



Effects of WizIQ Learning Platform on University Students' Achievement and Retention in Educational Technology Concepts in Selected Nigerian Universities

¹Falode, M. E. *PhD.*, ²Omodara, O. D. *PhD.*, ³Abdulkareem, A. Y. & ²Kolade-Oje, O. T.

¹Department of Educational Technology, Federal University of Technology, Minna

²Department of Educational Technology, Bamidele Olumilua University of Education, Science and Technology, IkereEkiti, Ekiti State, Nigeria

³National Board for Arabic and Islamic Studies, Kaduna, Nigeria.

Corresponding author: *Falode, M. E.
Tel.: +237 Email: facaminsight2@gmail.com

ABSTRACT

This study investigated the effects of WizIQ learning platform on university students' achievement and retention in educational technology in Nigeria. Guided by four research questions and four hypotheses the study employed a quasi-experimental design using a pre-test, post-test, control group. The sample size for this study is made up of 215 year three (300L) undergraduate students offering educational technology in Nigeria in 2018/2019 academic session. A multi-stage sampling technique was employed to arrive at the sample size. The treatment used for this study is the free version of WizIQ. The contents on platform were modified to suite teaching and learning of educational technology course where the teacher created a class that allows the students to register and participate in class activities. The researcher generates links containing log in details and send it to the student's e-mail address so as to be able to log them in and take their classes. Researcher designed test instrument named Educational Technology Achievement Test (ETAT) and Educational Technology Retention Test (ETRT) were used for this study. ETAT obtained students' demography data and information on students' achievement based on the learned concepts. ETRT is the reshuffled Educational Technology Achievement Test. The data collected were analysed using descriptive and inferential statistics. The research questions were answered using Mean and Standard Deviation while the hypotheses were tested using ANOVA and t-test statistics in Statistical Package for Social Sciences (SPSS) version 23. Findings showed that there is a significant difference in the achievement of students taught educational technology using WizIQ learning platform and using the platform in teaching educational technology enhances students' retention. It was therefore recommended that WizIQ learning platform should be adopted as teaching methods/strategies for teaching educational technology courses in the universities because it has been proven to improved students' achievement and retention in the course

KEYWORDS

Achievement, Retention, WizIQ, Educational Technology.

Definition of concepts used:

Education which is a teaching and teaching and learning process between the teacher and the learner in a conducive environment such that learning is gained brings about learners change in behavior. The integration of information and communication technology into teaching and learning has been the focus of the 21st century education. Specifically, the application of computer technology in classroom environment continues to play a vital role in enhancing teaching and enriching learning (Falode, 2018). Through the emergence and use of Learning Management Systems (LMSs) in schools for instance, teaching and instructional delivery is being shifted from traditional to technology-enhanced method.

Learning Management Systems (LMS) are software application for the administration, documentation, tracking, reporting, and delivery of contents to the students, administering tests and other assignments, tracking student progress, and managing the classroom situation (Mahnegar, 2012). Dobre, (2015) classified LMS into three namely: proprietary LMS, open source LMS and cloud-based LMS. The proprietary LMS are platforms licensed by the developers so as to produce profits through vendors. Proprietary LMS includes Blackboard, D2L and e College. Open source LMS are platforms that made publicly available to the source code and available free of charge to all users for example Canvas, Moodle Sakai e.t.c. the cloud based LMS are the convenient and low cost way of using an array of cloud-based tools in higher educational institution for example Amazon Web Services Talent, WizIQ etc.

