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COMPARATIVE STUDY OF THE EFFECTS OF PROJECTED AND NON-PROJECTED INSTRUCTIONAL MATERIALS ON STUDENTS' ACHIEVEMENT IN ENGLISH LANGUAGE IN SECONDARY SCHOOLS IN ENUGU EDUCATION ZONE

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Abstract

The use of various new technologies in schools and institutions has been considerably slow despite an increasing proliferation of teaching and learning technologies. Thus, it is not surprising that despite the position of English language in the National Policy on Education, students' performance in the subject have not been encouraging. The study sought to investigate and compare the effects of projected and non-projected instructional materials on students' academic achievement in English language in secondary schools in Enugu Education zone. The researcher adopted a non-equivalent quasi-experimental design. A sample of 357 SS2 students was drawn from the three schools in Enugu Education zone of Enugu State. In each of the schools used, three intact classes were randomly drawn; one intact class was then randomly assigned to the groups 1, II and III. The first group (Group 1) was taught using projected instructional materials (overhead projector), group II taught using non-projected instructional materials (charts, still pictures and chalkboard) and Group III was used as the control (taught without instructional materials). Three research questions and one hypothesis guided the study. Relevant data for the study were collected using English language Achievement Test (ELAT) with a reliability coefficient of 0.75. Research question was answered using mean and standard deviations while hypothesis was tested using Analysis of Covariance (ANCOVA). The results revealed that the mean achievement scores of students taught using projected instructional materials were significantly higher than those taught using non-projected instructional materials. Furthermore, the control group 3 had the lowest mean achievement score. Some recommendations made that amongst others, teachers should adopt the use of projected instructional materials in teaching English language

Keywords: Compare, Projected instructional materials, non-projected instructional materials, achievement, English Language, Enugu Education zone.

Introduction

English Language occupies a uniquely strategic role within Nigeria's educational system. Beyond being a core subject, it functions as the official language and the primary medium of instruction across all levels of formal education (Federal Republic of Nigeria, 2014). Thus, competence in English is not merely desirable; it is indispensable for academic success in other subjects. Scholars have consistently emphasized that students' performance in Mathematics, Sciences, and Social Sciences is strongly mediated by their level of proficiency in English (Oyetunde & Muodumogu, 2014). Thus, persistent underachievement in English Language has far-reaching implications for overall educational outcomes.

It is not a new policy that at the secondary school level, English Language is a compulsory subject in the Senior Secondary School Certificate Examination (SSCE) conducted by the West African Examinations Council and the National Examinations Council. Reports released annually by the West African Examinations Council (WAEC, 2022, 2023) reveal fluctuating but concerning performance trends in English Language. For example, WAEC Chief Examiners' Reports in recent years have revealed a widespread weaknesses in essay writing, comprehension, lexical usage and grammatical expression. Similarly, the National Examinations Council (NECO, 2022, 2023) has reported that a significant proportion of candidates fail to obtain credit-level passes in English Language which is an essential requirement for university admission in Nigeria. Educational commentators have repeatedly drawn attention to the implications of these statistics. According to WAEC (2023), candidates demonstrated persistent deficiencies in organization of ideas, sentence construction, and mechanical accuracy. NECO (2022) further noted that many students displayed limited exposure to functional English usage and struggled with inferential comprehension. These recurring patterns suggest that conventional instructional approaches may not be effectively addressing learners' needs.

Several researchers have attributed students' poor performance in English Language to multiple interacting factors, including overcrowded classrooms, inadequate teacher preparation, insufficient exposure to reading culture and lack of effective instructional materials (Aina, 2013; Owoeye & Yara, 2011). Among these variables, the availability and utilization of instructional materials have emerged as particularly significant. Instructional materials serve as concrete channels through which abstract concepts are clarified and learner engagement is stimulated (Obanya, 2014). Where such materials are scarce or poorly utilized, learning outcomes are often compromised. Within the context of Enugu State, the situation presents both promise and challenge. Historically recognized as an educational hub in Southeastern Nigeria, Enugu State hosts numerous public and private secondary schools. However, disparities exist in infrastructural development and instructional resource availability. Unfortunately, only a few urban schools have begun integrating multimedia projectors, digital slides and audio-visual technologies into classroom instruction and many rural and public institutions continue to rely heavily on

textbooks, chalkboards and handwritten notes. This uneven distribution of instructional resources raises critical questions regarding pedagogical effectiveness.

