Awareness and Utilization of Moodle among Students at Nursing Schools in North-Western Nigeria

Adamu A.1*, I.M Hayaat 2, Ladan M.A.3 and Adamu K.M.3
1. College of Nursing and Midwifery, Birnin Kudu, Jigawa State, Nigeria
2. Department of Nursing Sciences, Ahmadu Bello University, Zaria-Nigeria
3. Department of Nursing Sciences, Bayero University Kano-Nigeria
4. School of Nursing Usmanu Danfodio University Teaching Hospital, Sokoto

*Corresponding Author: Adamu A.
Corresponding Email: abduladam76@gmail.com

ABSTRACT

Background: E-learning has been observed to enhance and support the teaching and learning processes, ranging from the way students use educational materials on the web or server and accessing course work online while following a course on campus to programs offered entirely online. Again e-learning allows for efficient transfer of knowledge anywhere and anytime, regardless of subject matter. It opens up a world of learning unavailable in most corners of the world, while at the same time empowering learners with the information technology awareness and skills crucial to succeed in today's global knowledge economy.

Aim: The study aimed at assessing the awareness and utilization of moodle among students at nursing schools in North-Western Nigeria.

Methodology: A cross-sectional analytic design was used for this study. Multistage sampling technique was used to select three schools; school of nursing Birnin Kudu, Jigawa state, school of nursing Katsina, Katsina state and school of nursing Gusau, Zamfara state which forms the setting for the study. A total of 307 nursing students were selected and recruited for the study. A structured Self-Administered Questionnaire was used for data collection. Descriptive statistics and the Bonferroni Post Hoc test were used in data analysis which.

Results: The findings of the study revealed that most of the students (245 out of 305) have an excellent levels of awareness of e-learning with a percentage of 80.4%. The study also found out that most of the students have a high level of utilization of e-learning with 62%. The study also showed a statistically significant relationship between awareness and utilization of e-learning among students at nursing schools in North-Western Nigeria with P-values of 0.001.

Conclusion: Based on the findings, it was concluded from the results of the study that the students have an excellent level of awareness of e-learning and have a high level of utilization of e-learning.

Keywords: Information and Communication Technology (ICT), E-learning, Awareness, Utilization.

DOI: https://dx.doi.org/10.4314/bjnhc.v3i2.3

Introduction

In the context of this study, moodle means the Moodle platform by which the nursing students access and utilize for academic purposes. While Information and Communication Technologies (ICT) include computers and mobile phones and their accessories which are used in the teaching and learning process.

According to Brockett & Roger (2014), learning is a personal act of an individual to make full use of his/her potential. They suggest that it is a process of self-actualization to its maximum level.

The rapid growth in Information and Communication Technologies (ICT) has brought remarkable changes in the twenty-first century globally, as well as affected the demands of modern societies (Charles, 2012). There is also growing demand for educational institutions to use ICT to teach the skills and knowledge to students in need for the 21st century (Charles, 2012). The information and communication technology (ICT) revolution

Adamu A. et al, (2021)
is sweeping through the world and the gale has even caught up with developing countries like Nigeria and Ghana. ICTs have introduced new methods of teaching and conducting research and have been brought into education facilities for online learning, teaching, and research collaboration (citation needed). Teachers in the developing world have to change their teaching styles and acquire internet skills as new technologies transform classrooms over the next 20 years (citation needed). Teachers will need to learn new skills to teach students how to search for and use information from the Internet safety issues (Nwezech, 2010).

E-learning has been observed to enhance and support the teaching and learning process, ranging from the way students use educational materials on the web or server and accessing course work online while following a course on campus to programs offered entirely online. Also, e-learning allows for efficient transfer of knowledge anywhere and anytime, regardless of subject matter. It opens up a world of learning unavailable in most corners of the world, while at the same time empowering learners with the information technology awareness and skills crucial to succeed in today's global knowledge economy. Mazleena & Noorminsha, (2011) stated that the term e-learning refers to computer-enhanced training as opposed to the computer-based training of the 1980s.

It is usually delivered on a personal computer and includes learning delivered by other communications technologies. According to them, e-learning is an approach to facilitate and enhance learning through both computer and communication technologies. The devices that are used for this purpose include personal computers, CD ROMs, television, personal digital assistants (PDAs), MP3 players, and mobile phones. **Moodle** is a free and open-source learning management system (LMS) written in PHP and distributed under the GNU General Public License With customizable management features, Moodle is used to create private websites with online courses for educators and trainers to achieve learning goals. Moodle allows for extending and tailoring learning environments using community-sourced plugins F-.

Moodle is used for blended learning, distance education, flipped classrooms and other e-learning projects in schools, universities, workplaces, and other sectors. With customizable management features, it is used to create private websites with online courses for educators and trainers to achieve learning goals.

Globally, e-learning has been introduced to nursing curricula in a number of Western countries including Australia, Canada, Greece, Ireland, New Zealand, the United Kingdom, and America. In African countries such as Nigeria, the use of e-learning is rapidly increasing in nursing education. However, the effectiveness of moodle is still inconsistent, and a lack of evidence about the implementation of e-learning methods in nursing education (Ahmad, 2012).

**Methods and Materials**

An analytical cross-sectional descriptive design was adopted for this study. Analytic study tests hypotheses about exposure-outcome relationship.

