students. Young people are very captivated with technology. Educators must capitalize on this interest, excitement and enthusiasm about the internet for the purpose of enhancing learning. For already enthusiastic learners, ICT allows the teacher to provide students with additional learning activities not readily available in the classroom.

ii. Fast Communication - ICT promotes fast communication across geographical barriers. Students can join collaborative projects that involve students from different states, countries or continents. This type of

learning experience was not possible before the ICT. This is a unique learning experience very essential for each student as the world is becoming one big community.

iii. Cooperative Learning – ICT facilitates cooperative learning, encourages dialogue, and creates a more engaging classroom. For example, an internet programme in one class may allow other students to get involved in class discussions through e-mails in a way not possible within the four walls of the classroom.

iv. Locating Research Materials – apart from communication, research is what takes many people to the internet. There are many more resources on the internet than the school library can provide.

v. Acquiring Varied Writing Skills – if students are required to publish their work on the internet, they have no develop hypertext skills. These skills help students gain experience in non-sequential writings. Moreover, and since the internet is open to all with access, students publishing their work on the internet are forced to be mindful of their language and to write to non-expert audience.

Effective Use of ICT in the Teaching and Learning Process in College of Nursing and Midwifery, Jalingo

The healthcare system is growing more reliant on technology. As a result, nurses in all parts of the globe are required to improve their information and communication technology (ICT) abilities (Shen et'al, 2018). In this modern age, it is critical to develop the informatics abilities of nurses and midwives (Austria, 2017). To begin, ICT should be included into nursing curriculum and nursing and midwifery students should be computer savvy (Pilarski, 2010). Most areas of healthcare are accelerated and advanced by using information and communication technology (ICT) throughout the globe. These include the use of electronic medical records, virtual office visits, scheduling appointments online as well as paying for services, and getting medication prescribed electronically (Onu &Agbo, 2013). Studies revealed that healthcare providers largely find ICT advantageous for continuous professional development (Rouleau, Gagnon & Cote, 2015).Health care providers, especially nurses and midwives are better able to communicate and relate with patients using ICT thereby increasing their access to healthcare, consolidating the relationship between the patient and the nurse culminating in a better care (Nilsson & Skar, 2010). According to Project Reserves (2021) on the use of e-Health in nursing practice among nurses in Cape Coast. The study conducted aimed at identifying e-health usage among registered nurses in Cape Coast. It opined that most of the nurses (65.5%) had good knowledge and more than half of them (67.5%) generally demonstrated good attitudes towards e-health. The majority (54.9%) of respondents also demonstrated a good skill in the use of ICT in health service delivery.

Resources on health were available to most nurses. The study adopted a descriptive cross-sectional study using a quantitative approach. A multistage sampling technique was employed. Data collected from 206 registered nurses in Cape Coast revealed that

respondents were predominantly female (61.7%) and (38.3% were males.

Today health systems are more efficient and more responsive to client's need due to the incorporation of ICT. This is evident in the reduced healthcare costs, improved delivery and effectiveness of healthcare services and the increase in patient safety and decision support for clinicians (Remlex, 2007, O. Carroll, Yasnoff, Ripp& Martin, 2007, Acheampong, 2012).

Nursing form the greatest percentage of health care professionals worldwide and so play a crucial role in championing health care reforms such as the adoption of ICT (Institute of Medicine, 2004). In high income countries, nurses interact most with ICT systems due to the demands of their work. They are indispensable when it comes to helping patients set up their own health records, or explaining to them how they can use a patient's portal (Onu &Agbo, 2013). In order to obtain the greatest benefit from ICT, nurses must play a leading role to its adaptation.

However, studies have proven that nurses are dissatisfied with electronic health solutions provided for them due to lack of consultation. Other reasons were that the computer systems were laborious to use, illogical, slow, complex and undependable sometimes (Adams, Thorogood, Buckingham & Azza, 2015).

The use of ICT is getting special emphasis in the education of health workers, especially in nursing and midwifery education since they are with the patient 24 hours a day (Halliaet'al, 2014). As a result, Nurse Educators must teach students skills that are suitable for the degree of competence needed at various phases of their careers. Surprisingly, ICT is changing the health care sector and is now an essential component of health care delivery (Canadian Nurse Association, 2006). According to studies, health care professionals see e-health as a valuable tool for continuing their education (Rouleau, Gagnon & Cote, 2015).

