



Analysis of Effect of Science Instructional Materials on Students' Academic Performance in Ilorin West, Kwara State

Florence Omosholape Abidoye^{1✉} & Adekunle Omotayo Abidoye²

^{1✉}University of Ilorin, Nigeria, abidoye.fo@unilorin.edu.ng, Orcid ID: [0000-0003-3369-2624](https://orcid.org/0000-0003-3369-2624)

²University of Ilorin, Nigeria, abidoye@unilorin.edu.ng, Orcid ID: [0000-0001-6890-5330](https://orcid.org/0000-0001-6890-5330)

Article Info

History of Article

Received:
15 March 2023
Revised:
07 April 2023
Published:
15 April 2023

Abstract

This study examined the analysis of the effect of science instructional materials on students' academic performance in Ilorin West, Kwara State. Three research questions were formulated while two hypotheses were tested for the study. The study was descriptive research of the survey type. It was targeted at science students in various schools in Ilorin West, Kwara State, Nigeria. A random sampling technique was used to select 120 science students from various schools in Ilorin West LGA, Kwara State, Nigeria. The research-designed questionnaire was used to accumulate information about class size, school type, and academic performance from respondents. The data accumulated was analyzed using frequency count and percentage, mean, and standard deviation while the research hypotheses were analyzed using an independent t-test and ANOVA. Findings from the study revealed that science instructional materials have a great effect on various school students' academic performance. The students taught with science instructional materials have excellent performance compared to those taught without the science instructional material. There was also a significant effect based on school type while there was no significant effect based on class size. Recommendations made based on this result were that the Ministry of Education should take responsibility for providing science instructional materials to broader schools to enhance better performance in science around the state.

Keywords:

Effect, Science Instructional Materials, Students' Academic Performance

How to cite:

Abidoye, F. O. & Abidoye, A. O. (2023). Analysis of effect of science instructional materials on students' academic performance in Ilorin-West, Kwara State. *EduBasic Journal: Jurnal Pendidikan Dasar*, 5(1), 1-10.

Info Artikel*Riwayat Artikel*

Diterima:
15 Maret 2023
Direvisi:
07 April 2023
Diterbitkan:
15 April 2023

Abstrak

Penelitian ini menguji analisis pengaruh bahan ajar sains terhadap prestasi akademik siswa di Ilorin West, Kwara State. Tiga pertanyaan penelitian dirumuskan sementara dua hipotesis diuji untuk penelitian ini. Penelitian ini merupakan penelitian deskriptif dengan jenis survei. Itu ditargetkan pada siswa sains di berbagai sekolah di Ilorin West, Negara Bagian Kwara, Nigeria. Teknik pengambilan sampel acak digunakan untuk memilih 120 siswa Sains dari berbagai sekolah di area pemerintahan lokal Ilorin West, Negara Bagian Kwara, Nigeria. Kuesioner yang dirancang penelitian digunakan untuk mengumpulkan informasi tentang ukuran kelas, jenis sekolah, dan prestasi akademik dari responden. Data yang terkumpul dianalisis dengan menggunakan perhitungan frekuensi dan persentase, mean, dan standar deviasi sedangkan hipotesis penelitian dianalisis dengan menggunakan independent t-test dan ANOVA. Temuan dari penelitian tersebut mengungkapkan bahwa bahan ajar sains memiliki pengaruh yang besar terhadap kinerja akademik siswa di berbagai sekolah. Siswa yang diajar dengan bahan ajar IPA memiliki kinerja yang sangat baik dibandingkan dengan siswa yang diajar tanpa bahan ajar IPA. Ada juga pengaruh yang signifikan berdasarkan jenis sekolah sementara tidak ada pengaruh yang signifikan berdasarkan ukuran kelas. Rekomendasi yang dibuat berdasarkan hasil ini adalah Kementerian Pendidikan harus mengambil tanggung jawab untuk menyediakan bahan ajar Sains ke sekolah yang lebih luas untuk meningkatkan kinerja sains yang lebih baik di seluruh negara bagian.