The setting of the study is made up of three Nursing Schools in Northwestern Nigeria. These are:
1. School of Nursing Birnin Kudu Jigawa State
2. School of Nursing Katsina, Katsina State and
3. School of Nursing Gusau, Zamfara State.

The target population of the study comprises all students in nursing schools of northwestern Nigeria.

A total of 307 nursing students were recruited for the study. The sample size was determined using Yamene's (1967) formula for calculating sample size; this is because the
population size was known. A multi-stage sampling technique was used to select the three schools of nursing for the study.

**Stage One**

Northwestern Nigeria was grouped into three clusters according to old states in the region. Cluster One includes the Old Kano State (comprising Kano and Jigawa States), Cluster Two includes the Old Kaduna State (comprising Kaduna and Katsina States) and Cluster three includes the Old Sokoto State (comprising Sokoto, Kebbi, and Zamfara States).

**Stage Two**

One state was selected randomly from each cluster using the lottery method where Jigawa, Katsina, and Zamfara States were selected randomly for the study.

**Stage Three**

In each state selected, a school of nursing with at least 3 years’ accreditation status was selected. Therefore, School of Nursing Birnin Kudu in Jigawa state, School of Nursing Katsina in Katsina State, and School of Nursing Gusau in Zamfara state were selected based on this criterion.

**Stage Four**

The proportionate sampling method was used in distributing the sample size for each school according to their respective population. Then systematic random sampling technique was applied at an interval of 3 to select the required samples for the study in each school. To get the first sample, a computer-generated simple random sampling technique was used to ensure randomization.

The main tool for the study was a structured self-administered questionnaire. It was designed by the researcher after an intensive review of various works of literature and research papers that carried out similar investigations. A pre-testing was carried out on 10% of the samples at the School of Nursing Kano. An average reliability index of 0.72 showed that the instrument was reliable for the study.

The instrument was subjected to a supervisory team and a 5-member panel of juries for vetting for face validity. Content validity was done by experts in e-learning.

Ethical approvals were collected from the Research and Ethics Committees in Ahmadu Bello University, Zaria, and each state was selected for the study. Access and permission for the conduct of the study were asked from the Heads of the three Schools of Nursing. Informed consent was obtained from the participants prior to the commencement of the study. The participants were also made to understand that participation in the study was fully voluntary and at any point in time a participant had the right to withdraw from the study. Strict confidentiality was maintained throughout.

After collecting the data from the respondents, it was collated, coded, cleaned, and then analyzed using SPSS version 20. Descriptive and analytic statistics such as frequency, percentages, mean, and ANOVA were used in the analysis.
Results

Table 1: Sociodemographic characteristics of the respondents (N = 305).

| Variables                  | Frequency | Percent (%) |
|----------------------------|-----------|-------------|
| Age In Years               |           |             |
| • 15-19                    | 13        | 4.3         |
| • 20-24                    | 223       | 73.1        |
| • 25-30                    | 59        | 19.3        |
| • Above 30                 | 10        | 3.3         |
| Gender                     |           |             |
| • Male                     | 113       | 37          |
| • Female                   | 192       | 63          |
| Marital Status             |           |             |
| • Single                   | 255       | 83.6        |
| • Married                  | 48        | 15.7        |
| • Widowed/widower          | 2         | 0.7         |
| Religion                   |           |             |
| • Islam                    | 285       | 93.4        |
| • Christianity             | 20        | 6.6         |
| Previous Educational Background |       |             |
| • SSCE                     | 201       | 65.9        |
| • Diploma                  | 72        | 23.6        |
| • NCE                      | 13        | 4.3         |
| • Others                   | 19        | 6.2         |
| Formal Computer Training   |           |             |
| • Yes                      | 130       | 42.6        |
| • No                       | 175       | 57.4        |

Table 1 on the distribution of the respondents according to sociodemographic characteristics (N = 305) above indicates that most of the respondents (73.1%) were within the age range of 20 – 24 years and the mean age was 25, while 63% of them were female. 255 of the respondents (83.6%) were single and 93.4% were practicing Islam as their religion. The majority of the respondents (65.9%) hold SSCE before coming to the School of Nursing while most of them (57.4%) did not attend any formal computer training.
Table 2: Respondents’ level of awareness of e-learning (N = 305).

