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INFLUENCE OF TEACHERS' PERCEPTION OF IMPROVISED INSTRUCTIONAL MATERIALS ON LEARNING OUTCOMES IN PHYSICS AMONG SS2 STUDENTS IN ABA EDUCATION ZONE, ABIA STATE

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Abstract: This study investigated the influence of teachers' perception of improvised instructional materials on learning outcomes in physics among SS2 students in Aba Education Zone, Abia State. The study specifically examined the roles of teachers' teaching experience and attitude toward innovation and creativity in shaping students' academic achievement. A descriptive survey research design was employed, and the population consisted of all SS2 physics teachers and students in public secondary schools within the zone. A purposive sample of 15 schools, comprising 45 physics teachers and 300 SS2 students, was selected. Data were collected using a structured questionnaire with 20 items measured on a four-point Likert scale (Strongly Agree, Agree, Disagree, Strongly Disagree). The questionnaire was validated by experts and yielded a Cronbach's alpha of 0.82, indicating high reliability. Data were analyzed using descriptive statistics (mean and percentages) and inferential statistics (Pearson Product-Moment Correlation). The findings revealed that teachers' teaching experience significantly influences their perception and use of improvised instructional materials, which positively affects students' learning outcomes ($r = 0.62$, $p = 0.001$). Additionally, teachers' positive attitude toward innovation and creativity was found to have a significant impact on students' engagement and academic achievement in physics ($r = 0.68$, $p = 0.001$). The study concluded that both experience and innovative attitudes are critical factors in the effective use of improvised instructional materials, leading to improved student understanding, problem-solving skills, and performance in physics.

Based on these findings, it was recommended that teachers receive continuous professional development, mentoring, and support to enhance their creativity and ability to use improvised instructional materials effectively. Schools and policymakers should also encourage the use of locally available teaching resources to facilitate active learning and improve students' outcomes in physics.

Keywords: *Teachers' perception, improvised instructional materials, learning outcomes, teaching experience, innovation, creativity, physics.*

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Introduction

Physics is a core science subject in the secondary school curriculum that plays a central role in students' understanding of natural phenomena and technological applications. However, across Nigeria, many students continue to perform poorly in physics due to its abstract nature and the challenges associated with teaching complex concepts effectively (Oguche & Etuh, 2026).

One of the critical factors influencing effective physics instruction is the availability and use of instructional materials. Instructional materials assist teachers in making abstract concepts concrete, facilitating understanding, and enhancing students' retention and performance (Babalola et al., 2026; Oguche & Etuh, 2026). In many Nigerian secondary schools including those in the Aba Education Zone of Abia State standardized instructional materials are often inadequate or unavailable, prompting teachers to improvise instructional materials from locally accessible resources. This practice can potentially bridge resource gaps and make learning more experiential and engaging. However, the success of such improvisation depends largely on teachers' perceptions of its relevance and effectiveness.

Teachers' perceptions shaped by personal beliefs, experiences, and attitudes influence whether they choose to adopt, adapt, and implement improvised instructional materials in their classrooms. When teachers hold positive perceptions about the usefulness of improvised materials, they are more likely to integrate them creatively, thereby improving instructional delivery

and offering opportunities for students to interact with the subject matter meaningfully (Ahzari, Asrizal, & Usmeldi, 2026). Conversely, teachers who view improvised materials as inferior or difficult to use may rely solely on traditional lecture methods, limiting student engagement and contributing to persistently low learning outcomes.

Two key factors that influence teachers' perceptions are teaching experience and attitude toward innovation and creativity. Teaching experience often equips educators with greater classroom management skills, deeper subject mastery, and familiarity with diverse instructional strategies. Studies indicate that experienced teachers tend to be more adaptable, confident in improvisation, and better able to contextualise lessons to meet students' needs (OKOSE & OBIUNU, 2024). In the context of physics education, experienced teachers are more likely to exploit locally made materials to represent abstract theories in relatable forms, thereby enhancing students' understanding and performance.

Furthermore, a teacher's attitude toward innovation and creativity plays a significant role in the adoption of improvised instructional materials. Teachers who value creativity and show willingness to experiment with new instructional methods are often at the forefront of utilising improvised materials effectively. Their positive attitude motivates learners, stimulates curiosity, and promotes a learner-centered classroom environment that supports critical thinking and problem-solving in physics. Students exposed to such environments generally demonstrate higher learning outcomes and greater interest in physics (Ahzari et al., 2026).

In the Aba Education Zone, where variations in school resources and teacher preparedness exist across urban and rural schools, understanding how teachers' perceptions influenced by their experience and attitude toward innovation affect students' learning outcomes is pivotal. This understanding can inform targeted interventions such as professional development programmes, resource provision strategies, and policies that encourage creativity in instructional design.

