International Journal of Innovative Social & Science Education Research 12(2):35-42, April-June, 2024

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Influence Of Instructional Materials On Biology Students' Achievement In Chanchaga Local Government Area, Niger State, Nigeria

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ABSTRACT
This study was on influence of instructional materials on Biology Students' achievement in Chanchaga Local Government Area. The purpose of the study was to determine the influence of instructional materials on Biology students' achievement in Chanchaga Local Government Area. A survey research design was employed using a researcher made questionnaire which was validated by three experts and the reliability index was determined to be 0.88. A population of 8315 and a sample size of 384 SS II students were employed for the study. Three research questions were asked and three hypotheses were formulated and tested at 0.05 significant level. Data collected was analyzed using product moment correlation coefficient. The findings revealed that, there is a significant relationship between instructional material and academic achievement of senior secondary school Biology students in Chanchaga Local Government Area, Niger State. Based on the findings, three recommendations were made among which is that there should be adequate provision of printed instructional materials in public secondary schools in Chanchaga LGA by the State Government and other educational stakeholders
Keywords: Influence, Instructional Materials, Biology Students, Academic Achievement

INTRODUCTION

Biology as a science subject contains many abstract concepts, Proper teaching of these abstract concepts for effective understanding is a very challenging task to Biology teachers. Teachers always try to explain everything in detail as dictated by the curriculum and many students cannot connect the topics to each other and comprehend the knowledge (Nkok 2019) For effective teaching and learning of abstract concepts to take place, Biology teachers are always encouraged to improvise instructional materials. Instructional materials are of benefit to the teacher as they make instruction easier, and the learners as they clarify the learning objectives (Iyunade, 2014). Effective utilization of Instructional materials may be capable of captivating students' interest; stimulating desires in learning and make them participates in the lesson. In a situation like this, students' academic achievement could be positively influenced. Instructional materials include both the printed and audio-visual materials and as well as resource places and person. Printed instructional materials include, but not limited to textbooks, journal articles, instructor manuals and guides, student workbooks, assignments, and other reference materials. Audio-visual materials consist of electronic videos, audiotapes, slides, filmstrips, radio and/or television (Onyilagha & Nnajiofor 2016).

According to Broadbent and Fuller-Tyszkiewicz (2018), instructional materials include books, audio-visual, software and hardware of educational technology. Broadbent and Fuller-Tyszkiewicz further opined that the availability, adequacy and relevance of instructional materials in classrooms can influence quality teaching which can influence students' learning and academic achievement. The insight from

Shareef and Nithyanantham (2022) on linking instructional materials to students' academic achievement serve critical in the provision of quality education. Colvard, Watson, and Park (2018) concluded that, science education programmes cannot be taught effectively without the existence of equipment for teaching. This is because instructional materials may help learners develop problem-solving skills and scientific attitudes. Elaborating further on the same point, Bukoye (2019) emphasized that when instructional materials are provided to meet relative needs of teaching process, students have access to the reference material, learn at their own pace, which may influence their academic achievement. Biology is the study of life, both plants and animals and is divided into several branches like, Botany, Zoology, microbiology, anatomy among others, this means that the various branches of Biology need be presented as a unified whole by the teacher so that the learner cannot notice the various branches as separate entities. The Nigerian Biology curriculum is designed to be activity oriented and student-centered and the contents and contexts of Biology syllabus for secondary schools was intended to provide modern Biology course as well as meet the needs of the society through relevance and functionality in its contents, methods, processes and application (Ezeh 2007 in Nkok, & Chukelu (2019) 2022) The national policy statement notes that Biology teaching should emphasize adequate laboratory and field skills, meaningful and relevant knowledge to everyday life in matters of personal and community health and Agriculture, while ensuring reasonable and functional scientific attitude. Therefore, emphasis is laid more on teaching and learning of Biology as a process rather than as a body of knowledge. For this reason, field studies, guided discovery and laboratory technique and skills were recommended. To ensure the full realization of these interesting objectives, the contents and contexts of the syllabus place great emphasis on use of instructional materials, field studies, guided discovery, laboratory techniques and skills coupled with conceptual thinking. Unfortunately, researches have revealed that, Biology teachers employ conventional teaching method in teaching Biology in most secondary schools in chanchaga local government Area of Niger state, Nigeria. {Awotua-Efebo (2011 in Nkok 2022).