Kata Kunci:

Efek, Bahan Ajar IPA, Prestasi Akademik Siswa

Cara Mensitasi:

Abidoye, F. O. & Abidoye, A. O. (2023). Analysis of effect of science instructional materials on students' academic performance in Ilorin-West, Kwara State. *EduBasic Journal: Jurnal Pendidikan Dasar*, 5(1), 1-10.

INTRODUCTION

Education is regarded as an instrument of change and national development. It is a process and medium of relevant knowledge, skills, attitude, and values that can bring about the survival of change. Education as remarked by the *National Policy on Education* (Federal Republic of Nigeria), should be means of achieving creativity, nationalistic outlook, and independence from mental self-reliance and freedom of mind, outlook, and independence from mental colonization. The essence of education is the transmission of values and ideas that are meant to be internalized (Onasanya & Omosewo, 2011).

Science is a field of study concerned with discovering and describing the world around us by observing and experimenting. The three main branches of science are physical science, biological science, and applied science. Therefore, science is receiving much emphasis in education because of its significance and relevance to life and society yet science is defined as a body of knowledge, a way or method of investigating, and a way of thinking in the pursuit of an understanding of nature (Abimbola in Adedoyin & Bello, 2017). Science is one of the fields of education that had been severally described. The word "science" brings to mind many different pictures: a fat textbook, white lab coats, and microscopes, an astronomer peering through a telescope, a naturalist in the rainforest, Einstein's equations scribbled on a chalkboard, the launch of a space shuttle, bubbling beakers, etc. (Glaze, 2021).

Portana et al. (2021) examined the effectiveness and acceptability of the instructional materials developed by the faculty of the College of Management and Business Technology (CMBT) of the Nueva Ecija University of Science and Technology (NEUST). The following findings were made: the total weighted mean got 3.55 with a verbal description of "Very satisfactory" indicating that the instructional materials developed by CMBT faculty were acceptable, except for the item friendliness of figures which got a "Needs Improvement" rating. Learning involves the acquisition of new knowledge, ideas, skills, values, and experiences which enable the individual to modify and or alter his action.

Learning is a gradual process and presenting any learning concept to students must be done to appeal to students of varied interests and abilities, moving from the known to unknown and encouraging active class participation. The teacher cannot be said to have achieved his instructional objectives until there is the desired change in students' behavior.

Instructional materials are resources or teaching resources that the teacher uses in presenting his lesson so that the students can easily understand what is being taught and a means of making the teaching and learning process more meaningful, effective, and understandable. It helps to facilitate teaching and learning. The use of instructional materials did not only encourage teachers and students to work collaboratively but also results in more cooperative learning activities among the students (Syatriana, 2013). Instructional material is the main focus to unveil their effects on the academic performance of students. The importance of instructional materials in any teaching and learning Process cannot be over-emphasized. This is the fact that such materials enhance, facilitate and make teaching and learning easy, lively, and concrete.

Instructional materials are different teaching aids or apparatus which a classroom teacher uses to facilitate his or her teaching for the stated objectives. Instructional resources play an important role in conducting a quality education. Instructional resources assist teachers to transmit knowledge in an impressive way making learning more effective as they help learners in the greater acquisition of knowledge. It encourages participation especially if students are allowed to manipulate material use (Abidoye et al., 2022).

Bukoye (2019) investigated the utilization of instructional materials as tools for the effective academic performance of students. The findings revealed the great significance of the instructional materials to students' academic performance. Awolaju (2016) conducted a study on instructional materials as correlates of students' academic performance in Biology in senior secondary schools in Osun State. Findings revealed that students taught with instructional materials performed better than those taught without

instructional materials. Asrizal et al. (2018) observed the effect of instructional material on natural science with literacy skills of our respiratory and excretory health theme on the academic achievement of the students. The teaching process in the 21st century should be able to develop the holistic competence of students. Integrated teaching is relevant to the principles of 21st-century learning to develop holistic competence. Besides that, the integration of literacy skills in teaching can strengthen the competence of students in a certain area. In the 2013 curriculum, the education policy in Indonesia promoted the application of integrated teaching and literacy programs in the school. However, the integration of learning material of natural science and literacy skills of students in schools was still low. The results of the data analysis indicate that the application of instructional material of natural science with literacy skills in the scientific approach has meaningful.

