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AVAILABILITY, ACCESSIBILITY AND ATTITUDE TOWARDS E-LEARNING RESOURCES FOR TEACHING CHEMISTRY AMONG COLLEGE OF EDUCATION STUDENTS IN NIGER STATE, NIGERIA

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Abstract

Chemistry which is expected to be an interesting practical science subject is posing a great threat to many students nowadays. This is commiserating with the attitude of the students, lack of commitment and laxity of lecturers in their quality of teaching and availability of E-learning resources to help students in solving academic problems is affecting the students. The paper aimed to assess the Accessibility, Availability and Attitude of Students towards E-learning resources for teaching Chemistry among College of Education in Niger State. The study adopts a descriptive survey in other to document current condition that exists at the moment. The data collected for the study was analyzed using simple frequencies and spatial regression analysis using AMOS 23 software. The findings shows that websites have the mean value of 1.73 with the standard deviation of 0.85 which signifies it's highly available among the identify E-learning resources and Full text databases has the mean value of 3.01 with the standard deviation of 0.83 which signifies not available in colleges of education in Niger State as investigated by the respondents. The findings further show students attitudes towards the use of E-learning resources, it was discovered that "I believe using e-learning will improve the quality of my work" with the lowest mean value of 1.93 and standard deviation (0.88) is strongly agreed by the respondents. The study concluded that e-learning facilities are moderately available in the study area but it can be seen from the findings that e-learning facilities that will improve the academic performance of students and bridge the gap that exist between theories and practical are not effectively available. Thereby recommends that College authority should give priority in the provision of e-learning facilities through collaboration for effective teaching and learning to take place.

Key Words: Chemistry, Accessibility, Availability, Attitudes and E-learning

INTRODUCTION

Technology is a major part of students' lives and their academic training requires an introduction to scholarly uses of technology (Salavati, 2013). Technology offers tremendous promise for student learning and has ignited the imagination of those who are interested in bringing about revolutionary gains in the achievement of all students (Skolverket, 2016). Yet, the use of technology in education also raises a whole host of challenges, including those related to cost-effectiveness, teacher professional development, assessment, equity, and safety. Despite the challenges of utilizing technologies in education and teaching, the importance of the adoption and use of digital technologies in school education should not be underestimated. Technology constitutes a strong and powerful influencing force on how

education is to be carried out and what is expected of the future generation (Salavati, 2013).

E-learning means a lot of different things and it is understood differently by players with very different roles. Heterick, (2012) describes E-learning "as an umbrella term describing any type of learning that depends on or is enhanced by electronic communication using the latest information and communication technologies (ICT)". The trend of using E-learning as learning and teaching tool is now rapidly expanding into education (Lau and Woods, 2015). E-learning covers a wide set of ICTs Technology-based applications and processes, including computer-based learning, web-based learning, virtual classrooms, and digital collaboration and networking (Heterick, 2012).

E-learning in higher education is ranged from technology enhanced classroom to distributed learning; E-learning has been integrated into classroom teaching in the same way as previous technologies, teachers may build a course Webpage with links through the Internet to relevant resources on other Websites (Barker and Wendel, 2011). Instructors can convert their PowerPoint slide presentations to PDF files (electronic documents), which students can download and print from a website, or teacher's own papers and research materials such as photographs or slides, as well as links to other relevant sources. Teachers may also use other web sites for illustration within their classroom lectures and students may be asked to participate in on-line discussion forums, to discuss the lecture afterwards amongst them, enhancing classroom teaching is still by far the most prevalent use of the web in post – secondary education.

