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Appraisal of Flash Cards and Students' Academic Performance in English Language in Senior Secondary Schools in Rivers State

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Abstract

The research work focused on the appraisal of the use of flash cards and student's academic performance in English language in senior secondary schools in Rivers State. The study was guided by the descriptive survey research design. Two research questions and two null hypotheses were formulated to guide the study. The population of the study comprised one thousand and two (1002) senior secondary II students and 64 English language teachers. A sample size of 300 respondents was used using Taro Yamene formula. The instrument for data collection was a self-structured questionnaire tagged "Appraisal of Flash Cards and Students' Academic Performance in English Language" (AFCSAPEL). The instrument was validated by two experts in English Language. The reliability of the instrument was established through pilot testing in which the scores were correlated at 0.80. Mean and standard deviation were used to answer the research questions while Pearson Product Moment Correlation Coefficient was used to test the hypotheses at 0.05 alpha level. Consequently, it was revealed that pictures, models, drawings, posters, were enthusiastically available for teaching and learning; flash cards facilitate students' learning ability and understanding. Lack of fund, unqualified teaching skill, intolerance by some teachers in the use of flash cards hamper effective teaching. It was recommended that there should be consistent use of teaching aids to make learning factual. Teachers should use teaching aids with appropriate method and skills, etc.

Key words: Appraisal, flash cards, students, academic performance, English language, senior secondary schools.

Introduction

English language is seen as the second language in Nigeria and has occupied a dominant place in the nation's educational, political, media and business environment. It is the language predominantly spoken all over Nigeria. The importance of mastery and proper usage of the language by both teachers and students cannot be overemphasized. Every other subject of study in Nigerian Schools, need a good command of English language, hence, the need to be taught thoroughly if it is to meet the educational and social standard. Like every other language, the secondary aim of teaching English Language in schools is to develop communication skills in the students (Agari, 2020).

Education which is a process of equipping students with the skills and knowledge needed for a desirable change makes use of some aids or teaching materials in order to achieve this optimal goal. Teachers of yester years relied on few or no aids in teaching because they believed that knowledge could be forced no matter how unpleasant it is into the supposedly empty brains of their children. They substituted the cane for teaching aids.

Flashcards are cards bearing information such as words or numbers, or questions and answers on either or both sides. They can be used in classroom or during private study. Flashcards can support learning of any subject matter. In the classroom, an immediate teacher overview of the learners' understanding of the topic at hand can be obtained by asking learners to display their answer to a specific question on a flashcard. Thus coloured cards can also be used for learners' self-assessment of their level of understanding (e.g. green card for "understood", yellow card for "need support", red card for "not understood"). For example, flashcards can be used question and answers *drills*, interactive education games, or the assess learners' progress. Flash cards otherwise known as teaching aids are non human resources which are helpful to the teachers and students for effective teaching and learning. They are teacher's helping hand in the process of teaching the students. Some learn better by one or more senses, to some seeing is believing, to others, the sense of hearing, touch, smell and taste dominate in acquiring knowledge. The utilization of teaching aids such as flash cards among others in teaching English language at all levels, helps the teachers in expanding the student horizon of experience. It also helps the teachers in providing meaningful information to the student. Kay (2015) noted that teaching aids are things which are intended to help the teacher use a working model outside the experience of the student's than if he relies on a verbal description of it. In order to achieve effectiveness and efficiency during instructional process between the teacher and the students, the classroom teacher must try as much as possible to illustrate the subject matter with appropriate instructional materials to the student.

This is done by using real things/object/technology to represent real life situations. In this regard Onwuka (2013) maintains that common sense taught us that in the present phases of development, the child will be faced with great difficulties if left unaided.

A systematic use of audio-visual materials can make the subject matter clear and appealing to the students of diversified background and different abilities. Thus audio visual materials can foster effective learning not only for the student who reads and writes easily but also for the student who is not verbally gifted. Audio-visual materials encourage active participation, give needed reinforcement, widens the horizon of student's experience, ensure order and continuity of thought as well as improve effectiveness of other materials. In addition, visual materials like, diagram, charts, photographs, slides etc. present more realistic approach in education delivery and equally provide opportunity for class participation in groups or individually and when used correctly, appeal to many senses which will result to increase in the students' performance. Some of these materials such as flash cards are very good for the preservation of records and other documents. The use of flash cards is an eye opener to the teacher and promotes better planning and scheduling, providing the teacher more guidance, co-ordination, supervision and more time for correction. Underprivileged academic performance in English language could be linked to many factors among which teacher's strategy itself was considered as an important factor. This implies that mastery of English language concepts might not be fully achieved without the use of instructional materials. Conspicuously, not even one school in Rivers State could boast of being well equipped with necessary flash cards. Where some of these materials exist, the rate at which school administrators and classroom teachers use them is to say the least disappointing.

Bielinski and Davidson (2011) defined academic performance as the display of knowledge attained or skills developed by students in the school subject. It is the level of performance in the subject as exhibited by a student. Academic performance is the exhibition of knowledge attains or skills developed by learners in the school subject usually designed by test scores or by marks assigned by teachers which can be low or high. Salami (2018), noted that Academic performance is frequently defined in terms of examination performance. It refers to what skills the student has learned as is usually measured through assessment like standardized test, performance assessments and portfolio assessment.

Flashcards are cards with either pictures or words, as used by Mathura and Zulu in 2021 and Sartika in 2020 (Farida, Dian, Hasna, and I, 2019). These cards can either be printed or hand-drawn by students. Flashcards improve teaching materials through engaging activities and help students understand their teachers' explanations. They can also be used to introduce new vocabulary, grab students' attention with colorful pictures, and provide additional meaning based on the teacher's native language if necessary. Repeating words during the learning process can help students recognize and memorize English words through the use of pictures. Students can store words in their memory more effectively due to repeated exposure. Flash cards have borne several nomenclatures from colonial concepts of an apparatus to teaching aids, teaching aid to education media, educational media to instructional technology, instructional technology to curriculum materials, curriculum materials to its current nomenclatures teaching aids. Each of these conventional stages depicts the scope of its usage and application in classroom setting. Studies have shown that instructional materials are indispensable in the teaching and learning process at all levels of educational system. They are referred to as a veritable channel through which instructions can be impacted in the classroom.

Laival in Agari (2020) affirmed that both instructional aid and approaches occupies the highest level of idealization as they cover a long term of attainment and implementation respectively. This implies that a teacher must first understand the broad and specific objectives of his/her teaching, what to be taught (subject), component of curriculum, approaches and method of instructional materials to be used in his/her teaching because these factors form the basis with which to accomplish the predetermined goals of secondary education. Similarly, Ogundele (2007) considered flash cards as an essential part of teaching methods which helps the teacher to express its subject concept to the learners thus promoting students;' academic performance. That, such materials, should be the responsibility of the English teachers. Olaitan (2004) stated that flash cards are normally used during instruction to enhance proper or effective learning and to encourage retention. They reduce the workload of the English teacher in the classroom, reinforce and add clarity to learning. Ajayi (2009) observed that flash cards are versatile tools that are used in different ways for effective teaching and learning of English Language. These aids convey facts and ideas in all forms of communication. They offer quite an easy way of presenting information.

From the foregoing, it can be deduced that flashcard is the media that use a picture to show the students about the meaning from the picture in English. Flash card is very contemptible because we can make by our own from printing the picture on a piece of the paper, and we can make it whenever we need the flash card. They have ideal size in order to be able to see the whole students in the class and be easy to handle them. Flash cards can assist the learners to be perceptive on the meaning of the words, pronunciation and spelling, memorizing the new words, practicing the structure and word order among others. Materials for lesson are gathered and prepared ahead of time as students are not expected to sit diligently while waiting for the teacher to collect and prepare the materials for the lesson. Accessibility depends upon your available storage and upon your own usage habits Abdullahi (2012). Consider how much space you have for storing relevant instructional material for the activity to be carried out in teaching and learning English Language, and the location(s). Material that you need to refer to more frequently should be kept closer to hand, whether they are the materials from one or two previous terms or key reference materials you use during the teaching. Some instructors frequently refer back to previous terms when preparing classes, and others do not (Baganzi in Agari, 2020). The quality of the education and training on participation given to Secondary Schools Learners depends greatly on the availability and adequacy of instructional materials. School Administrators should adjust their educational content to the changing skill requirements of the nation.

Institutional training should aim to equip learners with useful skills and to improve their knowledge and capabilities in their participation in the classroom, National Policy on Education (2014). Awobodu (2011) has noted that availability and adequacy of instructional material in teaching facilitates learning and enhances pupil achievement because every learner is involved in the activity given.

In a research work by Momoh (2015) on the effect of instructional materials on student's performance in West African School Certificate Examinations (WASCE) in Kwara State. He collated materials resources with academic achievement of students in ten subjects. Data were collected from the subject teachers in relation to the resources employed in the teaching. Student performances in WASCE for the past five years were related to the instructional materials available for teaching each of the subjects. Momoh concluded that materials resources have a significant impact on student's performance in each of the subject.

Popoola as cited by Agari (2020) investigated the impact of use of flash cards in teaching-learning on the academic performance of students in five Secondary Schools in Ogun State. Questionnaires were design to elicit responses on instructional materials that were available for teaching and learning each of the three school subjects he examined. He collated WASCE results for five years and compared performance of students in schools with inadequate materials resources to students in schools with adequate materials resources. Finding showed a significant difference in the performances of the two sets of students. The students in schools with adequate instructional materials (especially flash card) performed far better than those with inadequate instructional materials. All available researches have concluded that effective and efficient use of appropriate instructional materials on any subject, English Language significantly improve the academic performance of students. Therefore, the use of flash cards as improvise should be encouraged hence it leads to academic performance of students.

Statement of the Problem

Every year, when the results of public examinations are released, there has always been mass failure in English language. Employers of labor during interviews for job seeker have always complained of graduates of higher institutions not being able to communicate or express effectively and efficiently in either written or spoken English. The reason for this could be ascribed to the fact that teaching English language as a second language in Nigeria poses serious problems of comprehension to students. The effect of mother tongue interference equally poses challenges to many students, leading to the assertion that this subject cannot be taught effectively and efficiently without the use of relevant instructional materials, in order to make the learning practical rather than purely theoretical.

We learn and remember 10% of what we hear, 40% of what we discuss with others and as high as 80% of what we experience directly or practice. Despite the consensus on the importance and place of instructional materials in teaching-learning of English Language, there is glaring absence of these materials and poor utilization by teachers leading to fatal consequences. Appraising the impact of use of flash cards in the academic performance of Senior Secondary Schools Students in Rivers State gave rise to the entire problem of this study.

Aim and Objectives of the Study

The study appraised the use of flash cards in teaching and learning and students' academic performance of English language in Senior Secondary Schools in Rivers State. Specifically, the objectives of the study included to:

1. examine the availability of flash cards and students' academic performance in English Language in Senior Secondary School in Rivers State.
2. determine the impact of flash cards on students' academic performance in English language students in secondary schools in Rivers State.

Research Questions

For the purpose of the study, the following research questions guided the study:

1. How available are the flash cards and student's academic performance in English Language in Senior Secondary Schools in Rivers State?
2. What are the impacts of using flash cards on student's academic performance in Senior Secondary Schools in English Language in Rivers State?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

Ho_1: There is no significant relationship between availability of flash cards and student's academic performance in English Language in Senior Secondary Schools in Rivers State.

H_{O2}: There is no significant relationship between impacts of flash cards on student's academic performance in English Language in Senior Secondary Schools in Rivers State.

Methodology

The study adopted a descriptive design. It is considered appropriate for this study because it dealt with events that are currently happening. The population comprised of 1,196 (64 teachers and 1,132 students) (Source: Rivers State Ministry of Education, 2019-2022). The sample size consisted of 300 teachers and students using Taro Yamene. The instruments for data collection consisted of structured questions tagged "Appraisal of Flash Cards and Students Academic Performance in English Language' (AFCSAPEL). The questionnaire was modified on a four point-likert scales of Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD).

The instrument for data collection was validated by two experts. The reliability of the instrument was determined through pilot testing. The scores were correlated using Pearson product moment correlation in which 0.80 reliability coefficient was obtained. The questionnaire was administered directly to the teachers and students by the researcher. Mean and standard deviation was used to answer the research questions while, Pearson's Product Moment Correlation was used to test the hypotheses at 0.05 level of significance.

Results

Research Question 1: How available are the flash cards and students' academic performance in senior secondary school in Rivers Sta **Criteria mean = 2.5**

S/N	ITEMS	Frequencies (f)				Total (N)	Mean ($\bar{x}$)	Std.	Remark
		SA	A	D	SD				
		4	3	2	1				
1	Flash cards are available for teaching and learning English in school	30 (120)	50 (150)	80 (160)	130 (130)	300 (560)	1.87	0.40	SD
2	Government has provided sufficient flash cards for learning English Language	50 (200)	60 (180)	90 (180)	100 (100)	300 (660)	2.20	0.30	SD
3	Flash cards are simple and adequate for learning	150 (600)	100 (300)	30 (60)	20 (20)	300 (980)	3.27	0.85	SA
4	Poster, computers, pictures, drawings and modes are available for use in schools	120 (480)	110 (330)	50 (100)	20 (20)	300 (980)	3.10	0.80	SA
5	Appropriate models, drawing and pictures are used for illustration and promotion of knowledge.	140 (560)	100 (300)	30 (60)	20 (20)	300 (940)	3.13	0.82	SA
	Grand mean						**2.714**		**SA**

Table 1 showed that items (3, 4, and 5) were strongly accepted since their mean criteria were above 2.5. This shows that the items were strongly accepted, while items (1, 2) were strongly disagreed rejected since their criteria mean was below 2.5. Again, the grand mean was 2.714. Therefore, it indicated that the items were strongly accepted as available flash cards for academic performance of English language.

Research Question 2: What are the impacts of using flash cards on student's academic performance in senior secondary schools in Rivers State? **Criteria mean = 2.5**

S/N	Questionnaire Items	Frequencies (f)				Total (N)	Mean ($\bar{x}$)	Std	Remark
		SA	A	D	SD				
		4	**3**	**2**	**1**				
11	Teaching and learning are improved by the use of flash cards	170 (680)	100 (300)	25 (50)	5 (5)	300 (1035)	3.45	0.92	SA
12	It saves time, promote retention and enhance academic performance of students	140 (560)	100 (300)	30 (60)	20 (20)	300 (940)	3.13	0.82	SA
13	It arouses student's interest and makes them concentrate on lesson.	135 (540)	110 (330)	45 (90)	10 (10)	300 (970)	3.23	0.84	SA
14	It promotes fast understanding of students and reduces burden of teachers	165 (660)	105 (315)	25 (50)	5 (5)	300 (1030)	3.43	0.90	SA
15	It simplifies and clarifies complex difficult concept	157 (628)	130 (390)	10 (20)	3 (3)	300 (1041)	3.47	0.94	SA
Grand mean						**3.342**		**SA**	

Table 2 revealed that items (11, 12, 13, 14, 15) indicated Strongly Agreed since their criteria mean was above 2.5. Again, the grand mean of 3.342 was obtained which was above 2.5 the mean criterion. Therefore, the items were strongly accepted as impacts of flash cards on students' academic performance.

Testing of Hypotheses

$H0_1$: There is no significant relationship between availability of flash cards and student's academic performance in English Language in Rivers State.

Table 3: Pearson Product Moment Correlation results of availability of flash cards and student's academic performance in English Language

Variables	Mean	Standard	n	Alpha	r-value	P-value	Decision
Availability of flash cards	2.714	0.634					
Academic performance	2.550	0.50	300	0.05	0.750	0.021	Significant

Table 3 revealed that the r-value of 0.750 with a corresponding P-value 0.021 <0.05 (which is lesser than) the chosen level of significant was obtained. Therefore, this indicated that there is significant relationship between the availability of flash cards and academic performance of English language students. This implied that the null hypothesis was rejected, while the alternate hypothesis was accepted. Therefore, there is a strong relationship between flash cards and academic performance of students in senior secondary schools.

$H0_2$: There is no significant relationship between the impacts of flash cards on student's academic performance in English Language

Table 4: Pearson Product Moment Correlation results of impact of flash cards on student's academic performance of English language

Variables	Mean	Std	n	Alpha	r-value	P-value	Decision
Problems hindering effective use of flash cards	3.342	0.884	300	0.05	0.790	0.037	Significant
Academic performance	2.550	0.50					

Table 4 reveals that r-value of 0.790, with its corresponding P-value of 0.037 <0.05 (which was less than) the chosen level of significant. This therefore shows that there is a positive significant relationship between the impacts of flash cards on academic performance of students in English language. It indicated that the null hypothesis was rejected, while the alternate hypothesis is accepted.

Summary of Findings

1) There is significant relationship between availability of flash cards and academic performance of students in English language, since (r= 0.750, p=0.021<0.05).
2) There is significant relationship between impacts of flash cards on academic performance of students in English language, since (r=0.790, p=0.037 <0.05).

Discussion of Findings

Research question one hypothesis one revealed that available flash cards are adequate to enhance academic performance of English students. This is in line with Abullahi (2012) who said that the use of available flash cards by teachers promote academic performance of students. This is supported by Awobodu (2011) who noted that when teachers use flash cards for teaching, the student's academic performances are increased. He encourages the modern teachers of secondary schools to always use flash cards so as to concretize learning. The result of Pearson Product Moment Correlation revealed that (r= 0.750, p= 0.021<0.05) the chosen level of significant was obtained. Therefore, the null hypothesis was rejected, while the alternate hypothesis was accepted. This implies that there is significant relationship between adequate use of flash cards and academic performance of students. This study is in agreement with the study of Anderson (2009) found significant relationship between the availability of flash cards and academic performance of students. He noted that flash cards make learning, fast and simple for students.

Research question two hypothesis two revealed that teaching and learning are improved by the use of flash cards; it saves time, promotes retention of information, arouses student's interest and concentration during lessons, reduces the burden of teachers, simplifies and clarifies complex difficult concepts. The study is in agreement with the study of Oladipo (2011) who asserted that flash cards are important tools for enriching, visualizing, simplifying, transmitting and accelerating the teaching and learning processes, thus enhance students' academic performance in English language. He further said that, effective instruction with flash cards in the classroom requires careful planning by the English language teacher. The result of Pearson product moment correlation revealed that (r 0.790, p=0.021 <0.05), the chosen level of significant was obtained. Therefore, the null hypothesis was rejected, while the alternate hypothesis was accepted. This indicated that there is significant relationship between impacts of flash cards on academic performance of students. This finding is in agreement with the findings of Popoola in Agari (2020) who noted that flash cards have direct impact on students as teaching and learning are made real, fast, meaningful, interesting and also enhance academic performance of students.

Conclusion

Consequently, the study concluded that flash cards are necessary to improve students' academic performance in English language. Flash cards facilitate students' learning ability and understanding. Flash cards have direct impact on students, as it makes instructions fast, simplify, clarify, interesting and real.

Recommendations

The following recommendations were made based on the findings of the research.

1. Teachers should use flash cards with appropriate method and skills in teaching students in senior secondary schools.
2. There should be consistent use of flash cards in the classrooms to make learning real, meaningful and retention of information by students

References

Abdullahi, A. (2005). A study of the relationship between interest in science and science curriculum material. *Journal of Researchers in Curriculum,* 2(4), 20-22.

Agari, I. S. (2020). Evaluation of instructional materials and students' academic performance in English Language in senior secondary schools in Ogba Egbema Ndoni Local Government Area Rivers State. An unpublished dissertation, submitted to the Postgraduate School, Ignatius Ajuru University of Education, Port Harcourt.

Ajayi, Y.A. (2009).*An Introduction to Educational Technology for Students and Teachers.* pp 23-36. Decency Printers/Publishers.

Anderson, R.C (2015). *Reading in the psychology of cognition*. Rinehart and Winston Inc.

Awobadu, V.Y. (2011). *Material resource utilization for teaching secondary science in the era of Universal Basic Education.* Alographil Komunnikation Company

Babayomi, A. A. (1999). *Comparative study of the Teaching and Learning Resources in Private and Public Secondary Schools in Lagos State.* Master's Thesis, Department of Educational Administration, University of Lagos, Nigeria.

Balogun, T.A. (2006). Improvisation of science teaching equipment. *Journal of Science Teachers Association of Nigeria, 3*(2), 50-52.

Bielinski, T., & Davidson, M. I. (2011). A sex difference by item difficulty interaction in multiple choice. *Journal of Educational Measurement, 38,* 51-77.

Bjorklind, D,F (2013). Children's thinking and development function and individual differences, edition. Practice grove, brooks/cole publishing company.

Federal republic of Nigeria,(2014). National policy on education (4th edition) NERDC Press.

Kusumawardhani, P. (2019) The use of flashcards for teaching writing to English young learners (EYL). *Journal of English Language Teaching* , 4(1); 35-52.

Ogundele, A. (2007). *Integrated social studies.* Ado-Ekiti: United Star Printers and Co. Ltd.

Olaitan S.O. (2004). *Vocational and technical education in Nigeria (issues and analysis).* Noble Graphics Press.

Onwuka, U. (2013). Curriculum development for Africa, Onitsha: Africana publisher ltd. Rivers State Ministry of Education (2010). *Planning, research and statistics bulletin*. Port Harcourt.