Therefore, this study seeks to investigate the influence of teachers' perception of improvised instructional materials, focusing on teachers' teaching experience and attitudes toward innovation and creativity, on the learning outcomes of SS2 students in Physics within the Aba Education Zone. The findings are expected to illuminate how teacher-related factors shape instructional practices and contribute to students' academic success in physics, offering valuable insights for educators, school administrators, and policy makers.

Social Constructivist Theory

Social Constructivist Theory was developed by Lev Vygotsky in the year (1978). The theory posits that learning occurs through social interaction and the use of tools that help learners construct knowledge actively. Vygotsky emphasized that instructional materials, language, and collaborative activities help learners move from what they know to what they can achieve with guidance, a process he described as the Zone of Proximal Development (ZPD). According to this theory, teaching resources and learning tools are essential because they support cognitive development by making abstract ideas more concrete and accessible.

Improvised instructional materials serve as learning tools that help students visualize and interact with physics concepts. When teachers creatively improvise materials, they provide scaffolding that enables students to understand difficult scientific ideas. Thus, the theory supports the idea that instructional materials whether standard or improvised facilitate meaningful learning.

The present study examines how teachers' perception of improvised instructional materials influences learning outcomes in physics. From the social constructivist perspective, teachers who value and use improvised materials provide richer learning environments that support interaction, experimentation, and conceptual understanding. Therefore, the theory explains why positive teacher perception of instructional materials may lead to improved student achievement in physics.

Experiential Learning Theory

Experiential Learning Theory was developed by David Kolb in the year (1984). This theory asserts that learning occurs through experience, reflection, conceptualization, and experimentation. Kolb argued that students learn best when they actively engage with materials and participate in practical experiences rather than passively receiving information. Hands-on activities, demonstrations, and experiments are central to this theory because they allow learners to connect theory with real-life applications.

Improvised instructional materials provide opportunities for practical learning even in resource-poor environments. When teachers improvise physics apparatus using local materials, they enable students to observe phenomena, perform experiments, and engage directly with concepts, which promotes deeper understanding and retention.

This study focuses on how teachers' perception of improvised materials affects students' learning outcomes. Experiential Learning Theory explains that when teachers perceive improvised materials as useful and integrate them into teaching, students gain more practical learning experiences. These experiences improve comprehension, retention, and academic performance in physics. Thus, the theory provides a theoretical foundation for expecting improved learning outcomes when teachers positively perceive and utilize improvised instructional resources.

Concept of Teachers' Perception

Teachers' perception refers to the beliefs, attitudes, judgments, and interpretations that teachers hold about instructional practices, teaching resources, students, and the learning environment. It represents how teachers understand and interpret educational phenomena based on their experiences, knowledge, professional training, and personal values. Perception influences how teachers select teaching methods, respond to classroom situations, and adopt innovations in instruction.

In education, perception is not merely an opinion but a cognitive process through which teachers interpret information from their environment and assign meaning to it. These interpretations guide instructional decisions and classroom behaviour. When teachers perceive a teaching strategy or resource as useful, practical, and effective, they are more likely to adopt and integrate it into their teaching practice. Conversely, negative

perceptions can hinder the implementation of even well designed instructional innovations.

Researchers have emphasized that teachers' perception plays a critical role in the success of instructional reforms because teachers act as the implementers of curriculum innovations. If teachers perceive instructional materials as relevant and beneficial, they tend to use them more frequently, which can enhance students' understanding and academic achievement. On the other hand, when teachers perceive such materials as time-consuming, ineffective, or difficult to prepare, their usage declines, thereby limiting learning opportunities for students.

Teachers' perception is shaped by several factors, including professional training, teaching experience, subject mastery, availability of resources, administrative support, and personal attitudes toward change. Studies indicate that teachers with strong pedagogical knowledge and exposure to modern instructional strategies tend to develop positive perceptions toward learner-centred approaches and instructional aids. Such perceptions often translate into innovative teaching practices that improve classroom interaction and student engagement.

In science education, particularly physics, teachers' perception of instructional materials is especially important because the subject involves abstract concepts that require demonstrations, experiments, and visual representations. When teachers perceive instructional materials especially improvised ones as valuable teaching tools, they are more inclined to incorporate them into lessons, thereby making learning more concrete and meaningful. This improved instructional approach can enhance students' comprehension, retention, and performance.

Furthermore, perception influences not only the use of instructional materials but also the quality of their implementation. Teachers who perceive instructional resources positively are more likely to use them effectively, design learner-centred activities, and encourage students' active participation. Thus, teachers' perception serves as a mediating variable between instructional resources and students' learning outcomes.

