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Effect of Instructional Materials on Students' Academic Performance in Chemistry in Public Secondary Schools in Ado Local Government Area, Ekiti State, Nigeria

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ABSTRACT

This study examines the impact of instructional materials on students' academic performance in chemistry within public secondary schools in Ado Local Government Area, Ekiti State, Nigeria. Utilizing a descriptive survey research design, the study investigates the availability, quality, and effectiveness of instructional materials in enhancing students' understanding and engagement. A total of 80 respondents, comprising 20 teachers and 60 students, were randomly selected from four public secondary schools. Data were collected using a structured questionnaire and analyzed using descriptive statistical methods. The findings reveal a strong consensus on the positive impact of instructional materials on students' academic performance. Specifically, 95% of respondents agreed that instructional materials improve academic performance, while 90% acknowledged their role in enhancing teaching and learning processes. However, challenges such as high costs, inadequate availability, and inconsistent usage of instructional materials hinder effective chemistry instruction. The study concludes that instructional materials play a crucial role in improving students' academic performance in chemistry. Increased investment in instructional resources, teacher training on effective material utilization, and policy interventions to ensure widespread access to quality teaching aids are recommended for more effective chemistry education and improved student outcomes.

Introduction

In the contemporary educational landscape, the role of instructional materials in enhancing students' academic performance has become increasingly significant, particularly in the field of science education [1]. Chemistry, as a core subject in secondary school curricula, presents unique challenges due to its abstract concepts and complex theories [2]. In Ado Local Government Area of Ekiti State, Nigeria, the effectiveness of instructional materials in chemistry education is a pressing concern, as it directly affects students' understanding and performance in the subject. This introduction will explore the significance of instructional materials, the current state of chemistry education in Nigeria, and the implications for students' academic performance.

Instructional materials encompass a wide range of resources, including textbooks, laboratory

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equipment, multimedia tools, and other educational aids that facilitate learning [3,4]. These materials are essential for providing students with the necessary context and practical experience to grasp complex scientific concepts. Research has consistently shown that the quality and availability of instructional materials significantly impact students' learning outcomes. For instance, Ortiz-Rodríguez *et al*. [5] emphasize significance of culturally sensitive instruction materials in promoting student engagement and understanding in chemistry. Similarly, Anza *et al.* [6] highlight the necessity of practical work in chemistry education, noting that inadequate resources can hinder effective teaching and learning.

In Nigeria, the teaching of chemistry often relies heavily on traditional methods, such as the "chalk-and-talk" approach, which limits student interaction and engagement [1]. This pedagogical style has been criticized for failing to foster critical thinking and problem-solving skills among students [7]. Furthermore, many secondary schools in Nigeria lack well-equipped laboratories, which are crucial for conducting practical experiments that reinforce theoretical knowledge [8]. The absence of adequate instructional materials not only affects students' comprehension of chemistry concepts, but also contributes to their overall academic performance [2].

The academic performance of students in chemistry is a multifaceted issue affected by different factors, including teaching methods, classroom environment, and the accessibility of educational resources. Studies indicates that the students' attitudes toward chemistry are often shaped by their experiences with instructional materials and teaching practices [9]. For instance, studies have shown that when students engage with hands-on activities and practical experiments, their interest in chemistry increases, leading to improved academic outcomes [10]. In contrast, a lack of engaging instructional materials can result in negative attitudes toward the subject, further exacerbating the challenges faced by students in achieving academic success.

In Ado Local Government Area, the current state of chemistry education reflects broader trends observed across Nigeria. Many schools struggle with inadequate resources, poorly maintained laboratories, and a reliance on outdated teaching methods. As a result, students often experience difficulties in understanding fundamental chemistry concepts, which can lead to poor academic performance. The need for effective instructional materials that cater to diverse learning styles and promote active engagement in the learning process is more critical than ever.

Moreover, the integration of modern teaching approaches, such as inquiry-based learning and the use of technology in the educational setting, has been shown to enhance students' understanding of chemistry [11]. These methods encourage students to explore scientific concepts actively, fostering a deeper understanding and retention of knowledge. However, the successful implementation of such approaches is contingent upon the availability of appropriate instructional materials and teacher training [7].

