

FACTORS AFFECTING THE ADOPTION OF ONLINE LEARNING IN TEACHING AND LEARNING DURING COVID-19 PANDEMIC AMONG TEACHERS AND STUDENTS IN NIGERIA: A STUDY OF PRINCE ABUBAKAR AUDU UNIVERSITY, ANYIGBA

¹Salami Dhariyyat, ²Olorunnishola Olufikayo Agnes and ³Abu Alice Oladehinde, Ph.D.

^{1,2,3}Prince Abubakar Audu University, Anyigba
e-mail: rockschamber@gmail.com

Abstract

This study was aimed at finding factors affecting the adoption of online learning in teaching and learning during covid-19 pandemic among teachers and students in Nigeria: a study of Prince Abubakar Audu University, Anyigba. Data for this study was collected through the use of four likart scale questionnaire consisting of 27 items. A sample of 120 subjects were drawn for the study from eight faculties in Prince Abubakar Audu University, Anyigba. Four research questions and four research hypotheses were answered and tested respectively. The research questions were answered with a descriptive mean statistic while the hypotheses were tested with chi-square statistics at 0.05 level of significance. The result of the findings showed that devices to participate in online learning as well as data, internet facilities were hindrances towards the online learning. Electricity was also a major factor that militate against the success of online learning. It is recommended based on these findings that school management and government should provide internet facilities and data as well as subsidized laptops to students for effective and enhanced internet services for online learning.

Keywords: Online-learning, covid-19, teaching, learning

Introduction

On 11th March, 2020, the World Health Organization (WHO) declared covid-19 a global pandemic. Currently, covid-19 is affecting over 200 countries. In response to covid-19, several countries have applied strict social distancing measures and a lockdown policy. Obviously, this pandemic has had a tremendous impact on education in general. Nigeria has been faced with a series of challenges in learning especially in the face of the pandemic. As a result of this pandemic known as Covid-19, the federal government and the state government has to embark in ensuring the closure of schools for certain periods. During this pandemic, school managements came up with the use of mobile learning for all students via Google classroom, Microsoft team, and Zoom (Salami, 2021). In advanced countries, the changes are noteworthy in the educational sector as traditional teaching methods have been transformed into modern methods (Kenan, Pislaru, Othman and Elzawi 2013). In advanced countries, students in the College routinely learned and studied with technology.

The high cost of ICT accessories and inadequate resource persons are among the problems limiting Online-learning in Nigeria (Ajadi, Salawu and Adeoye, 2020). The success of any information system depends on the usage of the system by the users (Almaiah, Al-Khasawneli and Althunibat 2020). Thus, student's acceptance of online-learning is considered as one of the main criteria for the success of online-learning

system. Several studies in the literature have addressed issues related to online-learning adoption in many countries over the world. In his study, Al-Rahmi (2016) investigated the critical factors that affect the use of online-learning system among Malaysian students. The results revealed advantages, observability, trial ability, perceived compatibility, complexity, and perceived enjoyment as the factors that play a significant role in students' decision to the use of online-learning system in Malaysia.

In a research carried out by Salloum, Al-Emran, Shaalan and Tarhini, (2019) using UAE as a case study for a quantitative investigation, the results indicated that four factors which are innovativeness, quality, trust and knowledge sharing were observed to achieve better online-learning system acceptance among students. Al-Gahtani (2016) also investigated the factors influencing student acceptance of online-learning. It was found from this research that the most significant determinants of online-learning acceptance were playfulness, self-efficacy and anxiety, while using computers, perceptions of external control, subjective norms and perceived usefulness. However, in the context of Saudi Arabia, social influence, demonstrability and perceived enjoyment were not related to the acceptance of Online-learning systems. Another study conducted by Almaiah, Al-Khasawneh and Althunibat (2020), they proposed new framework using Delphi method to determine the success factors of Online-learning system implementation in Saudi Arabia. The results highlighted website quality, technology options, top management support, and online-learning awareness by academic faculty and students as critical factors.