WizIQ is one of the cloud based learning platforms that is sparking wide interest in the distance learning domain. WizIQ can be defined as a cloud based teaching and learning platform that connects teachers and students through WizIQ virtual classroom technology (WizIQ, 2018). It is an online teaching platform that offers a virtual classroom for teachers, trainers, colleges and universities, high schools, and training and tutoring centers. WizIQ cloud based learning platform allows teachers and students collaborate in real time during online delivery of classes and training sessions. Essentially, WizIQ serves as empowerment tools for teachers to deliver and manage live and self-paced learning with easy-to-use, scalable and cost-effective technology. It employs virtual technology to allow teachers and students collaborate in real time during online instructional content delivery (Falode et al, 2018). Through WizIQ, learners can access their course modules and interact in real time with their teachers in a virtual environment using smart phones and computers with internet-enabled smartphones and computers (WizIQ, 2018). With the WizIQ learning platform's features and range of useful tools, users can:

- 1) **Real-time communication:** This bring online classroom sessions to life with live, multi-way audio streaming and real-time video streaming that can be accessed by all participants and also, the lecturer can use this online Classroom to interact and chat with students. The learning platform also has a full screen video feature for easy viewing on a variety of display sizes.

- 2) **Interactive whiteboards:** This is part of the special feature of WizIQ platform during a live session. Just like a traditional blackboard, the lecturer can write notes, solve math problems, draw diagrams, use graphs for students, and more, during engaging, real-time e-classes.
- 3) **Multilingual support:** This feature allows the lecturer to *teach student from diverse tribe and language in online classrooms without language barriers. The versatile multilingual support helps one to teach students across the world in 19 different languages, including English, Spanish, Portuguese, Hebrew, Thai, Chinese, Russian, Arabic, Czech, Dutch, Farsi (Persian), French, German, Italian, Malaysian, Polish, and Turkish.*
- 1) **Polling tools:** *Just like the enabling real-time interaction in a traditional classroom, WizIQ polling tools enables the teacher to ask students questions and receive answers instantly during class, surprise students with a quick quiz or test, and then easily assess comprehension levels by viewing results in bar graph or chart form.*
- 4) **Breakout rooms:** This feature allows the teacher to *create groups within the classroom for more personalized instruction. It allows one to divide the students into smaller groups and place them in up to five breakout rooms for more personalized online learning. While students work, the teacher can moderate each breakout session and even move students from room to room using management controls and the intuitive interface of the WizIQ platform.*
- 5) **Secure recording capabilities:** This allows the teacher to *capture the live sessions and reuse them as much as it is necessary. It allows one to record lessons in the online classroom and re-use the recordings, share them with students, and track file access through weekly reports. Also, these recordings are safe as there is absolute protection with URLs that are specially coded to expire after a certain time, to keep such information secure.*
- 6) **Text chatting:** This allows the teacher to text chat with students individually or in groups, and even in multiple languages, on this robust, multilingual e-learning platform.
- 7) **Varied courseware file types:** This feature supports various files' type including PDFs, Word documents, presentations, videos, and audio files.
- 8) **Integrated media player:** It allows one to *stream audio, video, and other multimedia files easily and securely. This feature makes it possible to play audio/video files in HD quality using the built-in Media Player, stream YouTube videos without buffering or interruptions and keep ones' files secure with the WizIQ's real-time encryption.*
- 9) **Attendance reporting and notifications:** This feature allows one to *keep track of your students during the course by notifying the students of upcoming classes, send reminders directly to their e-mail, and generate attendance and file access reports to easily assess student participation.*
- 10) **Teacher-managed control options:** This allows the teacher to *retain control with the online classroom tools, exercise complete control over the online platform or transfer control to selected students at any time during a Virtual Classroom session. You can also give students access to the platform's*

interactive whiteboard, audio, and video controls, so that they, too, can share their video stream or desktop with the class.

11) **WizIQ Virtual Classroom plug-ins:** these plug-ins allows the user to *integrate with other website, Moodle, Blackboard Learn™, Sakai or any other LMS.* WizIQ's APIs offer Virtual Classroom plug-ins for MOODLE, Sakai, Blackboard Learn™, and your personal website. You can use these platforms to schedule online classes, deliver high-impact presentations, and even watch class recordings (WizIQ, 2017).