| Variables                                                                 | 2 | 1 | 0 | X |
|---------------------------------------------------------------------------|---|---|---|---|
| **Meaning**                                                              |   |   |   |   |
| ● E-learning means learning conducted via electronic media               | 296| 97| 8 | 2.6| 1| 0.3| 1.97|
| ● E-learning is learning utilizing electronic technologies to access educational curricula outside of a traditional classroom | 254| 83.3| 42| 13.8| 9| 3| 1.80|
| ● E-learning is also called Web-based learning, online learning, distributed learning, computer-assisted instruction | 276| 90.5| 27| 8.9| 2| 0.7| 1.90|
| **Types/Categories**                                                     |   |   |   |   |
| ● Moodle is a free online management system                              | 255| 83.6| 44| 14.4| 6| 2| 1.82|
| ● Moodle system can be installed on laptop, desk top and mobile phones  | 290| 95.1| 13| 4.3| 1| 0.3| 1.95|
| ● Course contents can be uploaded on Moodle platform                     | 281| 92.1| 22| 7.2| 2| 0.7| 2.00|
| **Resources**                                                            |   |   |   |   |
| ● Multimedia resources can be uploaded on Moodle the platform           | 196| 64.3| 91| 29.8| 16| 5.2| 1.60|
| ● Moodle is flexible, open-source, and free to download learning materials | 246| 80.7| 48| 15.7| 11| 3.6| 1.77|
| ● Moodle is available online and on the local server accessible to teachers, librarians, and students within the school. | 274| 89.8| 21| 6.9| 7| 2.3| 1.96|
| ● Techniques in moodle include;, Multimedia teaching, submitting assignments, live discussions. | 244| 80| 53| 17.4| 7| 2.3| 1.78|
| **Advantage**                                                            |   |   |   |   |
| ● Moodle platform can be accessed in the office, at home, on the road, 24 hours a day, seven days a week | 148| 48.5| 87| 28.5| 69| 22.6| 1.29|
| ● Moodle has measurable assessments which can be used on both the teachers and students | 273| 89.5| 29| 9.5| 1| 0.3| 1.91|
| ● Students can modify the contents of Moodle                             | 135| 44.3| 99| 32.5| 69| 22.6| 1.23|
| ● Aggregate mean %                                                       |   |   |   |   |
| ● Aggregate mean score                                                   |   |   |   |   |
| (2 = Correct, 1 = not sure and 0 = incorrect. Poor level of awareness < 50%, Good level of awareness = 50 to 69% and Excellent level of awareness = 70% and above) |       |   |   |   |

Table 2 above on distribution of the respondents according to the level of awareness on e-learning (N = 305) expresses that, under the meaning of e-learning, respondents were more aware of and have an excellent level of awareness on ‘e-learning means learning conducted via electronic media’ with 97% correct. This is followed by ‘Moodle system can be installed on the laptop, desktop, and mobile phones’ under types/categories of e-learning, with a percentage of 95.1%. It also shows that; respondents were very much aware that ‘course contents can be uploaded on Moodle platform’ with 92.1% which means the excellent level of awareness). However, the
respondents demonstrated a poor level of awareness on the ‘Moodle platform can be accessed in the office, at home, on the road, 24 hours a day, seven days a week’ with 48.5%).

Table 3: Summary of distribution of the respondents according to the level of awareness on Moodle (N = 305).

| Category Variables     | 2   | 1   | 0   | X    |
|------------------------|-----|-----|-----|------|
|                        | F   | %   | F   | %   | F   | %   |
| Meaning                | 277 | 90.8| 24  | 7.9 | 4   | 1.3 |
| Types/categories        | 276 | 90.4| 26  | 8.6 | 3   | 1   |
| Resources              | 241 | 79  | 53  | 17.6| 11  | 3.7 |
| Advantage              | 187 | 61.1| 72  | 23.6| 46  | 15.3|
| Aggregate mean %       | 80.3| 14.4| 5.3 |
| Aggregate mean score   | 1.77|

Table 3 above on summary of the distribution of the respondents according to the level of awareness on moodle (N = 305) shows that respondents expressed excellent level of awareness on meaning, types, and resources of e-learning with 90.8%, 90.4%, and 79% respectively. While on the advantage of e-learning, 187 respondents i.e. 61.1% were correct which means a good level of awareness on e-learning. The aggregate mean percent of the respondents who ticked the correct options was 80.3%, which denotes the excellent level of awareness.

Table 4: Respondents’ level of utilization of Moodle (N = 305)

| Variables                                                | 3   | 2   | 1   | 0   | X    |
|----------------------------------------------------------|-----|-----|-----|-----|------|
| I log into Moodle for study purposes                     | 47  | 15.4| 225 | 73.8| 8.9  |
| I use Moodle to read uploaded materials by teachers      | 83  | 27.2| 175 | 57.4| 8.5  |
| I use Moodle to submit assignments                       | 60  | 19.7| 182 | 59.7| 15   |
| I use the Moodle to view educational multimedia          | 63  | 20.7| 154 | 50.5| 43   |
| Most of students around me use e-learning                | 88  | 28.9| 169 | 55.4| 38   |
| I use the moodle to communicate with my colleagues       | 157 | 51.5| 115 | 37.7| 19   |
| I use the moodle to communicate with my teachers         | 127 | 41.6| 121 | 39.7| 39   |
| I use the moodle throughout the week                     | 166 | 54.4| 103 | 33.8| 25   |
| I use the moodle to view social media                    | 126 | 41.3| 120 | 39.3| 26   |
| I use the moodle in my                                   | 139 | 45.6| 127 | 41.6| 21   |

(2 = Correct, 1 = not sure and 0 = incorrect. Poor level of awareness < 50%, Good level of awareness = 50 to 69% and Excellent level of awareness = 70% and above).
leisure time
I save money of purchasing books by using moodle.
Even if not monitored, I would trust using the moodle.
I intend to continue using the moodle in my studies
I will keep using the moodle as regularly as I do now.
I will strongly recommend that others use the moodle

Aggregatemean %
37.3% 44.8% 9.5% 8.1%

Aggregatemean score 2.13

(3 = Always, 2 = Sometimes, 1 = Seldom and 0 = Never. (High level of utilization = 68 - 100%, Moderate level of utilization = 34 – 67 and Low level of utilization = 0 – 33%).