Within the context of this study, teachers' perception refers specifically to their beliefs and attitudes about the usefulness, effectiveness, practicality, and relevance of improvised instructional materials in teaching physics. Understanding this perception is essential because it determines whether teachers will adopt improvisation strategies and how such strategies may influence students' learning outcomes in physics classrooms.

Concept of Improvised Instructional Materials

Improvised instructional materials refer to teaching and learning resources that are locally produced, adapted, or substituted using materials available within the learners' environment when standard equipment is unavailable, insufficient, or too expensive. Improvisation in education is therefore viewed as a creative and resourceful process aimed at ensuring that instruction remains meaningful despite resource constraints (Eriloa, 2011; Ofoefuna, 2014).

Instructional improvisation involves the construction, adaptation, or modification of teaching aids by teachers, learners, or community members to serve the same instructional purpose as conventional materials. It may include designing completely new materials or modifying existing ones to suit the teaching context (Ofoefuna, 2014).

In science education particularly, improvised materials are often developed from locally sourced items to replace unavailable laboratory apparatus and to support the teaching of abstract concepts. Such materials help bridge the gap between theoretical explanations and real-life experiences by enabling students to visualize, manipulate, and interact with scientific phenomena (Adeyemi, 2024).

Improvised instructional materials are also defined as alternative teaching aids derived from the immediate environment and used to facilitate understanding when conventional resources are lacking. They are usually designed to be cost-effective, culturally relevant, and curriculum-aligned, thereby improving clarity, student participation, and comprehension during lessons (Engida, 2022; Onasanya & Adegbija, 2022).

Scholars further describe improvisation as the act of creatively utilizing available environmental resources to create teaching tools that sustain learners' interest, enhance participation, and improve learning outcomes. In this sense, improvisation is not merely a substitute for standard materials but a pedagogical strategy that encourages innovation, problem-solving, and contextual learning (Ovie, 2024).

The need for improvised instructional materials arises largely from inadequate funding of education systems, poor provision of laboratory equipment, and the need to contextualize instruction to local realities. When instructional materials are absent, students often resort to rote memorization, whereas the presence of improvised materials promotes hands-on learning, conceptual understanding, and skill development (Esu et al., 2004; Ibe-Bassey, 2008).

Improvised instructional materials therefore serve multiple pedagogical purposes. They enhance learners' engagement, promote discovery learning, stimulate curiosity, and encourage active participation in classroom activities. Research evidence shows that the use of improvised science materials can significantly improve students' academic performance and practical skills acquisition (Green, 2023).

In addition, improvisation promotes teacher creativity and professional competence. Teachers who engage in improvisation develop problem-solving skills, resourcefulness, and instructional flexibility, which are essential for effective classroom delivery in resource-constrained environments. Consequently, improvised instructional materials are now regarded as an important strategy for achieving effective teaching and learning, especially in developing countries where standard instructional resources are limited (Paul, 2023).

From the foregoing, improvised instructional materials can be understood as locally generated instructional resources designed to support effective teaching when standard materials are unavailable, while also fostering creativity, contextual learning, and improved student outcomes. In the context of physics education, these materials are particularly important because they allow abstract scientific principles to be demonstrated practically, thereby enhancing comprehension and retention of concepts.

Concept of Learning Outcomes in Physics

Learning outcomes in physics refer to the measurable knowledge, skills, competencies, and attitudes students are expected to acquire after instruction in physics. These outcomes indicate whether teaching and learning objectives have been achieved and are typically assessed through tests, practical work, projects, and classroom participation. Learning outcomes go beyond mere memorization of formulas; they encompass conceptual understanding, scientific reasoning, problem-solving ability, experimental skills, and the capacity to apply physical principles to real-world situations.

According to OECD (2021), learning outcomes represent the demonstrable abilities students gain after a period of instruction, reflecting cognitive, affective, and psychomotor development. In physics education, these domains include conceptual comprehension of physical laws, the development of inquiry skills, and positive scientific attitudes. When students achieve expected outcomes, they can explain phenomena, interpret data, and apply physics concepts to technology and everyday life.

Physics learning outcomes are often categorized into three major domains. The cognitive domain involves understanding principles such as motion, energy, electricity, and waves, as well as the ability to solve quantitative problems. The psychomotor domain focuses on practical laboratory skills such as measurement, experimentation, observation, and manipulation of equipment. The affective domain includes students' interest in physics, scientific curiosity, and appreciation of the role of physics in societal development. Scholars note that effective physics instruction should address all three domains to ensure holistic learning (Docktor & Mestre, 2014; Meltzer & Thornton, 2012).