In their study, Bellaaj, Zekri and Albugami (2015) used the Unified Theory of Acceptance and Use of Technology (UTAUT) model to explore the factors affecting students' use of online-learning systems at the University of Tabuk, Saudi Arabia. They found that expectations regarding performance and effort had a strong influence on online-learning acceptance. In another study in Azerbaijan, Chang, Hajiyev and Su (2017) found subjective norms, experience and enjoyment influenced acceptance of online-learning. (Abdullah and Ward 2016) also investigated factors influencing Online-learning acceptance using TAM. Their findings revealed that self-efficacy; subjective norms, enjoyment, anxiety and experience with using computers had a significant effect on students' acceptance of online-learning. Similarly, Alhabeeb and Rowley (2017) found that academic staff knowledge of learning technologies, student knowledge of computer systems and technical infrastructure, were significant factors in facilitating the successful acceptance of online-learning in Saudi Arabian universities.

Online-learning usage and adoption among users is a challenging issue for many universities, both in developed and developing countries, but it is likely to be less of a concern in developed countries over the willingness of their students to accept and use the online-learning system, as significant progressive steps have already been taken, according to literatures. In this regard (Mulhanga and Lima 2017). And Eltahir (2019) indicated that the challenges of adopting online-learning system in developing countries, however, remain a reality due to the digital divide with the developing countries.

Lack of ICT knowledge, poor network infrastructure and weakness of content development were the main challenges of online-learning system adoption in developing countries (Aung and Khaing 2015). Another study revealed that system characteristics, internet experience and computer self-efficacy were the main issues that impede the successful adoption of online-learning system in Pakistan (Kanwal and Rehman 2017). A

similar study conducted in Kenya identified three main challenges of online-learning which are inadequate ICT infrastructure, lack of technical skills and financial constraints (Tarus, Gichoya and Muumbo, 2015). A study by Mulhanga and Lima (2017) found that poor interface design; inadequate technical support and lack of IT skills are the primary barriers that hinder the successful implementation of existing Online-learning projects. Mulhanga and Lima (2017) claimed that cultural, political, and economical constraints are the main reasons to fail the online-learning initiatives in Libya. In the same way, Kenan, Pislaru, Othman and Elzawi (2013); Chen and Tseng (2012) classified the challenges that affect the actual use of online-learning into four categories: management challenges, technological challenges, implementation challenges and cultural challenges. Despite these efforts, none of these studies have investigated the actual challenges that face users during the use of online-learning system.

Statement of the Problem

It is no doubt the importance of education in the building of any nation, education is a continual process and such should not be put on hold. It all came as a shock in Nigeria in March, 2020 when the federal government announced that the nation has to be put on a total lockdown to help prevent the spread of covid-19. To this, education was not left out, pupils, students, teachers among others were all on a lockdown. A quick decision and effective one has to be reached which gave rise to some schools embarking on an online learning at all cost. Insecurity in Nigeria is also a driving factor towards this present study. It is based on this urgent need to learn from home that this study seeks to find out the factors affecting the adoption of online learning in teaching and learning during covid-19 pandemic among teachers and students in Nigeria: a study of Prince Abubakar Audu University, Anyigba.

Aim and Objectives of the Study

The main aim of this study is to evaluate the factors affecting the adoption of online learning in teaching and learning during covid-19 pandemic among teachers and students in Nigeria: a study of Prince Abubakar Audu University, Anyigba.

Specific objectives are to:

- i. Investigate the level of students' participation of online-learning in teaching and learning during the covid-19 pandemic lockdown in Prince Abubakar Audu University.
- ii. Identify the factors that affected the adoption of online learning in teaching and learning during the covid-19 pandemic lockdown period in Prince Abubakar Audu University.
- iii. Identify the limitations to the use of online-learning in teaching and learning during covid-19 pandemic lockdown in Prince Abubakar Audu University.
- iv. Examine the level of compliance of instructors and students of Prince Abubakar Audu University to online-learning during the covid-19 pandemic lockdown.

Research Questions

The study attempted to answer the following research questions:

- i. What was the level of students' participation of online-learning in teaching and learning in Prince Abubakar Audu University during the covid-19 pandemic lockdown?
- ii. What are the factors that affected the adoption of online learning in teaching and learning during the covid-19 pandemic lockdown period in Prince Abubakar Audu University?
- iii. What are the limitations to the use of online-learning in teaching and learning during covid-19 pandemic lockdown in Prince Abubakar Audu University?
- iv. What was the level of compliance of instructors and students of Prince Abubakar Audu University to online-learning during the covid-19 pandemic lockdown?

