



JOURNAL OF INNOVATIONS IN SCIENCE EDUCATION (JISE)

A PUBLICATION OF ASSOCIATION OF
SCIENCE EDUCATORS ANAMBRA (ASEA)

Vol. 3(1) 2026

PRINT ISSN: 3092-9180 E-ISSN: 3115-4379



Editor in-Chief
PROF. JOSEPHINE N. OKOLI

JOURNAL OF INNOVATIONS IN SCIENCE EDUCATION
(JISE)
Vol. 3(1); 2026

**A PUBLICATION OF ASSOCIATION OF SCIENCE
EDUCATORS ANAMBRA (ASEA)**

JOURNAL OF INNOVATIONS
IN SCIENCE EDUCATION
(JISE)
Vol. 3 (1); 2026

JOURNAL OF INNOVATIONS IN SCIENCE EDUCATION
(JISE)
Vol. 3(1); 2026

© (JISE)

Print ISSN: 3092-9180
E- ISSN: 3115-4379

Published in January, 2026.

All right reserved

No part of this journal should be reproduced, stored in a retrieval system or transmitted in any form or by any means in whole or in part without the prior written approval of the copyright owner(s) except in the internet

Printed in Nigeria in the year 2025 by: **Love**



Isaac Consultancy Services

No 1 Etolue Street, Ifite Awka, Anambra State, Nigeria
+234-803-549-6787, +234-803-757-7391

JOURNAL OF INNOVATIONS IN SCIENCE EDUCATION
(JISE)
Vol. 3(1); 2026

EDITORIAL BOARD

Editor-in-Chief

Prof. Josephine N. Okoli

Editors / Reviewers

Prof. Chibuogwu V. Nnaka

Prof. Moses O. Onyesolu

National Open University of Nigeria

Nnamdi Azikiwe University, Awka,
Anambra State, Nigeria.

Dr. Moses John Billy

Niger Delta University, Wilberforce Island,
Bayelsa State, Nigeria.

Dr. JohnBosco O.C. Okekeokosisi

Federal College of Education (Technical) Asaba,
Delta State, Nigeria.

Dr. Esther B. Enaregha

Isaac Jasper Boro College of Education,
Sagbama, Bayelsa State, Nigeria.

Dr. Omoyeni O. Emmanuel

Ajayi Polytechnic, Ikere-Ekiti, Ekiti State,
Nigeria.

Dr. Celestine Njoku

University of Calabar, Cross River State,
Nigeria.

Dr. James C. Ogeke

Alvan Ikoku Federal University of Education,
Owerri, Imo State, Nigeria.

Consulting Editors

Prof. Ebele C. Okigbo

Nnamdi Azikiwe University, Awka,
Anambra State, Nigeria

Prof. Marcellinus C. Anaekwe

National Open University of Nigeria

Dr. Peter I.I. Ikokwu

Nwafor Orizu College of Education
Nsugbe, Anambra State.

JOURNAL OF INNOVATIONS IN SCIENCE EDUCATION
(JISE)
Vol. 3(1); 2026

EDITORIAL

Journal of Innovations in Science Education (JISE) is a Publication of Association of Science Educators Anambra (ASEA). It is publishable both online and offline. The publication is twice a year. It embraces only on science education and innovative ideas. JIES provide an avenue for dissemination of research findings, innovative ideas and practices between researchers, science educators and policy makers in the form of original research, book review, theoretical and conceptual papers which will serve as an important reference for the advancement of teaching, learning and research in the field of science education.

We are grateful to the contributors and hope that our readers will enjoy reading these contributions.

Prof. Josephine N. Okoli
Editor-in-Chief

JOURNAL OF INNOVATIONS IN SCIENCE EDUCATION
(JISE)
Vol. 3(1); 2026

TABLE OF CONTENTS

Effect of Chatgpt- Assisted Learning Instructional Approach on Senior Secondary Students' Academic Achievement in Data Processing in Onitsha Education Zone Nwankwo Madeleine Chinyere, Chiamaka Sophia Chita	1
Factors Militating against Teaching Practice Programme as Perceived by Human Kinetics and Sports Science Undergraduates, University of Calabar, Cross River State - Nigeria. David E.Eyam, Ahueansebhor, E.	17
Enhancing Students Interest in Physics in the 21 st Century through Digital Literacy: The Role of Physics Educators Okoye, Nestor E	37
Impact of Digital Learning Platforms on Students' Engagement in Chemistry Education in Senior Secondary Schools in Anambra State Emendu, Nnamdi B., Emendu, Ebele R.	52
Effect of Sensory-Based Instructional Strategy on Secondary School Students' Academic Achievement in Mathematics in Ogidi Education Zone, Anambra State Nwamaradi, Tobechukwu Albert, Ikechukwu, Chinelo Helen	69