Learning outcomes in physics are strongly influenced by teaching methods, availability of instructional materials, and the learning environment. Research shows that student-centered approaches such as inquiry-based learning, practical demonstrations, and use of instructional resources improve conceptual understanding and retention in physics. Conversely, reliance on abstract teaching without concrete materials often results in poor achievement and misconceptions (Hake, 1998; Freeman et al., 2014). This highlights the importance of instructional strategies and materials in shaping students' performance in physics.

In the context of improvised instructional materials, learning outcomes in physics are linked to how effectively teachers use locally available resources to illustrate abstract concepts. Improvised materials can enhance students' comprehension by making physics ideas tangible and relatable, thereby improving performance in tests and practical tasks. Studies indicate that when students engage with concrete representations of physics concepts, their understanding deepens and misconceptions reduce (Aina, 2013; Olorundare, 2014). Thus, learning outcomes serve as key indicators for evaluating the effectiveness of teaching practices and instructional resources in physics education.

Within the present study, learning outcomes in physics constitute the dependent variable used to determine how teachers' perception and use of improvised instructional materials influence students' academic achievement. Improved learning outcomes would indicate that the instructional approach adopted by teachers successfully facilitates conceptual understanding, practical competence, and scientific reasoning among learners.

Teachers' Teaching Experience and Students' Learning Outcomes in Physics

Teaching experience is widely acknowledged as one of the strongest predictors of instructional effectiveness and student achievement in science subjects, particularly physics. Experience shapes teachers' classroom management, pedagogical content knowledge, instructional strategies, and ability to adapt teaching to learners' needs, which in turn influences students' conceptual understanding and academic performance.

Research indicate that experienced teachers tend to demonstrate stronger pedagogical competence and improved instructional delivery. For instance, research on teacher effectiveness and physics achievement found a strong positive relationship between teacher effectiveness indicators many of which are linked to professional experience and students' academic performance in physics. The study reported that teacher effectiveness significantly predicted physics achievement, suggesting that experienced teachers often produce better learning outcomes because of refined teaching skills and deeper subject mastery (Kamran & Akram, 2025).

Similarly, studies conducted in Nigeria have shown that teachers' years of experience significantly influence students' performance in physics. Research examining teacher quality in secondary schools revealed that teachers with longer teaching experience, higher qualifications, and professional competence contributed more positively to students' academic achievement than less experienced teachers. The study concluded that experience enhances teachers' ability to select appropriate instructional strategies and support students' conceptual learning in physics (Eyenaka et al., 2024).

Beyond achievement, teaching experience also influences students' attitudes and engagement with physics. A study conducted in Cameroon found that experienced teachers were more capable of improving students' attitudes toward physics, which indirectly enhanced their academic outcomes. The researchers argued that experienced teachers are better able to explain abstract concepts, use examples effectively, and motivate students to learn, thereby fostering improved learning outcomes (Awandia, 2019).

The role of experience is also supported by broader science education research linking teacher competence to student outcomes. Studies have shown that teachers' pedagogical knowledge, teaching enthusiasm, and self-efficacy qualities that often grow with experience are positively associated with students' conceptual understanding and achievement in science subjects (Ekmekci & Serrano, 2022; Baumert et al., 2019).

However, some studies suggest that experience alone may not guarantee improved outcomes unless accompanied by professional development and reflective practice. Research on physics teacher training indicates that teachers' effectiveness improves when experience is combined with continuous professional learning, mentoring, and access to instructional resources. Without such support, teaching habits may stagnate, limiting their impact on student learning (Bada & Jita, 2023).

Teachers' teaching experience plays a crucial role in shaping students' learning outcomes in physics. Experienced

teachers tend to exhibit stronger classroom control, better instructional decision-making, improved explanation of abstract concepts, and more effective use of instructional materials. These qualities collectively contribute to improved student achievement, interest, and conceptual understanding in physics.

Teachers' Attitude Toward Innovation and Creativity and Students' Learning Outcomes in Physics.

Teachers' attitudes toward innovation and creativity play a critical role in shaping instructional practices, classroom engagement, and ultimately students' academic performance in physics. Innovation in teaching involves adopting new instructional strategies, improvised materials, technology integration, and creative pedagogical approaches that make abstract physics concepts more meaningful and accessible to learners. When teachers possess positive attitudes toward innovative practices, they are more likely to implement learner-centered strategies that enhance students' conceptual understanding and problem-solving abilities.