Critical analysis of the goals of Biology shows that students are prepared to develop interest in science, apply their scientific and technological knowledge and skills to meet societal needs, take advantage of the numerous career opportunities, and become prepared for further studies in science and technology, avoid drug abuse and related vices, maintain good hygiene, eat right and maintain good personal health as well as contribute to healthy living in the society. (FME 2012, p. vii)." knowledge acquired in Biology should empower the student to solve societal problems. This suggests that students' poor achievement in Biology would make the achievement of the goals difficult, which would eventually have negative influence in the society. Rezaei, and Saghazadeh (2022); Firat, (2020) and Asrizal, Amran, Ananda, Festiyed and Sumarmin (2018) opined that nations that want to advance in science and technology development for their societal growth needs to invest adequately on resources that can enhance its effective teaching and learning in the various schools. This assertion is undisputable because countries that we now called the superpowers such as China, Russia, Germany, Japan and United State of America owns their allegiance to how adequately they have invested into the sciences. Nepomnyashchiy, Dahn, Saykpah, and Raghavan (2020) noted that education in most Sub-Saharan countries faces chronic shortages in physical and human resources. According to Nepomnyashchiy, *et'al* (2020) rather than distributing the limited resources available for secondary education uniformly across schools, many governments allocate a relatively large share of available resources to a selected number of secondary schools, while majority of the schools are not provided with adequate resources and teachers. According to a National Audit report (2020), some schools are completely lacking material resources such as textbooks, charts, maps, audio-visual and electronic instructional materials such as radio, tape recorder, television and video tape recorder. Besides, teachers lack essential skills to make quality teaching and learning aids. Most science teachers lack the competencies for improvisation and even utilization of available instructional materials. While there are many factors which can influence academic achievement of learners, Instructional Materials and Physical Facilities are important factors which should not be ignored. There is poor achievement of Biology students in Chanchaga LGA of Niger State, which statistics from Niger State ministry of education (2023) shows that, the rise and fall in the percentage of students' achievements in Biology in their promotion

examinations is worrisome, in 2020, 60% of the students passed Biology at credit level, the trend was declining right from 2021 up to 2022. The percentage of students that fell into the categories of failure in the year 2022 was 49.21% (Niger State Ministry of Education, 2023). So many factors may be responsible for this high rate of failure, among which are learning environment, intelligence level, teachers' qualifications, teaching methods employed and lack of utilization of instructional materials during lessons. Most Biology teachers tend to teach without the application of instructional materials and this may have contributed to poor achievement of the students in examinations in Chanchaga Local Government Area (Niger State Ministry of education 2023). If this trend of poor achievement is not reversed, the implication is that many students will not be admitted to study science related courses like medicine, engineering and science education in tertiary institutions as most of them will not have at least a credit pass in Biology, the resultant effect will be inadequate number of science oriented professionals in the society which will have a negative effect on the society. To improve on this trend of poor performance, It's pertinent to investigate the impact of instructional materials on academic achievement of Biology students in Chanchaga Local Government Area.

Objectives of the Study

The main objective of this study is to determine the relationship between instructional materials on Biology Students' achievement in Chanchaga Local Government Area.

Other objectives of the study are:

1. To determine the relationship between printed instructional materials and Biology Students' achievement.
2. To determine the relationship between real image instructional materials and Biology Students' achievement.
3. To determine the relationship between electronic instructional materials and Biology Students' achievement.

Research Questions

The following research questions guided the Study:

1. What is the relationship between printed instructional materials and Biology Students' achievement in Chanchaga Local Government Area Niger State?
2. What is the relationship between the real image instructional materials and Biology Students' achievement in Chanchaga Local Government Area, Niger State?
3. What is the relationship between electronic instructional materials and Biology Students' achievement in Chanchaga Local Government Area?

Hypotheses

The following hypotheses were formulated to guide the study:

HO_1: There is no significant relationship between use of printed instructional materials and Biology Students' achievement in Chanchaga Local Government Area,

HO_2: There is no significant relationship between the use of real image instructional materials and Biology Students' achievement in Chanchaga Local Government Area

HO_3: there is no significant relationship between use of electronic instructional materials and Biology Students' achievement in Chanchaga Local Government Area