Table 4 above on distribution of the respondents according to the level of utilization of e-learning (N = 305) shows that the majority of the respondents mentioned that they sometimes log into e-learning Moodle for study purposes with a percentage of 73.8%. The respondents then said that they sometimes use e-learning Moodle to submit assignments with 59.7%. It also revealed that 57.4% of the respondents use e-learning Moodle to read uploaded materials by teachers. It was also revealed that only 6 (2.0%) of the respondents said that they never log in to e-learning for study purposes.

Table 5: Summary of distribution of respondents based on level of utilization of Moodle (N = 305)

| Categories  | Frequency | Percent (%) |
|-------------|-----------|-------------|
| Always      | 114       | 37.3%       |
| Sometimes   | 137       | 44.8%       |
| Seldom      | 29        | 9.5%        |
| Never       | 25        | 8.1%        |

Table 5 above on summary of the distribution of respondents based on level of utilization of e-learning (N = 305) indicates that the aggregate mean shows that majority of the students utilize e-learning sometimes with 44.8% and only 8.1% never utilize e-learning in their period of stay as students in the nursing schools of North-western Nigeria.
Table 6: Chi-Square for testing the relationship between nursing students’ level of awareness and utilization of the moodle at nursing schools in North-Western Nigeria.’ at 95% confidence level (N = 305)

| Level of Utilization | Chi-square Test |
|----------------------|-----------------|
|                      | Level of awareness |  \( \chi^2 \) | df | P-value |
|                      | Poor            |  5       | 2   |  0     | 17.63 | 4   | .001* |
|                      | High            | 71.4%   | 28.6% | 0.0%  |      |      |      |
|                      | Moderate        | 2.6%    | 1.9%  | 0.0%  |      |      |      |
|                      | Low             | 8       | 20    | 2     |      |      |      |
| Good                 | 26.7%           | 66.7%   | 6.7%  |      |      |      |
|                      | 4.2%            | 19.2%   | 16.7% |      |      |      |
| Excellent            | 65.7%           | 30.6%   | 3.7%  |      |      |      |
|                      | 93.1%           | 78.8%   | 83.3% |      |      |      |

\( p< 0.05, \ *\ indicates\ significant\ relationship\) Table 4.6 above is the Chi-Square result for testing the relationship between nursing students’ level of awareness and utilization of e-learning at nursing schools in North-Western Nigeria.’ The test shows that \( \chi^2 = 17.63, P = 0.01 \). This means there was a significant relationship between awareness and utilization since P-value (0.001) is less than the P-value (0.05). Therefore, it is concluded that there is the relationship between nursing students’ level of awareness and utilization of e-learning in the nursing schools of North-Western Nigeria.

Discussion of Findings

Sociodemographic characteristics

The findings of the results show that most of the respondents (73.1%) were within the age range of 20 – 24 years and the mean age of the whole distribution was 23 years, while 63% of them were female and 255 of the respondents (83.6%) were single. This is obvious as most of the students were fresh from secondary schools. It was also as a result of the influence of Women for Health (W4H) in Schools of Nursing of Northwestern Nigeria made it that majority of the students were female by gender.

It was revealed that 93.4% were practicing Islam as their religion. This is because the study area is Northern Nigeria where Islam predominates as religion. The majority of the respondents (65.9%) hold SSCE before coming to the School of Nursing while most of them (57.4%) did not attend any formal computer training.

Level of students’ awareness of e-learning

The result indicates that most of the students have an excellent level of awareness on the moodle with a percentage of 87.9%, 30 respondents (9.8%) had a good level of awareness and only 7 of the students (2.3%) had a poor level of awareness on e-learning. The result is in line with the finding by Ibrahim et. al. (2015) in their research on ICT knowledge, perception, and utilization among health care providers in Abuja that the majority of the respondents possess considerably average knowledge and skills in the use of word processors i.e. Microsoft Word (111, 42.9%). It is also in consonance with another study conducted at the College of Medicine and Health Sciences, the University of Gondar, Ethiopia on Knowledge and utilization of information communication technology (ICT) among health science
students by Woreta, Kebede, & Zegeye, (2013). This finding may strongly be related to the huge investment made by Women for Health in the training and retraining of teachers and students in the nursing schools of Northwestern Nigeria. Results indicated that half of the respondents (51%) had ICT knowledge. This finding might be so because…is obvious as ICT knowledge is increasing on a daily basis as a result students are becoming more and more aware of what is happening in their environment.

Level of students’ utilization of Moodle
Findings express that most of the students have a high level of utilization of e-learning with 62%, 34% have a moderate level of utilization of e-learning and only 12 of the students (3.9%) had a low level of utilization of e-learning. This finding is in contrast with a study by Eze, Chinedu-Eze, & Bello (2018) in their study ‘the utilization of e-learning facilities in the educational delivery system of Nigeria: a study of M-University, discovered that majority of lecturers in M-University indicated that e-learning facilities were not fully utilized which might be as a result some factors such as the attitude of the users, ‘not functional’ e-learning facilities, poor internet access and people not wanting to change.

