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Okenyi, Emmanuel C. Ph.D; Ugwuanyi, Christian S. Ph.D; Ezema, Victor S. Ph.D; and Ngwoke, Anthonia N. Ph.D, "Enhancing Learners' Motivation and Academic Achievement in Basic Science Using Printed Library Resources" (2022). *Library Philosophy and Practice (e-journal)*. 7010.

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Enhancing Learners' Motivation and Academic Achievement in Basic Science Using Printed Library Resources

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Abstract

In Enugu State, Nigeria, the researchers investigated the effects of printed library resources on students' motivation and academic achievement in basic science. The study used a quasi-experimental research design using 58 primary 5 pupils in public primary schools in Enugu State. Purposive sampling was used to select a sample size for the study. The achievement exams Basic Science Achievement Test (BSAT) and Motivation Scale were used to collect data (BSMS). Using Kuder-Richardson's formula 20 and the Cronbach Alpha technique, the instruments' reliability indices were judged to be 0.81 and 0.76, respectively. To answer the study questions, bar charts were used, while analysis of variance was used to test the null hypotheses at the 0.05 level of significance. Printed library resources improved significantly learners' motivation and achievement in basic science according to the findings. The researchers advised that the government should make available printed library resources for use by the primary school teachers.

Keywords: Printed library resources, Motivation, Academic achievement, Basic science.

Introduction

The extent to which printed library resources affect learners and the learning process has been a cause of concern for both learners and stakeholders in the education sector around the world. Teaching and learning appear to be both a simple and complex processes. Learning can take place in a variety of methods, including classical conditioning, operant conditioning, and observation (Cherry, 2020). The new knowledge must be reinforced in order for learning to take place. Learning can be reinforced via printed library resources, according to Eze and Ogbueghu (2017), because library resources/materials appear to excite and capture the learner's interest and attention throughout teaching and learning activities.

In the realm of education, printed library resources are critical tools that are used to improve instruction, maintain learners' interest, and promote academic accomplishment (Olayinka, 2016). Similarly, Shukla (2018) defined printed library resources as all resources that support and increase learning, including people, objects, animations, facilities, and equipment. The totality of resources deployed by the instructor for effective teaching and learning are referred to as instructional materials.

The use of printed library resources in the teaching and learning process appears to be quite beneficial. Aina (2013) emphasized the importance of instructional resources in augmenting verbal explanations of any idea in science class. Akoke (2017) elaborated on this position by stating that: the utility of IMs is undeniable, and IMs provide learners with the experimental experiences required for effective learning; improve the quality of instructions for optimal academic achievement of learners: enhance and complement the teacher's verbal and abstract presentation during instructions. According to Olayinka (2016), IMs aid in the memorization of concepts, the efficacy of teachers, and the performance of students. As a result, it is clear that printed library resources are essential components in the educational system. The government is anticipated to mass-produce (industrially) and distribute IMs to schools in this era of modernization and industrial revolution (Eze & Ogbueghu, 2017).

Unfortunately, most schools either lack or are inadequately supplied with industrially made library resources. The provision of printed library resources for operative teaching and learning experiences is being confronted by numerous challenges. According to Eze and Ogbueghu (2017), the acquisition of IIMs is hindered by both human and non-human variables. Earlier, Utibe-Abasi (2015) maintained that lack of professional experience, Lack of innovative and lack critical thinking, financial constraints, lack of tools as well as inadequate exposure to

improvisation are some of the factors militating against science teachers in improvisation. Printed library resources (IIMs) are expected to motivate and arouse the pupils' interest in learning.

Motivation is a mental and physical construct that instigate and direct the behaviours of an organism towards goal-oriented activities. Eze and Ogbuegbu (2017) defined motivation as an incitement that prompts an individual into achieving significant results. Similarly, Cherry (2020), viewed motivation as a process that facilitates, stabilizes and sustains behaviours toward a set objective. Motivation is an internal and external mechanism that stimulates, expedites and keeps an individual's behaviour on desired objectives.