Salami, B.O. (2018). Aetiology, treatment and prevention of juvenile delinquency among secondary school adolescents in Nigeria. *Journal of Research in Education,* 2(11)1-8.

Sartika, M. (2020). Increasing third grade mastery of simple present tense using flashcards. *Journal of Englishteaching, 6(*1);40 49.

Influence of Tablet-Assisted Instruction on Learning Engagement and Numeracy Achievement of Preschool Pupils In Rivers State East Senatorial District

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Abstract

This study investigated the influence of tablet-assisted instruction on learning engagement and numeracy achievement of preschool pupils in Rivers State, East Senatorial District. A quasi-experimental research design was employed, involving 220 preschool pupils drawn from intact classes in selected public preschools. The experimental group received tablet-assisted instruction, while the control group continued with conventional teacher-centered methods. Data were collected using a Learning Engagement Observation Checklist and a Numeracy Achievement Test, both validated for reliability. The experimental group participated of tablet-based instruction using educational applications and guided exercises aligned with the preschool numeracy curriculum. Pretests and posttests were administered to measure engagement and numeracy outcomes, and data were analyzed using descriptive and inferential techniques. Findings revealed that pupils exposed to tablet-assisted instruction demonstrated substantially higher gains in both learning engagement and numeracy achievement compared with those taught using teacher-centered methods. The results indicate that tablet-assisted instruction effectively promotes active participation, attention, and mastery of foundational numeracy concepts among preschool pupils. The study concludes that integrating tablet-assisted instructional strategies can significantly enhance early childhood learning outcomes. It recommends that teachers incorporate tablet-based activities into daily lessons, receive training on educational technology, and that schools ensure access to digital resources to optimize preschool education.

Keywords: Tablet-Assisted Instruction, Learning Engagement, Numeracy, Numeracy Achievement and Preschool Education

Introduction

It is crucial for preschoolers to learn certain skills in early childhood education, like language and literacy, as these will help them grow and make a seamless transition to primary school.

Early childhood represents a critical period during which children's curiosity, attention, and active participation shape the foundations of lifelong learning, particularly in numeracy development, where early competence is strongly associated with later academic achievement (Anggun et al., 2025). At this stage, children learn best through experiences that are concrete, interactive, and responsive to their developmental needs. In contemporary preschool environments, tablet-assisted instruction has emerged as a prominent instructional approach, offering interactive, play-based, and visually engaging learning experiences that align with how young children explore and make sense of their world. When appropriately guided by teachers, tablet use has the potential to enhance learning engagement and support numeracy achievement more effectively than traditional instructional approaches alone. As digital technologies increasingly permeate early childhood classrooms, examining their educational influence has become both timely and imperative (Onuegbu et al., 2025)

Learning engagement refers to the degree of attention, curiosity, interest, and active participation that learners demonstrate during the learning process (Bergdahl & Bond, 2022). In early childhood education, learning engagement is especially critical because it reflects how deeply preschool pupils are involved in learning activities, how long they sustain attention, and how positively they respond to instructional experiences. Engaged preschool pupils are more likely to develop foundational skills, including early numeracy, and to cultivate positive learning dispositions that extend into later schooling. Importantly, learning engagement does not reside solely within the child; rather, it emerges from the dynamic interaction between the learner and the learning environment (Wong & Liem, 2021). Instructional methods, learning materials, and teacher facilitation jointly shape the extent to which young learners are motivated, attentive, and actively involved in classroom activities.

Instructional approaches in preschool classrooms differ substantially in how they foster learning engagement. Teacher-centered instruction, which remains prevalent in many Nigerian preschools, including those in Rivers State, typically emphasizes direct teaching, repetition, and whole-class activities. While this approach may support classroom order and curriculum coverage, it often provides limited opportunities for exploration, interaction, and child-initiated learning, which are essential for sustaining engagement among young learners (Wong & Liem, 2021).

In contrast, tablet-assisted instruction introduces multimedia, interactive applications that allow preschool pupils to touch, manipulate, and respond to learning content in real time. Such features can stimulate interest, sustain attention, and promote active participation, key indicators of learning engagement in early childhood. Comparing the learning engagement level of preschool pupils taught using tablet-assisted instruction with those taught using teacher-centered instruction is therefore crucial for understanding how different pedagogical approaches shape children's involvement in learning activities.

Learning engagement is commonly conceptualized as a multidimensional construct encompassing behavioral, emotional, and cognitive dimensions (Xu et al., 2023). Behavioral engagement is reflected in pupils' on-task behavior, participation, and persistence in learning activities. Emotional engagement involves interest, enjoyment, and positive emotional responses during learning experiences, while cognitive engagement refers to pupils' willingness to think, explore, and invest effort in understanding learning tasks beyond surface participation. In the context of preschool education, these dimensions provide a robust framework for assessing how instructional approaches influence pupils' involvement in numeracy learning activities. Applying this framework allows for a nuanced examination of how tablet-assisted instruction and teacher-centered instruction differentially affect preschool pupils' engagement during classroom learning.

Empirical studies have increasingly demonstrated the potential of digital technologies to enhance engagement in early childhood settings. Miller (2018) found that although interactive mathematical applications on iPads did not produce statistically significant gains in number-sense achievement, they promoted collaboration and engagement in play-based kindergarten classrooms. Otterborn et al. (2019) reported high levels of engagement with digital tablets in preschools, particularly in activities involving problem-solving, design, construction, and creativity. Similarly, Rogowsky et al. (2017) observed that playful learning through educational software significantly enhanced literacy and numeracy outcomes among preschoolers. These findings suggest that while achievement gains may vary, tablet-based instruction consistently supports engagement, interaction, and active learning among young children.

Numeracy refers to the knowledge and understanding of numbers and their use. It encompasses number sense, operational skills, computation, measurement, and geometry (Umoh et al., 2023). Numeracy abilities lay the groundwork for future mathematical understanding, which will result in aptitude for scientific and technological growth (Adedigba,2023). Numeracy achievement in preschool children refers to the acquisition of basic mathematical skills such as counting, number recognition, quantity discrimination, addition, and subtraction, which form the foundation for later mathematical learning (Juhaevah et al., 2025). Several studies have reported positive effects of technology-assisted instruction on early numeracy development. Umoh et al. (2023) revealed that pupils exposed to computer-assisted instruction performed better in numeracy skills than those taught using the traditional chalk-and-talk method. Papadakis et al. (2018) found that pupils taught using tablet-assisted instruction outperformed those taught with personal computers or conventional methods, with no significant gender differences. Lee and Choi (2020) further demonstrated that a tablet-based math game intervention significantly improved early numeracy skills among children, particularly in number identification, quantity discrimination, addition, and subtraction. At a broader level, Juhaevah et al. (2025) reported through a meta-analysis that educational media significantly improved early numeracy skills. However, computer-based instruction appeared more effective than tablet-based approaches in some contexts.

Despite the growing body of evidence on tablet-assisted instruction and early numeracy, notable gaps remain. Most existing studies have been conducted in developed countries or outside the Nigerian context, with limited attention to preschool settings in Rivers State, particularly within the East Senatorial District. Moreover, many studies focus primarily on achievement outcomes without simultaneously examining learning engagement as a complementary construct that mediates learning. There is also a scarcity of empirical research that directly compares tablet-assisted instruction with the teacher-centered instructional method commonly used in Nigerian preschools. This study, therefore, seeks to fill these gaps by empirically investigating the influence of tablet-assisted instruction on both learning engagement and numeracy achievement among preschool pupils in the East Senatorial District of Rivers State.

Statement of the problem

In early childhood education today, the use of technology in teaching and learning is becoming increasingly common. Tablet-assisted instruction (TAI) has emerged as a practical approach to making learning more interactive and engaging for preschool pupils. Using tablets in the classroom can help young children develop basic numeracy skills, encourage curiosity, and support learning that is tailored to each child's pace. Tablets also have the potential to improve focus and attention, which can contribute to better learning outcomes. However, the use of TAI in preschool classrooms is still inconsistent, and little is known about how it affects children's participation, engagement, and understanding of numeracy concepts compared to traditional teaching methods.

Understanding how TAI influences these aspects is important because preschool is a critical period for building foundational skills. Without effective engagement and teaching strategies, children may struggle with essential numeracy skills. This study, therefore, aims to explore how tablet-assisted instruction affects learning engagement and numeracy achievement among preschool pupils in Rivers State East Senatorial District.

Aim and Objective

This study aims to investigate the influence of tablet-assisted instruction on learning engagement and numeracy achievement of preschool pupils in Rivers State, East Senatorial District. Specifically, the objectives of this study are as follows: to

1. determine the learning engagement level of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions.
2. determine the numeracy achievement of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions.

ResearchQuestions

The following research questions were used to guide this study

1. What is the learning engagement level of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instruction?
2. What is the numeracy achievement of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instruction?

Hypotheses

The following hypotheses were formulated and tested at a 0.05 level of significance:

1. There is no significant difference in the learning engagement level of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions.
2. There is no significant difference in the numeracy achievement of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions.

Methodology

This study adopted a quasi-experimental research design to examine the influence of tablet-assisted instruction on learning engagement and numeracy achievement of preschool pupils. The study population comprised 1,200 preschool pupils aged 4 to 6 years enrolled in 12 preschools across Rivers State East Senatorial District. The sample comprised two hundred and twenty (220) preschool pupils drawn from intact classes in selected public preschools within the Rivers State East Senatorial District. A purposive sampling technique was employed to select schools with similar class sizes, learning environments, and access to instructional resources. Within the selected schools, intact classes were used to form the study groups, with 103 pupils in the experimental group receiving tablet-assisted instruction and 118 pupils in the control group receiving conventional teaching. Using intact classes ensured that normal classroom dynamics were maintained and minimized disruption to regular school routines. Data were collected using a Learning Engagement Observation Checklist and a Numeracy Achievement Test (NAT). The observation checklist measured engagement in behavioral, cognitive, and emotional domains, while the NAT assessed foundational numeracy skills such as counting, addition, subtraction, and pattern recognition. Both instruments were validated by experts in early childhood education, and a pilot study involving 30 pupils outside the study sample was conducted to determine reliability. The Cronbach's alpha method was used to establish the internal consistency of the observation checklist, yielding a coefficient of 0.82, while the Kuder-Richardson 21 (KR-21) formula was used to determine the reliability of the Numeracy Achievement Test, yielding a coefficient of 0.88, indicating that both instruments were reliable for the study. The experimental group received tablet-assisted instruction for six weeks, using Lingokids, Endless Numbers, and guided digital exercises aligned with the preschool numeracy curriculum, while the control group continued with standard teaching practices. Pre-tests were administered to establish baseline engagement and numeracy performance, and post-tests were conducted to measure learning gains. Mean, standard deviation, and percentages were used to answer the research questions, and ANCOVA was used to determine significant differences between groups.

Results

Research Question 1: What is the learning engagement level of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instruction?

Table 1: Mean and standard deviation of learning engagement level of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions

Methods		Pre-Engagement	Post-Engagement	Mean Gain
tablet-assisted instruction	Mean	15.5534	29.6699	14.1165
	N	103	103	103
	Std. Deviation	1.80809	4.52745	4.65538
teacher-centered instruction.	Mean	14.5299	19.8120	5.2821
	N	117	117	117
	Std. Deviation	2.76547	5.61852	6.11082

Table 1 indicates that preschool pupils taught using tablet-assisted instruction recorded a mean gain in learning engagement of 14.1165 with a standard deviation of 4.65538, whereas those taught using teacher-centered instruction recorded a lower mean gain of 5.2821 with a standard deviation of 6.11082. The higher mean gain observed for the tablet-assisted instruction group shows a substantially greater improvement in learning engagement from pre-engagement to post-engagement compared with the teacher-centered instruction group. The large difference in mean gain scores suggests that tablet-assisted instruction was more effective in enhancing the learning engagement of preschool pupils than the teacher-centered instructional approach.

Research Question 2: What is the numeracy achievement of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instruction?

Table 2: Mean and standard deviation of numeracy achievement of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions

Methods		Pretest	Posttest	Mean Gain
tablet-assisted instruction	Mean	8.7476	15.5534	6.8058
	N	103	103	103
	Std. Deviation	1.36998	1.80809	2.40937
teacher-centered instruction.	Mean	8.6239	9.5299	.9060
	N	117	117	117
	Std. Deviation	1.42470	2.40536	2.68130

Table 2 indicates that preschool pupils taught using tablet-assisted instruction recorded a mean gain in numeracy achievement of 6.8058 with a standard deviation of 2.40937, whereas those taught using teacher-centered instruction recorded a much lower mean gain of 0.9060 with a standard deviation of 2.68130. The higher mean gain observed for the tablet-assisted instruction group shows a substantially greater improvement in numeracy achievement from pretest to posttest compared with the teacher-centered instruction group. The large difference in mean gain scores suggests that tablet-assisted instruction was more effective in enhancing numeracy achievement than the teacher-centered instructional approach.

Hypothesis 1: There is no significant difference in the learning engagement level of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions.

Table 3: ANCOVA Analysis of significant difference in the learning engagement level of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions

Tests of Between-Subjects Effects

Dependent Variable: Post Engagement

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	5361.234[a]	2	2680.617	101.791	.000	.484
Intercept	2568.255	1	2568.255	97.524	.000	.310
Pre Engagement	38.038	1	38.038	1.444	.231	.007
Methods	4899.532	1	4899.532	186.049	.000	.462
Error	5714.602	217	26.335			
Total	142348.000	220				
Corrected Total	11075.836	219				

a. R Squared = .484 (Adjusted R Squared = .479)

Table 3 reveals an F value of F (1, 217) = 186.049, p = .000 (p < .05) for the effect of instructional method on the posttest learning engagement level of preschool pupils after controlling for pretest engagement scores. This result indicates a statistically significant difference in the learning engagement of pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions. The Partial Eta Squared value of .462 indicates that the instructional strategy had a large effect on preschool pupils' learning engagement.

Hypothesis 2: There is no significant difference in the numeracy achievement of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions.

Table 4: ANCOVA Analysis of significant difference in the numeracy achievement of preschool pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions

Tests of Between-Subjects Effects

Dependent Variable: Posttest

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1987.466[a]	2	993.733	214.656	.000	.664
Intercept	860.039	1	860.039	185.777	.000	.461
Pretest	.017	1	.017	.004	.952	.000
Methods	1983.042	1	1983.042	428.356	.000	.664
Error	1004.584	217	4.629			
Total	36547.000	220				
Corrected Total	2992.050	219				

a. R Squared = .664 (Adjusted R Squared = .661)

Table 4 reveals an F value of F (1, 217) = 428.356, p = .000 (p < .05) for the effect of instructional method on the posttest numeracy achievement of preschool pupils after controlling for pretest scores. This result indicates a statistically significant difference in the numeracy achievement of pupils taught using tablet-assisted instruction and those taught using teacher-centered instructions. The Partial Eta Squared value of .664 indicates that the instructional strategy had a large effect on preschool pupils' numeracy achievement.

Discussion of Results

The findings of this study demonstrate that tablet-assisted instruction substantially enhanced the learning engagement of preschool pupils compared with the teacher-centered instructional approach. As shown in Table 1, pupils exposed to tablet-assisted instruction recorded a markedly higher mean gain in learning engagement than their counterparts taught using teacher-centered methods, indicating a greater improvement from pre-engagement to post-engagement. This descriptive result is further strengthened by the ANCOVA outcome in Table 3, which revealed a statistically significant effect of instructional method on post-engagement scores after controlling for pre-engagement levels. The large effect size (Partial Eta Squared = .462) suggests that the observed difference is not only statistically significant but also educationally meaningful, thereby confirming the effectiveness of tablet-assisted instruction in fostering active engagement among preschool pupils. These findings are consistent with prior empirical evidence emphasizing the role of digital technologies in promoting engagement in early childhood learning contexts. Miller (2018) reported that interactive tablet applications, while yielding mixed results in achievement, significantly supported collaboration and engagement in play-based classrooms. Similarly, Otterborn et al. (2019) observed high levels of learner engagement in preschool settings where tablets were used for problem-solving, creative design, and exploratory activities. Rogowsky et al. (2017) also found that playful learning supported by educational software enhanced active participation and learning outcomes among young children. The present study aligns with these findings by demonstrating that tablet-assisted instruction creates interactive and stimulating learning environments that sustain pupils' attention and involvement.

The findings of this study demonstrate that tablet-assisted instruction significantly enhanced the numeracy achievement of preschool pupils compared with the teacher-centered instructional approach. As indicated in Table 2, pupils taught using tablet-assisted instruction recorded a substantially higher mean gain in numeracy achievement than those taught through teacher-centered methods, reflecting a greater improvement from pretest to posttest. This descriptive evidence is further reinforced by the ANCOVA result presented in Table 4, which revealed a statistically significant effect of instructional method on posttest numeracy achievement after controlling for pretest scores. The large effect size (Partial Eta Squared = .664) indicates that the difference observed is not only statistically significant but also of considerable educational importance, confirming the effectiveness of tablet-assisted instruction in improving preschool pupils' numeracy outcomes. These findings are largely consistent with existing empirical studies that highlight the positive impact of digital and technology-based instruction on early numeracy development. Umoh et al. (2023) found that pupils exposed to computer-assisted instruction achieved significantly higher numeracy performance than those taught using traditional chalk-and-talk methods. Similarly, Papadakis et al. (2018) reported that tablet-assisted instruction produced superior numeracy outcomes compared with both personal computer–based and conventional instructional approaches. Lee and Choi (2020) also demonstrated that tablet-based mathematics games significantly improved early numeracy skills, particularly in core areas such as number identification, quantity discrimination, addition, and subtraction. At a broader level, the meta-analysis by Juhaevah et al. (2025) supports the general effectiveness of educational media in enhancing early numeracy skills, although it suggests that computer-based instruction may be more effective than tablet-based approaches in certain contexts. In contrast to this nuanced finding, the present study provides strong empirical evidence that tablet-assisted instruction, when appropriately integrated into preschool classrooms, can yield substantial gains in numeracy achievement beyond those achieved through teacher-centered instruction alone.

Conclusion

The results of this study show that tablet-assisted instruction is highly effective in improving both learning engagement and numeracy achievement among preschool pupils. Children who participated in tablet-based lessons demonstrated significantly higher gains in engagement and numeracy compared with those taught using traditional teacher-centered methods. The statistical analyses further confirmed that these differences were significant and meaningful, highlighting the strong impact of technology-enhanced learning in early childhood classrooms. In summary, the findings suggest that incorporating tablets into preschool teaching not only captures pupils' attention but also supports deeper understanding and mastery of basic numeracy concepts.

Recommendations

Based on the study's findings, the following recommendations are proposed:

1. Preschool teachers should incorporate tablet-based instructional activities into their daily lessons to boost engagement and learning outcomes.
2. Professional development programs should be provided to equip teachers with the skills needed to effectively use tablets and educational applications.
3. Schools should ensure that tablets, relevant educational software, and supporting materials are readily available for classroom use.
4. Tablet-assisted activities should be carefully aligned with preschool numeracy objectives to maximize learning relevance and effectiveness.

5. Teachers should regularly monitor pupils' engagement and numeracy performance to track progress and refine teaching strategies.
6. Education authorities should encourage and support the use of digital tools in early childhood education, recognizing their potential to enhance both engagement and foundational numeracy skills.

References

Adedigba, O. (2023). Enhancing numeracy instruction through games in pre-primary classrooms. *Journal Of Teaching And Learning In Elementary Education*, *6*(1), 96-110.

Anggun, M. S., Fakhruddin, F., Arbarini, M., Subali, B., & Widiarti, N. (2025). Implementing Creative Learning with Technology to Improve Literacy and Numeracy in Primary Schools. *Journal of Innovation and Research in Primary Education*, *4*(3), 430-437.

Bergdahl, N., & Bond, M. (2022). Negotiating (dis-) engagement in K-12 blended learning. *Education and Information Technologies*, *27*(2), 2635-2660.

Juhaevah, F., Tahmir, S., & Talib, A. (2025). The effect of learning media on students' early numeracy skills: Meta-analysis. *Journal of Mathematics and Science Teacher*, *5*(2), 1-12

Lee, H. K., & Choi, A. (2020). Enhancing early numeracy skills with a tablet-based math game intervention: A study in Tanzania. *Educational Technology Research and Development*, *68*(6), 3567-3585.

Miller, T. (2018). Developing numeracy skills using interactive technology in a play-based learning environment. *International journal of STEM education*, *5*(1), 39.

Onuegbu, C., Kalu, E. P., Akibu, E. O., Evelyn, U., & Seraphine, O. (2025). Digital Technology Use among Preschool Children in Ondo State: Types and Extent. *International Journal of Home Economics, Hospitality and Allied Research*, *4*(1), 147-164.

Otterborn, A., Schönborn, K., & Hultén, M. (2019). Surveying preschool teachers' use of digital tablets: general and technology education related findings. *International journal of technology and design education*, *29*(4), 717-737.

Papadakis, S., Kalogiannakis, M., & Zaranis, N. (2018). The effectiveness of computer and tablet assisted intervention in early childhood students' understanding of numbers. An empirical study conducted in Greece. *Education and Information Technologies*, *23*(5), 1849-1871.