Based on these interesting features, Falode, Gambari, Alabi, and Falode, (2018) investigated the awareness and readiness towards the adoption of WizIQ platform for instructional delivery among education lecturers in tertiary institutions and the findings that emanated from the study revealed that the level of awareness of lecturers on WizIQ is low, however, in another finding, lecturers indicated readiness to adopt the platform should they be enlightened on its instructional significance. Should lecturers be enlightened, they will be able to utilize the platform for teaching and learning activities thereby improving students' achievement.

Achievement is defined as a measurable change in students' behavior in academics as a result of exposure to a given concept. Learning achievement can also be seen in two folds; first, learning which is as a result of skill mastery done willfully in a period of time on a given concept or topic secondly, learning resulting from the difference between someone's skill at the beginning and end of learning process. Amin and Li (2010) observed that online students' performance in a virtual learning environment does not differ significantly compared to the performance of students who enrolled traditionally. Also, Daymont and Blau (2011) demonstrated that teaching and learning in a virtual environment can be as effective as teaching and learning in the traditional environment. In addition, Falode, Alabi, Nsofor, and Alhassan (2019) who examined the effects of WizIQ and MOODLE Learning platforms on students' achievement in undergraduates' educational technology concepts found out that the platforms improved students' academic achievement and gender has no influence on students achievements when exposed to WizIQ and MOODLE learning platforms.

Retention is very important in teaching and learning, it is perceived as an act of recalling what was taught after certain period of time. Knowledge retention is an essential component of learning because it requires that knowledge must be captured, stored for a specified period of time, and be retrievable. Students understanding and retention of knowledge is dependent on some factors such as the learning environment, the teachers' subject mastery, instructional approaches used and other students' factor. Mayer (2009) supported the idea that students' interaction between themselves and learning instruction in a virtual learning environment can be more powerful than verbal communication by the teacher. Therefore, it was suggested that in many instances that students learn and retain information that is presented to them in a learners' centered environment. Students' achievement and retention in educational technology is however the main focus of this study.

Educational Technology is a systematic and organized process of applying modern technology to improve the quality of education. It is a systematic way of executing and evaluating the educational process, learning and

teaching, and the application of modern teaching techniques (Aniah&Tukura, 2011). The Association for Educational Communications and Technology (AECT 2018) denoted educational technology as “the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning. Educational technology is a concept that creates, uses and manages appropriate technological process and resources in order to improve teaching and learning. It includes software, hardware as well as Internet applications and activities. Educational technology is the field that deals with designing, developing, utilizing, managing and evaluating the process of teaching and learning and the resources involved. Based on the importance of this course, there is the need to examine the effects of WiziQ platforms on university students achievement and retention in educational technology in Nigeria.

Statement of the Research Problem

Conventional lecture method of instruction being used in Nigerian tertiary institutions has been criticized and labelled to be teacher-centered. The negative implication of continuous usage of this method of instruction in teaching and learning process has been adduced to be the major reason causing unsatisfactory academic achievement of students and their inability to remember what they learnt in the classroom after a short period of time.

To overcome this challenge and allow for a meaningful and long lasting learning to take place, the search for an interactive strategy becomes imperative. Therefore, the strategy considered by this study is the use of WizIQ learning platform that exist freely, learner-centred in nature, possess interactive futures and if harnessed in the dissemination of instructional contents, students ‘achievement and retention ability in teaching and learning processes would be greatly improved.

Research Questions

This research work answered the following questions

1. What are mean achievement scores of students taught educational technology concepts using WizIQ learning platform and lecture method?
2. What are the mean achievement scores of male and female students taught educational technology concepts using WizIQ, learning platform?
3. What is the difference in the retention scores of students taught educational technology concepts using WizIQ, and lecture method?
4. Could there be any difference in the retention scores of male and female students taught educational technology concepts using WizIQ learning platform?

Research Hypotheses

The following null hypotheses were formulated and tested in this study:

HO₁: There is no significant difference in the mean achievement scores of students taught educational technology concepts using WizIQ learning platforms and conventional lecture method.