Also, this finding contrasted the one conducted by Gambari & Chike-Okoli (2014), on the availability and utilization of Information and Communication Technology (ICT) in tertiary institutions in Niger State which revealed that there was inadequate ICT facility and there was no significant difference between the availability and extent of effective use of ICT facilities and equipment for teaching and research purposes. This implies that when e-learning facilities are adequate in a school, there is a high expectation that the students will utilize them. Jumoke (2014) states that in Nigeria, many schools that do not have computers still do not have access to the internet, which is an important requirement for supporting networking for learners and teachers, as well as for collaborative learning. It is not surprising as this result shows the high level of e-learning utilization as we are in a technology era where everyone is using ICT in one way or the other.

Conclusion
Based on the findings, it was concluded as follows: The students have excellent level of awareness on e-learning and they have high level of utilization of e-learning. The study also concluded there was a statistically significant relationship between nursing students’ level of awareness and utilization of e-learning in the nursing schools of Northwestern Nigeria.

Recommendations
Based on the research findings, the following recommendations were made:

1. Students’ awareness of the use of information technology especially e-learning should be improved and maintained by the school management in each school through introducing module mobile.

2. State governments and Non-governmental Organizations should provide adequate ICT resources in the nursing schools to enhance accessibility and utilization by the students.

References
Adeoye, Y. M., Oluwole, A. F., & Blessing, L. A. (2013). Appraising the role of information communication technology (ICT) as a change agent for higher education in Nigeria. Retrieved on 5th December 2017 from https://doi.org/10.5897/IJEAPS12.027

Adesoji, F. (2012). Undergraduate students’ perception of the effectiveness of ICT use in improving teaching and learning in Ekiti State Universit, Ado-Ekiti, Nigeria. Retrieved on 4th December 2017 from https://doi.org/10.5897/IJLIS11.088

Ahmad, S. (2012). Essentialsities For E-Learning: The Nigerian Tertiary Institutions in Question. Academic
Ahmed, H. M. S. (2010). Hybrid E-Learning acceptance model: Learner perceptions. Decision Sciences Journal of Innovative Education, 8(2), 313-346.

Ajadi T. O., Salauw I., O., & Adeoye A. (2008). E-learning and distance education in Nigeria. The Turkish Online Journal of Educational Technology (TOJET) Retrieved on 5th November 2018. ISSN: 1303-6521 volume 7 Issue 4 Article 769.

Ajibade, B. L. (2013). Knowledge and Attitude towards the Introduction of Informatics to Nursing Training among Selected Nurse Educators/Leaders in Nigeria. IOSR Journal of Dental and Medical Sciences, 9(5), 01–07. Retrieved from https://doi.org/10.9790/0853-0950107 on 6th November 2019.

Ajuwon, G. A., Librarian, I. S., Odeku, E. L. & Library, M. (2008). The level of Internet access and ICT training for health information professionals in sub-Saharan Africa. 175–185. Retrieved from https://doi.org/10.1111/j.1471-1842.2007.00758. 7th June 2019.

Ajuzie, N. E. & Akukwe, A. C. (2015). An Assessment of the Use of ICT Tools by Students to the Study of Business Education. World Scientific News. 9(1), 9-17.

Al-Qdah, M. S., & Salim, J. (2013). A Conceptual Framework for Managing Tacit Knowledge through ICT Perspective. Procedia Technology, 11(Iccet), 1188–1194. Retrieved from https://doi.org/10.1016/j.proctey.2013.12.312 on 12/12/2018

Ani, O. E. (2010). Internet access and use. The Electronic Library, 28(4), 555–567. Retrieved from https://doi.org/10.1108/02640471011065373 on 10/12/2019

Apulu, I., Latham, A., & Moreton, R. (2011). Factors affecting the effective utilization and adoption of sophisticated ICT solutions. Journal of Systems and Information Technology, 13(2), 125–143. https://doi.org/10.1108/1328726111135972 on 09/10/2019

Atsumbe, B. N., Emmanuel, R., Igwe, C. O., & Atsumbe, J. (2012). Repositioning vocational and technical education for effective manpower production in Nigeria. IOSR Journal of Mechanical and Civil Engineering (IOSRJMCE), 1(4), 01–06.

Baylor, A. L., & Ritchie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology-using classrooms? Computers & Education, 39(4), 395–414. https://doi.org/10.1016/S0360-1315(02)00075-1

Behlol, M. G. (2010). Concept of Learning. Journal of Systems and Information Technology, 13(2), 125–143. https://doi.org/10.1108/1328726111135972 on 10/10/2019

Buabeng-Andoh C. (2012). Factors influencing teachers’ adoption and integration of information and communication technology into teaching: A review of the literature Charles Buabeng-Andoh. International Journal of Education and Development Using Information and Communication Technology, 8(1), 136–155.

Bupo, G. O. (2015). Business Education Students’ Utilization Of E-Learning In Anambra State Tertiary Institutions. International Journal of Scientific Research and Innovative Technology, 2(4), 16-25 International Journal of Education and Development Using Information and Communication Technology, 8(1), 136–155.

Chiaha, G.T., Eze, J. U., & Ezeudu, F. O. (2013). Education students’ Access to E-learning Facilities in Universities South-East of Nigeria. Information and Knowledge Management, 3(10), 32–42.