In summary, the connection between students' academic performance and instructional materials in chemistry is a crucial area of study, particularly in the context of Ado Local Government Area's public secondary schools located in Ekiti State, Nigeria. As educators strive to improve student outcomes, it is essential to recognize the role of educational resources in facilitating effective teaching and learning. By addressing the challenges associated with resource availability and pedagogical practices, stakeholders can work toward enhancing the quality of chemistry education and ultimately improving students' academic performance.

Literature Review

Instructional materials are indispensable tools in the educational landscape, serving as vital aids that facilitate effective teaching and learning processes across all subjects [12]. They encompass a wide array of resources, including textbooks, charts, models, laboratory equipment, audiovisual aids, and digital content, all designed to enhance comprehension and engagement [13]. The

pedagogical significance of these materials lies in their ability to bridge the gap between abstract concepts and concrete understanding, providing learners with tangible representations of complex ideas [14]. Research consistently highlights that well-selected and appropriately utilized instructional materials can significantly improve student motivation, foster active participation, and cater to diverse learning styles, thereby laying a strong foundation for academic success [3].

In the context of science education, particularly chemistry, the role of instructional materials becomes even more pronounced. Chemistry is inherently an abstract and practical subject, involving microscopic phenomena, complex reactions, and intricate molecular structures that are often difficult for students to visualize and grasp through verbal explanations alone [15]. Effective instructional materials, such as molecular models, periodic tables, laboratory apparatus, and visual aids depicting chemical reactions, are crucial for demystifying these concepts. They provide students with opportunities for hands-on experimentation, observation, and critical thinking, which are essential for developing a deeper understanding of chemical principles and fostering scientific inquiry skills [16].

Numerous studies have consistently demonstrated a positive correlation between the availability and effective utilization of instructional materials and students' academic performance in science subjects, including Chemistry [4,5-10]. These materials can transform the learning environment from a passive reception of information to an active, interactive, and engaging experience. By providing multiple sensory inputs, instructional materials help reinforce learning, improve retention rates, and enable students to connect theoretical knowledge with real-world applications [4]. This enhanced understanding often translates directly into improved test scores and overall academic achievement, as students are better equipped to comprehend and apply chemical concepts.

Despite the widely acknowledged benefits, the provision and effective utilization of instructional materials in public secondary schools, particularly in developing regions, often face significant challenges [17]. Issues such as inadequate funding, lack of proper infrastructure, limited access to modern teaching aids, and insufficient teacher training on how to effectively integrate these materials into lesson delivery are prevalent [18]. These limitations can severely hinder the quality of Chemistry instruction, leading to a reliance on traditional, less engaging teaching methods.

Statement of the Problem

The teaching and learning of chemistry in public secondary schools in Ado Local Government Area, Ekiti State, Nigeria, face significant challenges that negatively impact students' academic performance. Chemistry, as a foundational science subject, requires effective instructional materials to enhance students' understanding and engagement. However, inadequate availability and poor quality of instructional resources hinder effective learning. Research by Anza *et al.* [6] and Chogyel and Wangdi [8] and highlights the lack of well-equipped laboratories and outdated teaching methods as major barriers to student comprehension.

The quality of instructional materials is another concern, as many textbooks and resources are outdated and misaligned with modern scientific advancements [19]. This gap between curriculum content and teaching materials negatively affects students' ability to grasp complex chemistry concepts. Additionally, traditional lecture-based teaching methods, which dominate classrooms [20], fail to encourage active learning and critical thinking [21]. Francis [7] further emphasizes the detrimental effects of teacher-centered approaches on students' retention and comprehension of chemistry knowledge.

Socio-economic factors also contribute to the issue, as many schools in the region face underfunding, limiting access to essential resources for both teachers and students [22]. This financial constraint exacerbates educational disparities, particularly for students from disadvantaged backgrounds. Furthermore, the broader systemic challenges within the Nigerian education system, including

an overemphasis on rote memorization, undermine students' ability to apply theoretical knowledge in practical situations [23].
Addressing these challenges requires improved access to modern instructional materials and the adoption of interactive teaching strategies. If adequate resources are provided and properly utilized, students' academic performance in chemistry can significantly improve. Therefore, there is a need to examine the impact of instructional materials on students' learning outcomes in chemistry to develop effective interventions for enhancing science education in public secondary schools.