Rogowsky, B. A., Terwilliger, C. C., Young, C. A., & Kribbs, E. E. (2018). Playful learning with technology: the effect of computer-assisted instruction on literacy and numeracy skills of preschoolers. *International Journal of Play*, *7*(1), 60-80.

Umoh, I. G., Muhammad, A. S., Madu, I. G., & Enewan, E. U. (2023). Effect of Digital Media on Acquisition of Numeracy Skills among Preschoolers in North-East Senatorial District of Jigawa State, Nigeria. *African Journal of Humanities and Contemporary Education Research*, *12*(1), 222-236.

Wong, Z. Y., & Liem, G. A. D. (2021). Student engagement: Current state of the construct, conceptual refinement, and future research directions. *Educational Psychology Review*, *34*(1), 1–32.

Xu, X., Shi, Z., Bos, N. A., & Wu, H. (2023). Student engagement and learning outcomes: an empirical study applying a four-dimensional framework. *Medical Education Online*, *28*(1), 2268347.

The Impact of Social Media Addiction on Academic Performance of Students of Delta State Polytechnic, Otefe-Oghara

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Abstract

The study ascertained the rate at which the different social media platforms trigger addictiveness among students in Delta State Polytechnic, Otefe-Oghara (DSPT). The study was anchored on the Uses and Gratifications Theory. The research design used in this study was the survey design. The instrument for data collection was questionnaire on the impact of social media addiction on academic performance. The study area was Delta State Polytechnic, Otefe-Oghara. The population of the study comprised students of Delta State Polytechnic, Otefe-Oghara which was put at 7600 from which the sample size of 380 was determined. A total of 380 questionnaires were distributed to the respondents, out of which 350 (92.1%) were duly returned while 30 (7.9%) were not returned. The 350 questionnaires retrieved were analyzed using descriptive statistics such as frequencies and percentage. Findings from the study showed that most of the respondents make use of WhatsApp and Facebook more and barely visited Twitter (X) and YouTube. The study also revealed that social media addiction was an obvious factor affecting academic performance; thus, poor academic performance could be attributed to social media addiction. It was recommended therefore that students should make efforts on their own to reduce the amount of time spent on social activities via the social media network and make use of the technology for the purpose of learning and research.

Keywords: Social media, social media addiction, academic performance, students, Polytechnic, Netizens

Introduction

The emergence of social media or social network is believed to have been made possible as a result of technological advancement. Social networks are a group of websites and applications that enable individuals and communities to connect, discuss and trade information, and/or develop and distribute products. Today, thanks to the rapid growth of technology and the common uncomplicated access to cell phones, the use of social networks has been rising rapidly. Among the most widely used social media platforms are Instagram, Telegram, Facebook, Twitter, Skype, and WhatsApp (Salari et al., 2025).

The usage of social media by the younger generation has grown commonplace. With the introduction of the internet in the 1990s, social networking sites (SNSs) came into existence. Since then, social media use has grown significantly around the globe (Aku and Omale, 2020). Social media gives platform to promote communication between individuals irrespective of time, distance and place. Gradually but surely, people could now speak with other people from the comfort of their homes and receive feedback promptly. In recent years, it has been suggested that social networking sites (SNSs) like WhatsApp, Facebook, Telegram, Instagram, Twitter (now X), YouTube, etc. promote communication (Nwokoro et al., 2023). Social media, vital to contemporary life, offers major connection and entertainment benefits. However, its widespread usage has led to social media addiction, especially among teens who use it both inside and outside of the classroom (Amirthalingam and Khera, 2024). The omnipresent social media platforms and the easy access to the Internet bring about the possibility for social media addiction, namely, the illogical and excessive use of social media to the degree that it interferes with other parts of daily life (Griffiths, 2012 quoted in Hou et al., 2019). Despite social media's negative effects, kids can use it to gain important information and social skills (Aku and Omale, 2020).

Social media addiction and the huge distraction that comes with it, is likely to be one of the greatest adverse effects of social media within the academic space. Social media addiction can be viewed as one form of Internet addiction, where individuals exhibit a compulsion to use social media to excess (Starcevic, 2013). Understanding the causes, consequences, and remedies of social media addiction is thus of paramount importance (Hou et al., 2019). The lack of discipline and self-control in the use of social media is what results in social media addiction after some period of time. This is exhibited in the misuse of productive hours (time) for surfing the Internet and chit-chatting. Social media addiction has been described to be characterized by excessive screen usage, obsessive monitoring, and harmful consequences on real-life relationships and duties (Amirthalingam and Khera, 2024). The negative effects of social media addiction have been perceived to become grossly overwhelming among students in both secondary and tertiary institutions globally. As a result, social media now tends to contribute to poor academic performance of students. A good number of students in tertiary institutions end up becoming victims of the snare of social media which puts them at a disadvantage position in the quest for good and enviable academic achievements. The distraction that comes with social media addiction causes its users who in this case are students, to barely concentrate on academic activities (such as reading, studying, attending lecturers, doing assignments), meant to culminate in academic excellence. The positive use of social media to boost academic performance among students in tertiary institutions have eventually failed woefully, as students become overwhelmed with social media use, leading to social media addiction. It holds therefore that a good number of academic failure in tertiary institutions can be traced to over-use and addiction to social media platforms and social network sites. This calls for urgent need on the causes and effects of social media addiction in the academic performance of students; hence need for this study.

According to Wukich (2022), referenced in Okeya-Olayinka and Martins-Adediran (2025), social media refers to new media that are characterized by interactive participation. Social networks are a set of websites and applications that enable individuals and communities to connect, discuss and exchange information, and/or develop and share items (Salari et al., 2025). Social media is used to foster interpersonal relationships. With their support, individuals can speak with each other, even on other continents, listen to music, read books, look at images and much more (Aku and Omale, 2020). Social media are online technological platforms that serve to link people together far and near and establish interaction among people. Social media allows us to read books, listen to music, examine pictures, and communicate with one other even when we are on different countries. According to Nwokoro et al. (2023), social media is a type of modern communication technology that is used through the internet and some websites that are connected to it. This technology has made it easier for people to engage with each other and share ideas and information, especially among students, businesspeople, and the general public. Additionally, social media is described as a platform facilitating user contact and engagement (Lin, 2022 referenced in Okeya-Olayinka and Martins-Adediran, 2025).

According to Aichner et al. (2021), cited in Okeya-Olayinka and Martins-Adediran (2025), social media encompasses a wide range of online platforms, such as blogs, business networks, collaborative projects, enterprise social networks, forums, microblogs, photo sharing, product reviews, social bookmarking, social gaming, video sharing, and virtual worlds. According to Talaue et al. (2018 referenced in Aku and Omale, 2020), social media are online technological platforms that enable to bring people together far and near. Every user can manipulate a full conversation through their digital devices thanks to this net-based technology, which makes use of both web and mobile technology. Addiction to social networks involves excessive usage of these networks and lack of control that adversely impacts the lives of students (Khormi, 2016 cited in Salari et al., 2025). "Social media addiction is the obsessive use and focus on social media websites and apps, even though the use causes negative consequences like relationship issues, anxiety, and low self-esteem," according to Hilliard (2025). Amirthalingam and Khera (2024) observed that “Social media addiction is increasingly acknowledged as a significant factor impacting mental health. Prolonged use of these platforms has been associated to heightened levels of anxiety and depression, particularly among teenagers and young adults”.

According to Viola (2024), social media addiction is a collection of uncontrollable, impulsive, and harmful actions brought on by continuous use of social media in spite of recurrent bad outcomes. Furthermore, social media addiction is a behavioral addiction that is typified by excessive concern for social media, an insatiable desire to use or log on to social media, and spending so much time and energy on social media that it interferes with other crucial aspects of life (Hilliard, 2025). Social media addiction is defined as the compulsive usage of social media sites that presents itself in behavioral addiction symptoms (Idiedo and Eyaufe, 2023) Academic performance refers to the degree to which students fulfill their short- or long-term educational objectives (Sumi and Sonumol, 2018 cited in Okeya-Olayinka and Martins-Adediran, 2025). Academic performance fluctuates with several conditions. Decreased academic performance is one of the most important outcomes of social network addiction for students (Upadhyay and Guragain, 2017 cited in Salari et al., 2025). Academic performance is described as a multidimensional concept that includes a learner's abilities, attitudes, and behaviors that affect academic achievement in the classroom in a different study by Okeya-Olayinka and Martins-Adediran (2025).

This study was anchored on the Uses and Gratifications Theory. A method for comprehending why and how people actively seek out particular media to fulfill particular needs is called Uses and Gratification Theory (UGT). In response to conventional mass communication research that focused on the sender and the message, Blumler and Katz created it in the 1970s. UGT also termed functional theory is concerned with the social and psychological genesis of wants which generate expectation of the mass media which leads to diverse patterns of media exposure, resulting in need gratifications and other repercussions, generally unintentional ones (Katz et al., 1974). The needs of the audience dictate these uses (media exposure) and fulfillment (benefits). Uses and Gratifications Theory say that a medium or a message is a source of influence within the context of other possible influences. Rosengren and Egbert (2011) says that individual differences influence media effects. People choose media content and the channels purposively, with which they can associate easily and it is in response to their expectations and desires. Uses and Gratifications studies have delved deep into motives for using social media platforms and the effects associated with it. During the process of cultivation, audiences are also satisfying their needs and desires of communicating, socializing, being entertained, informed and having fun. Researchers have argued that gratification affects social behavior, psychological behavior, motivation, attitudes and activity. Hence, due to the expected need that netizens (who are students) desire to meet, they engage social media platforms. The implication of this theory holds that the addiction to social media has the ability to alter the involvement in academic activities; thus, if students of Delta State Polytechnic, Otefe-Oghara become addicted to social media platforms, it will result in decline in academic activities and academic performance.

Statement of The Problem

Overtime, the means of communication has transformed people’s living state of affairs and improvements in technology have made it an intriguing field to investigate (Nwokoro et al., 2023). The use of social media platforms and applications are characterized with online access for both young and old. Notably, some benefits associated with the use of social media include quick access to information at real-time and easy communication with people. However, there are also certain limitations that characterize social media use in both the academic and non-academic environment.

The rise of social media has altered worldwide communication, establishing a "Global village." However, concerns have been expressed concerning its impact on pupils' academic achievement (Opeyemi, 2023). A major worry in social media use is depicted in its addiction.

Individuals with social media addiction are typically extremely concerned about social media and are motivated by an uncontrolled impulse to log on to and utilize social media (Andreassen and Pallesen, 2014 cited in Idiedo and Eyaufe, 2023). Social networking among students has grown in popularity over time. It is a means to create relationships, not only on campus but with people outside of school. Due to the increased popularly of it, scholars are questioning whether grades of students will not be affected by how much time is spent on these sites; hence, this study.

Objectives of The Study

The following objectives guided the study:

1. To find out the level of social media use and addiction among DSPT students
2. To ascertain the rate at which the different social media platforms trigger addictiveness among DSPT students
3. To determine the extent to which social media addictive use affect DSPT students' academic performance

Research Questions

The following research questions were formulated from the objectives to guide the study:

1. What is the level of social media use and addiction among DSPT students?
2. What is the rate at which the different social media platforms trigger addictiveness among DSPT students?
3. To what extent does social media addictive use affect DSPT students' academic performance?

Methodology

The research design used in this study was survey design. The instrument of data collection for the study was questionnaire on the impact of social media addiction on academic performance. The study area was Delta State Polytechnic, Otefe-Oghara. The population of the study comprised students of Delta State Polytechnic, Otefe-Oghara which was put at seven thousand six hundred (7600) from which the sample size was determined.

To determine the appropriate sample size, Taro Yamane sample determination formula was deployed thus:

$$\mathrm{n} = \frac{\mathrm{N}}{1 + \mathrm{N(e)}^2}$$

Where: n = sample size
N = Population of the study (7600)
e = level of significance (5% or 0.05)
1 = Constant

$$n = \frac{7600}{1 + 7600\ (0.5)^2}$$

$$n = \frac{7600}{1 + 7600\ (0.0025)}$$

$$n = \frac{7600}{1 + 19}$$

$$n = \frac{7600}{20}$$

$$n = 380$$

Therefore, n = 380. Thus, the sample size was 380. Data collected was analyzed by use of simple percentage and presented in tables for easy presentation and analysis.

Data Presentation and Analysis

A total of 380 questionnaires were distributed to the respondents (students of Delta State Polytechnic, Otefe-Oghara), out of which 350 (92.1%) were duely returned while 30 (7.9%) were not returned. The 350 questionnaires retrieved were used as basis of analysis for this study.

Table 1: Social media platforms made use of mostly

Social Media Platforms	Frequency	Percentage (%)
Facebook	105	30
WhatsApp	100	28.6
Instagram	25	7.1
Twitter (X)	19	2,9
TikTok	90	25.7
YouTube	20	5.7
Total	350	100

Table 1 showed the degree of social media use among the sampled respondents out of which 105(30%) agreed that they used Facebook mostly, 100(28.6%) said WhatsApp, 25(7.1%) said Instagram, 10(2.9%) Twitter, 90(25.7%) TikTok and 20(5.7%) YouTube. Thus, most of the respondents make use of WhatsApp and Facebook more and barely visited Twitter (X) and YouTube.

Table 2: The level of social media platforms positive impact on academics

Social Media Platforms	Frequency	Percentage (%)
Facebook	45	12.8
WhatsApp	210	60
Instagram	16	4.6
Twitter (X)	22	6.3
TikTok	17	4.9
YouTube	40	11.4
Total	350	100

Table 2 showed the level of positive impact of social media platforms on the academics of the respondents (students of Delta State Polytechnic, Otefe-Oghara). Result from the table showed that 45(12.8%) of the entire sampled respondents stated that Facebook had positive impact on their academics, 210(60%) chose WhatsApp, 16(4.6%) chose Instagram, 22(6.3%) chose Twitter (X), 17(4.9%) chose TikTok while 40(11.4%) chose YouTube. Thus, majority of the respondents (60%) revealed that WhatsApp had more positive impact on their academics than Facebook, Instagram, Twitter (X), TikTok and YouTube.

Table 3: The level of addiction of social media platforms to the detriment of academic pursuit

Social Media Platforms	Frequency	Percentage (%)
Facebook	54	15.43
WhatsApp	61	17.4
Instagram	49	14
Twitter (X)	36	10.3
TikTok	102	29.14
YouTube	48	13.7
Total	350	100

Table 3 showed the level of addiction to the outlined social media platforms even to the detriment of the respondents' academic pursuit. From the table, it showed that 54(15.4%) of the total respondents insisted that they were more addicted to Facebook, 61(17.4%) said WhatsApp, 49(14%) said Instagram, 36(10.3%) said Twitter (X), 102(29.14%) said TikTok while 48(13.7%) said YouTube. Thus, majority of the respondents (29.14%) were of the opinion that addiction to TikTok use was more detrimental to their academic pursuit.

Table 4: The adverse effects of addiction to social media platforms on academic performance

Options	Frequency	Percentage (%)
Yes	329	94
No	21	6
Total	350	100

Table 4 showed that 329(94%) of the total respondents are aware of the adverse effects of social media addiction on academic performance of students while 21(6%) are of a contrary response. Thus, majority of the respondents (94%) agreed that addiction to social media platforms can affect academic performance.

Table 5: Attribution of poor academic performance to basically social media addiction

Options	Frequency	Percentage (%)
Yes	190	54.3
No	160	45.7
Total	350	100

Table 5 showed that 190(54.3%) of the total respondents attribute poor academic performance to basically social media addiction while 160(45.7%) are of the contrary opinion. Thus, majority of the respondents (54.3%) ascertained that social media addiction results in poor academic performance.

Discussion of Findings

From the analysis and interpretation of data above, the following findings were made.

From the study, it showed that most of the respondents make use of WhatsApp and Facebook more and barely visited Twitter (X) and YouTube. This result is consistent with studies done by Nwokoro et al. (2023) in which it was asserted that many parents and guardians are worried that students are spending too much time on Facebook and other social media sites and consequently do not have enough time to study. Similarly, findings from the study by Idiedo and Eyaufe (2023) is consistent with those of the present study. The study found that WhatsApp, Facebook, YouTube and Twitter are the commonly used social media tools by the students in Nigerian universities. The students mostly used the social media tools for the purpose of entertainment, fun and social communications. Also, result from study by Opeyemi (2023) was found to be consistent with those from the present study.

The findings highlight the diverse range of social media platforms used by individuals, with Facebook and WhatsApp being the most prominent choices. Results from the study is in line with studies conducted by Salari et al. (2025). According to the study, social networks provide students with numerous opportunities to improve learning and access to the latest information through communication with groups and other educational systems. Social networks can play a positive role in students' learning and academic performance improvement by: reducing barriers to communication and group interaction, supporting participatory learning activities, supporting active and social learning, encouraging self-study, increasing learning motivation, and increasing students' interaction with each other and with educators. Another study carried out by Aku and Omale (2020) had results consistent with those obtained in the present study. The results revealed that social media does not always affect students' academic performance negatively but positively. Similarly, Lambi (2016 cited in Idiedo and Eyaufe, 2023) argues on the benefits of Facebook use on academic performance when used for educational purposes.

Findings from the above table tallies with study done by Idiedo and Eyaufe (2023) in which it was highlighted that "it is crucial to consider the learning environment and what habits are being developed as students adjust to studying at home. Thus, educators need to explore the implications of distracting environments in online learning to develop supportive study habits rather than behaviors that are detrimental to learning". Similarly, study by Valkenburg and Peter (2011) supported result from the present study. According to the result, "the most common ways that teenagers engage in social media platforms include activities such as endless scrolling, reacting to posts, and direct messaging in a digital environment. Teenagers often spend an average of two to four hours per day engaged in various social media platforms, with many recognizing significant disruptions to their daily routines due to online interactions. Furthermore, study by Mashi et al. (2023) submitted to the results from the present study. Research findings from the study showed that a large number of students in Katsina state, are addicted to social media. The study revealed that the students' addiction to social media is high, and distraction it causes is great even though the number of hours spent is less while the report from respondent show that even with the engagement in social media the higher number of students grade is not affected.

Result from the study showed that 329(94%) of the total respondents are aware of the adverse effects of social media addiction on academic performance of students while 21(6%) are of a contrary response. This result aligns with studies conducted by Adebiyi et al. (2015 cited in Aku and Omale, 2020) on the role of attention deficit, predictors of behavior and academic competence in understanding the relationship between online social networking and students' academic performance among Covenant University undergraduates students, it was discovered that the prevalence and continuous engagement of online social networking services by the students' population group continued to be on the increase, thereby impacting negatively on their academic performance.

Similarly, Asemah et al. (2013), conducted a research titled "influence of social media on academic performance among undergraduate students of Kogi State University Anyigba Nigeria." They concluded that the exposure to social media by undergraduate students of the University is high and this has negative effect on their performance. Furthermore, study done by Lau (2017 cited in Idiedo and Eyaufe, 2023) found that whereas using social media for academic purposes did not predict academic performance indexed by the cumulative grade point average, using social media for non-academic purposes (e.g. video gaming) and social media multitasking negatively predicted academic performance.
Another study by Opeyemi (2023), revealed a significant difference in students' views on the impact of social media on their academic performance. 46.0% believe social media usage negatively impacts their academic achievements, while 54.0% disagree. This suggests a complex relationship between social media usage and academic outcomes. The study calls for further research and tailored interventions to mitigate potential drawbacks and enhance educational outcomes.

Result from the study also showed that 190(54.3%) of the total respondents attribute poor academic performance to basically social media addiction while 160(45.7%) are of the contrary opinion. This result is in line with studies conducted by Salari et al. (2025) in which it was highlighted that there has been a significant surge in the adoption of social networks by different groups over the past decade and students are no exception. These networks create several opportunities for university students, yet they pose a number of threats. Excessive use of social networks can lead to addiction to these networks and can affect students' academic performance. Another study conducted by Iro-Idoro and Jimoh (2017) had results in line with findings from the present study. Findings from the study revealed that participation in social media impairs dedication of students to academic activities and that it has negative effect on students' academic performance. Furthermore, study by Okeya-Olayinka and Martins-Adediran (2025) revealed that social media usage and lack of sleep have a combination or joint unfavorable influence on undergraduate students' academic performance. The findings from the above study were in line with those from the present study. Similarly, study done by Hou et al. (2019) disagreed with results from the present study. The result revealed that social media addiction was negatively associated with the students' mental health and academic performance and that the relation between social media addiction and mental health was mediated by self-esteem.

Conclusion

Social media have become very popular in recent years, this may be attributed to increasing proliferation and affordability of internet enabled devices such as personal computers, mobile devices and tablets. Social media have exerted its powerful influence in the way its users thinks and acts. This is so because the media have the capability of influencing its users. A direct relationship exists between social media and students' academic performance in tertiary institutions. With so many networking sites displayed on the internet, students are tempted to abandon their homework and reading time in preference for chatting online with friends.

This has made students addicted to the online rave of the moment with Facebook, WhatsApp, Twitter, etc. It holds therefore that the over-use of and addiction to social media should be discouraged among students by lecturers, parents and guardians and that social media platforms should be optimally used for academic purposes rather than chit-chatting.