Daniel, O. (2013). Nursing informatics: A key to improving nursing practice in Nigeria. International Journal of Nursing and
Dar, B., & Comfort, C. (2012). *AFRREV IJAH An International Journal of Arts and Humanities ISSN : 2225-8590 ( Print ) ISSN 2227-5452 ( Online ) Hindrances towards Infusing Environmental Management into the Operation of Micro Enterprises in Nigeria.* 1(3), 323–339.

De Laurentis, C. (2006). *Digital knowledge exploitation: ICT, memory institutions and innovation from cultural assets.* The Journal of Technology Transfer, 31(1), 77-89.

Dessus, P., Mandin, S., Dessus, P., Mandin, S., & Zampa, V. (2008). *What is Teaching? Cognitive-Based Tutoring Principles for the Design of a Learning Environment.* (212578), 49–55. Retrieved on 5th November 2018.

Directorate, R. H., Health, R., & Force, T. (2003). *Ministry of Health Women’s and Reproductive Health Directorate FOR REPRODUCTIVE HEALTH SERVICES ANTENATAL CARE SERVICES.*

Ditekemena, J., Koole, O., Engmann, C., Matendo, R., Tshefu, A., Ryder, R., & Colebunders, R. (2012). *Determinants of male involvement in maternal and child health services in sub-Saharan Africa: a review.* 1–8.

D-K, K., James, O., Adanma, O. S., & Harcourt, P. (2017). *Availability of E-Learning Facilities in Teaching and Learning of Undergraduate Business Education in Rivers State Universities.* 3(5), 12–18. Retrieved on 21st August, 2019 from www.iiardpub.org.

Elewa, A. H., & Guindy, H. A. El. (2017). *Nursing Students Perception and Educational Needs regarding Nursing informatics.*

Eze, S., Duan, Y., & Chen, H. (2012). Factors Affecting Emerging ICT Adoption in SMEs: An Actor Network Theory Analysis. International Conference on E-business Technology & Strategy (ICETS). China: Tanjin.

Eze, S., Duan, Y., & Chin, H. (2014). Examining Emerging ICT’s Adoption in SMEs from a dynamic Process Approach. Information Technology and People, 27(1), 63–82.

Eze, S. C., Awa, H., Okoye, J., Emerecha, B., & Anazodo, R. (2013). Determinant factors of information communication technology (ICT) adoption by government-owned universities in Nigeria: A qualitative approach. Journal of Enterprise Information Management, 26(4), 427–443

Eze, S. C., Chinedu-Eze, V. C., & Bello, A. O. (2018). The utilisation of e-learning facilities in the educational delivery system of Nigeria: a study of M-University. *International Journal of Educational Technology in Higher Education, 15*(1).

Falana, F. T. (2015.). Prospects and challenges of e-learning in Nigerian university education using national open university of Nigeria akure study center. Akoko: department of science and technical education (computer education unit) adekunle ajasin university akungba, akoko.

Form, G. (2002). APA Format – 6th Edition. *Current, 110*(2000), 1–4. https://doi.org/10.1080/00377990903493853

Frehywot, S., Vovides, Y., Talib, Z., Mikhail, N., Ross, H., Wohljtjen, H. & Scott, J. (2013). E-learning in medical education in resource-constrained low- and middle-income countries. 1–15.

Frydenberg, J. (2002). Quality standards in eLearning: A matrix of analysis. *International Review of Research in Open and Distance Learning, Vol. 3,* pp. 68–85.

Gadanya, W. L. (2015). Perception of Nigerian Students toward the Role of Information and Communication Technology (ICT) in Enhancing Language Learning. 6(7), 305–312.
Gambari, A. I., & Okoli, A. (2007). Availability and utilization of information and communication technology (ICT) facilities in higher institutions in Niger State, Nigeria. Information Technology, 4(1), 34-46.

Agarwal, H., & Pandey, G. N. (2013). Impact of E-Learning in Education. International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064(12), 146–148.

Haastrup, T. (2009). The application of information and communication technology in Nigerian secondary schools. International NGO Journal, 4(5), 281-286.

Haigh, T. (2011). The History of Information Technology. Annual Review of Information Science and Technology, 45. Retrieved on 14th April 2018.

Haliso, Y. (2011). Factors Affecting Information and Communication Technologies (ICTs) Use by Academic Librarians in Southwestern Nigeria Factors Affecting Information and Communication Technologies (ICTs) Use by Academic Librarians in Southwestern Nigeria.

Hennessy, S., Harrison, D., & Wamakote, L. (2010). Teacher Factors Influencing Classroom Use of ICT in Sub-Saharan Africa. 2, 39–54.

Iliyasu, Z., Abubakar, I. S., Galadanci, H. S., & Aliyu, M. H. (2010). Birth Preparedness, Complication Readiness and Fathers’ Participation in Maternity Care in a Northern Nigerian Community. 14(1), 21–32.

Indrawati, & Haryoto, K. S. (2015). The Use of Modified Theory of Acceptance and Use Of Technology 2 to Predict Prospective Users’ Intention in Adopting TV Streaming. Proceedings of the 5th International Conference on Computing and Informatics, ICoICI 2015, (125), 206–215.