Research Hypotheses

- H01: The factors that affects students' participation of online-learning in teaching and learning in Prince Abubakar Audu University during the covid-19 pandemic lockdown period, is not significant.
- H02: The factors that affected the adoption of online learning in teaching and learning during the covid-19 pandemic lockdown period in Prince Abubakar Audu University, is not significant.
- H03: The limitations to the use of online-learning in teaching and learning during covid-19 pandemic lockdown in Prince Abubakar Audu University, is not significant.
- H04: The level of compliance of instructors and students of Prince Abubakar Audu University to online-learning during the covid-19 pandemic lockdown, is not significant

Methodology

Research Design

This research work is a descriptive survey in conduct. This descriptive survey evaluated the factors affecting the adoption of online learning in teaching and learning during covid-19 pandemic among teachers and students in Nigeria: a study of Prince Abubakar Audu University, Anyigba. Data for the study was collected with the aid of Online Learning in Teaching and Learning Questionnaire (OLTLQ) which is a four likart scale consisting of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The questionnaire (OLTLQ) comprised of 27 items. This study was carried out in Prince Abubakar Audu University as a case study.

Population and Sample of the Study

For the purpose of this research, the population of this study comprised of the eight faculties in Prince Abubakar Audu University, Anyigba. The Faculty of Education, the Faculty of Management Sciences, the Faculty of Natural Sciences, Faculty of Physical Science, the Faculty of Social Sciences, the Faculty of Art and Humanities, Faculty of Law and Faculty of Agriculture.

Samples of One hundred and twenty (120) respondents across faculties were selected from the university in the study area. This allows the findings from a relatively small sample to be generalized to the population, and ensures that the diversity of the study area is described.

A structured questionnaire (Online Learning in Teaching and Learning Questionnaire) was adopted for the elicitation of information on the factors affecting the adoption of online learning in teaching and learning during covid-19 pandemic among teachers and students in Nigeria: a study of Prince Abubakar Audu University, Anyigba. It comprised two sections, namely: A and B. Section A elicited data on basic demographic information of respondents, Section B has items which elicited information on the factors affecting the adoption of online learning in teaching and learning during Covid-19 lockdown.

Data Presentation and Analysis

This deals specifically with the presentation and analysis of data collected from the population of the study. In presenting the data, it is of note that out of the 120 questionnaires distributed, only 110 were returned and were therefore used in answering the research questions and testing the research hypotheses.

Table 1: Level of Students' Participation of Online-Learning in Teaching and Learning during the Covid-19 Lockdown

S/N	ITEMS	SA	A	D	S D	MEA N
1	Have you ever received any online lecture before COVID-19 pandemic	11	8	59	32	1.9818
2	Have you ever been trained on the use of any Online-learning platform before lockdown	15	8	48	39	1.9909
3	Are you comfortable using Computer or your mobile phone for 2hrs and above without been bored	32	22	34	22	2.5818
4	Do you have ICT practical skills as in use of computer hardware and software effectively	21	11	46	32	2.1909
5	Are your lecturers helpful in using and adoption of Online-learning or M-learning during the lock	45	24	21	20	2.8545
6	Do you have facilities like bandwidth and electricity supply for keeping you online for 5 hours per day	17	6	51	36	2.0364
7	Did your location during the lockdown affect your access to internet via your mobile phone negatively	42	37	21	10	3.0091
	Cumulative Mean					2.377

Source: Research findings, 2021

From table 1 above, the level of students' participation in the online-learning during the covid-19 pandemic lockdown, is generally very low. Reason being that the cumulative mean agreement level of 2.377 is below the decision/benchmark mean of 2.5000. Specifically, majority of them were of the view that their location during the lockdown seriously affected their access to internet via their mobile phone negatively, this is according to 79 of the respondents as against 31 that disagreed with this view. Also, on if they have received any online lecture before covid-19 pandemic only 19 agreed as against the rest 81 that disagreed with this assertion. In summary, the level of students' participation in the online-learning during the covid-19 pandemic lockdown, is generally very low as most of their access to internet via mobile phone were affected during the covid-19 lock down and were never given any lecture before the covid-19 pandemic.