Another study by Arop, Imeh & Effiong (2015) examined the effect of instructional materials on the teaching and learning of basic science in Junior Secondary Schools in Cross River State. The result showed that the use of instructional materials has a favorable effect on students' achievement in science concepts. Achus & Oluwafunmilayo's study entitled *Using Instructional Materials: Effects on Students Performance in Biology Subject*. Investigated the effects of the use of instructional materials on students' performance in Biology in Surulere LGA, Lagos. The findings of the study were that instructional materials have a significant effect on the teaching of Biology. Also, the uses of instructional materials have a significant effect on the learning of Biology.

The availability of instructional materials makes both teaching and learning very pleasant to basic science teachers (Abdu-Raheem, 2012). He added that the factors can be poor laboratory facilities, the inability of the biology teachers to put across ideas clearly to the students, and the inadequate number of learning facilities in Ilorin West, Kwara State. The lack of availability and the credibility of instructional materials in the teaching of biology in terms of effectiveness and appropriateness of instructional materials have

remained major problems and issues of interest in schools in Nigeria.

Instructional materials stimulate students' interests and help the teacher and the students to overcome physical limitations during the presentation of the subject matter. Instructional resources make the teaching and learning process complete and functional (Omuna, Onchera & Kimutai, 2016). Therefore, instructional materials play a very important role in the process of teaching and learning.

The teaching of science subjects in schools has not been encouraging due to the abstract nature of the subject which is why the use of instructional materials is necessary and needed to facilitate students' learning in biology (Neji & Ntibi, 2019). The absence of instructional materials in teaching and learning science could discourage learning thereby leading to low achievement. Abidoye (2021) researched the effect of laboratory practicals on senior secondary school students in Biology in Ilorin South, Kwara State, and indicated that there was no significant difference in students' opinions towards the impact of laboratory practicals on the performance of students based on school type.

Ekundayo & Alonge (2012) reviewed a study that private schools were better equipped in terms of material resources than public schools and those private schools has better academic performance than public schools in external examinations. Igbinedion & Epumepu (2011) examined students' performance in Business Studies in private and public school Junior Secondary School Certificate Examinations. The finding showed that there was a significant difference in the performance of students in public and private schools.

Owoeye & Yara (2011) examined the class size and academic achievement of secondary schools in Ekiti State, Nigeria, and found that class size relates to the academic performance of students. Using the students' class size questionnaire (SCSQ) designed by the researcher, the study concluded that class size was a crucial factor in determining the quality of output from secondary schools in Ekiti State Nigeria. Students in schools having small class sizes had a better quality of output than students in schools having large class sizes. Ruffina, Esther & Anastecia (2018) also

investigated the impact of class size on students' academic performance in biology in Idemili North Local Government Area of Anambra State. The result indicated the same has a significant effect of class size on the students' performance.

Adeyemi (2008) examined the influence of class size on the quality of output in secondary schools in Ekiti State, Nigeria. The study surveyed 141 secondary schools that presented candidates for the 2003 senior secondary certificate examinations and showed that the probability was less than 0.05. Hence, the null hypothesis was rejected indicating a significant difference between the quality of output of students in schools having an average class size of 35 students and below and the quality of output in schools having an average class size of above 35 in the examinations. In terms of student achievement, there is a significant difference between schools with 35 and below-average class sizes and schools with 35 and above-average class.