Purpose of the Study

This study is to examine the impact of instructional material in teaching chemistry and academic performance of student in chemistry in secondary school in Ado LGA of Ekiti State.

Research Question

1. What is the impact of instructional material in the teaching and learning of chemistry?
2. Does the use of instructional materials impact academic performance of students in chemistry?
3. What are the problems affecting the use of instructional materials for the teaching of Chemistry in Ado Local Government Area of Ekiti State?

Research Hypotheses

H_1: There is no significant relationship between instructional materials and students' academic performance.
H_2: There is no significant impact on the use of instructional materials on students' academic performance in chemistry.
H_3: There is no significant problem affecting instructional material usage.

Materials and Methods

Research Design

Descriptive research design is considered appropriate since it focuses on the description of the existing situation regarding instructional material and students' academic performance. Because the study's goal was to investigate the existing state of affairs, particularly the connection between students' academic achievement in chemistry and the availability and utilization of instructional materials, this methodology was selected. Descriptive Survey Design gives the accurate assessment of the characteristics of the whole populations of people [24,25].

Population of the Study

This study consists of four (4) public secondary schools in Ado-Ekiti Local Government Area of Ekiti-State. Issues relating impact of instructional material and academic performance of student in the study of chemistry among the aforementioned location are adequately addressed. This research study covers a wide range of area in the Local Government and can be used to represent the state as a whole, based on the reliability of the research.

Sample and Sampling Procedure

The sample taken out of the population is a small fraction of the area under study, Ado-Ekiti metropolis has been selected as the area under study and since it is virtually impossible to study the entirely of Ado-Ekiti metropolis, a small portion of the population would be made the population in order to get an unbiased result. Twenty teachers (20) and sixty (60) students were used as sample. In selecting the sample, the researcher selected five (5) teachers and fifteen (15) students as respondents each from four schools. The total number of respondents from these schools came up to eighty (80). Therefore, 80 respondents were chosen from all the four public secondary schools.

Research Instrument

The data collection instrument used was a self-constructed questionnaire. The questionnaire was designed with the hope that it will help to show the impact of instructional material and

students' academic performance in chemistry in public secondary schools. Furthermore, the questionnaire also sought to know the attitude of teachers and students towards adequate use of instructional materials.

The validity of the questionnaire was ensured through expert review. The instrument was validated by supervisors and experts in Science Education in the Faculty of Education, Ekiti State University. Feedback from them was used to refine the instrument. A pilot study was conducted by testing in the immediate locality of the researcher before final administration of respondents. The purpose of the pilot study was to determine the reliability of the instruments, its difficulty level and also to determine whether the questions are free from ambiguity and whether it has power to discriminate over results. The instrument was personally administered by the researcher and scored. This was to give room for final corrections of the questionnaire items for possible commencement of field work.

The data collected from pilot study were used to calculate the reliability coefficient using split-half method. Also, Pearson Product Moment Correlation Coefficient (r) was adopted to determine the reliability coefficient of the instrument which gave 0.72. This indicated that the items were reliable within the acceptable limits.

Administration of the Instrument

The researcher administered the instruments (questionnaire) to the respondents personally. Before moving to the four sampled secondary schools, permission was sought from the Ekiti State Teaching Service Commission, Ado-Ekiti through a letter of introduction from the Researcher's institution. The researcher met the chemistry teachers and students in the four public secondary schools selected and administered questionnaire to them. This was administered within four (4) days. Copies were distributed personally to all the teachers and students selected, they completed and returned the instrument to the researcher. In analyzing the collected data, each item was considered separately and the frequencies with the percentages of responses were duly calculated.

Simple percentages and Chi-squared test were used to evaluate the data gathered from the questionnaire.

