

Impact of Flipped Classroom Instructional Strategy on the Academic Performance and Retention in English Language among Senior Secondary School Students in Katsina State, Nigeria

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ABSTRACT

This study examined the impact of flipped classroom instructional strategy on the academic performance and retention in English language among senior secondary school students in Katsina state, Nigeria. The study was guided by four research questions and two hypotheses. The population of the study consist of 12,169 senior secondary students out of which 135 students were drawn from the 13 co-educational senior secondary schools in Katsina metropolis using multi stage sampling. Lexis and structure Performance Test (LSPT) is 30 item objectives test instrument was used for data collection. Findings from this study indicated that Flipped classroom instructional strategy had significant impact on the academic performance ($t(133) = 1.46, p = 0.02$) and retention of students in English language ($t(133) = 1.09, p = 0.01$). The study also established that female students had better academic performance (Mean Gain $M=30.93, F=36.11$) and retention ability (Mean Loss $M= -8.22, F= -7.19$) than their male counterpart in a flipped English classroom. Based on the findings, the study recommend that teachers of English language should be encouraged to deploy flipped classroom instructional strategy so as to enhance the academic performance and retention of students in English language.

Keywords: Flipped Classroom Instructional Strategy, Academic Performance, Retention

INTRODUCTION

English is the language of instruction and a subject of study across all the levels of education in Nigeria. It is used in primary and secondary schools, colleges of education, polytechnics and universities. The main objectives of English language teaching are to give children permanent literacy and enable them to communicate effectively in the language (Federal Republic of Nigeria, 2013). Hence, the English language is a tool with which some of the objectives of education could be achieved. Furthermore, English language is the lingua franca of Nigeria, hence, it filled the communication gap between the various ethnic groups. At the moment, a candidate must have a pass in the English language at credit level to qualify for admission in to a university for any of the programmes. However, deficiency in grammar, lexis, and structure, and phonetics is one of the limitations students encounter in passing English language examinations in Nigeria (Gambari, Kutigi & Fagbemi, 2014).

There are many factors that can be attributed to poor performance of students in the English language in Nigeria. Lawal (2019); Olaleye, Ajayi, Oyebola & Ajayi (2017); Shehu, Zubairu and Hussain (2023) identified the absence of an enabling environment, ill-equipped classrooms, and over-crowded classrooms as factors that have contributed to this situation. The implication of over-crowded classrooms, poor teaching methods and lack of language laboratory and other learning materials are leading to restiveness and poor classroom management. Furthermore, Thompson, Morton and Storch (2013) reported that technology that could enhance English language teaching and learning had not been effectively utilized in most schools in Nigeria.

A flipped classroom is a student-centered task-based and activity-based learning approach that provides several advantages to the student (Johnson & Renner, 2012). The student-centred approach supported by instructional media could enhance effective teaching and learning (Gambari & Yusuf, 2015). The flipped classroom model is one of the recent instructional strategies that can be explored to enhance students' performance in the English language. It can assist the student to enhance the skills of communication, interpersonal social relationship, cooperation in sharing and caring, openness, flexibility, adaptability, knowledge retention, higher-order critical thinking.

The flipped classroom model is a new and an innovative instructional model, where content presentation and traditional activities normally done in the classroom are given to students as homework, and traditional homework activities become classroom activities (Bergmann & Sams, 2012). In the flipped classroom, the teacher becomes a facilitator who helps students to actively engage with lesson contents instead of merely presenting lesson contents to students. Teachers involve learners in discussions, problem-solving and hands-on activities (Akçayır & Akçayır, 2018).

Flipping classroom is the standard format in which students watch short explanatory or tutorial video before the class. They then practice key concepts doing exercises or debating while receiving personalized feedback. After the class, students review what they learned and expand their knowledge. The flipped classroom could be technology-driven because technology is one of the key components of the flipped approach (Pilten, 2016). The teacher in flipped classroom focuses on the desired outcome and makes use of learning technologies, particularly multimedia which provides opportunities for students to learn. These multimedia techniques could include podcasting, video, and screen casting to provide teaching contents outside the formal learning environment free from the traditional face to face lecture format (Marks, 2014).