Another relevant research by Ehebha & Adeyinka (2022) also found the effects of class size on the academic performance of biology students in senior secondary schools in Lagos State. The causal-comparative study designed 5 research questions and 3 research hypotheses which were analyzed descriptively and by independent sample T-test. From this study, it was discovered that large class size has a negative effect on biology students' academic performance, also, findings from the study revealed that large class size has no influence on gender difference and that large class size has an impact on the ability level of science. Those previous researchers were prone to know if the instructional materials enhance effective learning and better performance of students.

From those explanations, the main purpose of this study examined the analysis of effect of science instructional materials on students' academic performance in Ilorin West, Kwara State. Specifically, the study examined (1) science instructional materials effect on students' academic performance in various schools in Ilorin West LGA, Kwara State, Nigeria; (2) science instructional materials effect on students' academic performance based on school type; and (3)

science instructional materials on students' academic performance based on class size. In this work, the following research questions are set for answering that there is the effect of science instructional materials on students' academic performance and the effect on students' academic performance based on school type and class size.

METHODS

This study employed descriptive research of the survey type. The population for this study comprised selected students in senior secondary schools in Ilorin West LGA in Kwara State. The target population consists of science students from both public and private secondary schools. There are 348 public secondary schools and 114 registered private schools in Kwara State making a grand total of 362 secondary schools in Kwara State. The total number of public schools in Ilorin West is 28 while private secondary schools are 25 making a total of 53 schools in Ilorin West LGA. The scope was delimited to 6 secondary schools consisting of three (3) private and three (3) public schools. The target population consists of one hundred and twenty (120) science students from both sides. The students were selected from the sampled schools using a simple random sampling technique.

This study made use of an adapted questionnaire tagged "Science Instructional materials effect on Students' Academic Performance in School. The instrument has both closed and open-ended questions. The questionnaire consists of two sections (A and B). Section A includes information on the personal data of the respondents; the name of the school, school type, and class size, while section B contains items carefully organized in accordance with the research questions raised related to instructional material and academic performance. Section B is divided into four sub-sections. The section required the respondents to make choices from four options of a Likert scale answer by ticking their choice: SA (Strongly Agreed) for 4 points, A (Agreed) for 3 points, D (Disagreed) for 2 points and SD (Strongly Disagreed) for 1 point.

The researcher collected a letter of introduction from the Head of the Department, Department of Science Education, University of Ilorin. The letter from the head of the

department helped the researcher to gain access to the teachers of the schools sampled for the study. Also, the respondents' consent form was given to the principal of the selected schools before questionnaires were administered to the students. The instruments were administered by the researcher to the sampled biology students. The researcher provided necessary instructions to the respondents with regard to the whole exercise. The completed questionnaires were personally retrieved immediately to avoid the loss of questionnaires. Two hypotheses were involved in the study.

The data collected from the study was utilized to answer the research questions and test the hypotheses. The data were analyzed using descriptive and inferential statistics. Demographic information was subjected to frequency and percentage (%), and the research questions were answered with Mean and Standard Deviation. Hypothesis 1 was tested with a t-test while ANOVA was used to test hypothesis 2 on the effect of instructional materials on students' academic performance.

RESULTS AND DISCUSSION

The data collected for this study were analyzed and the results were presented in a table for easy interpretation. The data were the responses to the questionnaire items by the population on the school type and class size effect on science instructional material on students' academic performance in various schools in Ilorin West, Kwara State. Frequency count and percentage were used to describe the demographic data, then answers mean, standard deviation and t-test statistic were used to test all the hypotheses formulated at $\alpha=0.05$ significance level. All analyses were done using Statistical Package for Social Science (SPSS) version 25.0.

Table 1 shows the general data of respondents' personal information. Out of the total of 120 students sampled in this survey, 60 students which correspond with 50% of the total respondents were from public schools and also 50 students representing 50% were from private schools. 40 students in the lower were involved which corresponds to 33.3%, 49 were in the Middle (40.8) and 51 students were in Higher (25.8) based on their class size.