Recommendations

The following are recommendations as proffered by the Researcher:

1. Channeling assignments or discussions on the most used social media platforms such as Facebook, Instagram and WhatsApp should be made compulsory by the polytechnic management.
2. Students should make efforts on their own to reduce the amount of time spent on social activities via the social media network and make use of the technology for the purpose of learning and research.
3. College Deans or heads of departments should organize seminars to further enlighten and encourage lecturers and students to continue the use of social media platforms for better academic performance.

References

Adebiyi, A., Akinbode, M., Okuboyejo, S., Agboola, G. and Oni, A. (2015). Social Networking and Students' Academic Performance: the Role of Attention Deficit, Predictors of Behavior and Academic Competence**.** *International Conference on African Development Issues* (CU-ICADI) 2015: Information and Communication Technology Track.

Aichner, T., Grunfelder, M., Maurer, O. and Jejeni, D. (2021). Twenty-five years of social media: A review of social media applications and definitions from 1994 to 2019. Retrieved from https://10.1089/cyber.2020.0134

Aku, C.A. and Omale, B.O. (2020). Effect Of Social Media On The Academic Performance Of Office Technology And Management Students Of Kaduna Polytechnic, Nigeria. *Nigerian Journal of Business Education (NIGJBED);* 7(2): 185-196.

Amirthalingam, J. and Khera, A. (2024) Understanding Social Media Addiction: A Deep Dive. *Cureus;* 16(10): e72499. DOI 10.7759/cureus.72499

Andreassen, C.S. and Pallesen, S. (2014). Social network site addiction-an overview. *Current Pharmaceutical Design*, 20, 4053–4061.

Asemah, S., Okpanachi, R.A. and Edegoh, L.O.N. (2013). Influence of social media on the academic performance of the undergraduate students of Kogi State University, Anyigba, Nigeria. *Journal of Humanities and Social Sciences*, 3(12): 90-96.

Griffiths, M.D. (2012). Facebook addiction: Concerns, criticism, and recommendations: A response to Andreassen and colleagues. *Psychological Reports, 110*, 518–520. https://doi.org/10.2466/01.07.18.PR0.110.2.518-520

Hilliard, J. (2025). Social Media Addiction: Recognize the Signs. Retrieved from https://www.addictioncenter.com/behavioral-addictions/social-media-addiction/

Hou, Y., Xiong, D., Jiang, T., Song, L. and Wang, Q. (2019). Social media addiction: Its impact, mediation, and intervention. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *13*(1), Article 4. https://doi.org/10.5817/CP2019-1-4

Idiedo, V. and Eyaufe, O.O. (2023). Social media addiction and effect on academic performance among library and information science students in universities in Nigeria. *Journal of Library Services and Technologies, 5*(2), 53–71.

Iro-Idoro, C.B. and Jimoh, T.A. (2017). Social Media Use among Students of Federal Polytechnic Ilaro, Ogun State, Nigeria: Implication on Academic Performance. *IOSR Journal Of Humanities And Social Science (IOSR-JHSS);* 22(4): 59-66.

Katz, E., Blumler, J.G. and Gurevitch, M. (1973-1974). Uses and Gratification Research. *Public Opinion Quarterly. 37* (4), 509-523. https://doi.org/10/086s/268109.

Khormi, S. (2016). Addiction to social media among students at Jazan University. *Int. Acad. Sci. Res.,* 4 (4): 176–180.
[
Lambi, C.D. (2016). Correlation between Facebook use for educational purposes and academic performance of students. *Computers in Human Behavior*, 61, 313–320.

Lau, W. W. (2017). Effects of social media usage and social media multitasking on the academic performance of university students. *Computers in Human Behavior*, 68, 286–291.

Lin, Y. (2022). Social media for collaborative planning: A typology of support functions and challenges. *Cities*, 125, 103641.

Mashi, A.S., Abdulrahman, A. and Yahaya, A. (2023). The Impact Of Social Media On Academic Performance Of Students Of Tertiary Institutions In Katsina State, Nigeria. *Int. J. Innovative Info. Systems & Tech. Res.,* 11 (2):24-32.

Nwokoro, A.S., Ibe, N.G.A. and Kanu, E.C. (2023). Impact Of Social Media On Students' Academic Performance: A Study Of Students Of Federal Polytechnic, Ugep, Cross River State. *Journal of the School of General and Basic Studies;* 8(1): 33-44.

Okeya-Olayinka, A.O. and Martins-Adediran, B. (2025). Social Media Use and Sleep Deprivation on Academic Performance of Undergraduate Students in Nigeria. *AU Journal of Business and Social Sciences (AUJBSS);* 5(1): 97-113.

Opeyemi, A.A.F. (2023). Effect Of Social Media On Students' Academic Performance: A Case Study Of The Oke-Ogun Polytechnic, Saki, And Federal Polytechnic, Ilaro. *International Research Journal of Modernization in Engineering Technology and Science;* 5(9): 571-584.

Rosenberg, J. and Egbert, N. (2011). Online impression management: Personality traits and concerns for secondary goals as predictors of self-presentation tactics on Facebook. *Journal of Computer-Mediated Communication, 17,* 1–18. https://doi.org/10.1111/j.1083-6101.2011.01560.

Salari, N., Zarei, H., Rasoulpoor, S., Ghasemi, H., Hosseinian-Far, A. and Mohammadi, M. (2025). The impact of social networking addiction on the academic achievement of university students globally: A meta-analysis. *Public Health in Practice;* 9(2025) 100584.

Starcevic, V. (2013). Is Internet addiction a useful concept? *Australian and New Zealand Journal of Psychiatry*, 47, 16–19. https://doi.org/10.1177/0004867412461693i

Sumi, R. and Sonumol, R. (2018). Effect of sleep deprivation on the academic performance and cognitive functions among the college students: A cross-sectional study. *Journal of Halmeda Anand Rao Institute of Medical Sciences*, 14(2).

Talaue, G.M., AlSaad, A. AlRushaidan, N., AlHugail, A. and AlFahhad, S. (2018). The impact of social media on academic performance of selected college students. *International Journal of Advanced Information Technology* (IJAIT) 8 (4/5).

Upadhayay, N. and Guragain, S. (2017). Internet use and its addiction level in medical students. *Adv. Med. Educ. Pract.*, 8: 641.

Valkenburg, P.M. and Peter, J. (2011). Online communication among adolescents: an integrated model of its attraction, opportunities, and risks. *J Adolesc Health*, 48:121-7. 10.1016/j.jadohealth.2010.08.020

Viola, J.C. (2024). Social media addiction | Research Starters | EBSCO Research. Retrieved from https://www.ebsco.com/research-starters/health-and-medicine/social-media-addiction

Wukich, C. (2022). Social media engagement forms in government: A structure-content framework. *Government Information Quarterly*, 39(2), 101684.

Utilization of Workshop and Equipment for Students Craft Work in Teaching of Basic Technology in Junior Secondary Schools in Port Harcourt Metropolis, Rivers State, Nigeria.

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Abstract

This study examined the utilization of workshop and equipment for student's craft work in teaching of Basic Technology in Junior Secondary Schools in Port Harcourt Metropolis, Rivers State, Nigeria. The study adopted the descriptive research survey design. The population of the study was 270 Basic Technology teachers in Port Harcourt Metropolis in public schools. The population of 270 teachers was also used as the sample size to ensure generalization since the population was not a large one. The instrument for data collection was a self-made questionnaire titled "Utilization of Workshop and Equipment for Students Craftwork in Teaching Basic Technology (UWESCWTBT)". The instrument was structured on a four point likert scale. The instrument was validated by three experts in Measurement and Evaluation Department, Uniport. A reliability coefficient of 0.80 was obtained using Cronbach Alpha method via SPSS (Statistical Package for Social Science) software. The study further revealed that workshops are not available for the teaching of craft work in Basic Technology in public Junior Secondary Schools in Port Harcourt Metropolis. Also, the study further revealed that workshop equipments are available for the teaching of craft work in Basic Technology in Public Junior Secondary Schools in Port Harcourt Metropolis of Rivers State.

Keywords: Utilization, Workshop and Equipment, Students Craft Work.

Introduction

Basic education is the foundation that develops a student's vocational and technical skill. The basic technology curriculum inculcates the development of student's vocational and technical stills in woodwork, metal work, technical drawing, first aid treatment, etc. Ugwu (2017) observed that the future of any nation lies on the skills, knowledge and abilities of her citizens that are expected to be acquired from junior secondary schools, senior secondary schools and technical education offered in technical institutions. In recent years, there have been discussions and debates on the falling standard of education. The blame has always been on teachers, parents and students. In spite of the contributions of teachers, parents and even the students towards the failing standard of education in Nigeria, research have also found that lack of utilization of workshop and equipment for student's craft work is also a potent factor. Workshop building and equipment are important for the teacher to enhance teaching and learning of craft work by students in schools.

The workshop building and equipment as defined by Abdu-Raheem (2016) as an essential building and significant tools needed for teaching and learning of craftwork, in school which promotes teachers' efficiency and improve students' performance. According to Ogbu (2015), utilization of instructional facilities is the process of using procured and accessible facilities, tools, components, equipment and appliances to make teaching and learning process easier, interesting and rewarding. Gujjar, Khan, Baig, Ramzan and Saifi (2019) were of the opinion that the proper utilization of instructional and physical facilities would improve the performance and output of students in junior (basic secondary school. It is therefore presumed that the adequate utilization of instructional facilities (workshop & equipment) in the teaching and learning of craft work would improve the performance an output of the student in junior secondary school. This will make them relevant competent in their chosen vocation with little or no need for pre-employment training. Nwadiani and Ugolo (2022) noted that teaching and learning facilities constituted one of the major factors contributing to students' academic achievement which is a measure of the extent to which a student has performed in a particular set of tasks that have been taught and practiced. It is commonly measured by examination or continuous assessment. Utilization of workshop and equipment for craft work by students are essential for enhancing teaching and learning because they provide means of widening students' learning experience, expose students to a wide range of learning activities, increase the efficiency of the teacher by providing tutorials and response guidance for individual students and small groups.

They also facilitate increased interest in learning; hold learners' attention, provide opportunities of interacting with the social and physical environment and promote knowledge gathering (NTI Manstal, 2016). The use of workshop facilities/equipment is necessary for building students' knowledge in craft work more especially in woodwork, metal work, electrical/electronic work, among students in the junior secondary schools. It is perceived that students in junior public schools sometime find it difficult to comprehend immediately what is being taught by the teacher due to non-utilization of workshop facilities/equipment to convey the concept and topics taught to the learners. It is imperative to assert that utilization of workshop facilities/equipment in public junior secondary schools is important.

One of the most widely used measures in educational research and practice is retention and dropout, typically defined as a two side of the same coin. Student's retention and dropout is a major concern for educational institution around the world. It is not only a problem for educational institutions but has a direct link to the social, economic and political growth of a country, for which educational institutions provides strong foundation. According to Astin (2014) defines retention as staying in school until completion of an academic programme and dropping out as leaving school prematurely. Student's retention indicates how well a school ensures academic success or completion. Therefore, the function of technology teachers is to ensure students acquire requisite skills while undertaking craft and handwork subjects to instill in them skills for higher education and self-reliance even after junior secondary education, Mbazu (2024). The successful implementation of any academic programme greatly depends on the utilization of resources, therefore, their presence are good predictors of a well facilitated and effective programme. In this regard, Offorma (2020) disclosed that teaching is usually facilitated, and it is more effective when there is active participation of the learners and utilization of appropriate teaching materials. Instructional resources and environment of study place an important role to learners when it has to do with technological and scientific subject. Zhou & Bity (2024), Motivation by the use of instructional resources in teaching spurs up interest of learners thereby achieving maximum success in teaching and learning.

The use of instructional materials/resources changes the behavior of learners, promoting better learning outcome and creating a conducive learning environment, Aneke (2021). The active participation of the learner is facilitated by the availability and effective utilization of resource materials for effective teaching in public junior secondary schools in Port Harcourt, Rivers State. It is against this background that the researcher hopes to find out the extent of utilization of workshop and equipment for student craft work in teaching of Basic Technology in Junior Secondary Schools in Port Harcourt Metropolis, Rivers State, Nigeria.

Statement of the Problem

There cannot be effective teaching and learning of craft work in Basic Technology without the use of workshop and equipment. In order for the students to acquire the needed knowledge and skills, they must be taught in the right environment and equipment, they will find in the industries and also to effectively demonstrate such knowledge and skills which they are being trained. Though, workshops and equipment are lacking in most public junior secondary schools, their utility by teachers has also been questionable.

This is in variance with the National Policy on Education (FRN, 2013), where it was categorically stated that learning experiences for children shall be made more meaningful with the provision and effective use of innovative materials in schools. These innovative materials are broad-based instructional materials needed for teaching-learning process in public junior secondary schools. It is against this background that the researchers' hope to assess the utilization of workshop and equipment for student's craft work in teaching of basic technology in junior secondary schools in Port Harcourt Metropolis, Rivers State, Nigeria.

Purpose of the Study

The study is aimed at ascertaining the utilization of workshop and equipment for student's craft work in teaching of basic technology in junior secondary schools in Port Harcourt Metropolis, Rivers State. Specifically, the study was to:

(1) Examine the extent workshops are available for the teaching of craftwork in basic technology in city areas in public junior secondary schools in Port Harcourt Metropolis, Rivers State.
(2) To ascertain the availability of workshop equipment for the teaching of craftwork in basic technology in city areas in public junior secondary schools in Port Harcourt Metropolis, Rivers State.

Research Questions

(1) To what extent are workshops available for teaching of craftwork in basic technology in Phalga and Obalga public junior secondary schools in Port Harcourt metropolis?
(2) To what extent are workshops equipment available for the teaching of craftwork in basic technology in Phalga and Obalga public junior secondary schools in Port Harcourt metropolis?

Hypotheses

The study was guided by the following null hypotheses at 0.05 level of significance.

(1) There is no significant difference in the mean rating of junior secondary school teachers from Phalga and Obalga city area on the extent of availability of workshop for the teaching of craftwork in basic technology in public junior secondary schools in Port Harcourt metropolis, Rivers State.
(2) There is no significant difference in the mean ratings of teachers from Phalga and Obalga city areas on the extent of workshop equipment available for the teaching of craftwork in basic technology in public junior secondary schools in Port Harcourt metropolis, Rivers State.

Methodology

The study adopted the descriptive research survey design. The population of the study was 270 basic technology teachers in Phalga and Obalga city areas in Public Junior Secondary Schools. The population of 270 Basic technology teachers was also used as the sample size to ensure generalization since the population was not a large one. Instrument of data collection was a self-made questionnaire titled "Utilization of Workshop and Equipment for Students Craft Work in Teaching Basic Technology (UWESCWTBT). The instrument was structured on a four point likert scale; very great extent (VGE), great extent (GE) low extent (LE), very low extent (VLE). The instrument were validated by three experts in Educational Psychology, Measurement and Evaluation from University of Port Harcourt. A reliability coefficient of 0.80 was obtained using cronbach alpha method via SPSS (Statistical Package for Social Sciences) software. The research questions were answered with mean and standard deviation while hypothesis were tested with t-test at 0.05 level of significance.

Results

Research Question 1: To what extent are workshops available for the teaching of craftwork in Basic Technology in Phalga and Obio/Akpor Public Junior Secondary Schools in Port Harcourt Metropolis?

Table 1: Mean and Standard Deviation of Responses of Teachers in Phalga and Obio/Akpor on the Availability of Workshop in the Teaching of Craftwork in Basic Technology.

N= 270

S/N	Item description	Phalga			Obalga			Grand			
		N_1	X_1	SD_1	N_2	X_2	SD_2	N	X_g	SD_g	Decision
1	Workshop Buildings	108	1.10	0.36	162	1.23	0.51	270	1.17	0.44	low extent
2	Converted Classroom Block	108	2.50	1.23	162	2.53	1.08	270	2.52	0.16	Great extent
3	Wood Work Unit	108	1.11	0.34	162	1.30	0.61	270	1.21	0.48	low extent
4	Metal Work Unit	108	1.16	0.52	162	1.28	0.65	270	1.22	0.59	low extent
5	Display Unit	108	1.09	0.35	162	1.28	0.63	270	1.19	0.49	low extent
6	Muster Point	108	1.15	0.38	162	1.27	0.58	270	1.21	0.48	low extent
Cluster Mean and standard deviation									**1.42**	**0.61**	low extent

Source: Rivers State universal basic education board (RSUBEB) 2023

Analysis of data as presented in Table1 shows the mean responses of teachers in Phalga and Obalga on the extent of workshops available for the teaching of craftwork in Basic Technology in Public Junior Secondary Schools in Port Harcourt metropolis with their corresponding standard deviation.

Data presented in table 1 above revealed that mean response is of low extent except item 2 with a mean score of 2.52 while response to item 1, 3, 4, 5, and 6 shows a low extent of utilization and mean values of 1.17, 1.21, 1.22, 1.19 and 1.21.

Research question 2

To what extent are workshop equipment available for the teaching of craftwork in basic technology in public junior secondary schools in Port Harcourt metropolis?

Table 2: Mean and Standard Deviation of Responses of Teachers in Phalga and Obalga on Workshop Equipment Available for the Teaching of Craftwork in Basic Technology

N= 270

S/N	Item description	Phalga			Obalga			Gran		
		N_1	X_1	SD_1	N_2	X_2	SD_2	N	X_g	SD_g	Decision
1	Hand tools (screwdrivers, hammer, saw)	108	2.60	1.07	162	2.58	0.94	270	2.60	1.01	Great extent
2	Machines (circular, saw, surface planner)	108	1.48	0.90	162	1.30	0.62	270	1.40	0.76	Low extent
3	Snips/shears	108	1.34	0.50	162	1.31	0.53	270	1.33	0.55	Low extent
4	Measuring Tape	108	2.71	1.01	162	2.66	1.10	270	2.69	1.06	Great extent
5	Outside and Inside Caliper	108	1.36	0.68	162	1.24	0.43	270	1.30	0.56	Low extent
6	Layout table	108	1.12	0.38	162	1.31	0.48	270	1.22	0.43	Low extent
Cluster Mean and standard deviation									**1.76**	**0.73**	**Low extent**

Source: Rivers State universal basic education board (RSUBEB) 2023

Analysis of data as presented in table shows the man responses of teachers in Phalga and Obalga on the extent of workshop equipments available for the teaching of craftwork in Basic Technology in Public Junior Secondary Schools in Port Harcourt metropolis with their corresponding standard deviation.

Data presented in table above revealed that the respondents agreed on terms 1 and 4 respectively with mean scores of 2.60 and 2.69 while the respondents disagree with items 2, 3, 5 and 6 with a total mean value of 1.40, 1.33, 1.30 and 1.22 respectively.

Hypotheses 1

There is no significant difference in the mean rating of teachers from Phalga and Obalga on the extent of availability of workshop for the teaching of craftwork in Basic Technology in Public Junior Secondary Schools in Port Harcourt metropolis.

Table 3: t-test Analysis of the Responses of Teachers in Phalga and Obalga on the Extent of Availability of Workshop for the Teaching of Craftwork in Basic Technology in Public Junior Secondary Schools.

Respondent	N	Mean	Std. Dev	Std. Error Mean	df	T	Sig	α-level	Remarks
Phalga teachers	108	8.11	1.997	.192					Rejected
					268	-2.678	0.026	0.05	
Obalga teachers	162	8.90	2.567	2.567					

No. of Phalga teachers = 108, No. of Obalga teachers = 162, X_1 = Mean of Phalga teachers, X_2 = mean of obalga teachers, DF=268, P-Value = 0.026

Table 3 is a t-test analysis of the responses of teachers in Phalga and Obalga on the extent of availability of workshop for the teaching of craftwork in Basic Technology in Public Junior Secondary Schools in Port Harcourt metropolis. The table showed that, df = 268, t = 2.678, sig = 0.026 is less than alpha value = 0.05. Since the sig value (0.026) is less than the alpha value (0.05), the result is significant hence, the null hypothesis is rejected. This means that there is significant differences in the mean ratings of teachers in Phalga and Obalga on the extent to which a workshop is available for the teaching of craftwork in basic technology in public junior secondary schools in Port Harcourt metropolis.

Hypothesis 2

There is no significant difference in the mean ratings of teachers from Phalga and Obalga on the extent of workshop equipment available for the teaching of craftwork in basic technology in public junior secondary schools in Port Harcourt metropolis.

Table 4: t-test Analysis of the Responses of Teachers in Phalga and Obalga on the Extent of Availability of Workshop Equipment for the Teaching of Craftwork in Basic Technology in Public Junior Secondary Schools.

Respondent	N	Mean	Std. Dev	Std. Error Mean	df	T	Sig	α-level	Remarks
Phalga teachers	108	10.62	2.379	.229					Accepted
					268	.730	.961	0.05	
Obalga teachers	162	10.41	2.329	.183					

No. of Phalga teachers = 108, No. of Obalga teachers = 162, X_1 = Mean of Phalga teachers, X_2 = mean of obalga teachers, DF=268, P-Value = .961

Table 4 is a t-test analysis of the responses of teachers in Phalga and Obalga in Port Harcourt metropolis. The table shows that df = 268, t = .730, sig = .961 and alpha value = 0.05. Since the sig value (.961) is greater the alpha value (0.05), the result is not significant hence, the null hypotheses is accepted. This means that there is no significant difference in the mean ratings of workshop equipment available for the teaching of craftwork in basic technology in public junior secondary schools in Port Harcourt metropolis.