Studies in related literatures show that videos are often used as a means of teaching outside the classroom, while interactive tasks in which the students are actively participating are used as in-class activities (Basal, 2015; Graziano, 2017; Herreid & Schiller, 2013; Hsu, 2017; Lage, Platt, & Treglia, 2000; Roehling, Root Luna, Richie, & Shaughnessy, 2017; Song & Kapur, 2017; Zengin, 2017). Active participation and student-centered learning can be ensured through the use of videos that maintain students' attention and enable them to concentrate on the content (Herreid & Schiller, 2013). Taking advantage of the technology, instructors both create video materials and make use of the open access videos available on the Internet (Sherer & Shea, 2011).

Findings like that of Akintolure, Akinola, Olaleye and Braimoh (2023) established that flipped classroom practices increased the academic performance of students in practical physics statistically and significantly. flipped learning foster active learning in diverse educational contexts, including K-12 and higher education (Şahin & Fell-Kurban 2016; Hamdan et al. 2013). In addition to this, flipping classrooms enhances student satisfaction, confidence, teamwork, engagement, and motivation; promotes creativity, increases problem-solving skills of learners and makes the learning process more fun in comparison to the traditional method of teaching and learning (Bergmann & Sams, 2012; Akçayır & Akçayır, 2018; Awidia & Paynterb, 2019). Studies like that of Usman (2020) also established that Students taught Oral-English with Reciprocal Peer Tutoring Flipped Classroom (RPTFC) and Think-Pair-Share Flipped Classroom (TPSFC) recorded high retention ability.

Although most of the research suggests that the flipped classroom instructional strategy positively impacts students' learning, there are also studies which have not revealed anticipated positive effects. For example, Smallhorn (2017) did not find an observable increase in students' academic achievement. In another study conducted by Kim et al. (2014), they stated that there was no evidence that the FC Model contributed to increased student grades. Similarly, in a study by Sun and Wu (2016), the use of the FC Model did not impact teacher-students interaction and learning satisfaction. Flipped classroom Instructional Model does not yield significant impacts on increasing the students' academic achievement (Cabi, 2018).

Gender issues have also been linked with academic performance and retention of students in several studies (Achebe, 2008; Gambari, Yaki, Gana, & Ughovwa, 2014; Ozofo, & Onos, 2018; Umoru, & Adekunle, 2019; Usman, 2020; Shehu, Zubairu & Hussain, 2023). Gender differences have historically

been held responsible for divergence in academic and career success. It has been identified as one of the factors influencing students' performance in school subjects (Owodunni, & Ogundola, 2013). Andrew, Janice and Stephen, (2007) which revealed that females performed and retained better than males with Web-based learning and traditional method. Similarly, Richards-Babb and Jackson (2011) found that male students' average success rate improvement double that of female students. Usman (2020) established that male and female students taught Oral-English using Think-Pair-Share Flipped Classroom (TPSFC) had performed and retained equally well. Shehu, Zubairu and Hussain (2023) found that gender has no significant effect on the academic performance of students taught English language using ILIAS online learning platform. This study therefore, seek to examine the impact of flipped classroom instructional strategy on students academic performance and retention in English language in Katsina state, Nigeria.

Research Questions

1. What is the impact of Flipped Classroom Instructional Strategy (FCIS) on the students' academic performance in lexis and structure in Katsina state?
2. What is the impact of Flipped Classroom Strategy (FCIS) on the students' retention ability in lexis and structure in Katsina state?
3. How does gender impact the academic performance of students taught lexis and structure using Flipped Classroom Instructional Strategy (FCIS) in Katsina state?
4. What is the retention ability of male and female students taught lexis and structure using Flipped Classroom Instructional Strategy (FCIS)?

Research Hypothesis

HO₁: There is no significant impact of flipped classroom Instructional Strategy on the academic performance of students in lexis and structure.

HO₂: There is no significant impact of flipped classroom Instructional Strategy on the retention ability of students in lexis and structure.