METHODOLOGY

A survey research design was employed in this study. A researcher made questionnaire on the influence of instructional materials on Biology students achievement in Chanchaga local Government Area was used to elicit information on the influence of instructional materials on SSII Biology students' achievement. The population of the study was 12426 while sample size of 219 students was randomly selected using simple random sampling technique. The instrument was constructed using 4-likert scale of SA for strongly Agree, A, for agree, D for disagree and SD for strongly disagree which were scored 4,3,2 and 1 respectively. The validity and the reliability of the instrument were determined to be 0.082 and 0.88 respectively. The instrument was administered with the help of research assistants who were the Biology

teachers of the sampled schools. Research assistants were trained on the effective methods of administering the instruments by the researcher. The sampled subjects were made to sit in the school assembly halls and the instrument administered after brief explanations. The research assistants read the items one after the other for the respondents to tick one of the options that was best appropriate for each of the items. Data collected was analyzed using simple mean, standard deviation and Spearman rank correlation co–efficient. The result was correlated against the third term Biology Examination results of the respondents in 2022/2023 academic session and the hypotheses tested at 0.05 level of significance

Testing The Hypotheses.

$H0_1$: There is no significant relationship between printed instructional materials and Biology Students' performance in Chanchaga Local Government Area

Table 1: **Correlation result for relationship between printed instructional materials and Biology Students' achievement in Chanchaga Local Government Area**

Variable	N	Mean	df	r	p- Value	decision
Use of printed instructional materials	300	2.50	299	0.668	0.076	Significant
Biology Students' Achievement	300	55.75				

Table 1 reveals the relationship between printed instructional materials and Biology Students' achievement in secondary schools. The correlation between the two variables is 0.668, which is relatively large and positive, indicating a strong relationship. The p – value of 0.076 suggested that there is statistically significant relationship between use of printed instructional materials and Biology Achievement of secondary school students. Therefore, the null hypothesis which stated that there is no significant relationship between printed instructional materials and Biology students' achievement was rejected.

HO_2: There is no significant relationship between the real image instructional materials and Biology Students' achievement in Chanchaga Local Government Area

Table 2: **Correlation result for real image instructional materials and Biology Students' achievement in Chanchaga Local Government Area**

Variable	N	Mean	df	r	Sig. (2-tailed) p- Value	decision
Real image instructional materials	300	1.9	299	.795	.037	Significant
Biology achievement	300	55.75				

Table 2 shows the correlation result between real image instructional materials and Biology Students' achievement in Chanchaga Local Government Area. The correlation between these two variables is 0.795, which was relatively large and positive; indicating a strong relationship. The p- value of 0.037 suggests that there is a statistically significant relationship between real image instructional materials and students' achievement in Biology. Therefore, the null hypothesis which stated that; there is no significant relationship between the real image instructional materials and Biology Students' achievement was rejected. This implies that real image instructional materials can influence students' academic achievement in Biology positively.

HO_3: There is no significant relationship between electronic instructional materials and Biology Students' achievement in Chanchaga Local Government Area

Table3: Correlation result for relationship between electronic instructional materials and Biology Students' performance in Chanchaga Local Government Area

Variable	N	Mean	df	r	p- Value	decision
Electronic instructional materials	300	1.96	299	0.698	0.000	Significant
Biology achievement	300	55.75				

Table 3 above shows the correlation result for the relationship between electronic instructional materials and Biology Students' achievement in Chanchaga Local Government Area, Niger State. The two variables have a statically significant relationship ($r= 0.698$, $p< 0.000$). As the p-value of 0.000, which is less than the set significance value of 0.05, the decision rule is to reject the null hypothesis. This implies the acceptance of the alternate hypothesis which states that there is a significant relationship between the use of electronic instructional material and Biology students' achievement in Chanchaga Local Government Area, Niger State. The Pearson correlation, $r= 0.698$ suggests a strong positive relationship between the two variables.

DISCUSSION OF FINDINGS

The finding on influence of print instructional materials on secondary schools Biology students' achievement showed that diagrams, graphics, posters, billboard and reference books have positive influence on Biology students' achievements. This finding is in line with Ekanem (2014) who stated that private schools performed better than public schools because of availability and adequacy of teaching and learning resources, also with that of Gautam, et'al, (2020) who posited that students taught with instructional materials had higher achievement than those taught without instructional materials.

The findings on real image instructional materials and Biology Students' achievement revealed that real image instructional materials aid the student effective understanding, enhance students' performance, boost their knowledge and improve students' academic performance in Biology. This finding is in line with Aliyu, (2017) who confirmed that, in teaching Basic Technology, the mean academic performance of students exposed to pictures and realia was higher than those taught the same concept using conventional (lecture} method.