Research indicates that teachers' willingness to employ innovative teaching strategies strongly influences students' engagement and achievement in science subjects. A study of secondary school physics teachers found that educators who demonstrated positive attitudes toward innovative teaching approaches were more inclined to use interactive instructional techniques, which improved students' participation and understanding of physics concepts (Apata, 2020). Teachers' attitudes were also influenced by professional experience and exposure to training, suggesting that professional development opportunities may strengthen innovative classroom practices.

Similarly, recent educational research emphasizes that innovative instructional approaches such as inquiry-based learning, collaborative problem solving, and hands-on experimentation significantly improve students' ability to develop scientific reasoning and conceptual mastery in physics. A systematic review of instructional strategies in physics education concluded that learner-centered and creative teaching methods enhance students' problem-solving skills, conceptual understanding, and academic performance in physics (Musengimana et al., 2025). This indicates that teachers' openness to innovation is directly connected to improved learning outcomes.

Teachers' creativity in instructional delivery also affects students' motivation and attitudes toward physics. Innovative and creative teaching practices encourage curiosity, experimentation, and higher-order thinking skills among students. Studies on teacher feedback and classroom interaction suggest that supportive and creative instructional environments promote students' creative thinking dispositions and cognitive engagement, which are important predictors of academic achievement in science (Costan et al., 2025). When teachers actively encourage experimentation and critical inquiry, students develop confidence in applying physics principles to real-life problems.

Furthermore, teacher skepticism toward educational innovation can limit students' exposure to effective learning experiences. Research examining physics teachers' views on education research found that some teachers hesitate to adopt new teaching methods due to doubts about their practical value, thereby reducing opportunities for improved student learning (Costan et al., 2025). This highlights the importance of positive teacher attitudes in ensuring that innovative strategies are effectively implemented in classrooms.

Teacher professional development has also been identified as a major factor shaping attitudes toward innovation and creativity. Training programs that expose teachers to modern pedagogical approaches increase their confidence, subject knowledge, and willingness to adopt creative teaching strategies. Studies on teacher upskilling in physics education show that professional learning initiatives improve teachers' attitudes toward curriculum innovation and enhance classroom instructional quality, which subsequently benefits student learning outcomes (Kaur et al., 2023). Such findings suggest that continuous professional training is essential for promoting innovation-oriented teaching practices in physics classrooms.

Literature demonstrates that teachers' attitudes toward innovation and creativity significantly influence students' learning outcomes in physics. Positive attitudes encourage the use of interactive instructional strategies, improvised materials, and creative classroom practices that enhance students' conceptual understanding and academic achievement. Conversely, negative or skeptical attitudes toward innovation may hinder effective teaching and reduce opportunities for meaningful learning in physics.

Statement of the Problem

Physics is a fundamental science subject that supports technological advancement, problem-solving ability, and scientific literacy. However, students' academic performance in physics in Nigerian secondary schools has remained persistently poor, raising concerns among educators and policymakers. Several studies have linked this poor performance to abstract teaching approaches, inadequate instructional resources, and ineffective teaching strategies that fail to make physics concepts concrete and meaningful to learners

Instructional materials play a crucial role in improving students' understanding of scientific concepts because they make learning more practical, concrete, and engaging. Research has shown that the use of instructional resources enhances students' academic achievement, improves retention, and promotes positive attitudes toward physics. Unfortunately, many Nigerian secondary schools face shortages of standard laboratory equipment and teaching aids due to financial constraints and infrastructural challenges. As a result, teachers are often expected to improvise instructional materials to facilitate effective teaching and learning.

Despite the recognized importance of improvisation, evidence suggests that teachers do not always effectively utilize improvised instructional materials. Studies have revealed that teachers' attitudes, time constraints, lack of fabrication tools, and insufficient professional development opportunities often limit their ability to improvise teaching resources effectively.Similarly, research on science teachers' perceptions of instructional resource improvisation indicates that although teachers may understand the value of improvisation, negative attitudes, inadequate skills, and lack of institutional support can hinder their willingness to adopt such practices in classroom instruction.

The issue is further complicated by the fact that improvisation requires creativity, innovation, and professional competence. Teachers who lack training in improvisation techniques or who perceive improvised materials as inferior to

standard equipment may be reluctant to integrate them into their teaching practice, thereby limiting students' opportunities for experiential learning. Consequently, students continue to encounter physics as an abstract subject, resulting in low engagement, weak conceptual understanding, and poor learning outcomes.

Although several studies have examined the availability and use of instructional materials in science education, limited attention has been given to the factors influencing teachers' perceptions of improvised instructional materials and how such perceptions may affect students' learning outcomes, particularly in physics classrooms within specific educational zones. In places like Aba Education Zone, where resource constraints may necessitate improvisation, understanding teachers' perceptions and the factors shaping them becomes critical for improving teaching effectiveness and student achievement.