Chemistry which is expected to be an interesting practical science subject is posing a great threat to many students nowadays, with some of them developing phobia because of their consistent poor achievement on assessment or repeated failure in external examinations. Evidences have shown that most concepts in chemistry give examples are indeed difficult to learn by most students (Johnstone, 2016). Many scholars agree that E-learning resources play an increasingly important role in facilitating the educational processes and systems of today (Katundu, 2015)

These are not commiserating with the attitude of the students, lack of commitment and laxity of lecturers in their quality of teaching and availability of E-learning resources to help students in solving academic problems is affecting the students. Existing research on the use of E-learning resources reveal that E-learning improves students' achievements and performance (Johnson, 2015). Some researchers have examined the impact of E-learning information on both lecturers and students but none have investigated the accessibility, availability and attitude of students towards the use of E-learning resources in teaching of chemistry in Colleges of Education in Niger State to be specific. This research considers this as a gap to fill and therefore explores the personal and emotional aspects of the availability, accessibility and attitude towards E-learning resources for teaching chemistry among college of education students in Niger State.

Aim and Objectives of the Study

The aim of this study is to assess the Accessibility, Availability and Attitude of Students towards E-learning resources for teaching Chemistry among College of Education in Niger State.

Methodology

The research design will be a descriptive survey; as a result, the study will attempt to seek an understanding in other to document

current condition that exists at the moment. This study will therefore be discovering current situations as they relate to the Accessibility, Availability and Attitudes towards E-learning resources for teaching Chemistry among College of Education students in Niger State.The data collected for the study will be analyzed using simple frequencies and percentages for the demographic characteristics of the subjects. The answer to the research questions will be provided with tables of frequencies and percentages. For the test of the hypotheses, the Spearman correlation procedure will be used because of the non-parametric measurement of the variables. All the hypotheses will be tested at 0.05 level of significance.

Results

Availability of E-learning Resources

The availability of e-learning resources in Colleges of Education was investigated, Table 1 shows the rate at which the E-learning resources are available. It was observed that websites has the mean value of 1.73 with the standard deviation of 0.85 which signifies it's highly available followed by Reference databases with mean score of 2.45 and standard deviation of 1.05 which implies that it's medium available while OPAC with the mean value of 2.95 has the standard deviation of 0.91, CD-ROMs with the mean value of 2.97 and standard deviation of 0.77 , E-images with the mean value of 2.77 and standard deviation of 0.97, E- journal with the mean value of 2.55 and standard deviation of 1.07 signifies that they are less available respectively. It was also observed from the table that Institutional Repositories (IRs) has the mean value of 3.11 and the standard deviation of 0.99, Full text databases has the mean value of 3.01 with the standard deviation of 0.83 which are not available in colleges of education as investigated by the respondents.

Table 1: **Availability of E-learning Resources**

ITEMS	N	HA	MA	LA	NA	Mean	Std Deviation	Remarks
OPAC	319	30	51	141	97	2.95	0.91	Less Available
E-journals	319	62	99	77	81	2.55	1.07	Less Available
Search engines	319	19	44	166	90	3.02	0.81	Not Available
Full-text databases	319	22	43	163	91	3.01	0.83	Not Available
Websites	319	161	93	55	10	1.73	0.85	High Available
E-images	319	43	66	129	81	2.77	0.97	Less Available
CD-ROMs	319	19	44	183	73	2.97	0.77	Less Available
Reference databases	319	77	82	99	61	2.45	1.05	Medium Available
Institutional Repositories (IRs)	319	29	55	86	149	3.11	0.99	Not Available

Highly Available (**HA**), Moderately Available (**MA**), Less Available (**LA**), and Not Available (**NA**)

Test for normality using skewness and kurtosis for the respective variables is shown in Table 4.2. The result showed that the distribution of each of the variables where positively high skewed (as the values were greater than 1). OPAC had 3.91; E-journals had a skewness of 3.65; Search engines had 3.51 as skewness value. Full-text database (3.44), websites (3.51) all had skewness greater than; E-images (2.91); CD-ROMs (3.35); Reference database (3.66) while Institutional Repositories (IRs) as a skewness value 3.77. The finding of the study collaborates with the views of Madu and Pam (2011) who found out that only few e-learning facilities were available for teaching and learning in universities in Kwara state. He further stated that for effective teaching and learning to take place in management and business courses and for the students to be able to acquire relevant skills there is need for adequate provision of all relevant technologies that will enhance the teaching process.