Projected and Non Projected Instructional Materials

Instructional materials are broadly classified into projected and non-projected categories. Projected instructional materials include technologically mediated tools such as PowerPoint presentations, multimedia projectors, animations, and educational videos. These materials combine visual and auditory stimuli, potentially enhancing learning through dual-channel cognitive processing. Mayer's (2009) Cognitive Theory of Multimedia Learning posits that learners understand information more deeply when it is presented through coordinated verbal and visual representations rather than through words alone. According to this theory, meaningful learning occurs when learners actively select, organize, and integrate information across sensory channels. Conversely, non-projected instructional materials include traditional resources such as textbooks, charts, flashcards, models and realia. These materials, though not electronically mediated, facilitate sensual interaction and direct observation. Constructivist theorists argue that learning is most effective when learners actively construct knowledge through engagement with their environment (Bruner, 1966; Vygotsky, 1978). In this sense, well-utilized non-projected materials can also promote deep understanding and retention.

The increasing global emphasis on educational technology has created a perception that projected instructional materials are inherently superior to traditional methods. Studies have shown that multimedia integration can improve student motivation and academic performance when appropriately implemented (Adedoja & Tayo, 2015; Yusuf & Afolabi, 2010). However, technology alone does not guarantee improved outcomes. Clark (2013) contends that media are vehicles for instruction but do not directly influence learning unless integrated with sound. In contexts where electricity supply is inconsistent and technological maintenance is limited, conditions not uncommon in parts of Enugu State, the effectiveness of projected materials may be constrained.

Literature Review

Previous studies in Nigeria provide mixed findings. Aina (2013) found that instructional materials significantly improved students' academic achievement in secondary school subjects. Similarly, Owoeye and Yara (2011) reported positive correlations between resource availability and academic performance. However, most studies done had focused on the general use of instructional materials rather than conducting direct comparative analyses between projected and non-projected categories. Furthermore, few investigations have concentrated specifically on English Language performance in Enugu State secondary schools.

Given the persistent underperformance recorded by WAEC and NECO and the current educational advancements, a systematic comparative evaluation

becomes necessary. Policymakers, school administrators, and teachers require empirical evidence to determine whether projected instructional materials offer measurable advantages over non-projected materials in improving students' academic achievement in English Language. Therefore, this study seeks to conduct a comparative investigation of the effects of projected and non-projected instructional materials on students' academic achievement in English Language in secondary schools in Enugu State. By grounding the inquiry in both national examination trends and pedagogical theory, the study aims to contribute meaningful insights into instructional improvement strategies.

Statement of the problem

Despite educational reforms and policy initiatives, students' performance in English Language in external examinations remains a persistent challenge. WAEC (2023) and NECO (2022) reports indicate that a significant number of candidates fail to achieve credit-level passes required for tertiary education admission. These consistent patterns of underachievement raise concerns about the effectiveness of prevailing instructional strategies.

On the instructional side, the pace of adoption and use of various instructional materials and technologies in schools and institutions is considerably slower, despite an increasing proliferation of teaching and learning technologies like the audio, visual and interactive technologies (Muhammad, 2019). English Language instruction in many secondary schools remains predominantly teacher-centred, characterized by limited student participation and insufficient integration of diverse instructional materials (Adeniran, 2019). It appears that in Nigeria, teachers are more conversant with teaching without instructional technologies and materials, which is regarded as (conventional) traditional method of teaching, than they are with the use of multimedia. Furthermore, in some schools, projected instructional tools are introduced without adequate teacher preparation or infrastructural stability.