The youths and students including students' nurses and midwives tend to prefer the use of ICT in leisure and other social communication, with less regard on its use for education and health care delivery as their profession demands. They value its use in social activities and see it as boring and cumbersome in education and delivery of health care. With the emergence of Covid-19, with its associated precautions such as social distancing, avoiding unnecessary movements by staying at home, e-learning, tele nursing and tele-medicine has become imperative to both the students, lecturers and patients.

It is therefore of utmost importance to ensure that student nurses and midwives are well equipped in the use of ICT in health care delivery, to enable them to become relevant to the fast changing method of healthcare in the global world. According to Huges, Joshi &Lipke (2014), despite the fact that ICT is quickly growing in the healthcare system and nurses and midwives make up the bulk of the healthcare team, studies indicate that nurses have not kept up with technological advancements.

The researcher observed that student nurses and midwives in Taraba state are uninterested in using information and communication technology in health care delivery. The development of ICT skills among studentnurses and midwives in Taraba state has been hampered by a variety of obstacles. According to Bello and Colleagues (2017), this is due to lack of understanding about how to use it, the absence of ICT equipment, restrictions on its usage to prevent damage and improve maintenance, lack of power supply and lack of information seeking abilities. It is on this note that the study was aimed at investigating the use of ICT and the teaching and learning of nursing and midwifery in College of Nursing and Midwifery Jalingo, Taraba state.

Ofudu, (2007) in (Ajayi, Ekundayo &Haastrup, 2009) enumerated ICT tools used by both teachers and students to include: computers specifically; internet, telephone, digital camera and overhead projector. Other ICT materials include: compact disc-read only memory (CD-ROM), teleconferencing, audio-cassette tapes and video tapes interactive television, electronic board, optical fibres, electronic notice board, slides, radio among others.

Teachers and students turn to ICT for various reasons such as removing distance from education and making knowledge more accessible to all. Development of lifelong learning culture and capacity to empower learners by providing them with multiple pathways that offer choices and channels to meet their education and training needs (UNESCO, 2003) is another reason why people use ICT. ICT is cost-effective as it offers greater flexibility regarding time and location of training delivery. ICT also provides greater flexibility to adapt teaching and learning to meet learners' cognitive and learning styles.

Teachers and nursing/midwifery students have the obligation to know access and use various instructional aides including modern ICT tools during their course of teaching and learning. This is because ICT is redefining the way almost everything is done and is a ready tool for all strata of society including education. ICT is changing the way people teach and learn, thereby offering new alternatives to the traditional classroom methods of teaching and learning. Teachers and students who are unaware of existing ICT may lose an important opportunity to make use of the positive features (cheap, safe, effective and accessible) of ICT as well as teach and learn accordingly.

Teachers and students may not be able to harness all the benefits of ICT in Nigeria. Ofodu (2007) noted that Nigeria is a nation with constant power outage and poor infrastructural material supply in every stratum; her institutions of learning are not exempted as well. There may be lack of general information, access or misinformation about ICT used by both teachers and students during teaching and learning.

In summary, student nurses/midwives can use ICT equipment (medical devices) for checking vital signs, students can use clinical information system to input all patient records, students have competency in the use of intravenous devices, mobile charts, drug

retrieval and delivery systems and capable of interacting with patients through the use of ICT as it relates to their health.

Global and National issues in nursing informatics education

In the United States, in 1996, National Advisory Council on Nurse Education and Practice, created the Informatics, national agenda for education and practice which made five recommendations as follows:

i. Educate nursing students and practicing nurses on core informatics content.
ii. Prepare nurses with specialized skills in informatics.
iii. Enhance nursing education and practice through informatics projects.
iv. Preparing nursing faculty in informatics
v. Increase collaborative efforts in nursing informatics" (Health & Services, 1996).

In 2008, the National League for Nursing (NLN) published a position paper which outlined the recommendations for preparing nursing faculty, deans/ directors/chairs and NLN to work in an environment utilizing technology. Among the recommendations was the need for faculty to acquire competencies in informatics and inclusion of informatics into the nursing curriculum. The American Association of Colleges of Nursing (AACN) formed a list of core competencies which include use of information and communication technologies, use of ethics in the application of technology and enhancement of one's knowledge through information technologies (AACN, 2006, 2008, 2011).