The Chi-square (X^2) is calculated as follows:

$$X^2 = \sum \frac{(Fo-Fe)^2}{Fe}$$

Where,

X^2 = Chi-square

Fo = Observed Frequency

Fe= Expected frequency

Σ = Summation while the research hypotheses were tested using chi –square

$$Fe = \frac{(RT \times CT)}{GT}$$

Where, RT = Row total, CT = Column total, and GT = Grand total.

The calculated X^2 is a measure of the departure of obtained frequencies from the frequencies expected by change. The larger X^2 is the greater that obtained frequency deviate from the expected frequency.

Results

Research Question 1: What is the impact of instructional material in the teaching and learning of chemistry?

Table 1 presents the respondents opinion on the effect of instructional material in the teaching and learning of chemistry in public secondary schools. Based on Table 1, (95%) 76 respondents agree that instructional materials improve the academic performance of students in chemistry while (5%) 4 respondents disagree. (90%) 72 respondents agree that teaching policy of using instructional materials influence teaching and learning of chemistry while (10%) 8 respondents disagree. As indicated in Table 1, out of the total number of respondents (65%), 52 agree to the use of instructional materials in teaching of chemistry has positive impact on the level of students assimilation, (75%) 60 respondents agreed to

teaching and learning chemistry in secondary schools without instructional materials may hinder achieving desired educational outcomes and (55%) 40 respondents agreed that there has been record of high success rate of passing chemistry with the use of instructional materials, while (45%) 36 respondents disagreed that there has been a record of high success rate of passing chemistry with the use of instructional materials.

Table 1. Responses to the impact of instructional material in the teaching and learning of chemistry in public secondary schools

Sr./No.	Questionnaire Items	Responses				
		Total respondents	Agree	%	Disagree	%
1	Instructional materials improve the academic performance of students in chemistry.	80	76	95	4	5
2	The teaching policy of using instructional materials influence teaching and learning of chemistry.	80	72	90	8	10
3	The use of instructional materials in teaching of chemistry has positive impact on the level of assimilation of students.	80	52	65	28	45
4	Teaching and learning chemistry in secondary schools without instructional materials may hinder achieving desired educational outcomes.	80	60	75	20	25
5	There has been a record of high success rate of passing chemistry with the use of instructional materials.	80	44	55	36	45

Research Question 2: Does the use of instructional materials impact academic performance of students in chemistry?

In Table 2, 76 (95%) of the respondents agreed that there is faster and better learning of chemistry with the use of instructional materials, while 4 (5%) disagreed stating that it does not make chemistry lesson faster.

In item 7, 68 corresponding (85%) of the respondents agreed that instructional materials make the lesson interesting and student to have deeper understanding of chemistry, while 12 (15%) of the respondents disagreed with the statement that it does not make chemistry lesson interesting.

In item 8, 72 corresponding (90%) according to the responders mentioned that instructional resources provide opportunities for students to participate in the lesson, while 8 corresponding (10%) disagreed with the facts.

In item 9 above, it was affirmed that 52 corresponding (65%) of those surveyed concurred that educational resources stimulate students' interest and geared their curiosity to learn, while 28 corresponding (35%) disagreed.

The last item in the above Table 2 revealed that 60 (75%) of the respondents agreed that effective use of instructional materials enhance communication between the students and teacher of chemistry, while 20 (25%) disagreed with the statement.

Table 2. Responses to the use of instructional materials influence academic performance of students in chemistry

Sr./No.	Questionnaire Items	Responses				
		Total respondents	Agree	%	Disagree	%
6	There is faster and better learning of chemistry with the use of instructional materials.	80	76	95	4	5
7	Instructional materials make the lesson interesting and student to have deeper understanding of chemistry.	80	68	85	12	15
8	Instructional materials create opportunities for participation in chemistry class.	80	72	90	8	10
9	Instructional materials arouse learners' interest and geared their curiosity to learn.	80	52	65	28	35
10	Effective use of instructional materials enhances communication between the students and teacher of chemistry.	80	60	75	20	25

Research Question 3: What are the problems affecting the use of instructional materials for the teaching of chemistry in Ado Local Government Area of Ekiti State?