Table 2: Normality Test (Skewness and Kurtosis)

Variables	Skewness	Kurtosis
OPAC	3.91	.550
E-journals	3.65	.567
Search engines	3.51	.479
Full-text databases	3.44	.485
Websites	3.51	.482
E-images	2.91	.522
CD-ROMs	**3.35**	**.339**
Reference databases	3.66	.519
Institutional Repositories (IRs)	3.77	.532

Accessibility of E-learning Resources

The analysis in Table 2 shows the rate at which the E-learning resources are accessible. It was observed that website with the lowest mean value of 1.91 and standard deviation of 0.91 signifies that it's a highly accessible e-learning facilities followed by E-journals with mean value of 2.09 and standard deviation of 0.93 which is a moderately accessible. It was further observed that Search engines with the mean value of 2.64 and standard deviation of 1.11, Full-text databases with mean value of 2.92 and standard deviation of 0.97, Reference databases mean value of (2.95) and the standard deviation of 0.99 while Institutional Repositories (IRs) with the mean value of (2.69) standard deviation of 1.09 implies that they are Less accessible e-learning resources respectively. The table further shows that OPAC with the mean value of 3.11, standard deviation of (0.93) CD- ROMs with the mean value of 3.21 and standard deviation of 0.93 are non- accessible e-learning facility in the colleges of education.

Table 3: Accessibility of e-learning resources

ITEMS	N	HA	MA	LA	NA	Mean	Std. Deviation	Remarks
OPAC	319	19	67	92	141	3.11	0.93	Not Accessible
E-journals	319	97	123	71	28	2.09	0.93	Moderately Accessible
Search engines	319	59	96	63	101	2.64	1.11	Less Accessible
Full-text databases	319	33	66	111	109	2.92	0.97	Less Accessible
Website	319	131	101	71	16	1.91	0.91	Highly Accessible
E-images	319	21	66	93	139	3.09	0.94	Not Accessible
CD-ROMs	319	19	53	89	158	3.21	0.92	Not Accessible
Reference databases	319	31	73	95	120	2.95	0.99	Less Available
Institutional Repositories (IRs)	319	61	73	88	97	2.69	1.09	Less Available

Highly Accessible (**HA**), Moderately Accessible (**MA**), Less Accessible (**LA**), and Not Accessible (**NA**)