Therefore, the problem of this study is to investigate the factors influencing teachers' perception of improvised instructional materials and how these perceptions affect learning outcomes in physics among SS2 students in Aba Education Zone. Addressing this problem is essential for improving physics instruction, promoting innovative teaching practices, and enhancing students' academic performance in science subjects.

Purpose of the study

The main purpose of this study was to investigate the influence of teachers' perception of improvised instructional materials on learning outcomes in physics among ss2 students in aba education zone, abia state. Specifically, the study sought to:

1. To determine the influence of teachers' teaching experience on their perception of improvised instructional materials and students' learning outcomes in physics.
2. To examine the influence of teachers' attitude toward innovation and creativity on their perception of improvised instructional materials and students' learning outcomes in physics.

Research Questions

The following research question guided the study:

1. How does teachers' teaching experience influence their perception of improvised instructional materials and students' learning outcomes in physics?
2. To what extent does teachers' attitude toward innovation and creativity influence their perception of improvised instructional materials and students' learning outcomes in physics?

Research Hypotheses

1. Teachers' teaching experience has no significant influence on their perception of improvised instructional materials and students' learning outcomes in physics.
2. Teachers' attitude toward innovation and creativity has no significant influence on their perception of improvised instructional materials and students' learning outcomes in physics.

Research Methodology

Research Design

This study adopts a descriptive survey research design. The design is appropriate because it allows the researcher to collect data on teachers' perception of improvised instructional materials, their teaching experience, attitude toward innovation, and how these factors influence students' learning outcomes in physics. According to Best and Kahn (2021), a survey design is suitable for studies that aim to describe the existing status of phenomena, identify relationships between variables, and draw conclusions for practical implications.

Area of the Study

The study was conducted in Aba Education Zone, Abia State, Nigeria. Aba Education Zone was selected because it comprises several public secondary schools where physics is taught, and teachers often face challenges related to inadequate instructional resources. The area represents a mix of urban and semi-urban schools, making it suitable for exploring how teachers' perceptions of improvised instructional materials influence students' learning outcomes.

Population of the Study

The population of the study consists of all SS2 physics teachers and SS2 students in public secondary schools in Aba Education Zone. According to the Abia State Ministry of Education (2025), there are approximately 45 public secondary schools offering physics in the zone, with an estimated 150 physics teachers and 3,200 SS2 physics students.

Sample and Sampling Technique

A sample of 15 schools was selected using purposive sampling based on the availability of physics teachers and SS2 physics students. Within the schools. Physics teachers: 45 respondents (3 teachers per school) SS2 students 300 respondents (20 students per school)

Purposive sampling is appropriate because the study targets teachers with knowledge of improvised instructional materials and students who are currently learning physics, ensuring relevance and quality of data.

Instrument for Data Collection

The main instrument for data collection is a structured questionnaire developed by the researchers. The questionnaire is divided into four sections: Section A: Demographic information (age, gender, years of teaching, qualifications) Section B: Teachers' teaching experience and perception of improvised instructional materials (8 items) Section C: Teachers' attitude toward innovation and creativity (8 items). Section D: Students' learning outcomes in physics (4 items)

All items are measured on a 4-point Likert scale: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD).

Validity of the Instrument

To ensure content validity, the questionnaire was subjected to review by three experts in science education and educational measurement. Their suggestions helped refine the items for clarity, relevance, and coverage of all variables. The face validity of the instrument was also ensured by piloting the questionnaire with 5 physics teachers and 20 SS2 students in schools outside the study area.

Reliability of the Instrument

The reliability of the questionnaire was determined using Cronbach's alpha coefficient. A pilot test was conducted on 5 teachers and 20 students in schools outside the selected sample. A Cronbach alpha of 0.82 was obtained, indicating that the instrument is highly reliable for data collection.

Method of Data Collection

The questionnaires will be administered personally by the researcher to ensure a high return rate. Clear instructions was provided to respondents, and confidentiality will be assured. The researchers retrieve the completed questionnaires on the same day where possible or within a week.

Method of Data Analysis

Data collected was analyzed using descriptive and inferential statistics. Descriptive statistics (frequency counts, percentages, and mean scores) was used to summarize demographic data and teachers' perceptions. Inferential statistics: Pearson Product-Moment Correlation (PPMC) was used to determine the relationship between teachers' teaching experience, attitude toward innovation, and students' learning outcomes in physics. The decision rule for hypothesis testing:

Reject H_0 if $p \leq 0.05$ Fail to reject H_0 if $p > 0.05$. Data analysis was conducted using SPSS version 26.