Table 2: Factors that Affected the Adoption of Online Learning in Teaching and Learning during the Covid-19 Lockdown

S/N	ITEM	SA	A	D	SD	MEAN
1	Power supply	60	23	18	7	3.2182
2	Internet access	55	41	7	7	3.3091
3	Internet Data	64	44	2	0	3.5636
4	Laptop/mobile phone	60	41	4	5	3.4182
5	Instructor	30	15	41	24	2.4636
6	Institution	31	20	31	28	2.4909
	Cumulative Mean					3.0772

Source: Research findings, 2021

The perception of respondents in table 2 above revealed that there are very serious factors that affected the adoption of online learning in teaching and learning during covid-19 pandemic among teachers and students in Nigeria: a study of Prince Abubakar Audu University, Anyigba. This is because their agreement level of 3.2182 is above the 2.500 decision/benchmark mean. Specifically, they were of the very opinion that the low level of internet data was the highest factor that negatively affected the adoption of online-learning in teaching and learning during covid-19 pandemic lockdown period, because this view attracted the highest mean agreement level of 3.5636 with a total of 108 in agreement as against 2 that disagreed. In the same vein, lack of laptop/mobile phone to any institution within the period is another serious factor that affected the adoption of online learning in teaching and learning during covid-19 pandemic among teachers and students in Nigeria: a study of Prince Abubakar Audu University, Anyigba as this factor attracted the second highest mean agreement level of 3.4182 with a total of 101 in agreement as against 9 in disagreement of this factor. In summary, there are very serious factors that affected the adoption of online-learning in teaching and learning during covid-19 pandemic lockdown period especially the low level of internet data and laptop/mobile phone.

Table 3: Limitations to the Use of Online-Learning in Teaching and Learning during Covid-19 Lockdown

S/N	ITEM	SA	A	D	SD	MEAN
1	Poor electricity supply	58	28	18	16	3.2545
2	High cost and poor quality of Online-learning facilities	43	38	17	12	3.0182
3	The poor technical know-how of Online-learning	52	31	9	18	3.0636
4	Poor internet connectivity	36	43	22	9	2.9636
5	Lack of telecommunication infrastructure	22	32	45	11	2.5909
6	Lack of training support by the institutions	62	24	8	16	3.2000
	Cumulative Mean					3.015

Source: Research findings, 2021

In table 3 above, the level of limitations to the use of online-learning is very high. This is because their cumulative general agreement level of 3.015 is above the 2.500 decision/benchmark mean. Specifically, poor electricity level is the greatest limitation to the use of online learning as this view attracted the highest mean agreement level of 3.254 with a total of 86 in agreement and the rest 24 in disagreement. In the same vein, lack of training support by the institutions is another serious limitation to the use of online learning as this view attracted the second highest mean agreement level of 3.200 as a total

of 86 were in agreement as against 24 that disagreed. In summary, the level of the limitations to the use of online-learning is very great especially poor electricity and lack of training support by the institutions.

Table 4: Level of Compliance by Instructors and Students to Online-Learning in Teaching and Learning during the Covid-19 Lockdown

S/N	Items	SA	A	D	SD	Mean
1	Do you have stable Power to use internet or access Online-learning resources?	45	30	25	10	3.0000
2	Do your institution or school has online-learning platform that can be accessed online	45	33	22	10	3.0273
3	Do you have modern Computer, Laptop, mobile phones?	15	8	62	25	2.1182
4	Were you trained on the use of online-learning platform?	20	13	42	35	2.1636
5	Did your school engage the students during lockdown with any virtual learning approach	50	34	17	9	3.1364
6	Is your school management supportive in using Online-learning platforms?	55	36	13	6	3.2727
7	Do you have ICT practical skills as in the form of computer hardware and software effectively	10	22	45	33	2.0818
8	Did your location during lockdown affect your access to internet via your mobile phone negatively	19	28	37	26	2.3636
Cumulative Mean						2.645

Source: Research findings, 2021

From table 4 above, it is obvious with the level of compliance of instructors and students to online-learning during the covid-19 pandemic lockdown, this is as the cumulative or general agreement level of 2.645 is above the decision/benchmark mean of 2.500. Specifically, most asserted that their school management is supportive in using online-learning platforms as this had the highest mean agreement level of 3.272 with a total of 91 in agreement as against 19 that disagreed with this view. In the same vein, school engage the students during lockdown with any online learning approach with this having the second highest mean agreement level of 3.136 with a total of 84 agreed as against 26 that disagreed. In summary, the level of compliance of instructors and students to online-learning during the covid-19 pandemic lockdown especially as school management is supportive in using online-learning platforms and school engage the students during lockdown with any virtual learning approach.

Testing of Hypotheses

Table 5: Chi Square Level of Students' Participation of Online-Learning in Teaching and Learning during the Covid-19 Pandemic Lockdown.