Discussion

Result from table 1 above shows the mean score rating of respondent on the availability of workshop in the teaching of craftwork in Basic technology in public junior secondary schools in Port Harcourt metropolis, Rivers State. The result showed that responses was of low extent on the utilization and availability of workshop and equipment for teaching craft work while one item out of six indicated very great extent (VGE) item with a mean score rating of 2.52 and a t-test analysis of df = 268, t=2.678, sig=0.026 which is less than alpha vale =0.05. This shows lack of availability of workshop for effective teaching of craft work. The findings agree with the findings of Erickson (2016), who reported that poor infrastructural facilities and ill-equipped laboratories and workshops for technological and scientific studies in our school will lead to poor output. Also Mandah (2026) noted that the destiny of an individual/nation is determined by its level of commitment to quality of instructional resource available for teaching and learning. This simply confirms the statement of "gargabe in garbage out" (GIGO). The input equals the output. One of the implication here is a decrease in student's interest in science subjects due to lack of conducive space and equipment.

Also from our second research question, the result upholds Akariwor (2005), that opined that for effective dissimilation of knowledge there should not exist any gap from a structured pattern of learning and necessary gadgets, tools and apparatus. Dike (2016) also asserted that evaluation of student's performance on practical subjects should be carried out looking at all areas that should be explored in the curriculum. One major implication here is that the subject will not be taught well by teacher due to lack of sufficient equipment.

Result of table 2 reviewed that respondents agreed on two items with a mean scores of 2.60 and 2.69 and a t-test analysis of df=268, t=0.73, sig=0.961 which is greater than alpha value of 0.05. This shows that there are available workshop equipment for effective teaching of craft work.

Conclusion

From the result of the study, the following conclusions were made. Firstly, there is significant difference in the mean ratings of teachers in Phalga and Obalga on the extent to which workshop is available for the teaching of craftwork in basic technology in public junior secondary schools in Port Harcourt metropolis. Secondly, there is no significant difference in the mean ratings of workshop equipment available for the teaching of craftwork in basic technology in public junior secondary schools in Port Harcourt metropolis, Rivers State.

Recommendations

For effective teaching of a vocational subject like basic technology, the following recommendations were made.

(1) The government should ensure workshops are built in junior secondary schools through its intervention fund to enhance effective teaching of basic technology in our public schools

(2) The government should ensure the workshops are well equipped to improve student's technical skills at the junior secondary level.

(3) The government, private bodies, NGOs, should help in equipping schools with information and communication technology gadgets to also improve the student's technical skills.

References

Aneke, J. (2021). Managerial skills required of technical work in public secondary schools in Abia State. *International Journal, Quality Relation Management*, 27(9), 103-109.

Astin, A.W. (2014). *Predicting academic performance in college; selectivity data for 2300.* Blackwell publishers.

Erickson, A. (2016). *The world educational crisis, a system analysis.* Heinemann.

Federal Republic of Nigeria (2013). National Policy on Education.

Gujjar, A.A., Khan, N., Baig, M.N., Ramzam, M. & Saifi, S. (2019). A study to evaluate the availability and utilization of physical and instructional facilities in secondary schools of Bajaur Agency (Pakistan). *International Online Journal of Educational Science*, 2(3), 688-701.

Jerkins, O. (2019). Laboratory instruction and safety in science teaching. *Journal of Science Teachers Association of Nigeria*, 4(1), 17-21.

Mbazu, I.O. (2024). Perceived impact of principals'leadership behavior on teachers'productivity in secondary schools in EBonyi State. *International Journal of Studies in Education*, 20(2), 181-190.

Nwadiani, M. & Ugolo, S.P. (2022). The availability, adequacy in quantity utilization of physical facilities in public secondary schools in Bayelsa.*Journal of Studies in Education*, 8(1&2), 34-47.

Offorma, C. (2020). Perception of principals and teachers of external supervisions role in secondary school in Ogun State. *Nigeria Journal of Clinical and Counselling Psychology*, 8(1), 43-56.

Ogbu, J.E. (2015). Availability and utilization of instructional facilities for the teaching of basic electricity in Ebonyi State Technical College. *Developing Counting Studies*, 5(21), 162-168.

Ugwu, C.J. (2017). *Secretaryship, a practical approach.* Pearl publishers

Zhou, D. & Bity, S.A. (2024). Principal leadership styles and its impact on teachers' performance. *International Journal of Academic Research in Progressive Education and Development*, 13(1), 227-240.

Influence of Mobile Learning Applications On Students' Problem-Solving Competence in Mathematics in Rivers State, Nigeria

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Abstract

This study examined the influence of mobile learning applications on students' problem-solving competence in mathematics in public secondary schools in Rivers State, Nigeria. A quasi-experimental design complemented with a descriptive survey approach was adopted. The sample consisted of 240 Junior Secondary School II students drawn from eight public secondary schools. Three researcher-developed instruments were used for data collection: The Mobile Learning Application Usage Questionnaire (MLAUQ), the Mathematics Problem-Solving Competence Test (MPSCT), and the Students' Engagement Scale (SES). Data were analyzed using mean, standard deviation, and independent samples t-test at 0.05 level of significance. Results revealed that students taught with mobile learning applications achieved significantly higher problem-solving competence scores than those taught using the conventional method. The study also found a high level of engagement among students exposed to mobile learning applications. The findings underscore the pedagogical value of integrating mobile learning applications into mathematics instruction. It was recommended that teachers, curriculum planners, and policymakers promote structured use of mobile learning applications in Nigerian secondary schools.

Keywords: Mobile learning, Mathematics education, Problem-solving competence, Student engagement, Secondary schools

Introduction

Mathematics is a core subject in the Nigerian educational system and a fundamental tool for scientific, technological, and economic development. Despite its importance, persistent poor performance of secondary school students in mathematics remains a major concern among educators, parents, and policymakers. One of the major challenges confronting mathematics instruction is students' difficulty in developing effective problem-solving competence. Traditional teacher-centered instructional approaches often fail to actively engage learners and support deep conceptual understanding. Recent advances in information and communication technology have introduced mobile learning applications as innovative tools capable of transforming mathematics instruction. Mobile learning applications provide learners with flexible, interactive, and personalized learning experiences that extend beyond the classroom environment. Through features such as instant feedback, multimedia representations, and adaptive learning pathways, mobile learning applications have the potential to enhance students' engagement and problem-solving competence.

In Rivers State, the increasing availability of smartphones among secondary school students presents opportunities for leveraging mobile learning applications to address persistent challenges in mathematics education. However, empirical evidence on the effectiveness of mobile learning applications in enhancing students' problem-solving competence in mathematics within this context remains limited. This study therefore investigated the influence of mobile learning applications on students' problem-solving competence in mathematics in Rivers State. The concept of mobile learning refers to the use of portable digital devices such as smartphones and tablets to support teaching and learning anytime and anywhere. In mathematics education, mobile learning applications enable students to visualize abstract concepts, practice problem-solving skills, and receive immediate feedback. Problem-solving competence in mathematics involves the ability to understand problems, select appropriate strategies, apply mathematical procedures, and evaluate solutions. The study was anchored on constructivist learning theory, cognitive load theory, and self-determination theory. Constructivism emphasizes active learner engagement in knowledge construction, which is supported by interactive mobile learning environments. Cognitive load theory highlights the importance of instructional designs that reduce extraneous cognitive load, a function achieved through step-by-step guidance and visual representations in mobile applications. Self-determination theory explains how autonomy and competence foster intrinsic motivation, which is enhanced through personalized and self-paced mobile learning experiences. Empirical studies consistently report positive effects of mobile learning applications on students' mathematics achievement, engagement, and problem-solving skills. Previous studies have shown that students exposed to mobile-assisted instruction outperform their counterparts taught using conventional methods. However, contextual gaps exist regarding public secondary schools in Rivers State.

Methodology

A quasi-experimental research design complemented with a descriptive survey design was adopted for the study. The population comprised all Junior Secondary School II (JSS 2) Students in public secondary schools in Rivers State which is three hundred and thirty-two (332) with the population of twenty thousand one hundred and ninety-three 20,193 students [nine thousand nine hundred and twenty (9,920) male and ten thousand hundred and seventy-three (10,273) female)]. Source: Universal Basic Education Commission, 2022 Digest of Basic Education Statistics/Public Schools Enrolment by State. A sample of 240 students was selected using multistage sampling techniques. The students were assigned to experimental and control groups using intact classes. Three instruments were used for data collection: The Mobile Learning Application Usage Questionnaire, the Mathematics Problem-Solving Competence Test, and the Students' Engagement Scale. The instruments that used SA = 4, S = 3, D = 2 and SD = 1 were validated by three (3) experts in mathematics education and educational measurement. Reliability coefficients of 0.82, 0.79, and 0.85 were obtained for the MLAUQ, MPSCT, and SES respectively. The experimental group was taught selected mathematics topics using mobile learning applications for six weeks, while the control group received instruction using conventional teaching methods. Data were analyzed using mean, standard deviation, and independent samples t-test.

Results

Research Question 1: What is the influence of mobile learning applications on students' problem-solving competence in mathematics in Rivers State? The data in Table 1 was used in answering this question.

Table1: **Mean and standard deviation of the influence of mobile learning applications on students' problem-solving competence(Post-test) in mathematics in Rivers State**

Group	SA	A	D	SD	N	Mean	SD
Experimental (Mobile Learning)	52	44	16	8	120	21.45	3.62
Control (Conventional Method)	28	36	34	22	120	16.38	4.01

Table 1 presents the raw score distribution of students' problem-solving competence. The experimental group recorded higher frequencies in Strongly Agree and Agree categories compared to the control group. The higher mean score of the experimental group (21.45) indicates that mobile learning applications had a positive influence on students' problem-solving competence in mathematics.

Research Question 2: What is the level of students' engagement in mathematics when taught using mobile learning applications? The data in Table 2and Table 3 were used in answering this question.

Table 2: Distribution of Students' Responses on Engagement Scale (Raw Scores)

Response	Weight	Frequency	Weighted Score
Strongly Agree (SA)	`4	48	192
Agree (A)	3	64	192
Disagree (D)	2	26	52
Strongly Disagree (SD)	1	12	12
Total		150	448

Table 3: Mean and Standard Deviation of Engagement Scores

N	Mean	SD
150	2.99	0.7

Table 1 and 2 show that the majority of students either strongly agreed or agreed with engagement statements. The computed mean score of 2.99, which is above the criterion mean of 2.50, indicates a high level of engagement among students taught using mobile learning applications.

Research Question 3: Is there a difference in problem-solving competence between students exposed to mobile learning applications and those taught using the conventional method? The data in Table 4 was used in answering this question.

Table 4: Pre-test and Post-test Mean Scores of Experimental Group

Test	Mean	SD
Pre-test	14.12	3.85
Post-test	21.45	3.62

Table 4 reveals a substantial increase in the post-test mean score of students exposed to mobile learning applications, indicating improvement in problem-solving competence after the intervention.

Hypotheses

H_{01}: There is no significant difference in the mean problem-solving competence scores of students taught mathematics using mobile learning applications and those taught using the conventional method.

Table 5: Summary of analysis of t – test on the difference in the mean scores of problem-solving competence scores of students taught mathematics using mobile learning applications and those taught using the conventional method in Rivers State

Group	N	Mean	SD	df	t-cal	t-crit	Decision
Experimental	120	21.45	3.62	238	9.84	1.96	Rejected
Control	120	16.38	4.01				

Table 5 shows the t – test analysis for the test of hypothesis one. The mean response of experimental was 21.45 with SD of 3.62, while the mean response of control was 16.38 with SD of 4.01. The degree of freedom is 238 which is 120 + 120 – 2, the calculated t – score is 9.84. The data further revealed through t – test and analysis that there is significant difference between the mean responses of the groups. The result of the analysis is an indication that the t-cal (9.84) > t-crit (1.96), hence the null hypothesis one (H_{01}) was rejected at 0.05 alpha level. This implies that there is a significant difference in the problem-solving competence of students taught using mobile learning applications and those taught using the conventional method in Rivers State.

H_{02}: There is no significant relationship between students' use of mobile learning applications and their problem-solving competence in mathematics.

Table 6: Pearson Correlation between Students' Use of Mobile Learning Applications and Problem-Solving Competence

Variables	N	r-cal	r-crit	df	Decision
Mobile Learning Application Use and Problem-Solving Competence	240	0.63	0.138	238	Rejected

Table 6 shows that the calculated correlation coefficient (r-cal = 0.63) is greater than the critical r-value (r-crit = 0.138) at 0.05 level of significance and 238 degrees of freedom. Therefore, the null hypothesis is rejected. This implies that there is a significant positive relationship between students' use of mobile learning applications and their problem-solving competence in mathematics. Increased use of mobile learning applications is associated with higher problem-solving competence among students.

"Pearson's r-test was used to determine the relationship between mobile learning application usage and problem-solving competence, while the independent t-test was used to compare engagement levels between two independent groups."

H_{03}: There is no significant difference in engagement levels between students taught using mobile learning applications and those taught using conventional methods.

Table 7: Summary of analysis of t – test on the difference in the mean scores of engagement levels scores of students taught mathematics using mobile learning applications and those taught using the conventional method in Rivers State

Group	N	Mean	SD	df	t-cal	t-crit	Decision
Mobile Learning Application Group	120	3.02	0.71	238	6.47	1.96	Rejected
Conventional Method Group	120	2.41	0.68				

The data on **t**able 7 shows the t – test analysis for the test of hypothesis three. The mean response of experimental was 3.02 with SD of 0.71, while the mean response of control was 2.41 with SD of 0.68. The degree of freedom is 238 which is 120 + 120 – 2, the calculated t – score is 6.47. The data further revealed through t – test and analysis that there is significant difference between the mean responses of the groups. The result of the analysis is an indication that the t-cal (6.47) > t-crit (1.96), hence the null hypothesis one (H_{03}) was rejected at 0.05 alpha level. This implies that there is a significant difference in engagement levels between students taught using mobile learning applications and those taught using conventional teaching methods, with students in the mobile learning group demonstrating higher engagement in Rivers State.

Summary

Results indicated that students exposed to mobile learning applications recorded higher mean scores in mathematics problem-solving competence than those taught using conventional methods. Raw score distributions showed higher frequencies of agreement and strongly agree responses among the experimental group. Independent samples t-test revealed a statistically significant difference between the mean scores of the two groups in favor of the experimental group. The engagement results further showed that students taught using mobile learning applications demonstrated high levels of behavioral, emotional, and cognitive engagement in mathematics learning. These findings indicate that mobile learning applications positively influence both engagement and problem-solving competence.

Discussion of the Findings

The findings of this study align with constructivist learning theory, which emphasizes active engagement in learning. The superior performance of students exposed to mobile learning applications can be attributed to the interactive and learner-centered nature of mobile instruction. The high engagement levels observed support self-determination theory, suggesting that mobile learning applications enhance students' autonomy and motivation.

The findings corroborate previous empirical studies that reported significant improvements in mathematics achievement and engagement through mobile-assisted instruction. The study extends existing literature by providing context-specific evidence from public secondary schools in Rivers State.

Conclusion

The study concludes that mobile learning applications significantly enhance students' problem-solving competence and engagement in mathematics. Integrating mobile learning applications into mathematics instruction can improve learning outcomes in public secondary schools.

Recommendations

It is recommended that mathematics teachers incorporate mobile learning applications into instructional practices, curriculum planners embed mobile learning strategies into mathematics curricula, and educational authorities provide necessary digital infrastructure to support mobile learning.

References

Abdu, K., & Dikko, M. (2018). Effect of mobile applications on students' achievement in mathematics in Nigerian secondary schools. Journal of Mathematics Education, 9(2), 45–58.

Anyanwu, J. C., & Okeke, S. O. (2019). Mobile-assisted instruction and students' retention in junior secondary school mathematics. African Journal of Educational Technology, 4(1), 23–37.

Bello, A. A., & Aluko, R. O. (2019). Mobile game-based learning and students' engagement in mathematics. International Journal of Instructional Technology, 6(3), 61–75.

Chukwu, E. N., Afolabi, O. A., & Umo, B. I. (2020). Smartphone applications as cognitive tutors in algebra learning. Journal of Educational Research and Development, 12(1), 88–102.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Eze, T. I., & Nwankwo, C. A. (2020). Digital learning applications and reduction of mathematics anxiety among secondary school students. Nigerian Journal of Educational Psychology, 8(2), 54–69.

Faruk, M. A., & Ibrahim, H. S. (2021). WhatsApp-assisted instruction and problem-solving skills in mathematics. Contemporary Educational Research Journal, 11(2), 92–106.

Green, T. D., & Walker, J. M. (2021). Gamified mobile learning applications and student motivation in mathematics classrooms. Computers & Education, 164, 104121. https://doi.org/10.1016/j.compedu.2021.104121

Habu, S., Ahmed, Y., & Khalid, R. (2021). Tablet-based learning applications and mathematics achievement. International Journal of Mobile Learning, 5(1), 39–53.

Idris, A. M., & Salisu, S. U. (2022). Collaborative mobile learning and mathematical problem-solving skills. Journal of Learning Technologies in Education, 10(3), 120–134.

Junaid, A. R., & Bello, K. T. (2023). Adaptive mobile learning applications and students' mathematics performance. Journal of Digital Learning in Education, 7(2), 77–91.

Langley, R., & Bishop, K. (2024). Mobile learning applications and metacognitive development in mathematics. Educational Technology Research and Development, 72(1), 145–163. https://doi.org/10.1007/s11423-023-10245-6

National Council of Teachers of Mathematics. (2018). Principles to actions: Ensuring mathematical success for all. NCTM.

Sweller, J., Ayres, P., & Kalyuga, S. (2011). Cognitive load theory. Springer.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.

Use of Gamification-Based Teaching Strategies in Enhancing Students' Academic Performance in Basic Science in Rivers State, Nigeria

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Abstract

This study investigated the use of gamification-based teaching strategies in enhancing students' academic performance in Basic Science in Rivers State, Nigeria. The study was guided by two research questions and two corresponding null hypotheses tested at the 0.05 level of significance. A pretest–posttest control group quasi-experimental research design was adopted. The population comprised 3,120 Junior Secondary School Two (JSS2) students from 35 registered private secondary schools in Port Harcourt. A sample of 112 students was selected using a combination of simple random and purposive sampling techniques. Two schools were randomly selected, while intact classes were used, and schools were purposively chosen based on criteria such as availability of ICT facilities, presence of qualified Basic Science teachers, co-educational structure, and administrative consent. Data were collected using a researcher-developed Basic Science Performance Test (BSPT), which was validated by experts and yielded a reliability coefficient of 0.82 using the Kuder-Richardson 21 formula. The experimental group was exposed to gamification-based instruction involving points, badges, leaderboards, quizzes, and progressive challenges, while the control group was taught using the demonstration method. Data were analyzed using mean, standard deviation, and Analysis of Covariance (ANCOVA) to control for pre-existing differences. Findings revealed that students taught using gamification-based strategies performed significantly better than those taught using the demonstration method. The results also showed no significant difference between male and female students' academic performance when exposed to gamification. The study concludes that gamification enhances students' engagement, motivation, and academic performance in Basic Science. It recommends that teachers integrate gamification strategies into classroom instruction and that school administrators provide the necessary training and resources to support its implementation.

Keywords: Gamification-based teaching, Academic performance, Basic Science, Instructional strategies

Introduction

The scientific and technological progress of any nation is fundamentally anchored in the quality of its educational system, particularly science education at the basic level. Education serves as a structured process through which learners acquire knowledge, develop cognitive and psychomotor skills, internalize values, and cultivate the critical and creative thinking abilities necessary for personal and societal development. Basic Science, as a foundational subject, plays an essential role in nurturing scientific literacy, problem-solving capacity, and innovation skills required for national development. However, persistent challenges such as declining interest in science, passive learning environments, and poor academic performance continue to stand as a barrier to the effectiveness of Basic Science instruction in many developing countries, including Nigeria (Adeoye, 2023). In response to these challenges, educational technology has emerged as a critical driver of pedagogical transformation. Educational technology offers innovative tools and strategies that can enhance learner engagement, motivation, and academic achievement across diverse learning environments. Among these emerging strategies, gamification has attracted increasing scholarly attention as a means of reducing classroom boredom, stimulating learner motivation, and boosting academic performance in science-related subjects (Ginna et al., 2025). Gamification represents a pedagogical shift from teacher-centered instruction to learner-centered, interactive, and motivational learning experiences.

Gamification is defined as the deliberate integration of game design elements into non-game instructional contexts to motivate learners and enhance engagement, persistence, and performance. Unlike full-scale educational games, gamification incorporates specific game mechanics, including points, badges, leaderboards, levels, challenges, narratives, progress bars, and rewards, into existing curricular activities (Dikman, 2021).