In a study that investigated the effects of motivation on students' academic achievement Misalina (2018), found that motivation is among the critical qualities needed by students. The author further indicated that teaching aids are capable of arousing students' interest that leads to better achievement in academic endeavours. In a related study, Uenishi (2019) indicated that motivation is a process through which a learners' interest is aroused (internally or externally) towards a particular activity. Motivation proves learners' determination to focus on learning activity and that instructional materials are good sources of motivation to learners that leads to improved academic achievement.

Another empirical evidence by Edori (2014) indicated that students are motivated to read further by the use of instructional materials and that the use of instructional material enhances students' academic achievement. Eze and Ogbueghu (2017) investigated the effects of improvised instructional resources on students' motivation and academic achievement in economic at secondary school level. The result indicated that improvised instructional resources aroused students' motivation and enhanced academic achievement.

Ikwuka and Usifoh (2016) while investigating the effect of improvised instructional material on senior secondary school students' academic achievement in mathematics in Oshimili South Local Government Area discovered that students who were instructed using printed library resources attained better academic achievement in mathematics than those instructed without instructional materials. Further empirical evidence from Abdu-Raheem (2016) indicated that students who were taught social studies using instructional materials achieved more in social studies than to those taught without IMs.

Furthermore, Adebayo and Adigun (2018) found that the students that were taught using instructional aids performed better in physics than those taught without instructional aids and that there was a general lack of instructional aids in secondary schools. In a related study, Okpe (2018) indicated that the performance of physics students depends on the use of instructional materials in teaching and learning activities and teachers' ability to arouse the interest of the students using instructional materials.

The most pressing issue confronting the education industry in Enugu State and Nigeria as a whole is learners' low performance in internal and external examinations. This condition appears to be the result of learners' lack of enthusiasm and poor academic accomplishment in primary schools, which is exacerbated by a shortage of teaching tools. For effective and successful teaching and learning sessions, instructional materials are required. Accepting the notion in education that suitable and appropriate use of instructional aids piques students' attention, motivates them, and so improves teachers' effectiveness is comprehensible. Unfortunately, there is evidence that industrially produced instructional resources are undersupplied in primary schools or are unavailable to teachers and students.

The state of Enugu, specifically the Igbo-Etiti Local Government Education Authority, is noted for its lack of educational supplies. Teachers and educators have little choice but to innovate in the lack of teaching materials. There is currently little or no empirical research on the influence of printed library resources on primary school students' motivation and academic progress. As a result, the goal of this study is to look into the impacts of printed library resources on primary school learners' motivation and academic achievement in basic science in Enugu state.

Research Questions

1. How can printed library materials affect students' motivation in basic science?
2. What are the average achievement scores of students who were taught basic science using printed library resources versus those who were not?

Hypotheses

The study was guided by two hypotheses:

H₀₁: The mean motivation scores of learners taught basic science with printed library resources and those taught without printed library resources are not significantly different.

H₀₂: The mean academic achievement scores of kids taught basic science with printed library resources and those taught without printed library resources are not significantly different.

Methods

A quasi-experimental research design was used in this study. The non-equivalent control group design with pre-test and post-test was used. Because perfect randomization of subjects was not achievable, intact classes were used. Because random assignment of individuals to groups could disrupt the academic program and timetable of elementary schools, the researchers used this strategy. Adene et al. (2021), Ejimonye, Onuoha et al. (2020), Ejimonye et al. (2020), Njoku

et al. (2020), Offordile et al. (2021), Adonu et al. (2021), Odo et al. (2021) and others have used this design in comparable investigations. The survey included all 29,640 primary (5) five students from the 1,226 public primary schools in Enugu State, Nigeria.