**ENHANCING STUDENTS INTEREST IN PHYSICS IN THE 21ST CENTURY
THROUGH DIGITAL LITERACY: THE ROLE OF PHYSICS EDUCATORS**

Okoye, Nestor E

nestor.okoye@fcetumunze.edu.ng

Department of Physics Education

Federal College of Education (Technical) Umunze, Anambra State, Nigeria

Abstract

The study investigated the impact of digital literacy of Physics educators in enhancing the interest of students in physics in the 21st century. Two research questions and one hypothesis tested at 0.05 level of significance guided the study. The study adopted a descriptive survey research design. The sample for the study comprised of all the thirty one (31) physics teachers in 21 public secondary school in Aguata Local Government Area who were purposively selected based on availability of physics teachers in the schools. A 22-item questionnaire which was developed by the researcher and validated by three specialists was used for data collection. A reliability coefficient of 0.78 was obtained for the instrument using Cronbatch Alpha formula. Research questions were answered using mean and standard deviation while the null hypothesis was tested at 0.05 level of significance using t-test statistics. The result of the study revealed that digital literacy of physics teachers impacted greatly in enhancing the interest of students in physics, and there was no significant difference between male and female physics teachers on the impacted which digital literacy of physics teachers has in enhancing the interest of students in physics. Based on the results, it was recommended among other things that physics teachers should apply digital learning tools in teaching physics to students to enhance their interest in the subject.

Keywords: Interest, Digital Literacy, Physics educators.

Introduction

In the contemporary world, science and technology is the byword of the time. The survival and development of any nation today depends largely on its scientific and technological breakthrough. Nigeria is a developing country, hence a solid foundation in science and technology is much critical to attain the required technological height. This technological height is best attained through acquisition of process skills by students.

The process skills are effectively acquired through the study of physics (Chinwoke, 2011). Physics is a cross-cutting discipline that has applications in many sectors of scientific and technological and even economic development. It is simply defined as that science which studies matter and energy operating in them (Okoye, 2012). According to Ike in Okoye (2014), physics deals with the study of the laws that determine the structure of the universe with reference to the matter and energy in the universe. Physics education is an integral part of the general education programme which imparts knowledge, skills, attitudes as well as problem solving competences which one requires to perform optimally in the scientific and technological world. Physics education is competence-based. Hence, success in physics education is measured in terms of the learner's ability to perform certain tasks at a given level of efficiency and effectiveness in various branches of physics, including heat, electricity, mechanics, sound etc.

Hence, it aims at imparting knowledge to the learner to enable him develop scientific skills, self-reliance and self-realization. It produces the manpower that possesses the requisite knowledge, skills and attitudes for harnessing other resources. It is also the bedrock of engineering advancement. In fact, no engineer could design any kind of practical device without first understanding the basic principles and laws of physics involved.

For instance, no engineer could design a DVD player, a flat screen TV, an interplanetary space craft or even a better mouse trap without first understanding the basic laws of physics.

Furthermore, the knowledge of physics facilitates our understanding of some other disciplines. For instance, a thorough understanding of quantum mechanics is necessary to chemists and material scientists since the structure of every atom in the universe is determined by quantum mechanics. The importance of physics in the development of any nation could not be complete without mentioning its application in information technology sector. In developing fixed-line and optical-fibre network in information technology, for instance, knowledge of physics that underpin these technologies is essential.

By and large physics education plays the role of developing manpower that will help the nation attain her development objectives and become self-reliant as well promote the diversification of economy which is one of the indices for a strong economy. (Okoye, 2022).

Despite the promising objectives of physics education and its role in the realization of the nation's technological aspiration and development a low enrollment and poor performance in the subject in secondary schools has been witnessed over the years. Okeke and Okoye (2014) stated that no nation can survive economically, politically and socially if the future generation is showing declining interest in the pursuit of sciences, especially physics.