These elements leverage learners' intrinsic tendencies toward competition, achievement, curiosity, and mastery, thereby encouraging sustained involvement in learning tasks. From an educational psychology perspective, gamification is grounded in motivational theories that emphasize prompt feedback, goal orientation, reinforcement, and self-regulation. By structuring learning tasks as progressive challenges with visible achievements, gamification transforms students from passive recipients of knowledge into active participants in a continuous cycle of exploration, feedback, and mastery (Dikman, 2021). This shift is particularly valuable in science education, where abstract concepts often require sustained cognitive engagement and repeated practice. Empirical research further suggests that gamification strategies are highly context-dependent and must be carefully aligned with curricular goals and pedagogical intentions. Adaptive gamification environments designed to support inquiry-based and problem-based learning in science have been shown to significantly enhance students' conceptual understanding and knowledge retention compared with traditional instructional approaches (Zourmpakis et al., 2024). These environments typically integrate structured feedback loops, tiered challenges, collaborative tasks, and progress-tracking systems, all of which promote accountability, deeper cognitive processing, and meaningful learning experiences (Lee et al.,2020).

Academic performance in Basic Science is commonly assessed through students' mastery of scientific concepts, problem-solving abilities, and retention of learned knowledge. These indicators collectively reflect the level of scientific literacy attained by learners at the foundational stage. However, traditional Basic Science instruction in many Nigerian secondary schools remains largely lecture-based, emphasizing rote memorization rather than conceptual understanding and application. Such approaches often fail to stimulate students' intrinsic motivation, resulting in poor academic outcomes and negative attitudes toward science learning (Adeoye, 2023). In contrast, gamification-based instructional strategies have demonstrated considerable potential for improving students' academic performance in science subjects. Studies conducted in junior secondary school contexts reveal that students exposed to gamified instructional packages consistently achieve higher post-test scores in Basic Science and Technology than their counterparts taught using conventional teaching methods (Abidoye & Abidoye, 2022). These findings suggest that gamification enhances both the cognitive and affective dimensions of learning, which are essential for academic success. The effectiveness of gamification in improving academic performance can be attributed to its multifaceted mechanisms. Cognitively, gamification structures learning tasks as progressive challenges with clear performance benchmarks, thereby facilitating deeper processing, encoding, and retrieval of scientific concepts during assessments. Affectively, real-time feedback, rewards, and recognition foster motivation, persistence, and positive learning attitudes, which mediate sustained engagement and improved achievement outcomes (Ginna et al., 2025).

In the context of Basic Science, gamification offers significant instructional advantages. Science concepts often involve abstract processes, experimentation, and scientific reasoning that students find difficult to comprehend through conventional lecture-based approaches. Gamified instructional strategies can convert these abstract concepts into interactive and meaningful learning experiences by encouraging exploration, collaboration, experimentation, and immediate feedback (Nwachukwu & Johnson, 2020). Through digital quizzes, simulations, challenges, and reward systems, learners are more likely to engage actively with scientific content, practice problem-solving skills, and develop positive attitudes toward science learning. Recent empirical studies provide mixed but insightful evidence on the effectiveness of gamification. While several studies report significant improvements in academic achievement following gamified interventions (Arufe Giráldez et al., 2021; Kladchuen & Srisomphan, 2021), others indicate non-significant effects, often attributed to learners' unfamiliarity with gamification protocols or poor instructional design (Mee-Mee et al., 2020). These inconsistencies underscore the need for context-specific investigations that account for pedagogical implementation, learner characteristics, and instructional environments.

Gender is another important variable influencing the effectiveness of technology-enhanced instructional strategies. Gender refers to the socially and culturally constructed roles, behaviors, and expectations associated with males and females within a given society (Aderele & Abidoye, 2022). Research suggests that gender differences may shape learners' engagement with technology-based instruction, including gamified learning environments. However, evidence regarding gender differences in gamification outcomes remains inconclusive. Some studies report minimal or non-significant differences between male and female students' academic performance in gamified science classrooms (Abidoye & Abidoye, 2022), while others suggest that adaptive gamification approaches may differentially benefit female learners by providing supportive, low-risk environments for participation and mastery (Zourmpakis et al., 2024). These findings highlight the importance of examining gender as a moderating variable in gamification research. Abidoye and Ogundare (2024) revealed that students taught using gamification-based instructional packages performed significantly better than those taught with conventional methods. Importantly, the study also found no significant difference in the academic achievement of male and female students exposed to gamified instruction, suggesting that gamification may provide an equitable learning platform across gender lines.

Despite the growing global body of literature on gamification in education, its application in Nigerian secondary schools, particularly in Rivers State, remains limited. Challenges such as overcrowded classrooms, inadequate instructional resources, and declining student interest in science subjects continue to affect learning outcomes. Moreover, there is a scarcity of context-specific empirical studies examining how gamification-based instructional strategies influence students' academic performance in Basic Science within Rivers State. Against this backdrop, the present study investigates the use of gamification-based teaching strategies in enhancing students' academic performance in Basic Science in Rivers State, Nigeria

Statement of the problem

Basic Science is a critical subject that equips students with foundational scientific knowledge, problem-solving skills, and the ability to apply concepts in everyday life. Ideally, teaching should engage students, stimulate curiosity, and enhance academic performance. However, in many secondary schools in Rivers State, instruction is predominantly teacher-centered and lecture-based, leading to low motivation, limited participation, and poor understanding of scientific concepts. Many students struggle to grasp abstract scientific concepts due to the limited integration of interactive and technology-enhanced teaching strategies. Gamification, which incorporates game elements such as points, badges, leaderboards, and challenges, has the potential to create engaging and motivating learning experiences. The purpose of this study, therefore, is to investigate the use of gamification-based teaching strategies in enhancing students' academic performance in Basic Science, providing evidence-based recommendations for improving instructional practices in Rivers State secondary schools

Aim and Objectives of the Study

The aim of this study is to investigate the use of gamification-based teaching strategies in enhancing students' academic performance in basic science in Rivers State, Nigeria. Specifically, the study intends to

1. compare the academic performance of students taught Basic Science using gamification-based instructional strategy and those taught using a demonstration instructional strategy
2. Determine whether there is a significant difference between male and female students' academic performance that were taught Basic Science using gamification-based instructional strategy

Research Questions

1. What difference exists in the academic performance of students taught Basic Science using a gamification-based instructional strategy and those taught using a demonstration instructional strategy?
2. What is the difference between male and female students' academic performance taught Basic Science using gamification-based instructional strategy?

Research Hypotheses

The following null hypotheses were tested at the 0.05 level of significance

1. There is no significant difference in the academic performance of students taught Basic Science using a gamification-based instructional strategy and those taught using a demonstration instructional strategy.
2. There is no significant difference between male and female students' academic performance taught Basic Science using gamification-based instructional strategy.

Methodology

This study adopted a pretest-posttest, control group quasi-experimental research design. The population for this study comprised 3,120 Junior Secondary School 2 (JSS2) students across all 35 registered private junior secondary schools in Port Harcourt, Rivers State. These schools were selected for their registration with the Rivers State Ministry of Education and their active Basic Science programs. The focus on JSS2 students was due to the level's alignment with the teaching of foundational Basic Science concepts relevant to assessing academic performance.

The sample for the study consisted of 112 JSS2 students drawn from two intact classes in each of the two private junior secondary schools randomly selected from the list of private schools in Port Harcourt metropolis. The schools were also purposively selected based on specific criteria: they were co-educational, ensuring gender representation; they employed at least one professional Basic Science teacher with a B. Ed or B. Sc (Ed) qualification; they were well-equipped with ICT facilities suitable for gamification-based instruction; they were accessible within Port Harcourt to facilitate supervision; and the school administration provided consent for participation. This sampling approach ensured that the selected schools provided the necessary resources and environment to implement gamification effectively. The research instrument used for data collection was a researcher-developed Basic Science Performance Test (BSPT). The BSPT was validated by experts in Science Education and Educational Technology, yielding a reliability coefficient of 0.82 using the Kuder Richardson-21 (KR-21) formula. The instrument consisted of two sections: Section A captured respondents' biodata, while Section B contained 50 multiple-choice questions covering topics such as Ecosystem, Safety in the Laboratory, Cells and Tissues, Force and Motion, and Matter. Each correct answer attracted 2 marks, while incorrect answers scored zero, giving a maximum obtainable score of 100%. The BSPT was designed to measure students' academic performance in Basic Science.

Data collection was conducted in three stages. First, the researcher identified the sampled schools and obtained permission from the principals. Professional Basic Science teachers from the selected schools were trained to serve as research assistants during the study. In the second stage, the BSPT was administered as a pre-test to all sampled students to establish baseline academic performance. The students were then taught for four weeks, with the experimental group receiving gamification-based instruction, incorporating points, badges, leaderboards, quizzes, and progressive challenges, while the control group received conventional teaching methods. In the third stage, the BSPT was re-administered as a post-test to measure the students' academic performance after the intervention. The research assistants collected the completed scripts under the researcher's supervision, after which the researcher marked, graded, and recorded the scores.

The data obtained from the pre-test and post-test formed the basis for analysis. Descriptive statistics, including mean and standard deviation, were used to answer the research questions on students' academic performance, while Analysis of Covariance (ANCOVA) was employed to test the hypotheses at a 0.05 level of significance. ANCOVA was selected to control for pre-existing differences in students' academic ability, allowing for a precise determination of the effect of gamification-based teaching strategies on students' academic performance in Basic Science.

Results

Research Question 1: What difference exists in the academic performance of students taught Basic Science using a gamification-based instructional strategy and those taught using a demonstration instructional strategy?

Table 1: Mean and standard deviation of students' performance based on methods

Methods		Pretest	Posttest	Mean gain
Gamification	Mean	40.4815	71.8889	31.4074
	N	54	54	54
	Std. Deviation	6.21544	6.12347	7.98706
Demonstration	Mean	40.2759	49.3793	9.1034
	N	58	58	58
	Std. Deviation	4.04272	7.40040	7.58736

Table 1 shows that the gamification group had a pretest mean score of 40.48, which increased to a posttest mean score of 71.89, resulting in a mean gain of 31.41. In contrast, the demonstration group recorded a pretest mean score of 40.28 and a posttest mean score of 49.38, with a mean gain of 9.10. This suggests that students taught using gamification-based teaching strategies showed greater improvement in academic performance compared to those taught using the demonstration method.

Research Question 2: What is the difference between male and female students' academic performance taught Basic Science using gamification-based instructional strategy?

Table 2: Mean and standard deviation of students' performance based on gender

Gender		Pretest	Posttest	Mean gain
Male	Mean	40.3836	60.8493	20.4658
	N	73	73	73
	Std. Deviation	5.46359	12.44953	12.55884
Female	Mean	40.3590	59.0769	18.7179
	N	39	39	39
	Std. Deviation	4.67630	14.54464	15.50882

Table 2 shows that male students recorded a pretest mean score of 40.38, which increased to a posttest mean score of 60.85, resulting in a mean gain of 20.47. Similarly, female students had a pretest mean score of 40.36 and a posttest mean score of 59.08, with a mean gain of 18.72. The results indicate that both male and female students improved in academic performance, with male students showing a slightly higher mean gain than female students.

Hypothesis 1: There is no significant difference in the academic performance of students taught Basic Science using a gamification-based instructional strategy and those taught using a demonstration instructional strategy.

Table 3: ANCOVA Analysis of gamification-based instructional strategy and demonstration instructional strategy on students' performance in Basic Science

Tests of Between-Subjects Effects

Dependent Variable: Posttest

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	14339.537[a]	2	7169.768	158.250	.000	.744
Intercept	4671.007	1	4671.007	103.098	.000	.486
Pretest	170.561	1	170.561	3.765	.055	.033
Methods	14101.508	1	14101.508	311.246	.000	.741
Error	4938.428	109	45.307			
Total	425604.000	112				
Corrected Total	19277.964	111				

a. R Squared = .744 (Adjusted R Squared = .739)

Table 3 shows that after controlling for students' pretest scores, there was a statistically significant effect of instructional method on students' posttest performance in Basic Science, $F(1, 109) = 311.246$, $p = .000$ ($p < .05$). This result indicates a significant difference in the academic performance of students taught using the gamification-based instructional strategy and those taught using the demonstration instructional strategy. The Partial Eta Squared value of .741 indicates a very large effect size, suggesting that the instructional method accounted for a substantial proportion of the variance in students' posttest performance in Basic Science.

Hypothesis 2: There is no significant difference between male and female students' academic performance taught Basic Science using gamification-based instructional strategy.

Table 4: ANCOVA analysis of male and female students' performance in Basic Science

Tests of Between-Subjects Effects

Dependent Variable: Posttest

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	317.257[a]	2	158.628	.912	.405	.016
Intercept	4237.193	1	4237.193	24.358	.000	.183
Pretest	237.404	1	237.404	1.365	.245	.012
Gender	79.228	1	79.228	.455	.501	.004
Error	18960.707	109	173.951			
Total	425604.000	112				
Corrected Total	19277.964	111				

a. R Squared = .016 (Adjusted R Squared = -.002)

Table 4 shows that after controlling for students' pretest scores, there was no statistically significant effect of gender on students' posttest performance in Basic Science, $F(1, 109) = 0.455$, $p = .501$ ($p > .05$). This indicates that male and female students did not differ significantly in their academic performance after the intervention. The Partial Eta Squared value of .004 suggests a very small effect size, indicating that gender accounted for a negligible proportion of the variance in students' posttest performance.

Discussion of Results

The findings of this study in Table 1 indicated that gamification-based teaching strategies enhanced students' academic performance in Basic Science. Students taught using gamification showed considerably greater improvement in posttest scores compared to those taught with the demonstration method, suggesting that gamification effectively promoted engagement, motivation, and understanding of scientific concepts. The analysis in Table 3 further showed that the difference in performance between the two instructional groups was significant even after accounting for initial differences in pretest scores. This confirms that the improvement observed in the gamification group was due to the instructional strategy rather than prior knowledge, highlighting the effectiveness of gamification in enhancing learning outcomes.

These results align with previous research showing that adaptive gamification environments, especially those supporting inquiry-based and problem-based learning, improve students' conceptual understanding and knowledge retention compared with traditional instructional approaches (Zourmpakis et al., 2024). Studies in junior secondary schools similarly report that students exposed to gamified instructional packages achieve higher post-test scores in Basic Science and Technology than those taught using conventional methods (Abidoye & Abidoye, 2022). While some research indicates mixed outcomes due to factors such as unfamiliarity with gamification protocols or poor instructional design (Mee-Mee et al., 2020), the overall evidence supports the positive impact of gamification on academic achievement (Arufe Giráldez et al., 2021; Kladchuen & Srisomphan, 2021).

The findings of Table 2 indicate that both male and female students improved in academic performance in Basic Science following exposure to gamification-based teaching strategies. Male students recorded slightly higher gains than female students, but the difference was minimal. The analysis of Table 4 further showed that after accounting for pretest scores, gender did not have a statistically significant effect on posttest performance. This suggests that male and female students benefited similarly from gamified instruction and that the differences in gains were negligible. The results indicate that gamification-based strategies provide an equitable learning environment that supports both genders effectively.

These findings are consistent with previous research. Some studies report minimal or non-significant differences between male and female students in gamified science classrooms (Abidoye & Abidoye, 2022), while others suggest that adaptive gamification approaches may particularly support female learners by offering low-risk, motivating environments for participation and mastery (Zourmpakis et al., 2024). Similarly, Abidoye and Ogundare (2024) found no significant difference in the academic achievement of male and female students exposed to gamified instruction, reinforcing the idea that gamification can provide an inclusive platform for all learners.

Conclusion

The study concludes that gamification-based teaching strategies significantly enhance students' academic performance in Basic Science compared to conventional demonstration methods. Both male and female students benefited from gamified instruction, with no significant gender differences in post-intervention performance, indicating that gamification provides an equitable learning environment. The findings underscore the effectiveness of gamification in promoting engagement, motivation, and conceptual understanding in Basic Science.

Recommendations

Based on the findings of this study, the following recommendations were made to improve Basic Science teaching and learning in secondary schools:

1. Basic Science teachers in secondary schools should integrate gamification-based strategies into their instructional practices to improve students' learning outcomes.
2. School administrators and policymakers should provide professional development and training for teachers on effective gamification techniques.
3. Educational technology resources, including gamified learning platforms and tools, should be made available and accessible in schools to support interactive and engaging learning experiences.
4. Further research should explore the long-term impact of gamification on students' academic performance and investigate its effectiveness across other science subjects and educational levels.

References

Abidoye J.A. & Abidoye O.G. (2022). Gender and Internet use pattern of English Language Teachers in Secondary Schools in Ondo State. *ABSU Journal of Curriculum and Teacher Education* 2 (1) 9-16.

Abidoye, J. A., & Ogundare, S. A. (2024). Impact of gamification on students' academic performance in basic science and technology in junior secondary schools in Ondo State, Nigeria. *Rima International Journal of Education*, *3*(4), 66–75.

Adeoye, M. A. (2023). Influence of gamification elements on students' academic performance. *Indonesian Journal of Teaching in Science*, *3*(2), 105-112.

Aderele S.O. & Abidoye J.A. (2022). Effect of Edutainment Package on Primary School Pupils' Academic Performance in Basic Science and Technology in Irele Local Government Area of Ondo State. *ABSU Journal of Educational Studies* 9(1) 219-225

Arufe Giráldez, V., Sanmiguel-Rodríguez, A., Ramos Álvarez, O., & Navarro-Patón, R. (2022). Can Gamification Influence the Academic Performance of Students? *Sustainability*, 14(9), 5115.

Dikman, M. (2021). Does Gamification affect academic achievement? A meta-analysis of studies conducted in Turkey. *International Journal of Curriculum and Instruction*. 13(3), 3001-3020.\

Ginna A. Anno, Marie Pangowen, Marisa A. Wayan, Sophia P. Aragon, Martha Tabon (2025). Gamification Tools for Enhancing Academic Performance: A Systematic Review of Classroom Applications. I*nternational Journal of Research and Innovation in Social Science* (IJRISS), 9(03), 4266-4274. https://doi.org/https://dx.doi.org/10.47772/IJRISS.2025.903SEDU0303

Kladchuen, R., & Srisomphan, J. (2021). The synthesis of a model of problem-based learning with the gamification concept to enhance the problem-solving skills for the high vocational certificate. *International Journal of Emerging Technologies in Learning (Online)*, *16*(14), 4.

Lee, J. H., Lee, J., & Kim, Y. (2020). Gamification and education: A systematic review of the literature. *Educational Technology Research & Development*, *68*(4), 2095-2116.

Mee, R. W. M., Pek, L. S., Von, W. Y., Ghani, K. A., Shahdan, T. S. T., Ismail, M. R., & Rao, Y. S. (2021). A Conceptual Model of Analogue Gamification to Enhance Learners' Motivation and Attitude. *International Journal of Language Education*, *5*(2), 40-50.

Nwachukwu U.M. & Johnson P.A. (2020) Effects of Gamification on Performance and Interest of Students in Basic Technology in River State. *International. Journal of Innovative Information Systems and Technology Research* 8(2) 26-36

Zourmpakis, A. I., Kalogiannakis, M., & Papadakis, S. (2024). The effects of adaptive gamification in science learning: A comparison between traditional inquiry-based learning and gender differences. *Computers*, *13*(12), 324.

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A Review of the Israel-Gaza War and Its Effects On Women and Children

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Abstract

This work critically examined the effects of Israel-Gaza war on women and children. The main objective of this study was to critically examine the socio economic, psychological and health effects of Israel-Gaza war on women and children. It further examined the extent the war has restricted access to essential amenities like health care for pregnant women and infants, including education and housing for women and Children. The study adopted a qualitative case study research design based on the analysis of secondary data from a variety of credible sources, including reports, academic articles, government documents, NGO publications, and media coverage. Secondary data was analyzed to assess the effects of the Israeli-Gaza War on women and children, exploring physical, economic, and psychological consequences, as well as the role of women and children in post-conflict recovery. The study employed document analysis and content analysis techniques to extract relevant data from secondary sources. The secondary data for this research was gathered from multiple sources. Findings from the study showed that children were more victims of socioeconomic impacts of the Israel-Gaza war. The result from the study also showed that Gaza had a far more negative impact from the armed conflict compared to Israel. The research recommends that efforts must be made and directed toward ensuring the safety, health, and emotional wellbeing of children, even during conflict. International organizations such as the United Nations should urgently seek for ways to end the war so as to prevent further negative impacts of the war on women and children.