Table 3 indicates that 48 corresponding (60%) of the respondents agreed that the ability of students affects the use of instructional materials by the teacher, while 32 corresponding (40%) of the respondents disagreed. In item 12, 4 corresponding (5%) of the respondents agreed that instructional materials are costly and unaffordable, while 76 corresponding (95%) of the respondents disagreed. Similarly in item 13, 16 corresponding (20%) agreed that there is no appropriate and relevant instructional materials to deliver chemistry lesson, while 64 (8%) disagreed. In item 14, 36 individuals corresponding (45%) of the respondents agreed that teacher used instructional materials during the lesson, while 44 (55%) disagreed.

Item 15 also affirmed that students understanding of the subject can be improved if government provides relevant instructional materials. This corresponds to 44 respondents (55%) agreeing versus 36 (45%).

Table 3. Responses to the problems affecting the use of instructional materials for the teaching of chemistry in Ado Local Government Area of Ekiti State

Sr./No.	Questionnaire Items	Responses				
		Total respondents	Agree	%	Disagree	%
11	Ability of students affects the use of instructional materials by teacher.	80	48	60	32	40
12	Instructional materials are costly and unaffordable.	80	4	5	76	95
13	There is no appropriate and relevant instructional materials to deliver chemistry lesson	80	16	20	64	80
14	Teacher uses instructional material during the lesson.	80	36	45	44	55
15	Students understanding of the subject can be improved if government provides relevant instructional materials.	80	44	55	36	45

Testing of Null Hypotheses

Null Hypothesis One

There is no significant relationship between instructional materials and students' academic performance.

To calculate the Chi-Square **(X^2)** value stepwise, the following steps were followed:
Step 1: The Observed Frequencies (Fo) was set up (Table 4).

Table 4. Observed Frequency Distribution of Responses on the Role of Instructional Materials in Students' Academic Performance in Chemistry

Sr./No.	Questionnaire Items	Agree (Fo)A	Disagree (Fo)D	Total
1	Instructional materials improve the academic performance of students in chemistry.	76	4	80
2	The teaching policy of using instructional materials influences teaching and learning of chemistry.	72	8	80
3	The use of instructional materials in teaching of chemistry has a positive effect on the level of assimilation of students.	52	28	80
4	Teaching and learning chemistry in secondary schools without instructional materials may hinder achieving desired educational outcomes.	60	20	80
5	There has been a record of high success rate of passing chemistry with the use of instructional materials.	44	36	80
Total		**304**	**96**	**400**

Step 2: The Expected Frequencies (Fe) was calculated .
The expected frequency (Fe) for each cell is given by:

$$Fe = \frac{(RT \times CT)}{GT}$$

Where, RT = Row total, CT = Column total, and GT = Grand total (Table 5).

$$\text{Expected for Agree (Fe)A} = \frac{(80 \times 304)}{400} = 60.8$$

$$\text{Expected for Disagree (Fe)D} = \frac{(80 \times 96)}{400} = 19.2$$

Table 5. Expected and Observed Frequencies of Responses on the Role of Instructional Materials in Chemistry Teaching and Learning

Sr./No.	Questionnaire Items	Fo(A)	Fe(A)	Fo(D)	Fe(D)
1	Instructional materials improve academic performance	76	60.8	4	19.2
2	The teaching policy of using instructional materials	72	60.8	8	19.2
3	Positive impact on level of assimilation	52	60.8	28	19.2
4	Teaching chemistry without instructional materials	60	60.8	20	19.2
5	High success rate of passing chemistry	44	60.8	36	19.2

Step 3: Chi-square (X^2) using the following formula was computed.

$$X^2 = \sum \frac{(Fo-Fe)^2}{Fe}$$

For each cell, compute $\frac{(Fo-Fe)^2}{Fe}$:

$\frac{(Fo-Fe)^2}{Fe}$ (A)

$\frac{(Fo-Fe)^2}{Fe}$ (D)