Two primary schools with intact primary five classrooms were chosen using a targeted sampling strategy. The study had a sample size of 58 primary 5 students, including 30 in the experimental group and 28 in the control group. The sample size was determined using a process known as purposive sampling. The Basic Science Achievement Test (BSAT) and Basic Science Motivation Scale, both devised by researchers, were used to collect data (BSMS). The BSAT is a 15-item multiple-choice test that assesses students' knowledge of basic science concepts. The BSAT has a minimum and maximum score of 0 and 30, respectively, with each correct question receiving 2 points. The BSMS was a 20-item questionnaire designed to assess students' enthusiasm for learning basic science. The BSMS items were categorized as very highly motivated (VHM), highly motivated (HM), moderately motivated (MM), and not motivated (NM) on a four-point Likert scale (NM). The BSMS has a minimum and maximum score of 20 and 80, respectively. Experts in early education, educational psychology, and measurement and evaluation evaluated the tools. For both BSAT and BSMS, an estimate of internal consistency was calculated. The instruments were given to 30 students in a school that was not included in the study. Using Kuder-formula Richardson's 20 and Cronbach alpha techniques, reliability indices of 0.81 and 0.76 were calculated for BSAT and BSMS, respectively.

Prior to the start of the treatment, both classes were given a pre-test to serve as baseline data. The treatment, which lasted six weeks, began after that. Participants in the experimental group were taught fundamental science via IIMs, while those in the control group were not. Following that, the two groups were given a post-test. The mean and analysis of covariance were

used to analyze the data acquired from both the pretest and posttest (ANCOVA). The research questions were answered using the mean, and the hypotheses were tested using ANCOVA at 5% probability levels.

Results

The results were presented based on the study's research questions and hypotheses.