Table 1. Demographic Data of the Respondents

Variable	Frequency	Percentage
School Type		
Public	60	50
Private	60	50
Total	120	100
Class Size		
Lower	40	33.3
Middle	49	40.8
Higher	31	25.8
Total	120	100

16 items were presented to evaluate the analysis of science instructional materials' effect on students' academic performance in which an acceptable mean of 2.5 and above indicates agreement and a mean score below 2.5 were pegged for disagreement.

The Effect of Science Instructional Materials on Students' Academic Performance

Table 2 presented the mean and standard deviation on the effect of class size on science instructional materials on students' academic performance. The table revealed that all the listed items of the science instructional materials' effect on students' academic performance because the items gained mean greater than 2.50.

These items include: (1) the use of textbooks and charts makes science appear real, (2) when I am learning science with the use of charts, (3) it makes it simpler and gives meaningful learning, (4) science pictorial charts attract my attention during science lessons, (5) the use of biology specimen in learning science makes me more interested in learning science, (6) the use of realia encourages me to understand difficult topics in science, and (7) I am able to answer science question on my own when instructional resources are used to break down the topics among others.

Table 2. Mean and Standard Deviation on Science Instructional Materials' Effect on Students' Academic Performance

Items	Mean	SD
The use of textbooks and charts makes science appear real.	3.35	0.61
When I am learning science with the use of charts, it makes it simpler and gives meaningful learning.	3.44	0.57
The use of instructional resources by my teacher makes science easy to apply in daily activities.	3.43	0.59
The use of microscope by my teacher makes it easy for me to interpret biology abstracts.	3.25	0.65
science pictorial charts attract my attention during Biology lessons.	3.30	0.73
The use of science specimens in learning makes me more interested in learning.	3.40	0.60
I concentrate a lot when my teacher is giving examples using instructional resources	3.27	0.67
The use of microscope by the teacher makes me participate actively in science class.	3.20	0.77
The use of science-related resource persons motivates me to learn.	2.91	0.77
The use of instructional resources reduces the movement of students during biology lessons.	3.30	0.70
The use of Illustrations and charts in teaching science makes the class interactive during the lesson.	3.38	0.65
Science innovation makes learning fun for me.	3.21	0.62
The use of realia encourages me to understand difficult topics in Biology.	3.30	0.70
I am able to answer science questions on my own when instructional resources are used to break down the topics.	3.40	0.67
Instructional resources help me to have a wider knowledge of the topics learned in science.	3.42	0.66
I am able to answer questions better in science when learning with the use of instructional resources.	3.42	0.66

Science Instructional Materials Have Effect on Students' Academic Performance Based on School Type

H₀₁: There is no significant effect on school type in the use of science instructional materials on students' academic performance in Senior Secondary School.

Table 3 shows the mean score of private school students is 54.11(SD=4.25) while that of public school students is 51.98 (SD=4.23). at df=118, t-value =-2.75 and p<.05 level of significance. This result implies that private schools in Kwara State engaged in science instructional material more than public schools. Therefore, the null hypothesis is rejected since the hypothesis stated that there is no significant effect on school type.

This is in the favor of private schools because the students make more use of instructional material than the public school. The performance of the private school can be improved based on the finding in this work.

Table 3. T-test Analysis on Science Instructional Materials Effect on Students' Academic Performance Based on School Type

School Type	N	Mean	SD	t-value	df	Sig (2-tailed)
Private School	60	54.11	4.25	-2.75	118	0.007
Public School	60	51.98	4.23			

Science Instructional Materials Have Effect on Students' Academic Performance Based on Class Size

H₀₂: There is no significant effect of the use of science instructional materials on students' academic performance in school based on class size.

The data obtained based on the question and hypothesis of class size is presented in Table 4 below.