$\frac{(76-60.8)2}{60.8} = \frac{237.16}{60.8} = 3.90$

$\frac{(4-19.2)2}{19.2} = \frac{231.04}{19.2} = 12.04$

$\frac{(72-60.8)2}{60.8} = \frac{125.44}{60.8} = 2.06$

$\frac{(8-19.2)2}{19.2} = \frac{125.44}{19.2} = 6.53$

$\frac{(52-60.8)2}{60.8} = \frac{77.44}{60.8} = 1.27$

$\frac{(28-19.2)2}{19.2} = \frac{77.44}{19.2} = 4.03$

$\frac{(70-60.8)2}{60.8} = \frac{0.64}{60.8} = 0.01$

$\frac{(20-19.2)2}{19.2} = \frac{0.64}{19.2} = 0.03$

$\frac{(44-60.8)2}{60.8} = \frac{285.61}{60.8} = 4.70$

$\frac{(36-19.2)2}{19.2} = \frac{284.49}{19.2} = 14.83$

Step 4: The Chi-square values were summed up.
$X^2 = (3.90 + 2.06 + 1.27 + 0.01 + 4.70) + (12.04 + 6.53 + 4.03 + 0.03 + 14.83)$
$X^2 = 11.94 + 37.46$
$X^2 = 49.40$

Step 5: Degrees of Freedom was determined.
df = (k−1) = (5−1) = 4
k = 5 (number of groups)
For a test of significance at α = 0.05 and *df* = 4, the X^2 critical value is 9.49 (Table 6).

Table 6. Summary of Chi-square test result for research question one

X^2 Cal	X^2 Crit	df	Level
49.40	9.49	4	0.05

X^2 Cal = Chi-square calculated, X^2 Crit = Chi-square critical value, and df = Degree of freedom.
The calculated Chi-square (X^2) value is 49.40 with 4 degrees of freedom (df = 4).
Using a Chi-square critical value Table 6, the critical value at df = 4 and 0.05 significance level is 9.49. Since 49.40 > 9.49, the null hypothesis (which assumes no significant relationship between instructional materials and students' academic performance) is rejected. This means that there is a significant relationship between the use of instructional materials and students' academic performance in chemistry. Therefore, instructional materials significantly impact students' academic performance in chemistry.

Null Hypothesis Two

There is no significant effect on the use of instructional materials on students' academic performance in chemistry (Table 7).

Table 7. Summary of Chi-square test result for research question two

X^2 Cal	X^2 Crit	Df	Level
31.67	9.49	4	0.05

The calculated Chi-Square (X^2) value is 31.67 with 4 degrees of freedom (df = 4). Using a Chi-square critical value Table 7, the critical value at df = 4 and 0.05 significance level is 9.49. Since 31.67 > 9.49, the null hypothesis (which assumes no significant impact between

instructional materials and academic performance) is rejected. This means that the use of instructional materials significantly impacts students' academic performance in chemistry. Therefore, instructional materials have a significant positive impact on students' academic performance in chemistry.

Null Hypothesis Three

There is no significant problem affecting instructional material usage (Table 8).

Table 8. Summary of Chi-square test result for research question three

X^2 Cal	X^2 Crit	Df	Level
77.09	9.49	4	0.05

The calculated Chi-Square (X^2) value is 77.09 with 4 degrees of freedom (df = 4).
Using a Chi-square critical value Table 8, the critical value at df = 4 and 0.05 significance level is 9.49. Since 77.09 > 9.49, the null hypothesis (which assumes no significant problems affecting instructional material usage) is rejected. This means that the identified problems (cost, availability, and student ability) significantly affect the use of instructional materials in chemistry education. Therefore, problems such as affordability, availability, and student ability significantly hinder the effective use of instructional materials for teaching chemistry.

Discussion

The results of the study on the impact of instructional materials on students' academic performance in chemistry within public secondary schools in Ado Local Government Area of Ekiti State, Nigeria, reveal significant information into the relationship between instructional resources and educational outcomes. The findings are categorized based on three research questions, each addressing different aspects of instructional materials and their influence on teaching and learning processes.
The data presented in Table 1 indicates a strong consensus among respondents regarding the positive impact of instructional materials on students' academic performance in chemistry. A remarkable 95% of respondents agreed that instructional materials improve academic performance, while 90% acknowledged that teaching policies promoting the use of these materials influence the teaching and learning process in the area. This aligns with the findings of Yasmeen [26], who emphasized that effective instructional leadership ensures the availability of resources, which in turn enhances students' academic achievements in science subjects.