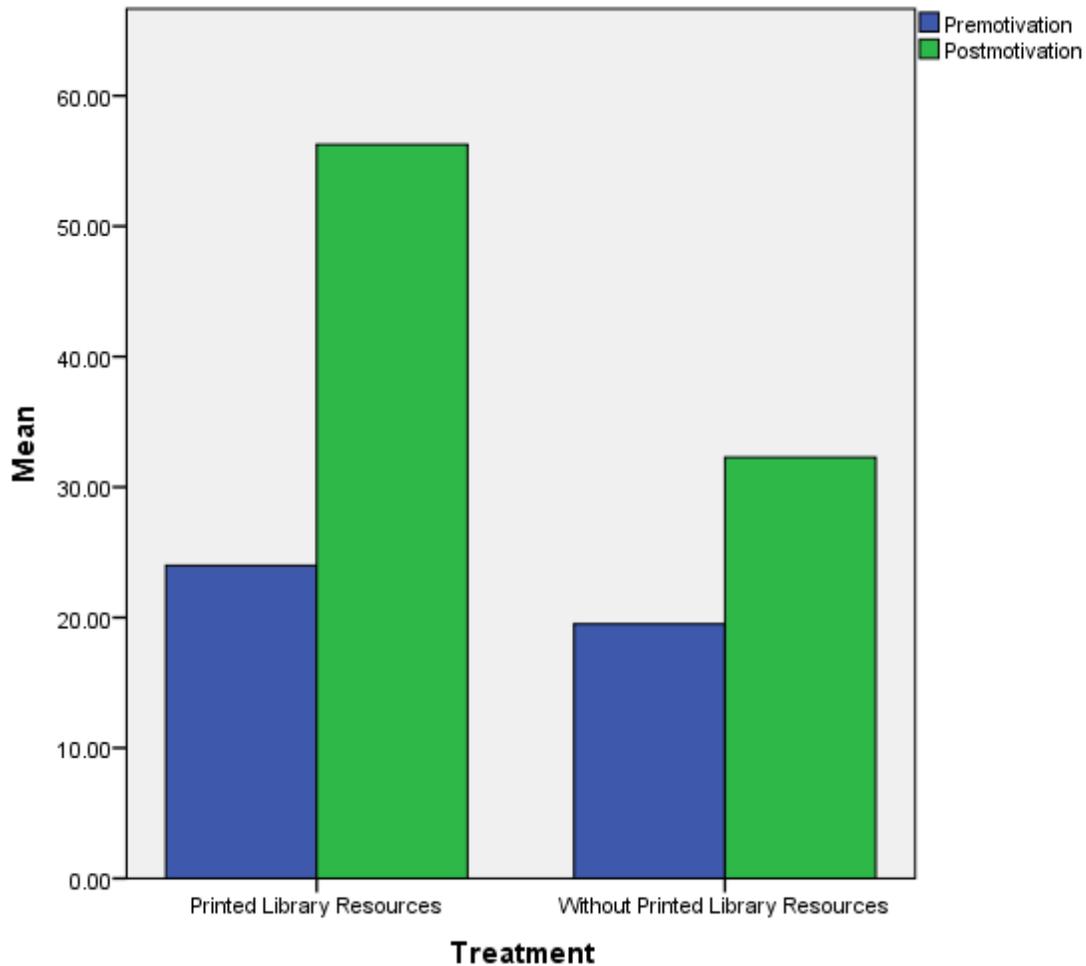


Figure 1: Bar chart representation of the mean motivation scores of pupils taught basic science using printed library resources and those taught without

Figure 1 showed that the pupils taught basic science using printed library resources had higher posttest mean motivation score ($M = 56.27$, $SD = 1.56$) than those taught without library resources ($M = 34.67$, $SD = 3.28$).

Table 1

Analysis of covariance of the difference in the mean motivation scores of pupils taught basic science using printed library resources and those taught without

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	8938.896 ^a	2	4469.448	68.636	.000	.714
Intercept	4500.897	1	4500.897	69.119	.000	.557
Pre-motivation	610.063	1	610.063	9.369	.003	.146
Treatment	5936.490	1	5936.490	91.164	.000	.624
Error	3581.518	55	65.119			
Total	128356.000	58				
Corrected Total	12520.414	57				

a. R Squared = .714 (Adjusted R Squared = .704)

Table 1 revealed that printed library resources had significant effect on the motivation of pupils in basic science, $F(1, 55) = 91.164$, $p = .000$, effect size = .624. Thus, the null hypothesis is rejected since $p < .05$. This implies that 62.4% change in pupils' motivation is attributed to their exposure to printed library resources.