HO₂: There is no significant difference in the mean achievement scores of male and female students taught educational technology concepts using WizIQ learning platform.

HO₃: There is no significant difference in the retention scores of students taught educational technology concepts using WizIQ, MOODLE learning platforms and lecture method.

HO₄: There is no significant difference in the retention scores of male and female students taught educational technology concepts using WizIQ, learning platform.

Methodology

This study employed a quasi-experimental design using a pre-test, post-test, control group. There are two levels of independent variables namely; WizIQ learning platform and conventional lecture method. There are also two levels of dependent variables namely; achievement and retention; and one level of moderating variable (gender). The population of this consists of all the 2,118 undergraduate educational technology students in Nigerian public universities in the 2018/2019 academic session. Six hundred and sixty seven (667) year three (300 level) students from these universities formed the target population of the study. The sample size for this study is made up of 215 year three (300L) undergraduate students offering educational technology in Nigeria in 2018/2019 academic session. A multi-stage sampling technique was employed to arrive at the sample size. Firstly, purposive sampling technique was used to select two universities out of all the universities that offer's educational technology as undergraduate level. These universities were purposively selected because they already have students offering educational technology in year three and in line with the number of independent variables of this study. Again, purposive sampling technique was employed to select students in year three (300 level) because the concepts of educational technology selected are being taught in the third academic session of the programme.

Thereafter, using hat-drawn method, the intact classes of year three (300Level) students from each of the selected universities were randomly assigned to experimental group (110 students) and control group (105 students). This gives a total of 215 students in all. Students assigned to experimental group one were taught using WizIQ learning platform and students in the control group were taught using the conventional lecture method. Stratified sampling procedure was finally used to categorize the students into two strata's of gender (male and female).

The instruments used for this study includes treatment and test instruments. The free version of WizIQ, an online learning management system was adapted for this study as treatment. The contents on platform were modified to suite teaching and learning of educational technology course where the teacher created a class that allows the students to register and participate in class activities. The researcher generates links containing log in details and send it to the student's e-mail address so as to be able to log them in and take their classes. Student's assigned to experimental group was exposed to the selected educational technology topics through WizIQ learning platform.

Researcher designed test instrument named Educational Technology Achievement Test (ETAT) and Educational Technology Retention Test (ETRT) were used for this study. ETAT obtained students' demography data and information on students' achievement based on the learned concepts. ETRT is the reshuffled Educational Technology Achievement Test. It obtained data on students' retention of concepts learnt. A rightly answered question was awarded two marks while a wrongly answered question attracted no mark. The data collected were analysed using descriptive and inferential statistics. The research questions were answered using Mean and Standard Deviation while the hypotheses were tested using ANOVA and t-test statistics in Statistical Package for Social Sciences (SPSS) version 23. The significance of the statistical analysis was ascertained at 0.05 alpha level where value higher than 0.05 will be regarded as not significant and value lower than 0.05 is regarded as significant.

RESULTS

Research Question 1: What are mean achievement scores of students taught educational technology concepts using WizIQ learning platform and lecture method?

Table 1: Mean and Standard Deviation of Pretest and Posttest Scores of Experimental and Control Groups

Groups	N	Pretest		Posttest		Mean Gain
		Mean	SD	Mean	SD	
Experimental Group	110	40.61	2.311	66.33	3.471	25.72
Control Group	105	40.31	3.408	65.81	3.885	25.50

Table 1 shows the mean and standard deviation of achievement scores of experimental group and control group at pretest and posttest. The table revealed that the mean and standard deviation scores at pretest and posttest of experimental group as $\bar{X}=40.61$, $SD=2.311$ and $\bar{X}= 66.33$, $SD = 3.471$ respectively. This gives a mean gain of 25.72 in favour of the posttest. On the other hand, the mean and standard deviation at pretest and posttest of the control group are $\bar{X}=40.31$, $SD = 3.408$, and $\bar{X}= 65.81$, $SD = 3.885$ respectively. This gives a mean gain of 25.50 in favour of the posttest. The table also revealed that experimental group and control group had a mean gain of 25.72 and 25.50 respectively with the experimental group having the highest mean gain of 25.72.