The core problem, therefore, lies in the lack of empirical evidence within Enugu State regarding which instructional material category (projected or non-projected) more effectively enhances students' academic achievement in English Language. Without such evidence, stakeholders may continue investing in instructional tools without clear understanding of their comparative impact. Thus, this study seeks to investigate to what extent projected and non-projected instructional materials differ in their effects on students' academic achievement in English Language in secondary schools in Enugu State.

Purpose of the study

The purpose of the study was to compare the effects of projected and non-projected instructional materials on students' achievement in English language in secondary schools in Enugu Education zone of Enugu State.

Specifically, the study seeks to determine the:

1. Effect of the use of projected and non-projected instructional materials on students' academic

achievement in English Language.
2. Effect of the use of conventional methods of teaching on students' academic achievement in English Language.
3. Significant difference in the mean achievement scores of students taught English language using projected and non-projected instructional materials

Research questions:

1. What is the mean achievement scores of students taught English Language using projected and non-projected instructional materials?
2. What is the mean achievement scores of students taught English Language without instructional materials (conventional method)?

Hypothesis

1. There is no significant difference in the mean achievement scores of students taught English language using projected and non-projected instructional materials

Method

The design for this stduy is quasi-experimental. The design is specifically a pretest post-test, non equivalent group design. The choice of this design agreed with Blair (2009) and Abimbade in Okafor (2000) who observed that this design was often used in classroom experiments when experimental and non-control groups are naturally assembled groups, such as intact classes, which may be similar in the level of education. This study was carried out in Enugu Education Zone of Enugu State. Enugu Education zone to the north is bounded by the Udi L.G.A, South by Nkanu West L.G.A, East by the Igbo Etiti L.G.A, and West by Enugu South L.G.A. It also has rural areas and semi-urban areas. The urban and semi-urban areas are covered mainly by civil and public servants and business men. The rural areas are mainly occupied by Enugu South indigenous and few non-indigenous persons. Some of them are farmers, some are petty traders and some are civil servants. The choice of this area is because of logistical convenience and the researcher saw the zone as thickly populated in terms of SS2 students among all the six zones in Enugu State.

The populations considered of all the thirty one (31) secondary schools in Enugu Education zone. The population of senior secondary school 2 students being 5,195. (PPSMB, 2018)

Stratified simple random sampling was used to draw three schools from the thirty one secondary schools in Enugu Educational zone. In each of the sampled schools, simple random sampling was used to pick three intact classes of SS2 in each school. Three intact classes were randomly assigned to the experimental group I, II, and III. A total of three hundred and fifty seven (357) which one hundred and nineteen (119) students assigned to each group.

English language Achievement Test (ELAT) developed by the researcher was used for data collection which consisted of forty seven objective test items. The choice of objective test items was to allow the researcher to cover more topic areas. The instrument was used for pretest and posttest. The items for the ELAT were written to reflect the specification in test blue print prepared. The scoring guide for the ELAT was prepared in order to guide the teachers that scored the ELAT.

The instrument went through both face and content validity. The items of ELAT and experimental packages were subjected to face validation by one expert in English language education, one expert in educational technology and one expert in Measurement and Evaluation. The instrument and experimental packages were validated in terms of clarity, appropriateness of the language used and also if any item is ambiguous. Their corrections and comments were useful in modifying the items of the tests and experimental packages. The surviving items, therefore, possessed adequate face validity of the instrument for data collection. The English Achievement Test after scoring guide was also "face" validated by the experts that validated the same English language Achievement Test. Forty-six questions survived out of sixty questions after validation.

The reliability of ELAT was determined using test re-test method. To determine the reliability of ELAT for the study, the ELAT was trial tested in community secondary school Amandim Olo in Ezeagu LGA of Enugu State. Then the sets of scores from the test administration of ELAT were correlated using Pearson Product moment correlation coefficient (γ) and is 0.75. The measure of internal consistency was determined using Kuder Richardson 20. (K-20).