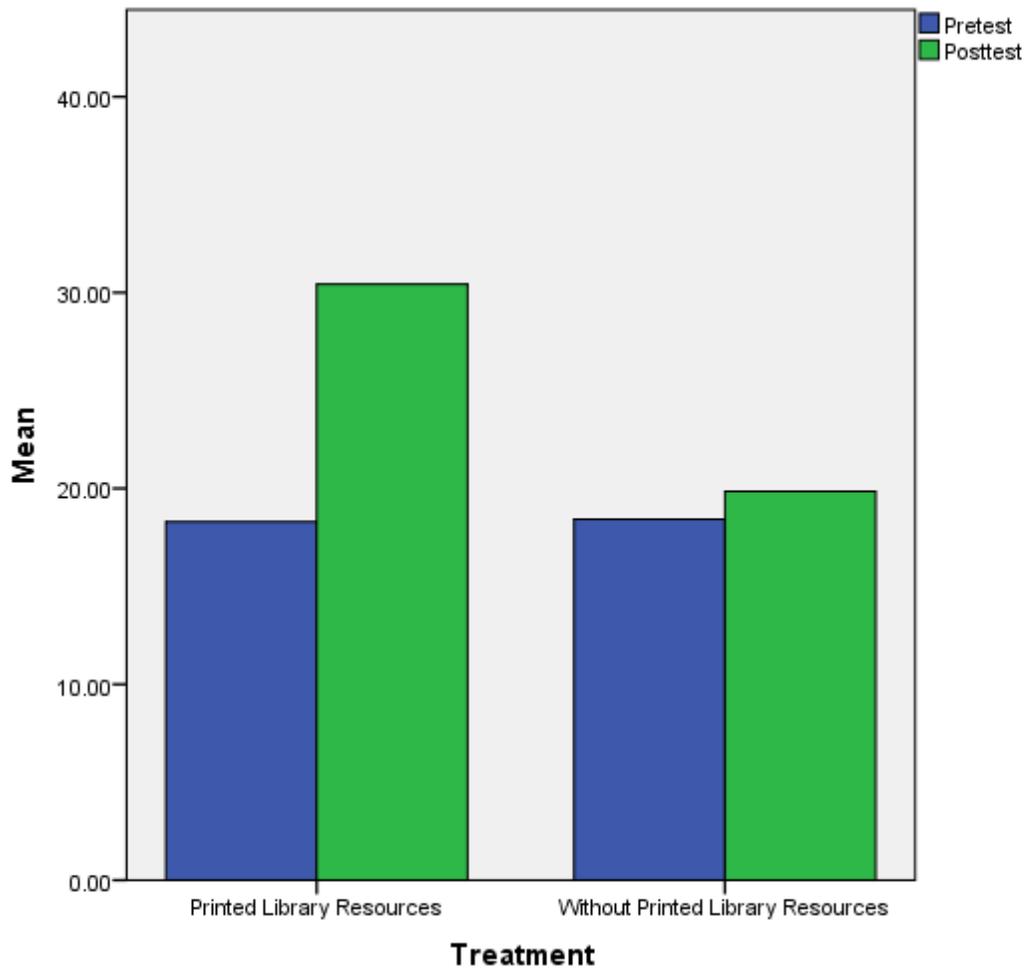


Figure 2: Bar chart representation of the mean achievement scores of the pupils taught basic science using printed library resources and those taught without

Figure 1 showed that the pupils taught basic science using printed library resources had higher posttest mean achievement score ($M = 30.43$, $SD = 4.38$) than those taught without library resources ($M = 19.86$, $SD = 4.95$).

Table 2

Analysis of covariance of the difference in the mean achievement scores of pupils taught basic science using printed library resources and those taught without

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1623.474 ^a	2	811.737	36.676	.000	.571
Intercept	3284.201	1	3284.201	148.386	.000	.730
Pretest	3.493	1	3.493	.158	.693	.003
Treatment	1618.028	1	1618.028	73.106	.000	.571
Error	1217.302	55	22.133			
Total	40047.000	58				
Corrected Total	2840.776	57				

a. R Squared = .571 (Adjusted R Squared = .556)

Table 2 revealed that printed library resources had significant effect on the achievement of pupils in basic science, $F(1, 55) = 73.106$, $p = .000$, effect size = .571. Thus, the null hypothesis is rejected since $p < .05$. This implies that 57.1% change in pupils' achievement in basic science is attributed to their exposure to printed library resources.

Discussion of the Findings

The result of the analysis revealed that the pupils who were exposed to the use of printed library resources had significantly higher motivation and achievement scores than those who were taught without printed library resources. In other words, printed library resources motivated pupils more than those taught without printed library materials. This finding validated the findings of Eze and Ogbueghu (2017) who found out that improvised instructional resources aroused students' motivation and enhanced academic achievement. Furthermore, the study corroborated the findings of Misalina ((2018) who discovered that instructional aides have the capacity to arouse the learners' interest in the classroom activities thereby motivating the learners to higher academic achievement. The findings of the study are also in line with the

findings of Adebayo and Adigum (2018) who revealed that students who were taught using instructional aids performed better in physics than those taught without instructional aids.

The result of the analysis showed that the mean achievement score of the pupils exposed to printed library resources is higher than the mean achievement score of those not exposed to printed library resources at the post-test. This study is consistent with Edori's (2014) findings, which found that instructional materials motivate students and improve academic attainment. Furthermore, these results corroborated that of Ikwuka and Usifoh (2016), who found a robust and favorable link between the utilization of printed library resources and students' academic progress. This study found that teachers who used printed library resources during teaching and learning activities achieved better results than those who did not use printed library resources, implying that teachers should make use of printed library resources.