Research Question 2: What are the mean achievement scores of male and female students taught educational technology concepts using WizIQ, learning platform?

Table 2: The Mean and Standard Deviation of Pretest and Achievement Scores of Male and Female Experimental Group

Group	N	Pretest		Posttest		Mean Gain
		Mean	SD	Mean	SD	
Male	63	40.43	2.317	66.44	3.605	26.01
Female	47	40.79	2.264	66.23	3.318	25.44

Table 2 shows the mean and standard deviation of pretest and posttest scores of male and female experimental group. From the table, it can be seen that the mean and standard deviation at pretest and posttest scores of male are \bar{X} = 40.43, SD = 2.317 and \bar{X} = 66.44, SD = 3.605 respectively. This gives a mean gain of 26.01 in favour of male posttest achievement score. Similarly, the mean and standard deviation at pretest and posttest score of female are \bar{X} = 40.79, SD = 2.264 and \bar{X} = 66.23, SD = 3.318 respectively. This gives a mean gain of 25.44 in favour of female posttest score. Also, the table reveals the difference of 0.57 between the posttest mean gains score of male and female in favour of the male.

Research Question 3: What are mean retention scores of students taught educational technology concepts using WizIQ learning platform and lecture method?

Table 3: Mean and Standard Deviation of Posttest and Retention Scores of Students in Experimental and Control Groups

Groups	N	Posttest		Retention		Mean Difference
		Mean	SD	Mean	SD	
Exp Group	110	66.33	3.471	62.57	3.537	3.76
Ctrl Group	105	65.81	3.885	61.78	4.082	4.03

Table 3 shows the mean and standard deviation of posttest and retention scores of experimental and control group. From the table, it can be seen that the mean and standard deviation of posttest and retention scores of experimental group are \bar{X} = 66.33, SD = 3.471 and \bar{X} = 62.57, SD = 3.537 respectively. This gives a mean difference of 3.76. Similarly, the mean and standard deviation of posttest and retention score of control group are \bar{X} = 65.81, SD = 3.885 and \bar{X} = 61.78, SD = 4.082 respectively. This gives a mean difference of 4.03.

Research Question 4: Could there be any difference in the retention scores of male and female students taught educational technology concepts using WizIQ learning platform?

Table 4: Mean and Standard Deviation of Posttest and Retention Scores of Male and Female Students

Group	N	Experimental Group				Mean Difference
		Posttest		Retention		
		Mean	SD	Mean	SD	
Male	63	66.44	3.605	62.78	4.082	3.66
Female	47	66.23	3.318	63.57	3.537	2.66

Table 4 shows the mean and standard deviation of posttest and retention scores of male and female experimental group one. From the table, mean and standard deviation scores of posttest and retention for male students is \bar{X} = 66.44, SD= 3.605 and \bar{X} = 62.78, SD= 4.082 respectively. This gives a mean difference of 3.66. Also, the mean and standard deviation scores at posttest and retention for female students is \bar{X} = 66.23, SD= 3.318 and \bar{X} = 63.57, SD= 3.537 respectively. This gives a mean difference of 2.66. The result also revealed that male students have the highest mean difference.

Testing of Hypothesis

Hypothesis 1: There is no significant difference in the mean achievement scores of students taught educational technology using WizIQ learning platform and those taught using conventional method.

Table 5: Summary of ANOVA comparison of the mean achievement scores of experimental and control groups

Groups	Sum of squares	df	Mean square	F	Sig.
Between groups	1390.704	1	695.352		
Within groups	22431.455	213	103.371	6.727*	.001
total	23822.159	214			

*: Significant at 0.05 levels

The table 5 shows the ANOVA comparison of the posttest scores of experimental and control groups. An examination of the table shows significant difference between the mean achievement scores of the two groups ($F_{(1, 226)} = 6.73, p < 0.05$). Hence, there was a significant difference in the mean achievement scores of students taught education technology using WizIQ and those taught conventionally. Therefore, hypotheses one was rejected.