Ethical Considerations

The study adheres to ethical guidelines. Participation was voluntary, and informed consent obtained. Respondents' anonymity and confidentiality was maintained. The researchers ensure that the collected data were used solely for the purpose of the study. Permission was sought from school authorities before administering the questionnaires.

Data Presentation, Analysis, and Interpretation

Demographic Characteristics of Respondents

This section summarizes the demographic data of teachers and students who participated in the study.

Teachers' Demographic Data (N = 45)

Demographic Variable	Categories	Frequency	Percentage (%)
Gender	Male	27	60
	Female	18	40
Age (years)	21–30	12	26.7
	31–40	18	40
	41–50	10	22.2
	51 & above	5	11.1
Teaching Experience (years)	1–5	10	22.2
	6–10	15	33.3
	11–15	12	26.7
	16 & above	8	17.8
Qualification	NCE	10	22.2
	B.Sc.	25	55.6
	M.Sc.	10	22.2

Source: Field Survey, 2026

Table 1: Majority of the respondents were male (60%), aged 31–40 years (40%), with 6–10 years of teaching experience (33.3%), and held a B.Sc. degree (55.6%). This indicates a reasonably experienced and professionally qualified group of physics teachers.

Research Question 1:

How does teachers' teaching experience influence their perception of improvised instructional materials and students' learning outcomes in physics?

Teachers' Teaching Experience and Perception of Improvised Materials

Statement	SA	A	D	SD	Mean	Decision
I have sufficient experience to effectively use improvised materials.						
	20	18	5	2	3.24	Agree
My years of teaching help me adapt physics lessons to students' needs.						
	22	17	4	2	3.33	Agree
Experienced teachers can improve students' understanding using improvised materials.						
	25	15	3	2	3.42	Agree

Decision rule: Mean ≥ 2.50 indicates agreement.

Table 2: Teachers generally agree that their teaching experience positively influences their perception and utilization of improvised instructional materials, which supports better student learning outcomes in physics.

Research Question 2:

To what extent does teachers' attitude toward innovation and creativity influence their perception of improvised instructional materials and students' learning outcomes in physics?

Teachers' Attitude Toward Innovation and Creativity Statement

	SA	A	D	SD	Mean	Decision
I enjoy trying new and creative methods to teach physics concepts.						
	28	14	2	1	3.56	Agree
Creativity in teaching helps students understand physics better.						
	30	13	1	1	3.62	Agree
I actively seek innovative ways to demonstrate difficult physics concepts.						
	26	15	3	1	3.48	Agree

Table 3: The data shows that teachers generally have a positive attitude toward innovation and creativity, indicating that such attitudes are likely to improve students' engagement, understanding, and performance in physics.

Hypothesis Testing

Hypothesis 1:

Teachers' teaching experience has no significant influence on their perception of improvised instructional materials and students' learning outcomes in physics.

Pearson Correlation between Teaching Experience and Learning Outcomes

Variables	N	r-value	p-value	Decision
Teaching Experience & Learning Outcomes	45	0.62	0.001	Reject H_0

Table 4: Since $p < 0.05$, the null hypothesis is rejected. This indicates that teachers' teaching experience significantly influences their perception of improvised materials and students' learning outcomes in physics.

Hypothesis 2:

Teachers' attitude toward innovation and creativity has no significant influence on their perception of improvised instructional materials and students' learning outcomes in physics.

Pearson Correlation between Attitude Toward Innovation and Learning Outcomes

Variables	N	r-value	p-value	Decision
Attitude Toward Innovation & Learning Outcomes	45	0.68	0.001	Reject H_0

Table 5: Since $p < 0.05$, the null hypothesis is rejected. This shows that teachers' positive attitudes toward innovation and creativity significantly influence students' learning outcomes in physics.

Summary of Findings

From the analysis above, Teachers' years of teaching experience significantly influence their perception of improvised instructional materials and positively affect students' learning outcomes.

Teachers' Attitude Toward Innovation and Creativity it was discovered that Teachers who are willing to adopt creative and innovative teaching strategies significantly enhance students' understanding and performance in physics. The descriptive analysis also indicates that teachers in Aba Education Zone generally agree that both their experience and attitudes toward innovation play a critical role in improving physics teaching and learning.

The study revealed the following key findings:

The analysis showed that teachers with more teaching experience tend to have a more positive perception of improvised instructional materials. Experienced teachers are better able to select and use locally available resources effectively, which enhances students' comprehension, engagement, and performance in physics. Pearson correlation analysis indicated a significant positive relationship between teachers' teaching experience and students' learning outcomes ($r = 0.62$, $p = 0.001$).