Researchers attributed low enrollment of students in physics to lack of interest among other variables (Okoye, 2010; Okoye & Okeke, 2014). Interest is an essential variable in learning. This is because interest of the learner is paramount in any teaching-learning process. Longman Dictionary of Contemporary English defines interest as that feeling that makes one to want to pay attention to something. It is that quality of a thing that attracts one's attention to it.

It can be expressed through overt actions or activities being performed by the subjects. Declining students enrollment and lack of interest in physics by students has been of serious concern to many serious-minded science teachers especially physics educators, male or female, in this 21st century. However, it is not yet certain which gender- male or female Physics teachers show more interest in the use of digital literacy tools in teaching Physics.

The 21st century marks the era of introduction of social interaction platforms such as you-tube, tiktok, snapchat, instagram, facebook apps etc. These have successfully captured the hearts of many young people including students. Ebosele (2024), asserted that with the rate at which these young students engage themselves in these media apps, the media if properly utilized, can be of great services to mankind and students in particular. Digital media are the varieties of technologies that facilitate the sharing of ideas and information among the users. These platforms create avenues for teaching and learning aside physical activities (face-to-face teaching and learning). Platforms like zoom and other webinar Apps create opportunities for learning, communication and interaction. Hence they can be incorporated in teaching and learning using digital tools. This way lessons, assignments and tests can be perfectly handled on-line. Twitter can be used to send assignment while whatsapp and facebook can be used more effectively to create classroom for students notes and topics.

The advantages of this mode of learning cannot be overemphasized According to UNESCO (2011), ICT provides teachers and students access to vast stores of knowledge beyond the school, as well as multimedia tools to add to this store of knowledge.

The huge growth of computers, the internet and other electronic devices provide opportunities for the development of quality teaching and learning of physics and other technology subjects. However, the teaching and learning of these subjects are today more or less confined to the classrooms with few ill-equipped workshops and laboratories using the teacher-centered method. This makes students bore and uninteresting.

Since teachers are the key factor in any educational innovation (teaching and learning), they need digital literacy training and re-training in the use of the new technology (e-learning devices) to enhance teaching and learning of physics and other technology subjects.

According to Eze (2016), e-learning simply means electronic learning which comprises the combination, implementation and relationship of teaching and learning via different ICT media such as computer, internet, multimedia, projector, video, taps, CD-ROM, flash drives, satellites, telephone, television among others. According to mar-riot in Eze

(2016) e-learning enables teachers to combine traditional methods of teaching with the internet facilities. This however requires high digital literacy.

Digital literacy involves utilization of digital technology in teaching and learning. It is the ability to find, evaluate and communicate information using digital technology and media platforms. It is the ability to navigate various digital platform and understand, assess and communicate through digital means. For effective utilization of these, students need to be taught with these tools.

The use of digital literacy tools enhances educators and students communication skills, critical thinking skills and creativity. According to Okoye and Ogundeji (2022) digital tools aid teachers in organizing, planning, motivating, teaching, guiding, encouraging and initiating the students to be engaged during teaching and learning process.

Since students are no more interested in conventional methods of teaching (face – to – face teaching and learning), but are always on the social media, effort should be made by physics educators to utilize the tools in teaching physics to motivates the students interest to enroll and learn physics. This is what motivate the researcher to the choice of the topic, “enhancing students interest in physics in the 21st Century through digital literacy : the role of physics educators”.

Statement of the Problem

Physics is a cross-cutting discipline that has applications in many sectors of scientific, technological and economic development including health, energy and information. The truism is that utility value of physics cannot be overemphasized. However, the level at which students enroll for the study of physics is low. This is because students nowadays have developed low interest in the study of the subject. One of the factors affecting students interest and academic achievement in physics is teacher effectiveness (Okoye & Okeke, 2014). The teaching and learning of physics and other technology subjects in secondary schools require instructional materials such as ICT facilities. These are set of tools that help one work with information and perform tasks related to information processing (Eze, 2016). ICT facilities in the society range from computers, laptops, internet, and digital calculators among others. According to Uzodimma (2007), some