The finding on influence of electronic instructional materials on Biology Students' performance in Chanchaga Local Government Area Niger State revealed that electronic instructional materials are very important influence on students' academic performance in Biology. This finding tandems with the findings Moses, et'al, (2020) who stated that there was a significant difference in students' achievement in Biology when taught with e-learning and modified lecture method; the e–learning students performing better. This finding also agrees with Ihejiamaizu and Ochui (2019) whose findings showed that utilization of electronic instructional materials significantly influenced students' academic achievement in Biology. The findings by Nkok,Uzochi and Adejoh (2019) which concluded that students taught using computer simulation performed better than those taught using conventional teaching method also aligns with the findings of the present study.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made

1. Biology teachers should always incorporate printed materials like charts, pictures, graphics and diagrams into Biology lessons so as to enhance learners understanding of abstract concepts which will have positive influence on academic achievement of the students.
2. Teachers should always provide real images of concepts taught whenever possible for easier demonstration and understanding of the Biology concept so as to enhance students understanding and retention which will result in improved academic achievement of Biology students.

3. Education stake holders should ensure that teachers are trained and well -motivated on the use of electronic instructional materials in the teaching process so as to improve academic achievement of Biology students.

CONCLUSION

Based on the findings of the study, it was concluded that, there is a positive relationship between instructional materials and academic achievement of secondary school Biology students. Therefore, Biology teachers should always incorporate instructional materials during Biology lessons for improved academic achievements of the students.

REFERENCES

Adebule, S.O., Ayoola, O.O. (2015). Impact of instructional materials on students' academic performance in mathematics in secondary schools in Ekiti State, Nigeria. *Research Journal of Educational Studies and Review, 2*(1), 1-4.

Aliyu, A. B., (2017) Effects of pictures and realia on academic performance of junior secondary school students in basic technology in Kaduna State, Nigeria. *A Thesis of Master Degree in Education (Instructional Technology) Department of Educational Foundations and Curricullum,* Faculty of Education Ahmadu Bello University, Zaria Nigeria.

Asrizal, A., Amran, A., Ananda, A., Festiyed, F., & Sumarmin, R. (2018). The development of Biology instructional materials to improve studentsâ€™ digital literacy in scientific approach. *Jurnal Pendidikan IPA Indonesia*, *7*(4), 442-450.

Barrett, P., Treves, A., Shmis, T., & Ambasz, D. (2019). *The impact of school infrastructure on learning: A Synthesis of the Evidence (English).* International Development in Focus Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/853821543501252792/The-Impact-of-School-Infrastructure-on-Learning-A-Synthesis-of-the-Evidence

Broadbent, J., & Fuller-Tyszkiewicz, M. (2018). Profiles in self-regulated learning and their correlates for online and blended learning students. *Educational technology research and development*, *66*(6), 1435-1455.

Brooks, E., & Brooks, A. L. (2019). Design as a Knowledge Constructing Activity. In *Interactivity, Game Creation, Design, Learning, and Innovation* (pp. 583-587). Springer, Cham..

Bukoye, R. O. (2019). Utilization of instruction materials as tools for effective academic performance of students: Implications for counselling. *Multidisciplinary Digital Publishing Institute Proceedings*, *2*(21), 1395.

Colvard, N. B., Watson, C. E., & Park, H. (2018). The impact of open educational resources on various student success metrics. *International Journal of Teaching and Learning in Higher Education*, *30*(2), 262-276.

Conference Proceeding of Science Teachers Association of Nigeria,.49-74.

Conference Proceeding of Science Teachers Association of Nigeria,.49-74.

Datta, A. (2018). The digital turn in postcolonial urbanism: Smart citizenship in the making of India's 100 smart cities. *Transactions of the Institute of British Geographers*, *43*(3), 405-419.

Earthman, G. I. (2004). *'Prioritization of 31 Criteria for School Building Adequacy', American Civil Liberties Union Foundation of Maryland.* http://www.aclumd.org/aTop%20Issues/Education%20Reform/EarthmanFinal10504.pdf>. Retrieved on 24th September, 2022

Ebele, E. O., James, I. O., & John, A. C. (2020). Covid-19 pandemic: challenges and the way forward in Nigeria secondary education. *Journal of African Studies and Sustainable Development*, *3*(13).

Ezeh C.C. (2007). Use of core curriculum in teaching biology. *Annual*

Ezeh C.C. (2007). Use of core curriculum in teaching biology. *Annual*

Federal Ministry of Education (1981). Nigeria Core Curriculum for Secondary School Biology.