METHODOLOGY

The research design adopted for this study is a quasi-experimental design. It is a pretest, posttest, non-randomized, non-equivalent control group design. An important component of the quasi-experimental study is the use of pre-testing or the analysis of prior performance to establish group equivalence (Wachanga, Githae & Keraro, 2015). It was not feasible to randomly compose and group students, or to disrupt classes already in existence as the experiment last for six weeks thus, intact class was used for this study.

The population of the study comprises of 12,169 public senior secondary school year two students in thirteen (13) public senior secondary schools in Katsina Local Government Area.

Six thousand, seven hundred and sixty six (6766) were male while five thousand four hundred and three (5403) were female with average age of 17-28 years. The schools are operating on day session and offering English language as a general subject. Multi-stage sampling technique was employed. The sample were drawn from the 13 co-educational senior secondary schools in Katsina metropolis, Katsina state. Firstly, purposive sampling technique was used in selecting the two senior secondary schools and was done based on criteria such as: equivalence (facilities and manpower), gender composition (mixed schools), infrastructure (computers and computer laboratories), exposure (students and teachers' exposure to the use of computer for teaching and learning), and candidates' enrolment (enrolling students for Secondary School Certificate Examination for a minimum of ten years). seven senior secondary schools met the above criteria, therefore, simple random sampling technique was used in selecting two of the senior secondary schools. Secondly, the selected schools were randomly assigned to the experimental groups using simple random sampling technique.

Thirdly, in each school, one stream of SSII class was randomly selected from the streams using simple random sampling technique. However, an intact class was used for the study (students in each class were not randomized). Thus, one hundred and thirty five (135) senior secondary school students were selected for the study. Sixty two (62) out of the One hundred and thirty five (135) are male students while seventy three (73) are female as shown in table 1.

Table 1: Sample of the study

School	No. of Students		Total
	Male	Female	
Experimental Group	33	41	74
Control Group	29	32	61
Total	62	73	135

Treatment Package

Flipped Classroom Lexis and structure Instructional Video Package (FCLSIVP) was used as a medium for instructional delivery in flipping the classroom settings. It comprised of five lessons from lexis and structure English language senior secondary school curriculum. These include concord, adjectival order, tenses and common spelling mistakes. Each lesson was structured in courseware format containing introduction, objectives, main contents, conclusion, summary, and tutor mark assignment. Each lesson was video recorded using Canon Camcorder HDMI, an attached Boom Microphone, a tripod and a flood light in acoustic video studio. The recorded video was edited using editing software called Canva (a free online video editor). Each lesson lasted for 40 minutes.

Instrumentation

Lexis and structure Performance Test (LSPT) is 30 item objectives test instrument drawn from a standardized West African Examination Council WAEC past questions in English language with option A-D. Students were required to indicate the correct answer by ticking the right answer that corresponds to each question. Lexis and structure Performance Test (LSPT) was administered at pre-test and shuffled before being administered for post test and post post-test.

Procedure for Data Collection

After obtaining permission to carry out the study, a training session was organized in the first week of study, to the research assistant on how to use the Lexis and Structure Instructional Video Package for Flipped Classroom Instruction. Pre-test was administered to the students in the two groups. The 2nd to 5th weeks was used to administer the treatment using Lexis and Structure Instructional Video Package for teaching the students both in experimental and control groups. The students in the experimental group were given time frame to study the video before the class session. In addition, they were allowed to go home with the Lexis and Structure Instructional Video Package for Flipped Classroom Instruction at the end of each week for more comprehension and mastery of the concepts in the video. After four weeks of treatment, LSPT was administered to all the groups simultaneously to determine their cognitive performance of the concepts.

Procedure for Data Analysis

The data obtained from the administration of LSPT at the pre-test, post-test and retention test was collated, marked and subjected to data analysis. The research questions were answered using mean and standard deviation while t-test independent sample was used in testing the two hypotheses.

RESULTS

Research Question 1: What is the impact of Flipped Classroom Instructional Strategy (FCIS) on the students' academic performance in lexis and structure in Katsina state?