physics and technology teachers in the secondary schools cannot effectively use ICT facilities in teaching due to lack of competence in basic ICT. Hence, the emergence of e-learning applications in educational delivery services in secondary schools pose a lot of problems to the teachers. In addition to this, is the problem associated with erratic, power supply, poor funding, and inadequate bandwidth, insufficient computers, inadequate infrastructure and low digital literacy level. Sequel to this students show apathy and lack of interest when physics lesson is delivered using traditional methods instead of the modern innovative approach. They engage themselves in pressing their mobile phones and stuffing the net in many social platforms. As a result of this a lot of innovation which include but not limited to technologies have assumed central stage in the 21st century education to boost students interest in learning. These technologies involve new media tools which enhance teaching and learning. Since students are always on social media, physics educators should direct assignment and tests and other related school activities to students through digital means to promote their interest and enhance performance and enrollment in physics, hence the topic “enhancing students interest in physics in the 21st century: the role of physics educators.

Purpose of the Study

The purpose of the study is to find out the impact of physics educators digital literacy in enhancing students interest in physics in Aguata Local Government Area of Anambra State. Specifically, the study sought to find out;

1. The impact of digital literacy of physics teachers on the interest of students in physics.
2. The strategies/approaches for improving the use of digital literacy tools by physics teachers in secondary schools.

Research Questions

Two research questions guided the study;

1. What are the impact of digital literacy of physics teachers on the interest of students in physics?
2. What are the strategies to be used to improve the use of digital literacy devices by physics teachers in secondary school?

H0₁: There is no significant difference between the mean scores of male and female physics teachers on the impact of physics teachers digital literacy on the interest of students in physics.

Methodology

The design adopted for the study was a descriptive survey research design. The population of the study consisted of thirty one physics teachers in public secondary schools in Aguata Local Government Area of Anambra State. A Purposive sampling technique was used to select ten schools out of twenty one based on the availability of physics teachers in the schools. All the thirty- one teachers teaching physics in the ten schools formed the sample of the study. A 22- item structured questionnaire developed by the researcher and titled “impact and strategies for enhancing students interest in physics” was used for collecting data for the study. The instrument was a 4 – point rating scale of strongly agree (SA), Agree (A), Disagree (D) and strongly disagree (SD). The instrument was face and content validated by three experts viz: two physics expert and one expert in Measurement and Evaluation all from Federal College of Education (Technical), Umuze. The reliability of the instrument was determined using Cronbach Alpha and the reliability coefficient of 0.78 was obtained. The questionnaire was distributed directly to the respondents by the researcher, and a 100% return was ensured. The research questions were answered using mean and standard deviation as statistical tools while t- test statistics was used to test the hypothesis at 0.05 level of significance. For positively cued items, a mean of 2.50 and above indicated that the respondents agreed with the item on the questionnaire while a mean below 2.50 indicated respondents disagreement. For negatively cued items the reverse is the case.

Results

Research Question1: What are the impact of digital literacy of physics teachers on the interest of students in physics

Table 1: Mean Response Scores of Physics Teachers on the Impact of Digital Literacy of Physics Teachers on the Interest of Students in Physics.

Table 1 shows that the respondents agree to all the items except item 7 which has a mean value less than 2.50. This indicates that physics teachers strongly agree that digital literacy of physics teachers has great impact in boosting the interest of students in physics.

Research Question 2: What are the strategies to be used to improve the use of digital literacy devices by physics teachers in secondary school

S/N	Item	N	SA	A	D	SD	$\bar{X}$	STD	Decision
1.	Computer usage as educational aid has been effective in stimulating students interest in physics.	17	6	5	3	31	3.20	0.98	Accepted
2.	The use of digital literacy tools enhances students communication skills	17	7	4	3	31	3.23	0.82	Accepted
3.	With digital literacy tools, students critical thinking is developed.	16	7	5	3	31	3.16	0.95	Accepted
4.	Teaching students using ICT tools is an affective vehicle for developing creativity.	16	10	5	0	31	3.35	0.78	Accepted
5.	Emphasis on the new ICT has attracted variety of interest in educational development	16	10	4	1	31	3.32	0.71	Accepted
6.	The use of CAI in teaching physics produces positive effect on the interest and performance of students in physics.	16	6	5	4	31	3.10	0.83	Accepted
7.	Teachers role and tasks become more difficult and challenging when digital literacy tools are used in teaching physics.	5	4	14	8	31	2.19	1.16	Rejected