Indrawati, & Putri, D. A. (2018). Analyzing factors influencing continuance intention of E-payment adoption using modified UTAUT 2 Model: (A case study of Go-Pay from Indonesia). 2018 6th International Conference on Information and Communication Technology, ICoICT 2018, (December), 167–173. https://doi.org/10.1109/ICoICT.2018.8528748

Kari, H. K. (2007). Availability and accessibility of ICT in the rural communities of Nigeria. The Electronic Library, 25(3), 363–372. https://doi.org/10.1108/0264047071075869

Kaye, D. K., Kakaire, O., Nakimuli, A., Osinde, M. O., Mbalinda, S. N., & Kakande, N. (2014). Male involvement during pregnancy and childbirth: men’s perceptions, practices, and experiences during the care for women who developed childbirth complications in Mulago Hospital, Uganda. 1–8.

Kolb, B. (2007). Do all mammals have a prefrontal cortex? Evolution of Nervous Systems, 3, 443–450. https://doi.org/10.1016/B0-12-370878-8/00081-1

Kwambai, T. K., Dellicour, S., Desai, M., Ameh, C. A., Person, B., Achieng, F., … Kuile, F. O. (2013). Perspectives of men on antenatal and delivery care service utilization in rural western Kenya: a qualitative study.

Law, N. (2008). Teacher Learning Beyond Knowledge. International Handbook of Information Technology in Primary and Secondary Education, 425–434. https://doi.org/10.1007/978-0-387-73315-9_25

Lee, A. (2014). The role of informatics in nursing. Nursing Made Incredibly Easy, 12(4), 55. https://doi.org/10.1097/01.NME.0000450294.60987.00

---

Adamu A. et al., (2021) 844
Length, F. (2013). *Knowledge and perception of extension agents on information and communication technologies (ICTs) use in extension service delivery in Ondo State, Nigeria.* 8(48), 6226–6233. https://doi.org/10.5897/AJAR2012.7061

Length, F. (2013). *The role of ICT in the teaching and learning of history in the 21st century.* 8(21), 2155–2159. https://doi.org/10.5897/ERR2013.1617

Lincetto, O., Mothebesoane-Anoh, S., Gomez, P., & Munjanja, S. (2016). *Antenatal Care - Opportunities for Africa’s Newborns. WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience,* 51–62. https://doi.org/10.1002/9780470753354.ch6

Mashagba, F. F. Al, & Nassar, M. O. (2014). Modified UTAUT Model to Study the Factors Affecting the Adoption of Mobile Banking in Jordan. *International Journal of Sciences: Basic and Applied Research (IJSBAR),* 6(1), 83–94.

Mavellas, S., Wellington, M., & Samuel, F. (2016). *Assessment Of The Availability And Utilization Of Icts For Teaching And Learning In Secondary Schools - Case Of A High School In Kwekwe.* 5(5), 282–288.

Mohammed, J. I. & Mumtaz, A. (2010). Enhancing Quality of Education through E-Learning: The Case Study Of Allama Iqbal Open University. Turkish Online Journal of Distance Education, 11(1), 84-97.

Mullany, B. C., Becker, S., & Hindin, M. J. (2007). *The impact of including husbands in antenatal health education services on maternal health practices in urban Nepal: results from a randomized controlled trial.* 22(2), 166–176. https://doi.org/10.1093/her/cyl060

Mura, G., & Diamantini, D. (2014). The Use and Perception of ICT among Educators: the Italian Case. *Procedia - Social and Behavioral Sciences, 141,* 1228–1233. https://doi.org/10.1016/j.sbspro.2014.05.211

Nwezeh, C. M. T. (2010). *The Use of ICT in Nigerian Universities: A Case Study of Ile-Ife.*

Olajubu, A. O., Irinoye, O. O., & Olowokere, A. E. (2014). Competencies and Barriers to the Use of Nursing Informatics among Nurses in Primary, Secondary and Tertiary Healthcare Facilities in Nigeria. *Journal of Health Informatics in Africa,* 2(1), Olajubu. https://doi.org/10.12856/JHIA-2014-v2-i1-85

Otuka, J. O. E. (2011). E-learning in Nigeria: Problems and Prospects. UNIZIK Orient Journal of Education, 6(1 & 2), 8 R 16.

Paper, C. (2016). *Students and Teachers Perceptions of ICT Use in Classroom: Pakistani Classrooms.* (April).

Project, U. K. (2015). *ICT Transforming Education in Africa UNESCO KFIT Project of information and communication technologies ICT Transforming Education in Africa.*

Rahimi, M., & Yadollahi, S. (2011). *Procedia Computer Computer anxiety and ICT integration in English classes among Iranian EFL teachers. Procedia Computer Science,* 3, 203–209. https://doi.org/10.1016/j.procs.2010.12.034

Rahman, A. E., Perkins, J., Islam, S., Siddique, A. B., Anwar, M. R., Mazumder, T., … Hoque, D. E. (2018). *Knowledge and involvement of husbands in maternal and newborn health in rural Bangladesh.* 1–12.

Ramayah, T., & Aafaqi, B. (2004). Role of Self-Efficacy in e-Library Usage Among Students of a Public University in Malaysia. *Malaysian Journal of Library & Information Science, 9*(1), 39–57.