Three English Language teachers (research Assistants) from each of the sampled schools received briefing for a period of one week from the researcher on the use of the projected (overhead projectors) and non-projected media (charts, still pictures and chalkboards) teach English Language respectively. Prior to the treatment, the English language teachers / research Assistants in the sampled schools who received briefing on how to use the research instrument administered the ELAT respectively to their SS2 students. At the end of the testing, the question papers and the answer script were collected from each student who took the pretest. ELAT was administered as pretest on the first week of treatment by research assistants. Scores of the students on the pretest were recorded and kept for the use after the experiment. The post test data were also generated after re-administration of ELAT to the students on the last week of treatment. For each for the groups, data for pretests and post tests were recorded separately. The test item on ELAT was scored two marks each to give a maximum mark of one hundred percent.

Mean ($\overline{x}$) and standard deviation were used in answering the research questions. Analysis on covariance was used to test the hypothesis. Rejected the null hypothesis (Ho) if the F-calculated is greater than F-table at 0.05, then fall to reject the null hypothesis at 0.05 if F-calculated is less than F-table.

Results

Research question 1

What is the mean achievement scores of students taught English Language using projected instructional materials and those taught using non-projected instructional materials?

Table 1: Mean achievement scores of students taught English Language using projected instructional materials and those taught using non-projected instructional materials.

	Mean (X)		Standard Deviation		N
Groups	Pretest	Posttest	Pretest	Posttest	
Experimental Group 1: (taught using projected instructional materials)	25.76	66.19	13.49	14.85	119
Experimental Group 2: (taught using non projected instructional materials)	26.40	61.21	12.39	14.90	119
Total					238

Table 1 presents the mean achievement scores of students taught using projected instructional materials (Group 1) and those taught using non-projected instructional materials (Group 3). The pretest mean score for Group 1 (projected materials) was 25.76, while the posttest mean score increased significantly to 66.19. In contrast, Group 2 (non-projected materials) had a pretest mean of 26.40, with a posttest mean of 61.21. The data indicates a marked improvement in both groups after the intervention.

Research question 2

What is the mean achievement scores of students taught English Language using non-projected instructional materials?

Table 2: Mean achievement scores of students taught English Language using conventional methods

	Mean (X)		**Standard Deviation**		**Total**
Groups	**Pretest**	**Posttest**	**Pretest**	**Posttest**	
Experimental Group 3: (taught using non-projected instructional materials)	24.40	36.55	10.40	10.20	119
Total					119

Table 2 provides data on the mean achievement scores of students taught using conventional methods (Group 3). This group had a pretest mean of 24.40, and a posttest mean of 36.55. Compared to the other two groups, Group 3 shows a much lower increase in posttest scores, indicating less improvement in achievement

Hypothesis

1. There is no significant difference in the mean achievement scores of students taught English language using projected and non-projected instructional materials

Table 3: Analysis of Covariance of no significant difference in the mean achievement scores of students taught English language using projected and non-projected instructional materials

Tests of Between-Subjects Effects

Dependent Variable: Posttest

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1540.044[a]	2	770.022	3.468	.033
Intercept	183691.019	1	183691.019	827.282	.000
Pretest	62.527	1	62.527	.282	.596
Group	1491.865	1	1491.865	6.719	.010
Error	52179.776	235	222.042		
Total	1019501.000	238			
Corrected Total	53719.819	237			

a. R Squared = .029 (Adjusted R Squared = .020)

Table 3 presents the ANCOVA results testing whether there is a significant difference in the mean achievement scores of students taught with projected versus non-projected instructional materials. The corrected model, which includes both the covariate (pretest scores) and the group factor (instructional material type), is statistically significant with an F-value of 3.468 and a p-value of 0.033. This suggests that the instructional material used significantly affects student academic achievement. The intercept term is highly significant ($p < 0.0001$), indicating that the overall posttest performance is influenced by initial pretest scores. However, the pretest variable itself does not significantly predict posttest scores ($p = 0.596$), suggesting that pretest scores did not have a strong impact on the effect of the instructional materials.