- | | | | | | | | | |
|--|----|----|---|---|----|------|------|----------|
| 8. Students are motivated to learn whenever physics teachers apply digital approach in teaching physics . | 15 | 7 | 4 | 5 | 31 | 3.03 | 0.92 | Accepted |
| 9. With the advent of ICT media, physics teacher is forces to collaborate with colleagues in an environment different from his usual environment | 15 | 8 | 7 | 1 | 31 | 3.20 | 0.71 | Accepted |
| 10. ICT guarantees large group workshop | 16 | 14 | 1 | 0 | 31 | 3.50 | 0.67 | Accepted |
| 11. ICT makes active learning possible | 15 | 10 | 5 | 1 | 31 | 3.26 | 0.83 | Accepted |
| 12. With digital literacy in teaching, proper planning is set out, and clear learning outcomes are achieved | 16 | 6 | 6 | 3 | 31 | 3.13 | 0.78 | Accepted |

Grand Mean

3.14

Table 2: Mean Response Score of Physics Teachers on the Strategies to be Adopted to Improve the Use of Digital Literacy Devices in Secondary Schools.

S/N	Item	SA	A	D	SD	N	$\bar{X}$	STD	Decision
1.	Adequate e-learning infrastructural facilities should be provided in schools	19	10	2	0	31	3.55	0.67	Accepted
2.	Bandwidth should be increased for effective reception	29	2	0	0	31	3.94	0.88	Accepted
3.	Adequate number of ICT teachers should be employed in secondary schools	17	10	4	0	31	3.41	0.73	Accepted
4.	Laptops should be distributed to serving physics teachers free of charge	22	7	2	0	31	3.65	0.90	Accepted
5.	Computation of students' results should be done using computer software	22	7	1	1	31	3.61	0.86	Accepted
6.	Physics teachers should be mandated to develop themselves	0	2	7	22	31	1.34	0.30	Rejected
7.	Seminars and workshops should be organized for serving physics teachers on the application of modern digital literacy tools.	12	11	6	2	31	3.06	0.82	Accepted
8.	High voltage generating power plants should be provided to school to supplement electricity from national grid	23	8	0	0	31	3.74	0.91	Accepted
9.	Physics teachers should occasionally direct classworks, assignment and tests to students through digital media tools	13	17	1	0	31	3.39	0.62	Accepted
10.	Monitoring team on the available e-learning devices provided to schools should be set up to ensure effective utilization.	15	8	5	3	31	3.13	0.97	Accepted
Grand Mean		3.28							

Table 2 shows that all the items had mean value above the cut-off points of 2.50 except item 6 which has a mean value of 1.34. By implication, the respondents strongly agreed on the identified strategies for improving the use of digital literacy tools in secondary schools.

The grand mean of 3.28 is positive which shows that physics teachers accepted the identified strategies.

H0₁: There is no significant difference between the mean scores of male and female physics teachers on the impact of physics teachers' digital literacy on the interest of students in physics.

Table 3: Result of t-test difference between the mean responses of male and female physics teachers on the impact of digital literacy of physics teachers on the interest of students in physics.

Category	N	$\bar{X}$	SD	t-cal	t-crit	Decision
Male	13	3.09	0.80	1.19	1.96	NS
Female	18	3.19	0.77			

From Table 3, it is observed that t-cal of 1.19 is less than the critical –t value of 1.96 at 0.05 level of significance. Therefore the null hypothesis was not rejected, which shows that there is no significant difference between male and female physics teachers mean rating on the impact of digital literacy of physics teachers on the interest of students in physics.

Discussion

The result obtained from table 1 indicated that digital literacy of physics teachers has great impart in enhancing the interest of students in physics. This is evidenced from the positive responses on all the items except items 6 which the teachers viewed as having little is no impact in enhancing the interest of students in physics.

Hence the digital literacy tools as well as e-learning devices and infrastructure such as computers, laptops etc. motivates the students whenever physics teachers apply them in teaching physics.