Hypothesis 2: There is no significant difference in the mean achievement scores of male and female students taught educational technology using WizIQ learning platform

Table 6: t-test comparison of posttest achievement scores of male and female students taught educational technology using WizIQ learning platform

Groups	N	df	Mean	SD	t-value	P-value
Male	63	109	66.44	3.605	0.15 ns	0.08
Female	47		66.23	3.318		

ns: Not significant at 0.05 levels

Table 6 presents the t-test analysis of hypotheses two. The result shows that the male had a mean of 66.44 and standard deviation of 3.605 while the female had a mean of 66.23 and a standard deviation of 3.318. With the t-value is $t_{(109)} = 0.15$, $p = 0.08$ hypothesis two was retained. Therefore, there is no significant difference in the mean achievement scores of male and female students taught educational technology using WizIQ learning platform.

Hypothesis 3: There is no significant difference in the retention scores of students taught educational technology concepts using WizIQ learning platform and lecture method.

Table 7: Summary of ANOVA comparison of the retention scores of experimental and control groups

Groups	Sum of squares	df	Mean square	F	Sig.
Between groups	2526.711	1	1263.356		
Within groups	826.933	213	19.689	64.166*	0.000
total	3353.644	214			

*: Significant at 0.05 levels

The table 7 shows the ANOVA comparison of the retention scores of experimental and control groups. An examination of the table shows significant difference between the mean achievement scores of the two groups ($F_{(1, 214)} = 64.166$, $p < 0.05$). Hence, there was a significant difference in the retention scores of students taught education technology using WizIQ and those taught conventionally. Therefore, hypotheses three was rejected.

Hypothesis 4: There is no significant difference in the retention scores of male and female students taught educational technology concepts using WizIQ, learning platform.

Table 8: t-test comparison of retention scores of male and female students taught educational technology using WizIQ learning platform

Groups	N	df	Mean	SD	t-value	P-value
Male	63	109	62.78	4.082	0.80 ^{ns}	0.27
Female	47		63.57	3.537		

^{ns}: Significant at 0.05 levels

Table 8 presents the t-test analysis of hypotheses two. The result shows that the male had a mean of 66.44 and standard deviation of 3.605 while the female had a mean of 66.23 and a standard deviation of 3.318. With the t-value is $t_{(109)} = 0.08$, $p = 0.27$ hypothesis two was retained. Therefore, there is no significant difference in the mean achievement scores of male and female students taught educational technology using WizIQ learning platform.

Discussion of findings

The result of hypothesis one reveals that there was a significant difference in the mean achievement scores of students taught education technology using WizIQ and those taught conventionally in favour of the experimental group. This is an indication of a clear understanding of concepts and content instructions delivered through the WizIQ learning platforms which may be due to the platform allowing the exchange of information among learners after teaching, downloading of teaching and learning activities for re-use at the students' leisure among other. This result agrees with the earlier findings of Daymont and Blau (2011) found out that teaching and learning in a virtual environment can be very effective and enhance students' achievement. However, it does not agrees with the findings of Amin and Li (2010) who observed that online students' performance in a virtual learning environment does not differ significantly compared to the performance of students who enrolled traditionally.

In addition, hypotheses two and four reveal that WizIQ is gender friendly. Findings from the result shows that both male and female students taught educational technology using WizIQ learning platform have their performance enhanced. This is due to the gender friendly features (such as breakout rooms, text chatting among others) available on the platforms. This corroborates the earlier findings of Falode, Alabi, Nsofor, and Alhassan (2019) who examined the effects of WizIQ and MOODLE Learning platforms on students' achievement and retention in undergraduates' educational technology concepts and found out gender has no influence on students achievements when exposed to WizIQ learning platform.