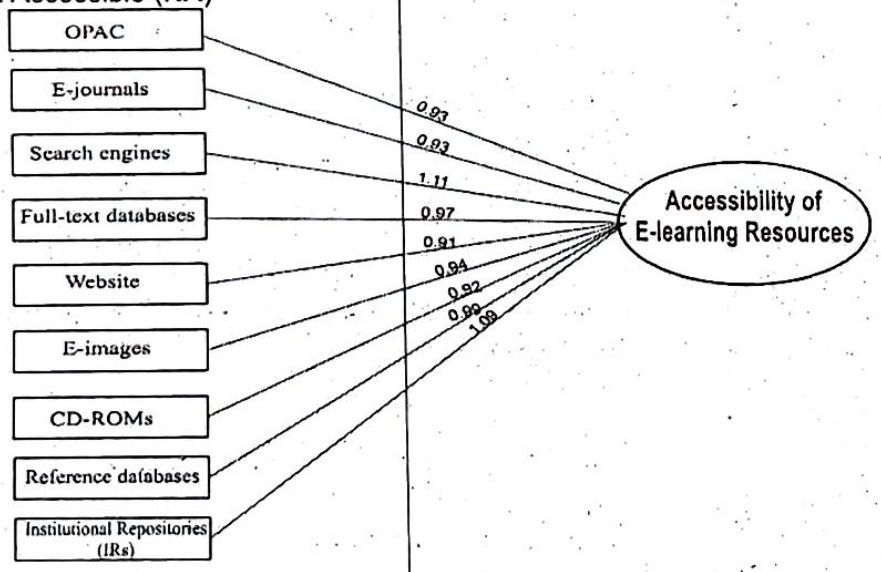

Figure 1 E-learning resources accessibility model

The model shows that website is most highly accessible among the e-laerning resources in College of Educations in Niger State, Search engine and full text database were less assessable, e-journal is moderate available while E-images and CD-ROMS were not available. This finding is line with Onojetah (2014) who affirmed that, there is correlation between availability and accessibility of e-learning resources as the status of the former greatly influences the latter, He further stressed that where new technologies are not available, it is probable that accessibility will be non-existent. Cohen (2001) indicated that the use of technology has an effect on all aspects of teaching and learning. When educators integrated technology into the lesson, it required new learning approaches to the curriculum. This implies that availability and accessibility of e-learning facilities was not varying among the selected Colleges. This finding was supported by Onojetah (2014) who noted that accessibility is a function of availability, where there is unavailability; there will be no accessibility because they are closely related. The study also is in line with Amiaya (2015) who stressed that the facilities required for teaching and learning of management and business courses are either grossly inadequate or not available in most of the institutions in Nigeria.

Students attitude towards E-learning resources

Based on the analysis in the table above it was observed that "I believe using e-learning will improve the quality of my work" with the lowest mean value of 1.93 and standard deviation (0.88) is strongly agreed by the respondents, it was also observed that those who find it interesting working with computers has the mean value of 2.07 and standard deviation of 0.92, I like reading magazines on new technology innovations having the mean value of 2.05 and standard deviation of (0.86), Communicating through social network is fun has the mean value of 1.99 and the standard deviation of 0.84, I believe using e-learning technologies will improve my learning ability with the mean value of 2.03 and the standard deviation of 1.06, those who prefer reading articles online has the mean value of 2.23 and the standard deviation of 1.13 which were Agreed upon respectively. The table further shows that E-learning increases learners' social isolation with the mean value of 2.17 and the standard deviation of 1.01 followed by I believe e-learning is very economical for educational institution to adopt has the mean value of 2.15 and the standard deviation of 1.04 were disagreed upon respectively. It was also observed that "I feel comfortable reading a textbook on a computer screen than a physical text book" with the mean value of 3.05 and standard deviation of 1.18, Interaction with the computer system is often frustrating with the mean value of 3.22 and standard deviation of 0.85 were strongly disagreed respectively.

Table 4: Students attitude towards E-learning resources

Strongly Agree (**SA**), Agree (**A**), Disagree (**D**), and Strongly Disagree (**SD**)

ITEMS	N	SA	A	D	SD	Mean	Std. Deviation	Remarks
I believe using e-learning will improve the quality of my work	319	121	112	71	15	1.93	0.88	Strongly Agree
I prefer reading articles online	319	109	93	51	66	2.23	1.13	Agree
I feel uncomfortable reading a text book on a computer screen than a physical text book	319	33	53	98	135	3.05	1.88	Strongly disagree
Interaction with the computer system is often frustrating	319	19	32	125	143	3.22	0.85	Strongly disagree
I believe using e-learning technologies will improve my learning ability	319	123	113	31	52	2.03	1.06	Agree
Communicating through social networks is fun	319	93	159	44	23	1.99	0.84	Agree
I like reading magazines on new technology innovations	319	91	141	66	21	2.05	0.86	Agree
E-learning increases learners' social isolation	319	89	131	52	47	2.17	1.08	Disagree
I believe e-learning is very economical for educational institutions to adopt	319	101	121	45	52	2.15	1.04	Disagree
I find it interesting working with computers	319	96	131	63	29	2.07	0.92	Agree