Table 2: Mean and Standard Deviations of students' Scores in Experimental and Control Groups (Pre-test and Post-test)

Group	N	Pre-test		Post-test		Mean Gain
		Mean	SD	Mean	SD	
Experimental	74	44.50	11.62	93.84	10.13	49.34
Control	61	42.32	11.71	74.93	12.61	32.61

Table 2 showed the mean and standard deviation of the pre-test and post-test scores of all students in the experimental and control groups. From the result, it can be deduced that the mean score and standard deviation of the pre-test for the Experimental group are 44.50 and 11.62 while the mean score and standard deviation of the same students in the post-test are 93.84 and 10.13. The mean gain is 49.34 in favour of the post-test scores. Similarly, the mean score and standard deviation of the pre-test for students in the control group are 42.32 and 11.71 while the mean score and standard deviation of the same students in the post-test are 74.93 and 12.61 respectively. The mean gain is 32.61 in favour of the post-test score. This shows that both medium of instruction has positive effects on the academic performance of students in English language. However, students in the experimental group taught using flipped classroom instructional strategy had recorded higher mean gain than those in the control group.

Research Question 2: What is the impact of Flipped Classroom Strategy (FCIS) on the students' retention ability in lexis and structure in Katsina state?

Table 3: Mean and Standard Deviations of students' Scores in Experimental and Control group (Post-test and Post Post-test)

Group	N	Post-test		Post Post-test		Mean Gain/Loss
		Mean	SD	Mean	SD	
Experimental	74	93.84	10.13	86.11	12.49	-7.73
Control	61	74.93	12.61	59.20	10.31	-15.73

Table 3 displays the means and standard deviation of students in experimental and control groups at post test and post post-test level. The mean retention scores of the post-test for students in the experimental group was higher with mean scores of 93.84 and 10.13 than the post post-test mean of 86.11 and 12.49. The mean loss was -7.73 indicating a marginal loss in their retention. For the control group, the mean retention scores of the post-test were also higher with a mean of 74.93 and 12.61 than the post post-test mean scores of 59.20 and 10.31. The mean loss was -15.73 indicating a relatively higher loss in their retention scores. This implies that students taught lexis and structure in a Flipped classroom had better retention rate than those taught in the conventional classroom.

Research Question 3: How does gender impact the academic performance of students taught lexis and structure using Flipped Classroom Instructional Strategy (FCIS) in Katsina state?

Table 4: Mean and Standard Deviations of Male and Female students' Scores in Experimental Group (Pre-test and Post-test)

Group	N	Pre-test		Post-test		Mean Gain/Loss
		Mean	SD	Mean	SD	
Male	33	40.51	13.41	71.44	14.03	30.93
Female	41	53.11	14.60	89.22	13.62	36.11

Table 4 shows the mean and standard deviation of the pre-test and post-test scores of male and female students in the experimental group. From the result, it can be deduced that the mean score and standard deviation of the pre-test for male students are 40.51 and 13.41 while the mean score and standard deviation of the same students in the post-test are 71.44 and 14.03. The mean gain is 30.93 in favour of the post-test scores. Similarly, the mean score and standard deviation of the pre-test for female students are 53.11 and 14.60 while

the mean score and standard deviation of the same students in the post-test are 89.22 and 13.62 respectively. The mean gain is 36.11 in favour of the post-test score. This shows that female students taught lexis and structure in flipped classroom had higher mean gain than their female counterpart.

Research Question 4: What is the retention ability of male and female students taught lexis and structure using Flipped Classroom Instructional Strategy (FCIS)?

Table 5: Mean and Standard Deviations of students' Scores of Male and Female Students in Experimental Group (Post-test and Post post-test)

Group	N	Post-test		Post post-test		Mean Gain/Loss
		Mean	SD	Mean	SD	
Male	33	71.44	14.03	63.22	13.43	-8.22
Female	41	89.22	13.62	82.03	12.50	-7.19

Table 5 shows the mean and standard deviation of the post-test and post post-test scores of male and female students in the experimental group. The result indicated that the mean score and standard deviation of post-test for male students are 71.44 and 14.03 while the mean score and standard deviation of the same students in the post post-test are 63.22 and 13.43. this indicates a mean loss of -8.22. Similarly, the mean score and standard deviation of the post-test for female students are 89.22 and 13.62 while the mean score and standard deviation of the same students in the post post-test are 82.03 and 12.50 respectively, indicating a mean loss of -7.19. This shows that female students taught lexis and structure in flipped classroom had slightly lower mean loss than their male counterpart.