Keywords: *War, Israel, Gaza, Women, Children, Consequence*

Introduction

Conflicts, disagreements, and arguments are natural possibilities in every human relationship, as individuals often differ in ideologies, beliefs, perceptions, behaviours, and attitudes. This potential for friction exists within close-knit circles and on a broader scale, such as among nations. A vivid example of this is the ongoing war between Hamas and Israel. The conflict in Gaza, marked by extreme violence and widespread destruction, has drawn global attention to the political dynamics of the Middle East. Efforts aimed at fostering regional stability, such as the recent Saudi-Israel Peace Deal and the Arab-Israeli reconciliation initiatives following the Abraham Accords, have been disrupted. Continuous hostilities in Gaza have shifted Arab nations' focus away from peace negotiations and altered the priorities of international alliances. Iran, in its bid to improve ties with Saudi Arabia, has issued warnings of pre-emptive strikes on Israel if it proceeds with a Gaza invasion (Safdar, 2024).
The long-term consequences of war significantly hinder societal progress and development (UN, 2020). The number of women and children impacted by armed conflicts has steadily increased since the turn of the millennium, due to global population growth, the urban nature of modern warfare, and a consistent rate of conflict occurrences. Armed confrontations contribute heavily to the illness and death rates among non-combatant populations. One of the central goals of the 2030 Sustainable Development Agenda is to reduce the prevalence and severity of armed conflicts. In 2017, it was estimated that about 10% of women and 16% of children globally—representing roughly 630 million individuals—were either displaced or living in direct proximity to zones of armed violence. Even those who remain in their homes are not immune to the traumatic and destabilizing effects of war (Eran et al., 2021).

In the face of divergent views and perspectives, war can hardly be considered the most reasonable or desirable solution for individuals, communities, or sovereign states. Some leaders wrongly equate war with the demonstration of power and dominance, believing that diplomatic approaches are signs of weakness. Such perceptions can lead to the hasty embrace of violence over peaceful engagement. However, war can never serve as an effective substitute for dialogue and amicable agreements. The harsh and destructive consequences of war are far-reaching—affecting not just the young and the elderly but also stalling economic progress and national development. Armed conflict halts the advancement of any nation striving for transformation and growth. Unarguably, war takes a heavy toll first on the population and then on the nation's structure and systems. Every year, millions of lives are lost to violent confrontations. Among those most susceptible during conflict periods are vulnerable populations such as children, the elderly, women, and persons with disabilities. The aftermath often includes elevated mortality rates, widespread disease, economic downturns, political chaos, and societal collapse. Furthermore, war diminishes the global image of participating nations, portraying them as dangerous and deterring tourism and international goodwill (Amnesty International, 2025). It is therefore critically important to emphasize that war is a poor choice compared to peaceful alternatives like compromise and constructive negotiations. These negative ramifications, often referred to as indirect impacts of war, encompass far more than just deaths from combat, making them methodologically difficult to measure and assess (Wise et al., 2021)

Some of the effects of the Hamas-Israeli War on children are hereby highlighted thus:

The murder and disfigurement of children: As of January 11, 2024, reports indicated that more than 10,000 children had lost their lives in Gaza. In addition, data from January 22, 2024, showed that 36 children were killed in Israel by Palestinian armed factions, and another 91 were killed in the West Bank by Israeli forces and settlers. The hostilities have also led to the forced displacement of approximately 1.7 million individuals within Gaza. Among them, at least 50,000 displaced persons from northern Gaza have taken refuge in 21 designated shelters located in Khan Younis City, which had a pre-conflict population of about 117,000 residents. This followed the Israeli military's emergency evacuation directive for nearly one-fifth of the city on December 3, 2023. Children across Gaza are in urgent need of secure environments, along with dependable access to essential resources such as food, water, sanitation, and shelter (Save the Children International, 2023). Amnesty International has reported the suspected use of heavy ordnance, possibly weighing up to 2,000 pounds, in the ongoing bombardments (Amnesty International, 2023). The deployment of such large-scale munitions in crowded civilian zones has led to devastatingly high casualty rates. Moreover, Human Rights Watch has documented claims that Israeli forces have employed white phosphorus in densely inhabited urban regions of Gaza during the current offensive, a tactic also observed in previous military operations (Human Rights Watch, 2023). Survivors often endure intense physical pain, permanent scarring, disabilities, and profound psychological trauma, which can lead to long-term social exclusion. Scientific literature highlights that children are particularly susceptible to the harmful effects of chemical agents due to their smaller body size and developing physiology (Shenoda et al., 2018).

Child abduction: Over 30 children who were kidnapped by Palestinian armed groups during their October 7, 2023, attacks were freed during the humanitarian halt, however it's unclear how many are still in captivity. According to Human Rights Watch, using children in "hostage videos" is an "outrage on personal dignity" (Minsberg, 2023). According to news reports of the child captives, the kids suffered from psychological anguish, poor nourishment, and unsanitary and unhygienic circumstances. The UN Human Rights Office has documented a sharp rise in Palestinian arrests and detentions since October 7, 2023, with most of these cases including no proof of criminal activity. Children are not exempt from this; it is estimated that 500–700 Palestinian children are arrested and detained by the Israeli military each year through administrative detention procedures where no charges are ever brought and through military courts that lack the fundamental protections for a fair trial (Defense for Children, 2023). Furthermore, dozens to hundreds of Palestinians, including boys as young as 15, who were taking refuge at a school on December 7, 2023, were arrested, stripped, bound, and taken to an unidentified location (Defence for Children International-Palestine, 2023). Children's physical and mental health are known to suffer when they are abducted and held captive, and survivors frequently have long-term effects (Shenoda et al., 2018).

Assaults on healthcare and educational facilities: Between October 7 and December 8, 2023, UNICEF recorded attacks on 352 educational establishments (UNICEF, 2023). By January 20, 2024, a total of 151 staff members of the United Nations Relief and Works Agency (UNRWA) had been reported killed (UNRWA, 2024). The mass displacement of civilians has forced many school buildings to be repurposed as emergency shelters, thereby increasing the number of casualties when these locations come under attack. A striking example is the UNRWA Al Fakhoora School situated within the Jabalia refugee camp, which housed around 20,000 displaced individuals when it was struck (Education Above All Foundation, 2023). Attacks have not been limited to schools—medical infrastructure has also suffered significantly. As of January 22, 2024, the World Health Organization (WHO) had verified more than 300 assaults on healthcare facilities, which included damages to 56 hospitals and 59 ambulances. Furthermore, Médecins Sans Frontières has reported that Israeli military forces deliberately targeted their vehicles. Children's fundamental rights to health and education, enshrined in the United Nations Convention on the Rights of the Child (UNCRC), are under direct threat. Article 24 guarantees every child the right to the highest attainable standard of health, while Article 28 affirms their right to receive an education. The current onslaught in Gaza demonstrates a profound violation of these provisions, as both health and educational systems have been gravely compromised (United Nations Children's Fund, 2023). The widespread devastation of civilian services, particularly those crucial to children's wellbeing, highlights the dire humanitarian consequences of the ongoing conflict. Schools and hospitals, meant to be safe havens, are now sites of extreme peril, undermining the essential frameworks needed to protect and nurture children in crisis.

Refusal to provide humanitarian access: Over the course of the 16-year siege of the Gaza Strip, Israeli authorities have restricted travel and placed import limits on necessities including food, building supplies, vital medical equipment, and gasoline (Save the Children International, 2023). Israeli Defense Minister Yoav Gallant has described the latest offensive as a "complete siege" in which Israel has cut off fuel, electricity, and aid supplies to Gaza. Additionally, Israel has attacked telecommunications infrastructure, making the already dire humanitarian situation worse (United Nations, 2023). UN authorities described the first 20 assistance trucks since October 7, 2023, which brought limited emergency supplies into Gaza through the Rafah border on October 21, 2023, as "a drop in the ocean of need." Israel permitted minor quantities of gasoline for vital humanitarian operations starting on November 18, 2023, and a total of 1723 relief vehicles had entered before the humanitarian halt began on November 24, 2023 (United Nations Office for the Coordination of Humanitarian Affairs, 2023). Children of all ages, especially newborns in need of incubators that run on power from fuel-dependent generators, are suffering in Gaza's hospitals due to the limitations on fuel and help entering the territory. Over the weekend of November 11 and 12, 2023, 37 preterm newborns were moved to an operating room without their incubators due to the absence of electricity at Al Shifa Hospital; by Monday, November 13, 2023, six of them were said to have passed away (Save the Children International, 2023).

Apart from the effects of the Hamas-Israeli War on children, studies have also shown that women are also greatly affected. The perspectives and lived experiences of individuals in war-affected regions—as civilians, combatants, survivors, or perpetrators—are deeply influenced by gender roles. Feminist movements and peace advocates have long emphasized the contributions of both Israeli and Palestinian women, promoting the ideals of solidarity and envisioning avenues for harmonious coexistence.

However, following the October 7 events, the narrative around gender in the Israeli-Palestinian conflict shifted dramatically, particularly with the increased politicization of sexual and gender-based violence (SGBV). Accusations against Hamas and other Palestinian factions involving sexual violence targeting Israeli civilians and military personnel highlight the weaponization of SGBV in warfare (Marteu, 2024). On October 7, 2023, during an operation dubbed "Al-Aqsa Flood," Hamas launched an unexpected attack on Israel, which resulted in the deaths of approximately 1,200 people and the abduction of 253 others. In retaliation, Israel initiated an extensive air campaign and a ground invasion of Gaza, formally declaring war on Hamas. By December 20, 2023, figures from the Hamas-controlled administration indicated that over 20,000 people had perished in Gaza (Zanotti et al., 2023). The conflict's human toll is staggering; Professor Michael Spagat, an authority in conflict-related casualty data, emphasized its extraordinary scale (Crowden, 2023). In Gaza alone, roughly 951,490 women have been forcibly displaced. Additionally, over 2,700 women are now widows and must assume the roles of household heads. The trauma is especially severe for girls who have lost their families or homes, as they face disruptions in education and access to healthcare. The destruction of housing and the overcrowding of temporary shelters create highly unstable living conditions. Moreover, the collapse of law and public services generates an atmosphere filled with fear and insecurity for these young girls (Ramadan & Abouzid, 2024).

The term "women in the Gaza war" encapsulates the diverse involvement of Israeli and Palestinian women as fighters, survivors, community leaders, and information disseminators during the ongoing conflict. Gender-specific violence has been a brutal feature, including serious accusations of rape and sexual assault perpetrated by Hamas. Various accounts and visual documentation from the aftermath of the October 7 attacks reveal acts of torture, including sexually violent assaults against Israeli women and minors. In response, several Israeli women's groups have mobilized efforts to secure the release of female hostages and draw international attention to their plight. Nearly 100 Israeli women were reportedly abducted and held in Gaza. Global bodies such as UN Women and the UN Secretary-General have strongly condemned these gender-targeted acts (Tapper et al., 2024).

Throughout the duration of the conflict, there has been a notable surge in sexual harassment, discrimination, and abuse targeting women and girls, particularly across the West Bank and East Jerusalem. The conflict has also severely strained Gaza's healthcare infrastructure, with 64% of primary healthcare centers now non-operational, exacerbating an already critical health emergency. Pregnant women, who are inherently more susceptible to medical complications, are facing heightened dangers due to the ongoing collapse of essential services. With about 50,000 pregnant women currently in Gaza, the likelihood of delivering under life-threatening and unsanitary conditions is extremely high. Each day, over 180 women are forced to give birth amid scarcity and instability, with around 5,500 pregnancies expected to reach full term in the coming days (OH-CHR, 2023). In northern Gaza, only Al-Awda Hospital—operated by ActionAid—remains functional for maternity care. Despite relentless bombings and a mid-November fuel shortage, the hospital continues to assist in delivering up to 20 babies daily (Shepherd, 2023). The absence of anesthesia, sterilization, and necessary medical interventions makes childbirth highly dangerous. The shortage of fuel, clean water, medications, and medical tools poses a severe threat to both maternal and infant survival (Faddoul et al., 2023).

Current expert assessments and United Nations reports reveal that women and children are suffering disproportionately from the Israel-Hamas conflict in Gaza. Since the renewed hostilities began on October 7, more than 10,000 people have been reported dead and over 25,000 injured in Gaza. In contrast, Israeli sources confirm that at least 1,400 individuals have died and over 6,900 have sustained injuries following Hamas' initial attacks. Approximately 67% of all casualties in Gaza are women and children, with many more suffering from injuries. Men typically take on combat roles, whereas the civilian toll mostly includes women, children, and the elderly, making them the most affected demographic in such conflicts (Kekatos, 2023). Women and children often become the most exposed to exploitation and abuse during such times of instability. Post-conflict periods offer no reprieve, as many children continue to suffer abuse, including sexual assault, trafficking, and abduction. Living in environments marked by war and refugee displacement leaves these young individuals vulnerable to continued neglect and harm. (Snoubar and Duman, 2016). Unfortunately, some national leaders often fail to consider the grave, harrowing, and long-lasting impacts of warfare before hastily engaging in armed confrontations. This pattern is evident in the ongoing Israel-Hamas conflict, where diplomatic resolutions have been overshadowed by military aggression. The aim of this work is to examine how the Israel-Hamas war has affected women and children. Ultimately, the goal is to provide compelling reasons to discourage continued participation in this international conflict while urging political leaders to pursue peace through dialogue and meaningful compromise.

Statement of Problem

It is opined that war can hardly be considered the most reasonable or desirable solution for individuals, communities, or sovereign states. Some leaders wrongly equate war with the demonstration of power and dominance, believing that diplomatic approaches are signs of weakness. Such perceptions can lead to the hasty embrace of violence over peaceful engagement. The harsh and destructive consequences of war are far-reaching—affecting not just the young and the elderly but also stalling economic progress and national development. Armed conflict halts the advancement of any nation striving for transformation and growth.

Among those most susceptible during conflict periods are vulnerable populations such as children, the elderly, women, and persons with disabilities. The aftermath often includes increasing mortality rates, widespread disease, economic downturns, political chaos and societal collapse (Amnesty International, 2025). Nevertheless, certain scholars have argued that, under certain circumstances, war might be unavoidable. However, it is undeniable that women and children face overwhelming health risks and mortality due to such violent conflicts. Research has outlined both the direct effects—those resulting from physical violence—and the indirect effects that wars impose on women and young individuals, including adolescents. Between 1995 and 2015 alone, more than ten million deaths were recorded among children under five as a result of armed conflicts worldwide. Women of childbearing age residing near highly volatile regions were found to experience three times the mortality rate of those in non-conflict areas (Bendavid et al., 2021).

Armed conflict remains a profound threat to public health, particularly for children, both in the immediate and distant future. Direct health implications for children include experiencing various forms of violence, injuries, disabilities, or death resulting from shootings, bombings, or structural collapses. Moreover, exposure to armed conflict also has prenatal consequences. In Gaza, around 50,000 pregnant women are reportedly facing risks of negative birth outcomes due to heightened maternal stress, physical trauma, food insecurity, and the destruction of health infrastructure. The broader, less visible effects include exposure to infectious diseases, chronic health problems caused or worsened by insufficient living conditions, displacement, loss of family members, orphanhood, and lack of access to basic human needs such as security, shelter, nutritious food, clean water, hygiene, medical services, and education (Boukari et al., 2024).

Across many parts of the globe—particularly in the Middle East—ongoing wars and armed confrontations significantly influence every facet of daily life, especially in directly affected communities. These conflicts result in the destruction of vital community infrastructure, including healthcare, educational institutions, and social welfare systems. In areas like the Middle East, the impact of war on families and individuals has been deeply unsettling. Families are broken apart, with roles shifting dramatically due to displacement and asylum-seeking. On an individual level, psychological, social, and physical wellbeing is greatly diminished. Women and children often become the most exposed to exploitation and abuse during such times of instability. Post-conflict periods offer no reprieve, as many children continue to suffer abuse, including sexual assault, trafficking, and abduction. Living in environments marked by war and refugee displacement leaves these young individuals vulnerable to continued neglect and harm. Some are even used as human shields, while others, particularly those taken into custody by occupying forces, suffer inhumane treatment including sexual and physical assault while imprisoned. The long-lasting, devastating impact of armed conflict on these defenseless groups is profound and demands urgent attention (Snoubar and Duman, 2016). While several studies have explored the consequences of the Israel-Gaza conflict, most have not paid close and systematic attention to its specific effects on women and children. Hence, this study seeks to critically analyze and document how the Israel-Gaza war continues to affect these two vulnerable groups.

Objectives of the Study

The objectives of the study are to:

i. critically examine the socio economic, psychological and health effects of Israel-Gaza war on women and children.
ii. examine the extent the war has restricted access to essential amenities like health care for pregnant women and infants, education and housing for women and Children.

Research Questions

i. What are the major socio economic, psychological and health care effects of the Israel-Gaza conflict on women and children in the affected region?
ii. In what ways has the war restricted access to basic amenities like healthcare, education and housing for women and children in Gaza and Israel?

Methodology

This study adopted a qualitative case study research design based on the analysis of secondary data. Secondary data was gathered from multiple sources, including academic literature, reports from international organizations, government and legal documents, media coverage, and humanitarian data. The research employed document analysis and content analysis to identify themes, patterns, and insights about the physical, economic, and psychological impacts of the Hamas-Israeli War on women and children. Secondary data was analyzed to assess the impacts of the Hamas-Israeli War on women and children, exploring physical, economic, and psychological consequences, as well as the role of women and children in post-conflict recovery. The research employed document analysis and content analysis techniques to extract relevant data from secondary sources.

The secondary data for this research was gathered from multiple sources: Academic Literature (scholarly articles, books, and dissertations on the Hamas-Israeli conflict, gender-based impacts of war, human security, and the role of women and children in conflict zones); reports from International Organizations and NGO (reports by organizations such as the United Nations, Human Rights Watch, Amnesty International, and UNICEF that provide data on the humanitarian situation, with a focus on the impacts of conflict on women and children), Government and Legal Documents (documents from governments, such as national reports, policy papers, and legislative responses to the conflict, particularly focusing on the protection of civilians and the rights of women and children), Media Coverage (News articles, press releases, and feature stories from credible media outlets (e.g., BBC, Al Jazeera, Reuters) that cover the experiences of women and children during the conflict, including testimonies, human interest stories, and on-the-ground reports) and well as Humanitarian and Development Agency Data (data from humanitarian and development agencies that focus on the aftermath of the conflict and the rehabilitation of women and children. This includes assessments of mental health, displacement, and recovery programs).

Results

Research Question 1: What are the major socio economic, psychological and health care effects of the Israel-Gaza conflict on women and children in the affected region?

Table 1: Fatalities and Injuries of Palestinians and Israeli as effects of the Israel-Gaza War from 2008-2025

Years	**Palestinians**		**Israeli**	
	Fatalities	***Injuries***	***Fatalities***	***Injuries***
2008	873	2325	37	844
2009	1059	6401	16	133
2010	87	1572	8	178
2011	117	2260	12	150
2012	259	4677	7	571
2013	39	4031	6	154
2014	2327	17534	88	2709
2015	174	14639	26	313
2016	108	3464	12	211
2017	77	8470	17	158
2018	300	31274	13	117
2019	138	15491	12	123
2020	30	2754	3	106
2021	328	19182	11	175
2022	191	10345	21	253
2023	548	13349	37	265
2024	503	3144	34	159
2025	125	1556	8	54
Total	7283	162468	368	6673

(Source, OCHA, 2015)

Secondary information collected in this research (table 1) revealed that the Israel-Gaza conflict has had numerous far-reaching socioeconomic, psychological, and healthcare consequences on women and children. Among the major socioeconomic effects identified are food shortages, hunger, heightened poverty levels, economic instability, inflation, and a general scarcity of essential goods. The psychological toll on affected individuals includes rising cases of trauma, child abduction and trafficking, feelings of desperation, and exposure to physical and sexual abuse, including rape. In addition, the healthcare impacts documented in the study comprise widespread malnutrition, illnesses, fatalities, injuries, and abortion, all of which are increasingly becoming prevalent in conflict-affected zones among women and children.

One year into the ongoing war, the humanitarian situation in Gaza has deteriorated to catastrophic proportions. Casualty figures have soared, critical infrastructure has been destroyed, and food insecurity is rampant. The conflict has severely undermined essential sectors such as education, healthcare, the economy, and environmental sustainability. Many schools have been demolished, with students and teachers losing their lives, and the educational system in disarray. Gaza's healthcare infrastructure is nearing collapse due to acute shortages in drugs and equipment, alongside widespread malnutrition particularly affecting children. The environmental damage resulting from the conflict remains difficult to quantify and may take years to fully understand. Meanwhile, the availability of social services has declined drastically, leaving most civilians to survive without basic governmental support. In the West Bank, intensified Israeli military activity has resulted in significant loss of life, infrastructural damage, and deep economic setbacks (United Nations, 2024).

By January 11, 2024, more than 10,000 children had been killed in Gaza. In addition, by January 22, 2024, at least 91 children had lost their lives due to actions by Israeli forces and settlers in the West Bank, while 36 children were reportedly killed in Israel by Palestinian armed groups. The war has forced approximately 1.7 million people in Gaza into internal displacement. Following Israeli evacuation orders affecting about 20% of Khan Younis City on December 3, 2023, nearly 50,000 displaced persons are now sheltering in 21 designated locations within a city that initially had a population of about 117,000. All children in Gaza urgently require secure environments, sufficient food, clean water, adequate shelter, and access to sanitation facilities. The enduring effects of war on children are profound and long-lasting, and with Gaza's healthcare infrastructure significantly weakened, there is an anticipated rise in child mortality and morbidity once the current hostilities subside (Boukari et al., 2024).