Variable	SA	A	D	SD	Total	Df	χ^2	χ^2	P
Level of students participation in online during COVID-19	45	24	21	20	110	18	21.112	28.869	0.087
	26.1	16.6	40.0	27.3					

Source: Research finding, 2021 $p\text{ value} > 0.05, \chi^2_{\text{computed}} < \chi^2_{\text{critical}}$ at $df\ 18$.

Results of the chi square statistics in table 5 above showed that the level of students' participation in the online-learning during the covid-19 pandemic lockdown, is not significant. This is because the p value of 0.087 is greater than the 0.05 alpha level and the X^2 computed value of 21.112 is lower than the X^2 critical value of 28.869 at df 18. This shows that the level of students' participation in the online-learning during the covid-19 pandemic lockdown, is not significant. Therefore, the null hypothesis which states that the level of students' participation in the online-learning during the covid-19 pandemic lockdown, is not significant, is hereby accepted and retained.

Table 6: Chi Square Statistics on the Factors Affecting the Adoption of Online Learning in Teaching and Learning during Covid-19 Pandemic Lockdown Period.

Variable	SA	A	D	SD	Total	Df	X^2	X^2	P
Factors that affect role of teaching and learning maths during COVID	64	44	2	0	110	15	175.348	24.996	0.000
	50.0	30.7	17.2	12.2					

Source: Research finding, 2021 p value < 0.05, X^2 computed > X^2 critical at df 15.

The chi square statistics in table 6 above showed that the factors that affected the adoption of online learning in teaching and learning during covid-19 pandemic lockdown period, is significant. This is because the p value of 0.000 is lower than the 0.05 alpha level and the X^2 computed value of 175.348 is greater than the X^2 critical value of 24.996 at df 15. This shows that the factors that affected the adoption of online learning in teaching and learning during covid-19 pandemic lockdown period, is significant. Therefore, the null hypothesis which state that the factors that affected the adoption of online learning in teaching and learning during covid-19 pandemic lockdown period, is not significant, is hereby rejected.

Table 7: Chi Square Statistics on the Limitations to the Use of Online-Learning in Teaching and Learning

Variable	SA	A	D	SD	Total	Df	X^2	X^2	P
Factors that limit the use of online learning	62	24	8	16	110	15	85.698	24.996	0.001
	45.5	32.7	19.8	12.0					

Source: Research finding, 2021 p value < 0.05, X^2 computed > X^2 critical at df 15.

The chi square statistics in table 7 above showed that the limitations to the use of online-learning, is significant. This is because the p value of 0.001 is lower than the 0.05 alpha level and the X^2 computed value of 85.698 is greater than the X^2 critical value of 24.996 at df 15. Therefore, the null hypothesis which state that the limitations to the use of online-learning, is not significant, is hereby rejected.

Table 8: Chi Square Statistics on the Level of Compliance of Instructors and Students to Online-Learning in Teaching and Learning during the Covid-19 Pandemic Lockdown

Variable	SA	A	D	SD	Total	Df	X ²	X ²	P
Compliance of instructors and students to online learning during covid-19	55	36	13	6	110	21	208.067	32.671	0.002
	32.4	25.5	32.9	19.5					

Source: Research finding, 2021; p value < 0.05, $X^2_{computed} > X^2_{critical}$ at df 21.

The chi square statistics in table 8 above showed that the level of compliance of instructors and students to online-learning during the covid-19 pandemic lockdown, is significant. This is because the p value of 0.002 is lower than the 0.05 alpha level and the X² computed value of 208.067 is greater than the X² critical value of 32.671 at df 21. Therefore, the null hypothesis which state that the level of compliance of instructors and students to online-learning during the covid-19 pandemic lockdown is hereby rejected.

Discussion of Findings

Based on the findings, it has been established that the level of students' participation in the online-learning during the covid-19 pandemic lockdown, is generally very low as most of their access to internet via mobile phone were affected during the covid-19 lock down and were never given any lecture on online learning before the covid-19 pandemic. This is supported by the work of Aung and Khaing (2015), Alhabeeb and Rowley (2017). This is also supported by the work of Kisanga and Ireson (2015), Mulhanga and Lima (2017). There are very serious factors that affected the adoption of online learning in teaching and learning during covid-19 pandemic lockdown period especially the low level of internet data and laptop/mobile phone. Supported by the work of Kisanga and Ireson (2015), Mulhanga and Lima (2017). The Level of the limitations to the use of online-learning is very great especially poor electricity and lack of training support by the institutions. The work of Kisanga and Ireson (2015), Mulhanga and Lima (2017), Cheng and Tseng (2012) also supported this finding. This is also supported by the work of Alhabeeb and Rowley (2017), Tarus, Gichoya and Muumbo (2015).