HO₁: There is no significant impact of flipped classroom Instructional Strategy on the academic performance of students in lexis and structure.

Table 6: Result of t-test independent sample of Students in a Flipped and Conventional Classroom at pre-test and post test

Group	N	Mean	SD	df	t	p-value	Remark
Experimental	74	93.84	10.13	133	1.46	0.02	Significant
Control	61	74.93	12.61				

Table 6 revealed that there was significant difference in the academic performance of students taught English language in a flipped classroom and those taught in a conventional classroom. This is reflected in the result, $t(133) = 1.46$, $p = 0.02$. That is, the result of t-value of 1.46 resulting in p-value of 0.02. The significant value was less than 0.05 alpha value. From the data analyzed, it was revealed that there was significant difference in the academic performance of students taught English language in a flipped classroom and those in a conventional classroom. Thus, the hypothesis which states that there is no significant effect of flipped classroom Instructional Strategy on the academic performance of students in lexis and structure is rejected.

HO₂: There is no significant impact of flipped classroom Instructional Strategy on the retention ability of students in lexis and structure.

Table 7: Students' Retention Ability in a Flipped and Conventional Classroom

Group	N	Mean	SD	df	t	p-value	Remark
Experimental	74	86.11	12.49	133	1.09	0.01	Significant
Control	61	59.20	10.31				

Table 7 revealed that there was significant difference in the retention ability of students taught English language in a flipped classroom and those taught in a conventional classroom. This is reflected in the result, $t(133) = 1.09$, $p = 0.01$. That is, the result of t-value of 1.09 resulting in p-value of 0.01. The significant value was less than 0.05 alpha value. From the analysis, it was revealed that there was significant difference in the

retention ability of students taught English language in a flipped classroom and those in a conventional classroom. Hence the hypothesis which states that there is no significant effect of flipped classroom Instructional Strategy on the retention ability of students in lexis and structure is also rejected.

DISCUSSION

From the data analysed, there is significant difference in the academic performance of students taught lexis and structure in a flipped classroom and those in the conventional classroom. Flipped classroom instructional strategy has significantly increased the academic performance of students in lexis and structure. This finding is in line with that of Akintolure, et al. (2023) which established that flipped classroom practices increased the academic performance of students in practical physics statistically and significantly. Similarly, Şahin and Fell-Kurban (2016) found that flipped learning foster active learning in diverse educational contexts, including K-12 and higher education. However, the finding contradicts that of Smallhorn (2017) which did not find an observable increase in students' academic achievement in a flipped classroom. In another study which is not in line with this finding conducted by Kim *et al.* (2014), established that there was no evidence that the Flipped Classroom Model contributed to increased student grades.

The study also established that flipped classroom instructional strategy significantly enhance the retention ability of students taught lexis and structure in a flipped classroom. This is in agreement with the findings of Usman (2020) which established that Students taught Oral-English with Reciprocal Peer Tutoring Flipped Classroom (RPTFC) and Think-Pair-Share Flipped Classroom (TPSFC) recorded high retention ability. In the same vein, it was established that flipping classrooms enhances student satisfaction, confidence, teamwork, engagement, and motivation; promotes creativity, increases problem-solving skills of learners and makes the learning process more fun and retention of concepts in comparison to the traditional method of teaching and learning (Bergmann & Sams, 2012; Akçayır & Akçayır, 2018).

Moreover, female students taught English language in a flipped classroom recorded better academic performance than their male counterpart. The finding is in agreement with that of Andrew *et al.* (2007) which revealed that females performed and retained better than males with Web-based learning and traditional method. Similarly, Richards-Babb and Jackson (2011) found that male students' average success rate improvement double that of female students. However, the finding contradicts that of Usman (2020) which established that male and female students taught Oral-English using Think-Pair-Share Flipped Classroom (TPSFC) performed equally well and that both male and female students in a Flipped Classroom retained English language concepts equally well. Similarly, Shehu, *et al.*, (2023) also found that gender has no significant effect on the academic performance of students taught English language using ILIAS online learning platform.