Since the escalation of Israeli military operations in Gaza on October 7, 2023, following attacks by Palestinian militants, the Ministry of Health in Gaza has reported over 30,717 deaths, including 12,550 children. On the other hand, the Government of Israel stated that 1,200 individuals, among them 33 children, were killed, and more than 240 persons were taken hostage, including at least 30 children. A dire hunger crisis is unfolding, with almost all children in Gaza facing the risk of starvation due to the acute lack of food and clean water. Reports indicate that at least 15 children in northern Gaza have already died from starvation and dehydration. Children's mental health has deteriorated markedly, with conditions worse than in previous conflicts.

Symptoms reported include persistent anxiety, sleep disturbances, bedwetting, hypervigilance, behavioral regression, aggression, and weakened emotional bonds with parents (Save the Children International, 2024). Gaza, home to approximately 2.3 million people and part of the occupied Palestinian territories, has experienced continuous siege for over 16 years. On October 7, 2023, Palestinian fighters killed 1,200 civilians, including 36 children, and kidnapped others, prompting Israel to commence ground operations and aerial bombardments. The study emphasizes that the severe social, psychological, and medical consequences of such conflicts deter many nations from engaging in warfare as a policy option (Boukari et al., 2024).

While the precise number of children still being held hostage remains unknown, reports confirm that over 30 minors were freed after their abduction by Palestinian armed groups during the October 7, 2023, assault. Human Rights Watch described the public use of minors in hostage videos as a blatant violation of personal dignity. These children reportedly endured emotional trauma, malnutrition, and unhygienic living conditions during captivity. Amnesty International has reported the use of massive explosives, estimated to weigh up to 2,000 pounds, in densely populated areas—inevitably leading to extremely high civilian casualties. Additionally, Human Rights Watch has gathered evidence of Israeli forces deploying white phosphorus in populated Gaza neighborhoods, as was documented in previous military engagements. Exposure to white phosphorus can cause deep chemical burns and systemic organ failure, resulting in lifelong disability, disfigurement, and psychological scars. Children, due to their smaller size and physiological vulnerability, are particularly susceptible to the devastating effects of chemical warfare. The targeting of innocent youth—who bear no responsibility for the root causes of the conflict—is both a moral and humanitarian travesty (Boukari et al., 2024).

Research Question 2: In what ways has the war restricted access to basic amenities like healthcare, education and housing for women and children in Gaza and Israel?

Secondary data obtained during the study indicated that Israel has restricted access to essential services in Gaza, effectively leaving the civilian population—particularly women and children—isolated and vulnerable. Reports highlighted the denial of water-related assistance, intentional destruction of water infrastructure, prevention of maintenance activities, and obstruction of humanitarian relief efforts from NGOs and international aid organizations. These blockades have intensified the suffering of the affected population. With healthcare systems nearly non-operational and many families severed from medical care, it is presumed that actual casualty figures are significantly higher than reported. This dire situation has led to an alarming increase in anxiety and psychological distress among both children and adults. Prior to the October 7 escalation, many children in Gaza were already experiencing severe mental health issues stemming from repeated cycles of violence, restricted movement, limited access to vital services, economic deterioration, and the emotional trauma of separation from loved ones (Save the Children International, 2024). Since October 7, 2023, around 1,100 children have reportedly been arrested by the Israeli military, while approximately 39,000 have lost one or both parents due to ongoing violence (Al Jazeera, 2025).

On top of an ongoing siege that has lasted over 17 years, children in Gaza have been exposed to relentless psychological anguish over the past five months, fueled by widespread violence, displacement, starvation, and disease (Save the Children International, 2024). Conversations with parents and guardians have revealed that many children have lost the ability to imagine a peaceful existence, a sentiment echoed by frontline child welfare organizations. The emotional burden on caregivers has become increasingly overwhelming as they attempt to protect their families from gunfire and air raids, grieve lost relatives, flee through ravaged streets, and wake daily with no guarantee of food or safety. The inability to access basic resources and support systems is making it almost impossible for caregivers to fulfill their responsibilities. Child protection experts from Save the Children have emphasized the urgent need for a permanent ceasefire and unimpeded humanitarian access, warning that without immediate intervention, the ongoing conflict will continue to inflict irreversible psychological trauma on the younger population, significantly reducing any future chances of recovery. In these unsanitary and hazardous conditions, waterborne diseases such as hepatitis A, polio, and diarrhea have surged, posing life-threatening risks especially for children under the age of five. The reemergence of type 2 poliovirus (cVDPV2) in Gaza in July 2024, after more than two decades, reflects the deteriorating health environment. Furthermore, education in Gaza has suffered severely. Nearly 658,760 school-aged children are currently unable to attend regular classes due to persistent displacement mandates and repeated airstrikes targeting educational institutions, which have been repurposed as emergency shelters. The academic calendar remains indefinitely suspended, resulting in the complete loss of the current school year. Projections suggest that the cumulative educational deficit could amount to five lost academic years for affected children (United Nations, 2024).

Discussion of Findings

This study explored the effects of Israel-Gaza on women and children. The study comprised of two research questions which were analyzed. Research question 1 delved on the major socioeconomic, psychological, and health care impacts of the Israel-Gaza conflict on women and children in the affected region. The study showed that children were more victims of socioeconomic impacts of the Israel-Gaza war. This means that from the study children were more affected by armed conflicts, due to their level of innocence, naiveness posing greater level of vulnerability. The study also showed that hunger and food shortage/scarcity were predominant socioeconomic impacts amongst women and children. This study is in agreement with studies conducted by International Rescue Committee (IRC, 2024) which stated that "The Ministry of Health estimates that 8,000 of the confirmed deaths in Gaza are minors, and many more are unaccounted for. Tens of thousands more people have been abandoned or cut off from their loved ones. The cumulative impacts of ongoing violence, forced relocation, and missing a whole school year are likely to affect youngsters for the rest of their lives, putting an entire generation at risk of being "forgotten." Children who are left without people to care for them or who have been separated from their family are among the most vulnerable.

An estimated 17,000 youngsters may be left alone or separated from their parents and other caretakers. But according to the IRC, based on prior crises, this figure may be three times higher". According to IRC research, there has been a significant increase in the likelihood of family separation in recent months, which has been made worse by several rounds of displacements, arrests, Israeli forced relocation orders, and fatalities. In hospitals, some kids have been discovered living alone.

According to reports, as of 2024, the lives of children and their families throughout the State of Palestine, Israel, and the surrounding area have been severely disrupted by a year of war that has been characterized by deaths, injuries, kidnappings, displacement, disease, malnutrition, dehydration, ongoing fear, and severe trauma. At least 14,000 children are said to have died and several more injured in Gaza; thousands more are probably buried beneath the debris, and an estimated 17,000 more are either unattended or separated from their caretakers (United Nations, 2024). According to the UN organization, it confirmed the information of 8,119 persons who were murdered in Gaza between November 2023 and April 2024. According to their investigation, 26% of confirmed casualties were women and 44% were children. The majority of the deceased were between the ages of five and nine. Residential structures or comparable dwellings accounted for almost 80% of the fatalities (Mallory, 2024).

The study's secondary data highlighted that Gaza has endured disproportionately harsher consequences from the armed conflict compared to Israel. Gaza has suffered from underreported fatalities, disease outbreaks caused by water shortages, deliberate obstruction of water-related aid, destruction of water infrastructure, and active interference with repairs. Additionally, healthcare and housing facilities, agricultural systems, and sanitation networks have been severely damaged. Infants, pregnant and breastfeeding women, and people with disabilities have been especially affected. Attacks targeting wastewater treatment plants, reservoirs, and water workers, along with deliberate deprivation of water, electricity, and fuel, have restricted essential services and contributed to disease and mortality due to poor sanitation and hygiene.

These findings align with a 2016 report by the UN Country Team in the Occupied Palestinian Territory. It noted that limitations on economic activity, especially restrictions on the movement of goods, have significantly hindered Palestinian growth and market development. With the private sector hamstrung, the economy has become heavily reliant on public-sector employment and foreign aid, often leaving Palestinians dependent on government or donor support. Gaza's economy has been further weakened by recurrent military operations and the prolonged blockade, which have impeded reconstruction and amplified the impact of economic shocks. High Israeli tariffs, import quotas, and non-reciprocal trade rules have also tilted commercial relations in Israel's favor. Palestinian manufacturers shifted focus toward the Israeli market, while Israeli products flooded Palestinian retail, eroding the competitiveness of local producers.

Research question 2 explored ways the war restricted access to basic amenities like healthcare, education and housing for women and children in Gaza and Israel. The study showed that Israel has restricted access to essential services in Gaza, effectively leaving the civilian population—particularly women and children—isolated and vulnerable. A 2022 UN analysis emphasized that Israeli policies after the Oslo Accords fractured and crippled the Palestinian economy, making it fully dependent on Israel. The policy environment severely damaged the Palestinian industrial base and diversified economic activities, while Israel's much larger and more diverse economy remained unscathed. The UN noted that Israel, as the occupying power under international humanitarian law, has not implemented any macroeconomic or monetary policies in support of the Palestinian economy; security control, rather than economic development, has been the focus of its policy. During the 16-year blockade of Gaza, Israeli authorities have restricted travel and imposed import bans on vital goods such as fuel, food, construction materials, and medical supplies. As Israel's Defense Minister Yoav Gallant described, this amounts to a "complete siege"—cutting off gasoline, electricity, and relief supplies. Telecommunications infrastructure has been hit as well, deepening the region's humanitarian crisis (Boukari et al., 2024). Medical shortages have worsened dramatically, with as much as 60% of essential medicines either depleted or in critically low supply. Restrictive import policies have led to severe shortages in healthcare. More than 500,000 women of reproductive age in Gaza lack access to prenatal, postnatal, family planning, and STI services, increasing risks of life-threatening complications. They also face a higher prevalence of chronic conditions such as diabetes and hypertension, while evacuation for serious illnesses or injuries is virtually impossible (United Nations, 2024).

Conclusion

This study delved into the wide-ranging impacts of armed conflict, examining its repercussions across economic, health, and cultural dimensions, including the destruction of significant heritage landmarks. In particular, the research highlighted the disproportionate effects of the Israel-Gaza conflict on women and children. Women have frequently endured harassment, intimidation, and violence within their homes and communities, especially while navigating through conflict-affected areas and military checkpoints. Many women have been coerced into sheltering and supporting combatants, which exposes them to retaliation and endangers their safety and that of their families. This additional burden, often accompanied by scarce resources, creates deeply distressing and precarious situations. Furthermore, the prolonged conflict poses serious threats to the physical, psychological, emotional, and social development of children in Gaza. Ongoing violence severely disrupts their cognitive growth and emotional well-being, placing an entire generation at risk of long-term developmental impairments. This research further emphasized the need to envision the peaceful coexistence of two sovereign states, Israel and Palestine, as the cornerstone of a durable resolution. Addressing the developmental vulnerabilities of children caught in the crossfire of the Gaza conflict necessitates an integrative strategy that balances urgent protective interventions with sustained developmental support.

Immediate measures should prioritize safeguarding children from further violence, trauma, and displacement. In parallel, long-term solutions must focus on rebuilding educational and healthcare systems, enhancing psychosocial support, and creating safe environments that allow children to thrive. Such a comprehensive approach would ensure not only their survival but also their potential to lead stable, healthy, and fulfilling lives in the aftermath of war.

Recommendations

The researcher in view of the above subject matter, proffers the following recommendations among others thus:

1. Deliberate efforts should be focused on safeguarding the physical health, mental stability, and emotional welfare of children, even amid ongoing hostilities. Accordingly, it is recommended that priority attention be accorded to women, elderly individuals, and children in the distribution of care and essential services throughout the duration of the conflict, particularly while diplomatic negotiations and peace-building initiatives are still underway.

2. The Israeli government must act swiftly to comply with the provisional directives issued by the International Court of Justice (ICJ). This includes halting all assaults on civilians as well as on vital repair personnel and ceasing the unlawful demolition of water-related infrastructure across the Gaza Strip. The government should also immediately lift the blockade on Gaza, reinstate access to essential utilities such as electricity and water, and allow the unrestricted delivery of critically needed supplies including fuel, food, medical aid, and water through all available land entry points. Furthermore, the Israeli authorities must facilitate and accelerate the rehabilitation of water facilities that have been damaged, ensuring the restoration of safe and reliable water access to the population.

3. In order to stop genocide and other crimes, governments and international organizations—particularly those that have sway over the Israeli government, such the US, UK, and EU states—should intervene immediately. This is meant to put real pressure on the Israeli government to abide by the ICJ's provisional measures and its other duties under IHL and human rights law, this includes actions like targeted sanctions, halting arms transfers and military aid, and reviewing bilateral trade and political agreements.

References

Al-Jazeera (2025). UN says 100 children killed or injured in Gaza every day since war resumed | Israel-Palestine conflict News. Accessed 26th May 2025 and retrieved from https://www.aljazeera.com/news/2025/4/5/un-says-100-children-killed-or-injured-in-gaza-every-day-since-war-resumed

Amnesty International (2023). Israel/OPT: US-made munitions killed 43 civilians in two documented Israeli air strikes in Gaza – new investigation. 2023. Available: https://www.amnesty.org/en/latest/news/2023/12/israel-opt-us-made-munitions-killed-43-civilians-in-two-documented-israeli-air-strikes-in-gaza-new-investigation/

Amnesty International (2025). Armed Conflict - Amnesty International. Retrieved from https://www.amnesty.org/en/what-we-do/armed-conflict/

Bendavid, E., Boerma, T., Akseer, N., Langer, A., Malembaka, E.B., Okiro, E.A., Wise, P.H., Heft-Neal, S., Black, R.E., Bhutta, Z.A. and the BRANCH Consortium Steering Committee (2021). The effects of armed conflict on the health of women and children. *Lancet*; 397: 522–32. https://doi.org/10.1016/ S0140-6736(21)00131-8

Boukari, Y., Kadir, A., Waterson, T., Jarrett, P., Harkensee, C., Dexter, E., Cinar, E.N., Blackett, K., Nacer, H., Stevens, A. and Devakumar, D. (2024). Gaza, armed conflict and child health. *BMJ Paediatrics Open;* 8(1): 1-5.

Crowden, G. (2023). Who has been killed in Gaza? Two experts examine the data. [Internet], Every Casualty Counts. Retrieved from 〈 https://everycasualty.org/who-has-been-killed-in-gaza-two-experts-examine-the-data/[cited 2024 Apr 7]. Available from.

Defence for Children (2023). Childhood in captivity: Palestinian children arbitrarily detained in Israeli prisons. Available: https://defenceforchildren.org/hrc53-side-event-childhood-in-captivity-palestinian-children-arbitrarily-detained-in-israeli-prisons/

Defence for Children International-Palestine (2023). Number of Palestinian children (12-17) in Israeli military detention. Available: https://www.dci-palestine.org/children_in_israeli_detention [Accessed 05 Dec 2023].

Education Above All Foundation (2023). Education above all: schools are off-limits – cease attacks now. Accessed 20/05/25 and available: https://reliefweb.int/report/occupied-palestinian-territory/education-above-all-schools-are-limits-cease-attacks-now.

Eran, B., Ties, B., Nadia, A., Ana, L., Espoir, Bwenge, M., Emelda, A O., Paul, H.W, Sam, Heft-Neal, Robert E. Black, Zulfiqar, A.B. (2021). Women's and Children's Health in Conflict Settings 2 The effects of armed conflict on the health of women and children.

Faddoul, A., Shannon, G., Asghar, K., Boukari, Y., Smith, J. and Neilson, A. (2023). The health dimensions of violence in Palestine: a call to prevent genocide, *Lancet*. S0140673623027514.

Human Rights Watch. Israel: white phosphorus used in Gaza, Lebanon. 2023. Available: https://www.hrw.org/news/2023/10/12/israel-white-phosphorus-used-gaza-lebanon

International Rescue Committee (IRC, 2024). What is happening to children and pregnant mothers in Gaza? | The IRC. Retrieved from https://www.rescue.org/article/what-happening-children-and-pregnant-mothers-gaza

Kekatos, M. (2023). Why women, children are disproportionately impacted by the conflict in Gaza: Experts - ABC News. Accessed 10th February 2025 and retrieved from https://abcnews.go.com/International/women-children-disproportionately-impacted-conflict-gaza-experts/story?id=104655493

Mallory, M. (2024). Nearly 70% of Gaza war dead women and children – UN. Retrieved from https://www.bbc.com/news/articles/cn5wel11pgdo

Marteu, E. (2024). The Israeli-Palestinian Conflict and the Gaza War through a Gender Lens. *Strategic Sectors/ Culture & Society*, IEMed Mediterranean Yearbook.

Minsberg, T. (2023). Relatives describe the trauma of child hostages freed by Hamas. The New York Times. Accessed 08 December 2023. Available: https://www.nytimes.com/2023/11/29/world/middleeast/relatives-describe-the-trauma-of-child-hostages-freed-by-hamas.html.

OCHA, "Humanitarian Response Plan, OPT." 2023. Humanitarian Programme Cycle. United Nations Office for the Coordination of Humanitarian Affairs (OCHA). www.ochaopt.org/content/humanitarianresponse-plan-2023.

OHCHR [Internet]. [cited 2023 Dec 24]. Women bearing the brunt of Israel-Gaza conflict: UN expert. Available from: 〈 https://www.ohchr.org/en/press-releases/2 023/11/women-bearing-brunt-israel-gaza-conflict-un-expert〉 .

Ramadan, A. and Abouzid, M. (2024). Resilience beyond borders: Gaza's women and their silent battles. *Women and Birth;* 37: 101623.

Safdar, M. (2024). "Israel-Hamas War In Gaza: Rearrangement Of Regional Powers And Implications For The Middle East". *Margalla Papers* 28 (1):161-79. https://doi.org/10.54690/margallapapers.28.1.246.

Save the Children International (2023). GAZA: 3,195 children killed in three weeks surpasses annual number of children killed in conflict zones since 2019. Save the Children International; 2023. Available: https://www.savethechildren.net/news/gaza-3195-children-killed-three-weeks-surpasses-annual-number-children-killed-conflict-zones [Accessed 18 Dec 2023]. [Google Scholar]

Save the Children International (2024). "Complete psychological destruction": Children in Gaza have suffered "relentless mental harm" during five months of war – Save the Children | Save the Children International. Accessed 26th May, 2025 and retrieved from https://www.savethechildren.net/news/complete-psychological-destruction-children-gaza-have-suffered-relentless-mental-harm-during

Shenoda, S., Kadir, A. and Pitterman, S. (2018). The effects of armed conflict on children. *Pediatrics,* 142:e20182585. DOI: 10.1542/peds.2018-2585

Shepherd, A. (2023). Help women in Gaza and across the globe. *BMJ*, p. 29-59.

Snoubar, Y. and Duman, N. (2016). Impact of Wars and Conflicts on Women and Children in Middle East: Health, Psychological, Educational and Social Crisis. *European Journal of Social Sciences Education and Research;* 6(2): 211-215.

Tapper, J., Appleton, K., and Clarke, R. (2024). "Attackers laughed as they raped and murdered a woman in Israel on October 7, witness says". CNN. Retrieved 2024-01-05.

UNICEF (2023). Statement by UNICEF Executive Director Catherine Russell on the resumption of fighting in Gaza, Available: https://reliefweb.int/report/occupied-palestinian-territory/statement-unicef-executive-director-catherine-russell-resumption-fighting-gaza [Accessed 02 Dec 2023].

United Nations (2020). Transforming our world: the 2030 Agenda for Sustainable Development. Sustainable Development Knowledge Platform; [accessed Dec 10, 2020]. https://sustainabledevelopment.un.org/post2015/transformingourworld

United Nations (2023). Amid increasingly dire humanitarian situation in Gaza, Secretary-general tells Security Council Hamas attacks cannot justify collective punishment of Palestinian people. Available: https://press.un.org/en/2023/sc15462.doc.htm [Accessed 01 Nov 2023].

United Nations (2024). Gaza war: Expected socioeconomic impacts on the State of Palestine. UNDP, E/ESCWA/UNDP/2024/Policy brief.2,

United Nations Children's Fund (2023). The United Nations convention on the rights of the child. 1989. Available: https://www.unicef.org.uk/wp-content/uploads/2016/08/unicef-convention-rights-child-uncrc.pdf [Accessed 27 Oct 2023].

United Nations Office for the Coordination of Humanitarian Affairs (2024). Hostilities in the Gaza strip and Israel - flash update #99. Available: https://reliefweb.int/report/occupied-palestinian-territory/hostilities-gaza-strip-and-israel-flash-update-99-enhear#: [Accessed 23 Jan 2024].

UNRWA (2024). UNRWA situation report #67 on the situation in the Gaza strip and the West Bank, including East Jerusalem. Accessed 10th April 2025 and available at: https://www.unrwa.org/resources/reports/unrwa-situation-report-67-situation-gaza-strip-and-west-bank-including-east-Jerusalem#:~:text=As%20of%2020%20January%202024,for%20the%20past%20seven%20days. [Accessed 23 Jan 2024].

Wise, P.H., Shiel, A. and Southard, N. (2021). The political and security dimensions of the humanitarian health response to violent crime. *Lancet*. doi: 10.1016/S0140-6736(21)00130-6. published online Jan 24.

Zanotti, J., Sharp, J.M., Blanchard, C.M., Thomas, C., Weed, M.C. and Margesson, R. (2023). Isr. Hamas Oct. 2023 Confl.: Freq. Asked Quest. (FAQs).