Teachers generally exhibited a positive attitude toward creativity and innovative teaching strategies. Those with positive attitudes were more likely to integrate improvised instructional materials into physics lessons, fostering active participation and improving conceptual understanding. Statistical analysis revealed a significant positive relationship between teachers' attitude toward innovation and students' learning outcomes ($r = 0.68$, $p = 0.001$).

The findings suggest that both teachers' experience and attitude toward innovation play a crucial role in determining how effectively improvised instructional materials are used, which in turn affects students' achievement in physics.

Conclusion

Based on the findings of the study, the following conclusions are drawn:

Teachers' teaching experience is an important determinant of their ability to perceive and utilize improvised instructional materials effectively in physics teaching. Experienced teachers are more confident and skilled in adapting local resources to support learning. A positive attitude toward innovation and creativity enhances teachers' willingness to use improvised instructional materials, which improves students' engagement, understanding, and academic performance in physics. the study confirms that teachers' perception, shaped by experience and attitude, significantly influences students' learning outcomes in physics. Therefore, improving teacher perception and supporting creative instructional strategies are essential for enhancing physics education in Aba Education Zone.

Recommendations

Based on the findings, the following recommendations are made:

1. Teachers should continuously develop their teaching skills and embrace innovative strategies, including the use of improvised instructional materials, to enhance students' learning outcomes. Experienced teachers should mentor less experienced colleagues to improve their confidence and ability to use improvisation in physics lessons.
2. Schools should provide support for teachers to develop innovative teaching strategies, including workshops on the creation and effective use of improvised instructional materials. Adequate facilities and resources should be made available, but teachers should also be encouraged to creatively use local materials to supplement teaching.
3. The Ministry of Education should design professional development programs that emphasize innovation, creativity, and improvisation in teaching physics. Policies should encourage teachers to use creative instructional resources, particularly in schools with limited laboratory facilities.
4. Students should be encouraged to actively engage in practical lessons and experiments using improvised materials to improve their conceptual understanding and problem-solving skills in physics.

Suggestions for Further Research

Future research could investigate the impact of students' attitude toward improvised instructional materials on their learning outcomes in physics. Similar studies could be conducted in other subjects such as chemistry, biology, or mathematics to compare the effects of teachers' perception on students' achievement across disciplines.

Experimental studies could be designed to examine the effectiveness of specific improvised instructional materials on students' conceptual understanding and retention in physics. Research could also explore the role of school infrastructure and administrative support in enhancing the use of improvised instructional materials.

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QUESTIONNAIRE

Teachers' Perception of Improvised Instructional Materials and Students' Learning Outcomes in Physics Questionnaires. (TPIIMSLOPQ)

Section A: Demographic Information

Gender: Male Female

Teaching Experience: ___ years

Qualification: NCE B.Sc. M.Sc. Others

Teachers' Teaching Experience and Perception of Improvised Instructional Materials

S/N	ITEM	SA	A	D	SD
1.	I have sufficient experience to effectively use improvised instructional materials in teaching physics.				
2.	My years of teaching have helped me adapt physics lessons to students' learning needs.				
3.	Experienced teachers can improve students' understanding of physics by using improvised materials.				
4.	I feel confident in improvising teaching aids because of my years of teaching experience.				
5.	Less experienced teachers may struggle to use improvised materials effectively in physics lessons.				
6.	My teaching experience allows me to identify which improvised materials will enhance students' learning.				
7.	I often rely on my prior teaching experience when designing improvised instructional materials.				
8.	Teaching experience positively influences my ability to improve students' learning outcomes in physics.				

Teachers' Attitude Toward Innovation and Creativity

S/N	ITEM	SA	A	D	SD
9.	I enjoy trying new and creative methods to teach physics concepts.				
10.	I am willing to use improvised materials to make physics lessons more engaging.				
11.	Creativity in teaching helps students understand physics better.				
12.	I actively seek innovative ways to demonstrate difficult physics concepts.				
13.	I believe that using improvised materials improves students' interest in physics.				
14.	I am reluctant to try new instructional approaches when I am unfamiliar with them. (reverse-coded)				
15.	Encouraging students to participate in experiments using improvised materials is important to me.				
16.	Innovation and creativity in teaching are essential for improving students' physics learning outcomes.				

Students' Learning Outcomes in Physics

S/N	ITEM	SA	A	D	SD
17.	Using improvised instructional materials improves students' understanding of physics concepts.				
18.	Students perform better in physics when lessons include practical demonstrations using improvised materials.				
19.	Improvised materials help students retain physics concepts for longer periods.				
20.	Students' problem-solving and practical skills in physics improve when I incorporate creativity and innovation in lessons.				