CONCLUSION

Based on the outcome of the study, the following conclusions were made:

1. Flipped classroom instructional strategy had significant effect on the academic performance of students in English language.
2. Students taught English language in a flipped classroom retain better than those in the conventional classroom.
3. Female students had better academic performance and retention ability than their male counterpart in flipped English classroom.

RECOMMENDATIONS

1. Teachers of English language should be encouraged to deploy flipped classroom instructional strategy so as to enhance the academic performance and retention of students in English language.
2. Workshops and seminars should be organized for teachers by Education Authorities – Federal and State Ministries of Education, and Local Education Authorities on the development and utilization of flipped classroom instructional strategy for better academic performance and retention of English language.

3. To improve retention of English language, Governments and Non-governmental organization should assist in providing adequate ICT facilities in schools necessary for flipping classes.

REFERENCES

1. Achebe, A. E. (2008). Effect of videotape instructional package on achievement and retention in food and nutrition at senior secondary school level in Minna, Nigeria. *JOSTMED*, 1(1), 33-39.
2. Akçayır, G., & Akçayır, M. (2018). The flipped classroom: A review of its advantages and challenges. *Computers & Education*, 126(1), 334–345.
3. Andrew, M. C., & Janice, M., & Stephen, R. Y. (2007). GIS pedagogy, web-based learning and student achievement. *Journal of Geography in Higher Education*, 31(2), 22- 239. <https://doi.org/10.1080/03098260601063677>
4. Basal, A. (2015). The implementation of a flipped classroom in foreign language teaching. *Turkish Online Journal of Distance Education*, 16(4), 28-37. doi: 10.17718/tojde.72185
5. Bergmann, J., & Sams, A. (2012). Flip your classroom: Reach every student in every class every day. International society for technology in education.
6. Cabi, E., (2018). The Impact of the Flipped Classroom Model on Students' Academic Achievement. *International Review of Research in Open and Distributed Learning*. Volume 19, Number 3
7. Federal Republic of Nigeria (2013). National policy on education, 6th Edition. Lagos:NERDC.
8. Gambari, A. I., Kutigi, A. & Fagbemi, P. O. (2014). Effectiveness of Computer-assisted Pronunciation and Verbal Ability on the Achievement of Senior Secondary School Students in Oral-English. *Gist Education and Learning Research Journal*, 8(1), 11-28. Retrieved from: www.publicacionesunica.com/gist/index.php/gist/issue/view/13/showTos
9. Gambari, A. I. & Kutigi, A. & Gana, E. S. (2013). Effect of Computer-Assisted Instructional Packages on the Performance of Senior Secondary Students in Oral- English in Minna, Nigeria. *Journal of Nigerian Association of Teachers of Technology (JONATT)*, 9,(2), 306 - 313. ISSN: 1118-4558. Available at www.nattnigeria.com
10. Gambari, A. I., Yaki, A. A., Gana, E. S. & Ughovwa, Q. E. (2014). Improving secondary school students' achievement and retention in biology through video- based multimedia instruction. In *Sight: A Journal of Scholarly Teaching*, 9, 78-91. Retrieved from <http://insightjournal.net/Volume9.htm>
11. Gambari, A. I., & Yusuf, M. O. (2015). Effectiveness of computer-assisted STAD cooperative learning strategy on Physics problem solving, achievement and retention. *Malaysian Online Journal of Educational Technology*, 3(3), 20 - 34. A Publication of Faculty of Education, University of Malaya, Malaysia Available at: www.mojet.net
12. Graziano, K. J. (2017). Peer teaching in a flipped teacher education classroom. *TechTrends*, 61(2), 121-129. doi: 10.1007/s11528-016-0077-9
13. Hamdan, N., McKnight, P., McKnight, K., & Arfstrom, K. M. (2013). A review of flipped learning. Retrieved from: http://www.flippedlearning.org/cms/lib07/VA01923112/Centricity/Domain/41/LitReview_FlippedLearning.pdf.
14. Herreid, C. F. & Schiller, N. A. (2013). Case studies and the flipped classroom. *Journal of College Science Teaching*, 42(5), 62-66.
15. Johnson, L., & Renner, J. (2012). Effect of the flipped classroom model on secondary computer applications course: Student and teacher perceptions, questions and student achievement. Doctoral Dissertation, University of Louisville.
16. Kim, M. K., Kim, S. M., Khera, O., & Getman, J. (2014). The experience of three flipped classrooms in an urban university: An exploration of design principles. *The Internet and Higher Education*, 22, 37-50. doi: 10.1016/j.iheduc.2014.04.003
17. Lawal, I. (2019, March 7). Nigeria: Overcrowding as metaphor for declining educational quality. *The Guardian Newspaper*. Retrieved from: <https://allafrica.com/stories/201903070752.html>
18. Marks, D. B. (2014). Flipping the classroom: Turning an instructional methods course upside down. *Journal of College Teaching & Learning*, 12(4), 12-26.
19. Olaleye, F. O., Ajayi, A., Oyebola O. B., & Ajayi, O. A. (2017). Impact of overcrowded classroom