Table 4. Analysis of Variance (ANOVA) Showing the Science Instructional Materials' Effect on Students' Academic Performance Based on Class Size

	Sum of squares	df	Mean F	Sig.
Between Group	90.73	2	45.3	2.44 0.09
Within Group	2172.97	117	18.57	
Total	2263.70	119		

Table 4 presents an analysis of variance (ANOVA) showing the effect of science instructional materials on students' academic performance based on class size. The Table revealed that the F-value of 2.44 with a p-value of 0.09 computed at a 0.05 level of significance. Since the p-value is greater than 0.05, the null hypothesis which States that there was no significant effect on class size in the use of science instructional materials on students' academic performance in School is therefore not rejected. The science student in the higher class performed better than those in the lower classes.

Discussion

This study examined the science instructional materials' effect on students' academic performance in science in Ilorin West LGA, Kwara State. The result revealed that students performed better when taught with science instructional materials which affect their academic performance. In this finding, it is well clear that instructional material involvement enhances the better performance of the students. This may be because science instructional materials are available and well utilized by the students. This is in line with the findings of Okhakhu et al. (2016) studied the effects of the use of instructional materials on students' performance in secondary school in Lagos State. The findings of the study show that instructional materials have a significant effect on the teaching of Biology. Also, the uses of instructional materials have a significant effect on the learning of Biology.

The finding showed that there was a significant difference between private schools

and public schools in the use of science instructional materials on students' academic performance in school in Ilorin West LGA. The finding indicated that those teachers in private schools make use of the instructional materials very well because the eyes of the authority are on them all the time. This may be because private schools concentrate on science instructional materials more than public schools. This result corroborates the findings of Igbinedion & Epumepu (2011) on students' performance in Business studies in private and public school Junior Secondary School Certificate Examinations, which showed that there was a significant difference in the performance of students in public and private schools. in public schools.

The finding showed that there was no significant difference in the class size in the use of science instructional materials on students' academic performance in various Schools in Ilorin. This shows that the upper, middle, and lower classes were determined to concentrate more on instructional materials and properly because of the external examination. This may be since both lower, Middle, and Higher students can pay attention to science instructional materials during the lesson. This study is in agreement with the finding of Ehebha & Adeyinka (2022) who investigated the effects of class size on the academic performance of Biology students in senior secondary schools in Lagos State and the result indicated that there was no significance in the class size.

CONCLUSION

Science instructional materials in Ilorin West, Kwara State was a significant effect on students' academic performance and also based on school type while it was not significant based on class size. The class that instructional materials are used for performs better than those that instructional materials are not used. Instructional materials should be used for all the classes for the improvement of the performance of the students. As a result of these findings, the Ministry of Education should take responsibility for providing science instructional materials to schools.

Government should provide public schools with science instructional materials to enhance better performance of students in

science. Stakeholders should build more infrastructure such as classrooms, laboratories, and others. Finally, this study can be this study could be replicated in other local government areas in Kwara State and other parts of the country.

This study is limited in geographical, sample, and statistical scope. Further studies should therefore be conducted using a larger geographical and sample size with more robust statistical techniques to enhance the generalizability of the findings. Future research could examine the availability and utilization of science instructional materials on students' academic performance in schools.