Formal nursing training in Nigeria started in 1946 with the establishment of the Nursing Council of Nigeria. Nursing education takes into consideration the National policy on education for developing sound principles which are important to the preparation of nurses to function, independently / interdependently as members of interdisciplinary/intersectoral teams (Adebanjo & Olubiyi, 2008). Nursing education is at various levels in Nigeria, the first level is the basic nursing/midwifery level which leads to the award of the Registered Nurse (RN)/Registered Midwife (RM) certificate, the second level is made up of the post basic programmes in Midwifery, Opthalmic / Perioperative / Psychiatry / Public health / Orthopaedic nursing programmes. These programmes lead to specialization in Nursing. Next to this are first degree programmes which is obtainable either part/full time or as a distant learning programme or at the National Open University of Nigeria (NOUN). A few Universities currently run Masters and PhD programmes in nursing as well. Nursing education at the basic and post-basic levels is regulated by the Nursing and Midwifery Council of Nigeria (N&MCN) while undergraduate and postgraduate/graduate programme are jointly regulated by National University Commission (NUC) and N&MCN. West African Health Examination Board (WAHEB) regulates post basic public health programmes in collaboration with N&MCN. The past decade has witnessed significant increase in the use of electronic media in educational settings in most developed countries. It has been affirmed that computer technologies have opened the door to many new teaching approaches to nurse

educators. Cuing into this development will be of great advantage to the nursing education system in Nigeria (Axley, 2008).

The Nursing education system should produce graduates that are well equipped to work in an evolving highly technological environment. This calls for integration of Information Communication Technology (ICT) into nursing education curricula at all levels. In line with this the Nursing and Midwifery Council of Nigeria revised the curriculum for General Nursing and Midwifery in 2013. Information Communication Technology (ICT) and Use of computers in Midwifery Practice courses were added to the basic Nursing and Midwifery curricular respectively (NMCN, 2013a; NMCN, 2013b). The National Universities Commission (NUC) also mandated all Universities in Nigeria to include introduction to computers and computer programming as one of the undergraduate courses. In addition to this a few Universities have nursing informatics courses integrated into their curriculum. The courses expose students to theoretical and hands on experiences on computer science. Furthermore, both NUC and N&MCN has stipulated in their minimum accreditation requirement for basic and undergraduate nursing programmes, provision of adequate number of computers in Schools / Departments of nursing/midwifery and linkage of the institutions to internet facilities. It should be noted that although these efforts are in the right direction, nursing informatics is not just computer science, word processing, clinical documentation or use of the internet (ANA, 2008). A study carried out among 540 nursing deans/directors and 1557 faculty revealed that online course offerings and information literacy skills were wrongly equated to informatics (NLN, 2008). The Nigerian Association of University Nursing Programmes (NAUNP) at its 10th National Scientific conference, focused on nursing informatics as the cutting edge for modern day nursing. This was to create awareness and update nurse academics' knowledge about nursing informatics (NAUNP, 2014). A comprehensive nursing informatics agenda is therefore required for Nigeria to address students' needs at all levels as well as faculty needs. A descriptive study which examined Nursing Informatics (NI) preparedness of graduate nurses in Calabar, Nigeria reported that only 51.0% of nurse educators were knowledgeable about nursing informatics while only 25 (24.8%) of the respondents considered their level of computer literacy adequate (Akpabio & Ella, 2014) Importantly, the practice settings should be well equipped to give opportunities to nursing students to practice in an ICT compliant environment, which is largely lacking in most health institutions in Nigeria. The practitioners who should mentor the students too should have basic informatics competencies.

Types of Information and Communication Technology (ICT)

There are varieties of technologies that can be used in education. Each of these technologies has its own redeeming qualities and limitations and different situations calls for different technologies according to (UNESCO, 2003) are as follows:

i. ***Internet/Web-Based Training*** – this provides an environment where

students and teachers access and study course materials online. It may involve the use of live e-learning tools such as application, sharing, internet, telephone, online whiteboards, discussion boards and chat and messaging programmes that allow real time interaction between instructors and learners. It can also be used to transmit text, graphics, images, animation or video. The required tools for online learning include a personal computer and internet connection. There are several ways a user can connect to the internet; standard analog modem, Digital Subscriber Line (DSL), Cable Modem, Integrated Service Digital Network (ISDN), Local Area Network (LAN), Cellular, and Wireless broadband (fixed wireless and satellite).