Research question 2 addressed the strategies that could be adopted to improve the use of digital literacy tools as a means of encouraging students active participation and interest in physics. From the analysis on Table 2 it was found out that the respondents strongly agreed that provision of adequate e-learning infrastructures, increment in bandwidth, recruitment of adequate numbers of ICT teachers to schools, distributing laptops freely to teachers, organizing regular seminars and workshops for teachers, as well as using computer software for computing students results among others are effective strategies for improving students interest in learning physics. This is in line with UNESCO (2011) which asserts that applying ICT and other digital literacy tools in teaching and learning provides teachers and students access to vast stores of knowledge beyond the school as well as provide opportunities for the development of quality teaching and learning.

The result in Table 3 showed that the calculated t-value was less than the critical value of 1.96 at 0.05 level of significance. Hence the null hypothesis was not rejected. This implies that male and female physics teachers did not differ in their mean response ratings on the impact of digital literacy of physics teachers in enhancing the interest of students in physics. The teaching and learning of physics with CAI has been noted to respond positively in terms of enhancing learners performance and interest. Hence according to Ogbuagu and Eyibe (2018), the use of CAI and other digital tools make teaching of physics interesting and act as a very useful aid to learning.

Conclusion

For a physics teacher the main concern is the search for efficient ways of communicating physics concepts to his or her students to make it interesting and enjoyable. This he can achieve by providing novel learning environments to the students or by devising new and viable teaching strategies. One of the best innovative approaches is the use of CAI packages and other digital literacy tools to enhance the interest of students irrespective of sex.

Recommendation

In the light of the findings of the study the following recommendation are hereby offered;

1. Seminars and workshops should be organized regularly for in-serving physics teachers to update them with packages on the use of digital literacy tools.
2. The federal and state government should as a matter of necessity ensures that electricity is continuously supplied to schools.
3. Adequate e-learning facilities should be provided to schools by the federal and state governments.
4. Schools should provide physics teachers with the necessary ICT resources such as computer hardware and software.
5. The ministry of education should set-up a monitoring team to monitor the extent of use of the available digital literacy tools and facilities provided to schools.

References

- Chinwoke, F.U (2011). Approaches to effective teaching of Science Technology and Mathematics in schools. *Unizik Journal of STM Education*, 1 (2)
- Ebosele,A (2024). Forward: National Mathematical week booklet. Information Communication Technology at the services of catechesis towards effective evangelization in Nigeria.
- Eze, C.P (2016). Availability of e-learning devices and strategies for improvement in secondary schools in Anambra State. *Journal of Technology Education and Research Development (JOTERD)*, 5 (1); 11-21.
- Ogbuagu, J.O & Eyibe, S.C. (2018). Challenges of e-learning and globalization in higher education in Nigeria. *Journal of Technical Education and Research development (JOTERD)*, 5(1); 45-54
- Okoye, N.E (2010). Physics Education: The foundation for achieving universal primary education and eradication of extreme poverty for millennium development goals (MDGS). In J.O Ogbuagu & A.T Nwamaradi (eds.). *Skills development in science/technology education for the millennium development goals*. Nimo: Rex Charles & Patrick ltd.
- Okoye, N.E (2022). Assessing the efficacy of two modes of digital learning object packages on students' achievement and interest in rocket and satellite in post covid-19 era. Paper presented at the maiden virtual conference of Department of Science Education. University of Nigeria, Nsukka, 23rd -24th June, 2022.
- Okoye, N.E & Ogundeji, O.M. (2022). Effect of physics practical activities on senior secondary school students' achievement in Nigeria. *Journal of Empirical research in science and technology education*, 7 (1); 41-50.

Okoye, N.E & Okeke, S.O. (2014). Factors affecting students' interest and academic achievement in physics. *Journal of education for professional growth*, 9(1); 175-181.

Okoye, N.E & Okeke, S.O (2018). Effect of self-regulated and lecture models on students' achievement in physics: Implication for poverty eradication for MDGS. *Journal of Empirical Research in Science and Technology Education*, 6 (1); 11-21.

UNESCO (2011). *ICT in schools*. A handbook for teachers on how ICT can create an open learning environment: Paris, UNESCO.

Uzodimma, U. (2007). The use of ICT in secondary schools in Nigeria: In D.N Eze and N Onyegebu (eds). *ICT in the service of education*. Nsukka, Timex publishers.