REFERENCES

- Abidoye F. O. (2021). Effect of laboratory practical on senior secondary student's academic performance in Biology in Ilorin South LGA, Kwara State. *Eurasian Journal of Science and Environmental Education*, 10(2), 34–49.
- Abidoye F. O., Maroof, Z. A., Ahmed, A. R., & Ogunlowo, O. S. (2022). Instructional resources for teaching biology secondary schools in Moro, Kwara State, Nigeria. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, 8(2), 187–193.
- Adedoyin, A. O., & Bello, G. (2017). Conceptions of the nature of science held by undergraduate pre-service biology teachers in South-West Nigeria. *Malaysian Online Journal of Educational Sciences*, 5(1), 1–9.
- Adeyemi, T. O. (2008). The influence of class size on the quality of output in secondary schools in Ekiti State, Nigeria. *American Eurasian Journal of Scientific Research*, 3(1), 7–14.
- Abdu-Raheem, B. O. (2012). The influence of gender on secondary school students' academic performance in South-West, Nigeria. *Journal of Social Sciences*, 31(1), 93–98.
- Arop, B. A., Umanah, F. I., & Effiong, O. K. (2015). Effect of instructional materials on the teaching and learning of basic science in junior secondary schools in Cross River State, Nigeria. *Global Journal of Educational Research*, 14(1), 67–73.
- Asrizal, A., Amran, A., Ananda, A., & Festiyed, F. (2018). Effect of instructional material of natural science with literacy skills of our Respiratory and Excretory Health Theme on Academic Achievement of Students. *Journal of Physics: Conference Series*, 1317, 012174.
- Awolaju, B. A. (2016). Instruction materials as correlates of students' academic performance in biology in senior secondary schools in Osun State. *International Journal of Information and Education Technology*, 6(9), 705–708.
- Bukoye R. O. (2019). Utilization of instructional materials as tools for effective academic performance of students: Implication for counseling. *Proceedings 2019*, 2(21), 1395.
- Ehebha, G. A. & Adeyinka, O. L. (2022). A paper on the influence of classroom sizes on biology students' educational achievements. *International Journal of Innovative Science and Research Technology*, 7(7), 241–248.
- Ekundayo, H. T. & Alonge, H. O. (2012). Human and material resources as correlates of academic performance of private and public secondary school students in Ondo State, Nigeria. *European Scientific Journal*, 8(10), 170–180.
- Glaze, A. L. (2021). Acceptance, confidence, and time: Exploring dynamics of middle and secondary science teacher autonomy in teaching evolution in the Southeastern United States. *Eurasian Journal of Science and Environmental Education*, 10(2), 63–75.

- Igbinedion, V. I., & Epumepu, E. A. (2011). A comparison of students' academic performance in business studies in public and private junior secondary school certificate examinations (JSSCE) in Ovia South West Local Government Council Area of Edo State. *Technical and Vocational Education Journal (TVEJ)*, 3(1), 42–53.
- Neji, H. A. & Ntibi, J. E. E. (2019). Effect of E-learning devices on chemistry students' academic performance in Calabar Municipality, Cross River State. *Interdisciplinary Journal of Science Education*, 1(1), 170–178.
- Okhakhu, D. O., Oladiran, M. D., & Omoike, D. A. (2016). Instructional materials as determinants of students' academic performance at the secondary school level In Ikorodu local government, Lagos State, Nigeria. *Information Impact: Journal of Information and Knowledge Management*, 7(1), 138–149.
- Omuna, M. O., Onchera, O., & Kimutai, C. K. (2016). Availability and use of instructional resources for teaching and learning of English reading skills in secondary schools in Teso North Sub County, Kenya. *Educational Research*, 7(1), 1–9.
- Onasanya, S. A., & Omosewo, E. O. (2011). Effects of improvised and standard instructional materials on secondary school students' academic performance in Physics in Ilorin Nigeria. *Singapore Journal of Scientific Research*, 1(1), 68–76.
- Owoeye, J. S., & Yara, P. O. (2011). Class size and academic achievement of secondary schools in Ekiti State Nigeria. *Asia Social Science*, 7(6), 184–186.
- Portana, H. V., Fronda, J. G., Policarpio, D. G. T., Rigat, K. A. R. C., & Llames, G. A. (2021). Effectiveness and acceptability of instructional material in the enhancement of students' academic achievement. *International Journal of Advanced Engineering, Management and Science (IJAEMS)*, 7(1), 12–15.
- Ruffina, A. N., Esther, A. E., & Anastecia, I. N. (2018). Impact of class size on students' academic performance in biology in Idemili North Local Government Area of Anambra State. *International Journal of Education and Evaluation*, 4(8), 22–32.
- Syatriana, E., Husain, D., Haryanto, H., & Jab, B. (2013). A model of creating instructional materials based on the school curriculum for Indonesian secondary schools. *Journal of Education and Practice*, 4(20), 10–19.