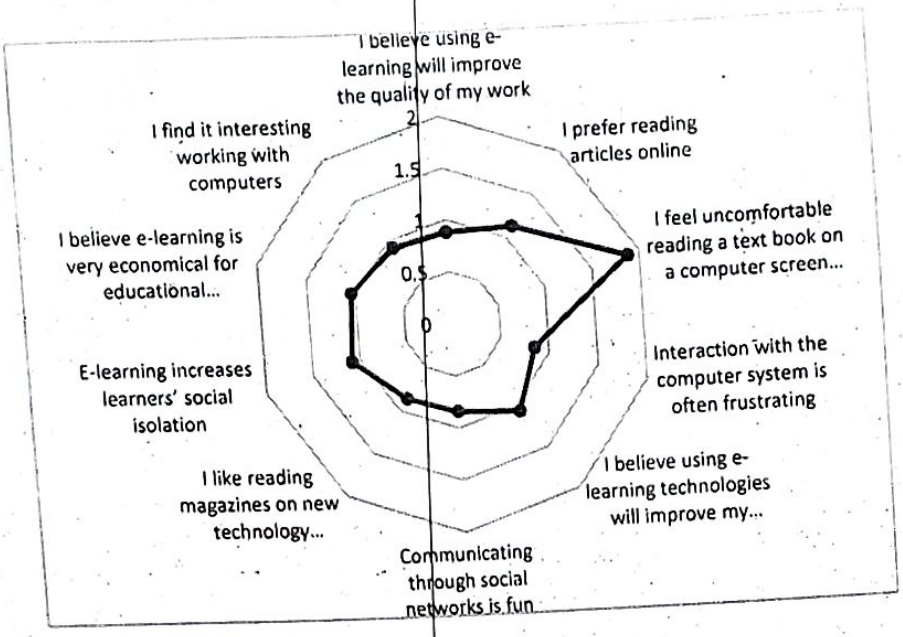

Figure 2: Graphical representation of **Students attitude towards E-learning resources**

Results revealed that there is a connection between technical abilities and students' attitude towards e-learning. Attitude is also influenced by time dedicated to computer use, indicator of pc experience. No influences were registered due to specialty and year of study. This finding is compatible with the study of (Ahmad Bendania, 2011) which supported that Saudi student have a high positive attitude towards e-learning.

The results show that students believe using e-learning will improve the quality of my work" with the lowest mean value of 1.93 and standard deviation (0.88). This assertion concurs with Ajzen (2001) as well as Ajzen and Fishbein (2005) that familiarity can lead to positive feelings and when such positive feelings are activated; their effect would be expected to influence an attitude, which, in turn, has an impact on actions. The assertion is also in line with the theory of the *mere exposure effect*, which holds that exposing an individual repeatedly to a particular stimulus enhances the individual's attitude towards the stimulus (Burgess & Sales, 1971; Young & Claypool, 2010).

Conclusion and Recommendations

Based on the findings of the study, it was concluded that e-learning facilities are moderately available in the study area but it can be seen from the findings that e-learning facilities that will improve the academic performance of students and bridge the gap that exist between theories and practical are not effectively available. E-learning facilities are good way of learning to complement the lecturers' effort in the learning situation. The study also showed that e-learning facilities are been used occasionally for teaching and learning of chemistry courses in College of Education in

Niger state. In the light of this, College of education should know that e-learning and various ICT tools as real potential technologies that will transform teaching and learning. This will assists the students, and serves as a prerequisite for getting employment and compete with their counterparts in the world of work.

With regard to the discussions of the findings, the following recommendations are drawn from the study:

1. The College authority should give priority in the provision of e-learning facilities through collaboration for effective teaching and learning to take place.
2. The College should not relent on their own efforts through the use of Memorandum of Understanding with international bodies and multinational organization in the provision of e-learning facilities in order to achieve educational goals as stated in national policy of education.
3. Usage of e-learning facilities will assist the lecturers to shifts from traditional methods of teaching to new pedagogy which will enable the students to see themselves as knowledge generator and active participants and lecturers as facilitators of students learning process.
4. Colleges should encourage their lecturers in the use of e-learning facilities for teaching and learning of management and business courses through regular training and institutional policy e-learning to promote global competitiveness.

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