All the above connections, except for a standard analog modem connect are considered broadband connections. All these methods allow connections to an internet service provider (ISP) that provides a gateway to the rest of the internet. An analog modem and ISDN require a "dial up" connection where a user must dial into connect to the ISP, whereas the other internet access method denoted as "always on" connections, require on dialing.

ii. ***CD – ROM and DVD*** – (Compact Disc-Read Only memory) store on any computer equipment with a CD-ROM drive (Hampton and Bartram, 2002 in UNESCO, 2003). DVD (Digital Video Disk or Digital Versatile Disk) are similar to CD_ROMs and can be used the same way as CD-ROMs but contain more information. Most CD-ROMs have 650 or 700 megabytes storage space whereas most DVDs have room for 4.7 gigabytes, which equals approximately seven times more storage space than a CD-ROM. DVDs are not widely used yet, mainly because of different standards for writing to DVDs.

CD-ROMs have a large capacity and can support the storage of information in a variety of formats including text, animation, video, audio and graphics. Thus, learning materials can be presented in different ways. This allows the material to cater to multiple styles of teaching (UNESCO, 2003).

CD-ROM or DVD is very durable and quality, it does not degrade after repeated used. However, scratching the surface or other abuse on medium may prohibit it from being read by the CD-ROM drive. A major limitation with CD-ROM and DVD is that a computer with CD-ROM drive (in the case of DVD, a DVD drive) is required to access the information. This equipment may not be available to learners in developing countries.

iii. ***Teleconferencing*** – this refers to interactive electronic communication among people located at two or more different places. There are four types of teleconferencing based on the nature and extent of interactivity and the sophistication of the technology: audio

conferencing, audio graphic conferencing, video conferencing and web-based conferencing.

iv. ***Audio Conferencing*** – this involves the live (real time) exchange of voice messages over a telephone network. When low-bandwidth text and still images such as graphs, diagrams, or pictures can also be exchanged along with voice messages, then this type of conferencing is called audio graphic. Non-moving visuals are added using a computer keyboard or by drawing and writing on a graphics tablet or whiteboard.

Audio conferencing allows two-way, real-time communication between instructors and learners through audio. Older audio-conferencing technology uses the telephone system infrastructure, where the key component is an electronic device called an audio-conferencing bridge. Using internet telephony where digitized voice packets are sent between individuals over the internet. Individuals can use computer programmes such as instant messenger, Microsoft net-meeting or MSN messenger to converse with individuals. Older audio-conferencing technology simply includes local or long-distance telephone costs and the cost of the bridge itself.

Internet audio conferencing incurs the cost of internet access and the internet telephony equipment and or programmes. The main advantage of audio conferencing is that it allows for direct, two-way interaction between participants. Discussion occurs in real time where learners can ask questions and instructors can respond immediately.

Conclusion

Information and communication technologies (ICT) emergence in the society has made the world a global village. Its relevance in a globally competitive society cannot be overemphasized as ICT has become common place entities in all aspect of life. The emergence of ICT in this century is a significant development in education and as well has an impact on the teaching and learning process in College of Nursing and Midwifery Jalingo, Taraba State. The use of ICT in the teaching and learning process in nursing and midwifery education has greatly enhances intellectual capacity building of students to meet up with the demands of a 21st century Nigeria.

Recent worldwide trends suggest wider use of informatics in nursing curricula to improve the quality of nursing education. The emerging rise in the use of technology demands that nursing Schools, Colleges and Departments adopt ICT in the teaching-learning process. Simborio (as cited in Intel, 2010), emphasized that the growth of ICT in higher education is showing that traditional instruction is slow, time consuming and provides limited access to information. Its use should therefore be de-emphasized in nursing education. The use of ICT in classroom teaching as earlier highlighted is dynamic, innovative and creative; it also extends students learning experience to any

location with access to a wireless network.

It is therefore no longer an optional choice for use in the teaching-learning process in nursing education. Nurse educators who are vested with the responsibility of producing competent nurses, well suited to function in highly technological environment should endeavour to be digitally literate in spite of the impediments. In this way, they will significantly change the existing teaching strategies in nursing education.

According to Saba (2011), technological revolution is here to stay and should be embraced by all nurses regardless of area of specialization. The rapid growth of the digital age will certainly continue; therefore, faculty development is crucial in ensuring that nursing education administrators and faculty alike enhance students' learning and retains faculty members.

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