The level of compliance of instructors and students to online-learning during the covid-19 pandemic lockdown especially as school management is supportive in using online-learning platforms and school engage the students during lockdown with any virtual learning approach is a huge success. This is supported by the work of Abdullah and Ward (2016), using computers had a significant influence on students' acceptance of online learning. Alhabeeb and Rowley (2017) also found that academic staff knowledge of learning technologies, students' knowledge of computer systems and technical infrastructure were significant factors in facilitating the successful acceptance of online learning.

Conclusion

In conclusion, the level of students' participation in the online-learning during the covid-19 pandemic lockdown, is not significant, while the factors that affected the adoption of online learning in teaching and learning during covid-19 pandemic lockdown period, the limitations to the use of online-learning and the level of compliance of instructors to online-learning during the covid-19 pandemic lockdown, are all significant.

Recommendations

The following recommendations were made based on the result of the findings:

The students should be well lectured and made knowledgeable about the covid-19 and how to manage time of lock down if it happens again in future.

Schools should provide internet facilities and data as well as subsidized laptops to the students for effective and enhanced internet activities during other lock downs

The Ministry of Education should provide all needed infrastructure such as telecommunications infrastructure and internet infrastructure.

The school authorities should be exposed to constant software and hardware trainings as well as on line eLearning platforms.

References

- Abdullah F. & Ward R. (2016). Developing a general extended technology acceptance model for e-learning by analyzing commonly used external factors. *Computers in human behavior*, **56**: 238-256
- Al-Gahtani, S. S. (2016). Empirical investigation of e-learning acceptance and assimilation: A structural equation model. *Applied computing and informatics*, **12** (1): 27-50
- Alhabeeb, A. & Rowley, J. (2017). Critical success factors for e-learning in Saudi Arabian universities. *International journal of educational management*, **31** (2): 131-147
- Almaiah, M. A; Al-Khasawneh, A. & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the e-learning system usage during covid-19 pandemic. *Journal of educational information technology*, 1-20
- Bellaaji, M.; Zekri, I. & Albugami, M. (2015). The continued use of e-learning system: An empirical investigation using UTAUT model at the University of Tabuk. *Journal of Theoretical and Applied Information Technology*, **72** (3).
- Chang, C. T; Hajiyev, J. & Su, C. R. (2017). Examining the students' behavioural intention to use e-learning approach. *Computers and Education*, **111**: 128-143
- Cheng, H. R. & Tseng, H. F. (2012). Factor that influence acceptance of web-based e-learning system for the inservice education of junior high school teachers in Taiwan. *Evaluation and Program Planning*, **35** (3): 398-406
- Eltahir, M. E. (2019). E-learning in development countries: is it a panacea? A case study of sudan. *IEEE Access*, **7**: 97784-97792
- Kenan, T.; Pislaru, C.; Othman, A. & Elzawi, A. (2013). The social impact and cultural issues affecting the e-learning performance in Libyan higher education institutes. *International Journal of Information Technology and Computer Science*, **12** (1): 50-56

- Kisanga, D. & Ireson, G. (2015). Barriers and strategies on adoption of e-learning in Tanzanian higher learning institutions: lessons for adopters. *International journal of education and development using ICT*, **11** (2).
- Mulhanga, M. M & Lima, S. R. (2017). Podcast as e-learning enabler for developing countries: current initiatives, challenges and trends. In proceedings of the 2017 9th international conference on education technology and computer. 126-130
- Salami, D. (2021). Attitude of science education students towards the use of mobile-learning in Nigeria. *Journal of Science Technology and Education*, **9** (1): 38-43.
- Salloum, S. A.; Al-Emran, M.; Shaalan, K. & Tarhini, A. (2019). Factors affecting the e-learning acceptance: A case from UAE. *Education and information technologies*, **24** (1): 509-530
- Tarus, J. K; Gichoya, D. & Muumbo, A. (2015). Challenges of implementing e-learning in Kenya: A case study of Kenyan public universities. *The International Review of Research in Open and Distance Learning*, **16** (1): 120-141.