Federal Ministry of Education (F.M. E) (2014). National curriculum for senior secondary schools. Lagos: *Federal Ministry of Education*.

Federal Republic of Nigeria (2013) National policy on education; Lagos:

Firat, E. A. (2020). Science, technology, engineering, and mathematics integration: Science teachers' perceptions and beliefs. *Science Education International, 31*(1), 104-116.

Gardner, V., Joubert, M., Barrett, A. M., & Tikly, L. (2018). Approaches to Strengthening Secondary STEM & ICT Education in Sub-Saharan Africa. *Bristol: University of Bristol*.

Gautam, M., Gautam, D., & Bishnoi, I. (2020). Impact of print media on student's academic performance of Varanasi City, India. *Advances in Research*, *21*(12), 62-69.

Ihejiamaizu, C. C., & Ochui, I. (2019). Utilization of modern electronic instructional materials and biology students' academic achievement in Calabar Education Zone, Cross River State. *Global Journal of Educational Research*, *18*(2), 57-62.

Iyunade, O. T. (2014). Availability and utilization of instructional materials in selected andragogical setting in Ogun State, Nigeria. *International Journal of Humanities and Social Science,* 4 (4), 268-277.

Jacob, O. N., & Onyekachi, M. C. (2021). Education financing in Nigeria: problems and the way forward. *International Journal of Development and Public Policy*, *1*(5), 162-174.

Moses, J. B., Akporehwe, N. J., & Agah, R. (2020). Effect of electronic-learning on the academic achievement of biology students in Bayelsa State, Nigeria. *African Research Review*, *14*(1), 210-216.

Mupa, P., & Isaac Chinooneka, T. (2019). Factors contributing to ineffective teaching and learning in primary schools: Why are schools in decadence.

Nepomnyashchiy, L., Dahn, B., Saykpah, R., & Raghavan, M. (2020). COVID-19: Africa needs unprecedented attention to strengthen community health systems. *The Lancet*, *396*(10245), 150-152.

NERDC Press

Nkok, E.M., Uzochi B.C and Adejoh M.J (2021) Effect of Computer simulation on students' interest and achievement insexual reproduction in plants in niger state. International journal of innovative, social and science education 9 (3)10-18

Nkok, E.M.and Chukelu C.U. (2019) Biology achievement of teenage girls in senior secondary school Minna, survey of impact of street hawking. International journal of innovative education research 7,107-113

Nwike, M. C., & Catherine, O. (2013). Effects of Use of Instructional Materials on Students Cognitive Achievement in Agricultural Science. *Journal of Educational and Social Research*, *3*(5), 103-108.

Obi, N. C., & Obi, J. J. (2019). Effect of improvised instructional materials on academic achievement of SS1 chemistry students in cross river State Nigeria. *IJAR*, *5*(7), 444-448.

Oduh, W. A., Agboola, J. O., & Ironua, M. O. (2020) Adequacy of instructional materials and interest of secondary school students in the study of Physics in Oredo Local Government Area of Edo State, Nigeria.

Ogunode, N. J. (2022). Basic education in Nigeria: challenges and way forward. *Journal of Intellectual Property and Human Rights*, *1*(2), 1-13.

Olarewaju, A. O. (1994). New approaches to the teaching of integrated science. *Ibadan: Alafas Nigeria Company*.

Olayinka, A. R. 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.

Onyilagha, J. C. and Nnajiofor, F. N. (2016). Comparative study of the impact of instructional materials and technology on traditional and distance education systems. *International Journal for Innovation Education and Research*. 4 (2), 71- 78. www.ijier.net

Rezaei, N., & Saghazadeh, A. (2022). Introduction on Biology: Multidisciplinarity and Interdisciplinarity in Health. In *Multidisciplinarity and Interdisciplinarity in Health* (pp. 1-40). Springer, Cham.

Shareef, S. M., & Nithyanantham, V. (2022). *Fundamentals of Educational Technology*. Bentham Science Publishers.

Tety, J. L. (2016). *Role of instructional materials in academic performance in community secondary schools in rombo district"* (Doctoral dissertation, The Open University of Tanzania).

Wils, A., Sheehan, P., & Shi, H. (2019). Better secondary schooling outcomes for adolescents in low-and middle-income countries: Projections of cost-effective approaches. *Journal of Adolescent Health*, *65*(1), S25-S33.