Resources, M. H. (n.d.). *Human Resources for Health Global standards for the initial education of professional nurses and midwives.*

Robinson-Bassey, G., & Edet, O. (2015). Nursing informatics education and use: challenges and prospects in Nigeria. *Global Journal of Pure and,* Vol. 21, pp. 171–179. Retrieved from
Robinson-Bassey, G. C., & Edet, O. B. (2015). Nursing informatics education and use: challenges and prospects in Nigeria. Global Journal of Pure and Applied Sciences, 21(2), 171-179.

Ruiz, J. G., Mintzer, M. J., & Leipzig, R. M. (2006). The impact of E-learning in medical education. [Review] [39 refs]. Academic Medicine: Journal of the Association of American Medical Colleges, 81(3), 207–212. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=med4&AN=16501260

Sánchez, A. B., Marcos, J. J. M., González, M. A., & GuanLin, H. (2012). In service teachers’ attitudes towards the use of ICT in the classroom. Procedia-Social and Behavioral Sciences, 46, 1358-1364.

Salmon, G., & Salmon, G. (2016). Flying not flapping: a strategic framework for e-learning and pedagogical innovation in higher education institutions Flying not flapping: a strategic framework for e-learning and pedagogical innovation in higher education institutions. 7769. https://doi.org/10.1080/09687760500376439

Spector, J. M., Ifenthaler, D., Sampson, D., Yang, J. L., Mukama, E., Warusavitara, A., ... & Gibson, D. C. (2016). Technology-enhanced formative assessment for 21st-century learning.

Story, W. T., Burgard, S. A., Lori, J. R., Taleb, F., Ali, N. A., & Hoque, D. M. E. (2012). Husbands’ involvement in delivery care utilization in rural Bangladesh: A qualitative study.

Sub-counties, W., County, K., Jepkosgei, S., & Mary, K. (2017). Male Partner Involvement In Antenatal Care Services In Mumias East. 6(4), 37–46. https://doi.org/10.9790/1959-0604033746

Taiwo A. I. (2015). ICT knowledge, Utilization and Perception among Healthcare Providers at National Hospital Abuja, Nigeria. American Journal of Health Research, 3(1), 47. https://doi.org/10.11648/j.ajhr.s.2015030101.17

Tegegne, K. M. (2014). The Influence of E-Learning on the Academic Performance of Mathematics Students in Fundamental Concepts of Algebra Course: The Case in Jimma University. Ethiopian Journal of Education and Sciences, 9(2), 41-59–59.

Teklesilasie, W., & Deressa, W. (2018). Husbands’ involvement in antenatal care and its association with women’s utilization of skilled birth attendants in Sidama zone, Ethiopia: a prospective cohort study. 1–10.

Tezci, E. (2009). Teachers’ effect on ICT use in education: The Turkey sample. Procedia-Social and Behavioral Sciences, 1(1), 1285-1294.

Ukachi, N. B. (2015). Information literacy of students as a correlate of their use of electronic resources in university libraries in Nigeria. The Electronic Library, 33(3), 486–501. https://doi.org/10.1108/EL-05-2013-0085

Usun, S. (2009). Information and communications technologies (ICT) in teacher education (ITE) programs in the world and Turkey. 1(1), 331–334. https://doi.org/10.1016/j.sbspro.2009.01.062

Uyouko, A., & Wong, S. L. (2015). Teachers’ Cultural Perceptions of ICT in Nigerian Schools. International Journal of Education and Training, 1(1).

Venkatesh, V., Thong, J., and Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology, MIS Quarterly, 36(1), 157-178

Woreta, S. A., Kebede, Y., & Zegeye, D. T. (2013). Knowledge and utilization of information communication technology (ICT) among health science students at the University of Gondar, North Western
Ethiopia. *BMC Medical Informatics and Decision Making* VO - 13.
https://doi.org/10.1186/1472-6947-13-31

Yargawa, J., & Leonardi-bee, J. (2015). *Male involvement and maternal health outcomes: systematic review and meta-analysis*. 604–612.
https://doi.org/10.1136/jech-2014-204784

Yıldırım, S. (2007). *Current utilization of ICT in Turkish basic education schools: A review of teacher’s ICT use and barriers to integration*. *International Journal of Instructional Media*, Vol. 34, pp. 171–186.

Yuen, A. H. K., & Ma, W. W. K. (2008). *Exploring teacher acceptance of e-learning technology*. *Asia-Pacific Journal of Teacher Education*, Vol. 36, pp. 229–243.
https://doi.org/10.1080/13598660802232779

Yuqin, Z., Guijun, W., Zhenqiang, B., & Quanke, P. (2012). A Game between Enterprise and Employees about the Tacit Knowledge Transfer and Sharing. *Physics Procedia*, 24, 1789–1795.
https://doi.org/10.1016/j.phpro.2012.02.263

Yusuf A. (2019). Sustaining quality nursing education and practice in the 21st century: the place of professional examination. Paper presentation at OSCE workshop organized by N&MCN at Katsina.

Zaim, H., Gürcan, Ö. F., Tarım, M., Zaim, S., & Alpkan, L. (2015). Determining the Critical Factors of Tacit Knowledge in the Service Industry in Turkey. *Procedia - Social and Behavioral Sciences*, 207, 759–767.
https://doi.org/10.1016/j.sbspro.2015.1