Conclusion

The study found that printed library resources motivate students to participate in fundamental scientific lessons both intrinsically and extrinsically. The students' desire to learn motivates them to participate actively in the learning process. As a result, printed library resources in elementary classrooms are predictable tools for ensuring kids' motivation and active involvement in basic science. The study found that using printed library resources allow students to concretize abstract notions, improving their retentive capacity and thus their academic accomplishment in fundamental science. Making the subject matter relevant to the students is also part of achieving these goals. As a result, teachers must adapt any teaching material that is not readily available.

Recommendations

The following suggestions are offered based on the study's findings:

1. Teachers should make every effort to use printed library resources during teaching of basic science.
2. The state and federal governments should hold conferences and seminars to educate teachers use of printed library resources.

References

- Abdu-Raheem, B. O. (2016). Effects of instructional materials on secondary schools students' academic achievement in social studies in Ekiti State, Nigeria. *World Journal of Education* 6(1), 32-39. <https://www.files.eric.ed.gov/fulltext/EJ1158251.pdf>
- Adebayo, O. O. & Adigun, S. Q. (2018). Impact of instructional aids on students' academic performance in physics in secondary schools in Federal Capital Territory (FCT) Abuja, Nigeria. *European Scientific Journal* 14(4), 366-376. <https://core.ac.uk/download/pdf/236406395.pdf>.
- Adene, F.M., Umeano, E.C., Adimora, D.E., Ugwuanyi, C.S., Okeke, C.I.O., Offordile, E.E., Amaeze, F.E., Uzodinma, U.E., Abdullahi, Y., Ejiofor, J.N. & Ishiwu, E.N. (2021). Effectiveness of Peer Collaborative Learning Strategy on Self-Esteem of Pupils with Behaviour Problems in Nsukka Education Authority. *Journal of Critical Reviews*, 8(1), 1055-1069. <http://www.jcreview.com/fulltext/197-1615692041.pdf?1615708380>
- Adonu, C.J., Nwagbo, C.R., Ugwuanyi, C.S., & Okeke, C.I.O. (2021). Improving Students' Achievement and Retention in Biology using Flipped Classroom and Powerpoint Instructional Approaches: Implication for Physics Teaching. *International Journal of Psychosocial Rehabilitation*, 25(2), 234-247. <https://www.psychosocial.com/article/PR320026/37829/>
- Ahmed, A. M. (N.D). Improvisation of instructional materials for the teaching of Biology/an important innovation in Nigerian educational system. <http://www.globalacademicgroup.com/journals/pristine/>
- Aina, K. J. (2013). Instructional materials and improvisation in physics class: Implications for teaching and learning. *IOSR Journal of Research and Method in Education* 2(5), 38-42.
- Ajoke, A. R. (2017). The importance of instructional materials in teaching English as a second language. *International Journal of Humanities and Social Science Invention* 6(9), 34-44.
- Cherry, K. (2020). What is motivation? <https://www.verywellmind.com/>
- Cherry, K. (2020). The psychology of how people learn. <https://www.verywellmind.com/what-is-learning-2795332>
- Edori, P. G. (2014). Students' motivation and the challenges instructors face incorporating ICT based instructional materials. <http://www.i-rep.emu.edu.tr:8080>
- Ejimonye, J.C., Onuoha, J.C., Ugwuanyi, C.S., Eneogu, N.D., Ugwuanyi, B.E & Ogbuehu, S.N (2020). Effectiveness of Two-Dimensional Animation Technique in Enhancing Students' Motivation in Quantitative Economics Concepts. *International Journal of Future Generation Communication and Networking (IJFGCN)*, 13(1):27-38.
- Ejimonye, J.C., Ugwuanyi, C.S., Okeke, C.I.O., & Nwoye, M.N. (2020). Two-Dimensional Animation and Students' Achievement in Mathematical Economics: Implications for