The group factor, which compares the projected materials group to the non-projected materials group, has an F-value of 6.719 with a p-value of 0.010, indicating a significant difference between the two groups. Specifically, students taught using projected materials performed significantly better than those taught with non-projected materials, demonstrating the effectiveness of projected materials in enhancing students' academic achievement in English Language. Therefore, the ANCOVA results confirm that projected instructional materials have a statistically significant impact on improving student's academic achievement compared to non-projected materials

Discussions of the findings

The study aimed to compare the effectiveness of projected and non-

projected instructional materials in improving students' achievement in English Language. The results from the ANCOVA analysis confirm that there is a significant difference between the two groups. The group taught with projected materials (Group 1) performed better in the posttest compared to the group taught with non-projected materials (Group 2). Furthermore, Group 3, which was taught using conventional methods, showed the least improvement, supporting the idea that multimedia and technological tools have a greater impact on student academic achievement than traditional instructional methods.

The effectiveness of projected instructional materials can be attributed to their ability to integrate visual and auditory stimuli, which support dual-channel processing, as outlined by Mayer's (2019) Cognitive Theory of Multimedia Learning. This theory suggests that learning is enhanced when information is presented in both visual and verbal forms, allowing students to process and retain information more effectively. Studies have shown that multimedia learning environments, which include projected materials such as PowerPoint presentations and videos, can improve student understanding, retention, and motivation (Eze, 2021; Idris & Ogunyemi, 2020). In this study, students who were exposed to projected materials likely benefited from these multimedia effects, which made learning more interactive and engaging.

In contrast, the group taught with non-projected instructional materials, such as charts and models, showed less improvement in their posttest scores. While these materials still provide some level of interaction and engagement, they lack the dynamic nature of projected materials, which may explain the smaller gains in student performance. Research has pointed out that non-projected materials, though beneficial, tend to be less engaging and may not facilitate the same level of cognitive processing as multimedia tools (Oluwaseun & Akinyemi, 2017). Furthermore, non-projected materials often rely on static representations, which can make complex ideas harder to grasp, especially in subjects like English Language that require the integration of various skills, such as reading, writing, and comprehension.

The findings of this study also reflect the broader trend in educational research that highlights the increasing importance of instructional technology in the classroom. A study by Ajayi and Oyediran (2022) found that students exposed to multimedia-enhanced teaching methods demonstrated higher academic performance in various subjects, including language arts. Similarly, Eze (2021) highlighted the need for the adoption of technology in schools to bridge the gap between traditional and modern learning methods. These findings suggest that the integration of projected instructional materials, when properly utilized, can significantly improve student learning outcomes in English Language.

However, it is important to note that the use of projected instructional materials is not without challenges. The practical limitations of technology, such as unreliable electricity supply and the need for regular maintenance, can hinder the effectiveness of multimedia tools in certain contexts. According to Ibrahim and Adebayo (2020), the effectiveness of projected materials in schools is often

constrained by infrastructural challenges especially in rural areas where technological resources are limited. This is a crucial consideration for policymakers and school administrators who must ensure that adequate infrastructure and training are in place to maximize the benefits of such tools. Moreover, while the projected materials group showed better results, it is also essential to acknowledge the potential of non-projected materials in educational contexts. Studies have shown that non-projected materials, when used effectively, can promote active learning and foster deeper understanding, especially in environments with limited technological resources (Oluwaseun & Akinyemi, 2017). The challenge lies in integrating these materials with modern teaching practices to create a balanced, effective instructional approach.

Conclusion

The study demonstrates that the use of projected instructional materials significantly enhances students' academic achievement in English Language compared to non-projected instructional materials and conventional methods. However, the potential challenges in the adoption and maintenance of such technologies in resource-limited settings should be considered.

Recommendations

Based on the findings, the following recommendations are made:

1. English language teachers should incorporate multimedia tools, especially projected instructional materials, in their teaching to enhance student engagement and academic performance, particularly in large classrooms with limited resources.
2. School principals and education administrators should organize periodic workshops to train teachers on the effective use of multimedia in teaching, ensuring that teachers are equipped with the necessary skills and resources.
3. Schools should be encouraged to prioritize the use of instructional materials, including multimedia, in their curriculum delivery, while also ensuring that the infrastructure needed to support such technologies is adequately maintained.

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