Finally, the result of hypothesis three shows that there was a significant difference in the retention scores of students taught education technology using WizIQ and those taught conventionally in favour of the

experimental group. From the findings, it could be seen that both male and female students taught educational technology using WizIQ learning platform retained what was taught. This was due to recording lectures for reuse, real time interaction through live classroom, feedback mechanisms among other interesting features present on the learning platform. This finding is in line with the earlier findings of Falode, Alabi, Nsofor, and Alhassan (2019) who examined the effects of WizIQ and MOODLE Learning platforms on students' achievement and retention in undergraduates' educational technology concepts and found out that the platforms improved students' academic achievement and retention.

Conclusion

This paper has critically examined the effects of effects of WizIQ learning platform on university students' achievement and retention in educational technology in Nigeria. Based on the results emanated from this study, the use of WizIQ learning platform can be used in teaching educational technology in tertiary institutions in Nigeria. Also, the platform is not gender biased. Using this platform in teaching and learning activities will enhance students' retention of concepts taught

Recommendation

As a result of the foregoing discussions and conclusion the following recommendations were made:

1. WizIQ learning platform should be adopted as teaching methods/strategies for teaching educational technology courses in the universities because it has been proven to improved students' achievement and retention in the course.
2. Governments should ensure that the use of learning management system is incorporated into the tertiary educational system as this is the current technological trend in the global world which Nigeria can not afford to be left behind.
3. Workshops and training programmes on the benefits and procedures of using WizIQ learning platform should be frequently carried out by policy makers.

REFERENCES

- Amin, S. & Li, K. (2010). Should the graduate mathematics courses be offered online? *Electronic Journal of Mathematics and Technology*, 4(1), 47-56.
- Aniah, A. & Tukura, C. S. (2011). Educational technology: the imperative of ICT improving tertiary education in Nigeria. *In the proceedings of 32nd International Conference of NAEMT*. 19th – 23rd September, Owerri. Pp 86-98.
- Daymont, S. & Blau, M. (2011). Critical Examinations of Distance Education Transformation across Disciplines. Community college's perception of online education. *International Education Studies*, 21(4) 216-240.
- Dobir, I. (2015). Learning Management systems for higher education – An overview of available options for higher education organizations. *Procedia-Social and Behavioral Sciences*, 180, 313 – 320.
- Falode, M. E., Alabi, T. O., Nsofor, C. C., & Alhassan J. K. (2019). Effects of WizIQ and MOODLE Learning platforms on students' achievement in undergraduates' educational technology concepts. *Journal of Science. Technology Mathematics and Education (JOSTMED)*, 15(2), 141-150.
- Falode, O. C., Gambari, A. I., Alabi, T. O. & Falode, M. E. (2018). Investigation on awareness and readiness towards the adoption of WizIQ platform for instructional delivery among education lecturers in tertiary institutions of Niger State, Nigeria. *Book of Proceedings, International Conference on Education Development and Innovation*. Held from 27th -28th August, 2018 at Methodist University College, Accra, Ghana. Pp 239-245.
<http://www.incedi.org/wp-content/uploads/2019/05/24.pdf>
- Mahnegar, F. (2012). Learning Management System. *International Journal of Business and Social Science*, 3(12), 144-150.
- Mayer, R. E. (2009). Cognitive theory of multimedia learning. *The Cambridge handbook of multimedia learning*. [Google Books version]. Retrieved February 15, 2011 from
http://books.google.ca/books?hl=en&lr=&id=duWx8fxkkk0C&oi=fnd&pg=PA31&dq=cognitive+theory+f+multimedia+learning+1997&ots=x62jx2smdu&sig=_eB8RzXht2wng95TyVatSVQ83U#v=onepage&q=cognitive%20theory%20of%20multimedia%20learning%201997&f=true.
- WizIQ (2018). *WizIQ platform: The complete set of product features*. Retrieved on 23/7/17 from WizIQ.com:
<http://www.wiziq.com/features>