Science Teaching. *International Journal of Engineering Research and Technology*, 13(6), 1220-1230

- Eze, D. m. & Ogbueghu, S. N. (2017). Effect of improvised instructional resources on students' motivation an academic achievement in economic at secondary school level. *International Journal of Studied in Education* 15 (1), 97-110
- Eze, D. M. & Ogbueghu, S. N. (2017). Effects improvised instructional resources on students' motivation and academic achievement on economics at secondary school level. *International Journal of Studies in Education* 15(1), 97-110.
- Ikwuka, O. I. & Usifoh, A. C. (2016). Effect of improvised instructional materials on senior secondary school students' academic achievement in mathematics in Oshimili South Local Government Area. *Journal of Science Education and Technology* 3(2), 67-77. <https://www.researchgate.net/publication/327606807>
- Misalina, E. (2018). Language teaching materials and learner motivationin Ma'arif Nahdlatul Ulama University students. <https://www.researchgate.net/publication/324572298>
- Njoku, M.I.A., Nwagbo, C.R., & Ugwuanyi, C.S. (2020). Effect of Peer Tutoring and Peer-Led Team Learning on Students' Achievement in Biology. *International Journal of Database Theory and Application (IJDTA)*, 13(1),1-10. <https://doi.org/10.33832/ijdt.2020.13.1.01>.
- Odo, I.O., Agwagah, U.N.V., Ugwuanyi, C.C., Shiaki, O.B., Nwoye, M.N., Emeji, E.I., Okeke, A.M., Osakwe, I.J., Okeke, C.I.O., & Ugwuanyi, C.S. (2021). Effectiveness of First Principles of Instruction in Promoting high Achievement of students in Mathematics: Implications for physics teaching. *Journal of Critical Reviews*, 8(2), 119-128. <http://www.jcreview.com/fulltext/197-1616736017.pdf?1616753765>
- Offordile, E.E., Umeano, E.C., Adene, F.M., Obi, M.C., Ugwuanyi, C.S., Okeke, C.I.O., Adimora, D.E. (2021). Improving the academic achievement of low achieving secondary school students in physics using peer tutoring learning strategy: Implications for Engineering Career. *International Journal of Mechanical and Production Engineering Research and Development (IJMPERD)*, 11(3), 201–212. <http://www.tjprc.org/publishpapers/2-67-1618048208-15IJMPERDJUN202115.pdf>
- Okpe, V. O. (2018). Effect of instructional materials on academic achievement of physics students in secondary schools in Udi Local Government Area of Enugu State. Unpublished ME.d project, Godfry Okoye University, Enugu.
- Olayinka, A. B. (2016). Effects of instructional materials on secondary school students' academic achievement in social studies in Ekiti State, Nigeria. *World Journal of Education* 6(1), 32-39. URL: <http://dx.doi.org/10.5430/wje.v6n1p32>
- Osei-Himah, V., Parker, J. & Asare, A. (2018). The Effects of improvised materials on the study of science in basic schools in Aowin Municipality – Ghana. file:///C:/Users/DELL/AppData/Local/Temp/41980-45232-1-PB.pdf
- Shukla, A. (2018). Teaching aids and instructional materials-tools for teachers and students. <https://cognitiontoday.com/2018/05/teaching-aids-and-instructional-materials-tools-for-teachers-and-students/>
- Uenishi, K. (2019). The usefulness of original teaching materials for motivation. <https://www.10.5772/intechopen.85440>
- Utibe-Abasi, S. S. (2015). Problems of improvising instructional materials for teaching and learning of physics in Akwa Ibom State Secondary Schools, Nigeria. *European Journal of Education* 3 (3), 27-35. <http://www.eajournals.org>