- on academic performance of students in selected public secondary schools in Surelere local government of Lagos state, Nigeria. *International Journal of Higher Education and Research, (IJHER)*, 7(1), 110-132. Retrieved from www.ijher.com
20. Owodunni, A. S., & Ogundola, I. P. (2013). Gender differences in the achievement and retention of Nigeria students exposed to concept in electronic works trade through reflective inquiry instructional technique. *British Journal of Education, Society & Behavioural Science*, 3(4), 589-599. Retrieved from www.sciencedomain.org.
 21. Ozofo, N. M., & Onos, C. N. (2018). Effect of ethno-mathematics on senior secondary school students' achievement in Ikwuano Local Government Area, Abia State. *Research Journal's Journal of Mathematics*, 5(1), 1-14. Retrieved from www.researchjournali.com
 22. Pilten, G. (2016). The evaluation of effectiveness of reciprocal teaching strategies on comprehension of expository texts. *Journal of Education and Training Studies*, 4(10), 232-247.
 23. Richards-Babb, M., & Jackson, J. K. (2011). Gendered responses to online homework use in general chemistry. *Chemistry Education Research and Practice*, 4. <https://doi.org/10.1039/C0RP90014A>
 24. Şahin, M., & Fell-Kurban, K. (2016). *The flipped approach to higher education: Designing universities for today's knowledge economies and societies*. Bingley: Emerald Publishing.
 25. Sherer, P., & Shea, T. (2011). Using online video to support student learning and engagement. *College Teaching*, 59(2), 56-59. Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/87567555.2010.511313>
 26. Shehu, Y., Zubairu, S. A. & Hussain, M. S. (2023). Effect of ILIAS online Learning Platform on Pre-service Teachers' Atitude and Academic Performance in English Language, Katsina State, Nigeria. *Gombe Journal of General Studies*, 7(2), 43-56.
 27. Smallhorn, M. (2017). The flipped classroom: A learning model to increase student engagement not academic achievement. *Student Success*, 8(2). doi: 10.5204/ssj.v8i2.381
 28. Sun, J. C., Wu, Y. (2016). Analysis of learning achievement and teacher-student interactions in flipped and conventional classrooms. *International Review of Research in Open and Distributed Learning*, 17(1), 79-99.
 29. Umoru, T. A., & Adekunle, O. P. (2019). Effects of programmed instruction teaching method on academic achievement and retention of students in business studies in Oyo State, Nigeria. *Nigerian Journal of Business Education*. 6(2), 63-72. Retrieved from <http://www.nigjbed.com.ng/index.php/nigjbed/article/view/340/338>
 30. Usman, A. K., (2020). Effects of flipped classroom instructional strategies on senior secondary school students' performance in oral- English in Minna, Niger State, Nigeria. Retrieved from: <https://kubanni.abu.edu.ng>
 31. Wachanga, S. M., Githae, R. W. & Keraro, F. N. (2015). Effects of collaborative concept mapping teaching approach on secondary school students' motivation to learn biology in Nakuru, north country, Kenya *Journal of education Policy and Entrepreneurial Research (JEPER)*, 2(8), 1-17.