Moreover, 65% of respondents noted that the use of instructional materials positively impacts the level of students' assimilation, suggesting that these resources facilitate better understanding and retention of chemistry concepts in the studied area. This finding is corroborated by Mushimiyimana [27], who argued that the use of improvised instructional materials enhances learners' understanding and leads to higher academic achievements. The results also indicate that 75% of respondents believe that teaching chemistry without instructional materials would not yield the expected educational outcomes, further emphasizing the necessity of these resources in the learning environment.

However, it is noteworthy that only 55% of respondents reported a high success rate in passing chemistry with the use of instructional materials. This suggests that while instructional materials are beneficial, other factors may also play a crucial role in students' academic performance in the studied location. For instance, Alkan [28] highlighted that inquiry-based learning in chemistry laboratories can enhance motivation and engagement, which are critical for academic success.

Table 2 provides compelling evidence that the use of instructional materials significantly impact students' academic performance in chemistry. A striking 95% of respondents agreed that there is faster and better learning of chemistry with the use of instructional materials. This finding is consistent with the

research conducted by Abidoye [29], which revealed that students taught with instructional materials performed better than those who were not exposed to such resources.

Furthermore, 85% of respondents indicated that instructional materials make lessons more interesting and foster a deeper understanding of chemistry in the studied area. This aligns with the assertion by Getu [30] that context-based teaching positively affects students' academic achievement, as it engages learners and makes the subject matter more relatable. Additionally, 90% of respondents acknowledged that instructional materials create opportunities for participation in chemistry classes, which is crucial for active learning and engagement within the context of this study.

The results also show that 75% of respondents believe that effective use of instructional materials enhances communication between students and teachers. This finding is in line with the conclusions drawn by Adalikwu and Iorkpilgh [1], who noted that instructional materials improve students' understanding of concepts and lead to higher academic achievements. Overall, the data strongly support the notion that instructional materials are integral to enhance students' academic performance in chemistry in Ado LGA.

The responses to the problems affecting the use of instructional materials in the teaching of chemistry, as shown in Table 3, reveal several challenges that hinder effective teaching and learning. Notably, 60% of respondents agreed that the ability of students affects the use of instructional materials by teachers. This suggests that different levels of student preparedness and understanding may affect how effectively instructional materials are utilized in the classroom.

A significant barrier identified is the cost of instructional materials, with only 5% of respondents agreeing that they are affordable. This finding highlights a critical issue, as the financial constraints faced by schools can limit access to essential resources. The lack of appropriate and relevant instructional materials was also a concern, with 80% of respondents disagreeing that suitable materials are available for delivering chemistry lessons. This aligns with the findings of Okwanga and Mwesigwa [31], who emphasized the need for quality instructional materials to support effective teaching.

Furthermore, 55% of respondents indicated that teachers do not consistently use instructional materials during lessons, which may contribute to the ineffective teaching of chemistry. This finding shows the significance of teacher training and professional development in ensuring that educators are equipped to integrate instructional materials effectively into their teaching practices. The belief that students' understanding of the subject can be improved if the government provides relevant instructional materials was supported by 55% of respondents, indicating a need for systemic support in addressing these challenges.

Conclusion and Recommendation

This study on the effect of instructional materials on students' academic performance in chemistry within public secondary schools in Ado Local Government Area, Ekiti State, Nigeria, unequivocally affirms their critical role in enhancing educational outcomes. The findings consistently demonstrate a strong positive correlation between the use of instructional materials and improved academic performance, faster learning, enhanced student assimilation, and increased engagement in chemistry lessons. This reinforces the widely accepted pedagogical principle that tangible and visual aids are indispensable for demystifying abstract scientific concepts and fostering a deeper understanding of the subject matter. Stakeholders, including educators, policymakers, and government officials, should collaborate to ensure that adequate resources are made available to support effective teaching and learning in chemistry in this area.

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