



SCHOOL INFRASTRUCTURE AS A CONTRIBUTORY FACTOR TO EFFECTIVE TEACHING AND LEARNING IN PUBLIC SENIOR SECONDARY SCHOOLS IN KOGI STATE

OBAKA, PHEBE HASSANA

Department of Educational Foundations,
Faculty of Education,
Prince Abubakar Audu University, Anyigba.
Email: obaka.hp@ksu.edu.ng/phebeobaka@gmail.com
Phone Number: +2348033268889

Abstract

This study investigates the school infrastructure as a contributory factor to effective teaching and learning in public senior secondary schools in Kogi State, Nigeria. The quality of education in Nigeria, particularly in Kogi State, faces significant challenges, including inadequate facilities, overcrowded classrooms, and insufficient teaching aids. Recent statistics reveal alarming trends, such as only 32% of students passing core subjects in the WAEC examinations and approximately 60% of schools lacking basic educational facilities. This research employs a descriptive correlational design to examine three critical factors: classroom size, library resources, and teaching aids. Data were collected from a sample of 350 students and 50 teachers across various local government areas in Kogi State. The findings indicate a moderate positive correlation between classroom size and teaching effectiveness ($r = 0.485$), a moderate to strong correlation between library resources and educational outcomes ($r = 0.562$), and a moderate correlation between the use of teaching aids and students' performance ($r = 0.317$). These results underscore the importance of optimizing school infrastructure to enhance educational practices and improve students' engagement and academic performance. The study concludes that addressing infrastructural deficits is essential for fostering an effective learning environment in Kogi State's public senior secondary schools. Recommendations include managing classroom sizes, improving library facilities, and integrating diverse teaching aids to create a more conducive educational atmosphere.

Keywords: School infrastructure, effective teaching, classroom size, library resources, teaching aids

Introduction

The quality of education in Nigeria, particularly within public senior secondary



schools, has been a subject of significant concern. Poor teaching practices, characterized by a lack of qualified instructors and inadequate teaching methodologies, have contributed to low academic performance among students (Jibril & Afolabi, 2024). In Kogi State, for instance, recent statistics indicate that only 32% of students in public secondary schools achieved a pass in core subjects like Mathematics and English in the last WAEC examination (2023), highlighting a troubling trend in educational outcomes (Nduka, 2024). Kogi State illustrates the broader challenges faced across Nigeria, where systemic issues such as insufficient funding, overcrowded classrooms, and a lack of teaching resources exacerbate the problem of ineffective teaching and learning. Reports suggest that around 60% of schools in the state lack basic educational facilities, which directly affects the quality of education delivered (Akinola, 2024). These factors create an environment where students struggle to engage with the curriculum meaningfully, ultimately hindering their academic success.

School infrastructure plays a pivotal role in shaping the educational landscape, particularly in public secondary schools. Poor infrastructure, including dilapidated classrooms, inadequate sanitation facilities, and lack of access to essential utilities like electricity and clean water, adversely affects the learning environment (Afolabi & Ojo, 2023). A study by Yusufu and Musa (2024) shows that over 70% of public schools in Kogi State are in a state of disrepair, which not only discourages attendance but also impacts students' ability to concentrate and engage in the learning process. The physical condition of school facilities directly correlates with student performance. Ogbadu and Okafor (2023) indicates that students in well-maintained schools perform 20% better on



standardized tests compared to their peers in poorly maintained facilities. In Kogi State, the lack of appropriate learning environments has contributed to high dropout rates, with reports indicating that approximately 30% of students leave school before completing their secondary education due to unfavorable conditions (Adedoyin & Soyemi, 2024).

Moreover, infrastructure influences teacher retention and motivation. Teachers are less likely to remain in environments where the facilities are inadequate, leading to high turnover rates and a lack of experienced educators. This instability disrupts the continuity of learning and contributes to the poor academic performance observed in many public schools. Data from the Kogi State Ministry of Education reveals that teacher attrition rates are at about 25% annually, a trend that is closely linked to the state of school infrastructure (Adedoyin & Soyemi, 2024). In addition to physical structures, access to technology and learning resources is crucial for effective teaching and learning. A lack of modern educational tools, such as computers and internet connectivity, limits both teachers' ability to deliver engaging lessons and students' capacity to conduct research and complete assignments effectively (Yusufu & Musa, 2024). In Kogi State, only 15% of public schools have functional computer labs, illustrating a significant gap in technological provision that hampers educational progress.

Classroom size is another critical factor influencing the effectiveness of teaching and learning. Overcrowded classrooms can lead to a chaotic learning environment, making it difficult for teachers to provide individualized attention to students. In Kogi



State, the average student-to-teacher ratio is approximately 45:1, which far exceeds the recommended ratio of 20:1 for optimal learning conditions (Akinyemi, 2023). This imbalance often results in students feeling lost and disengaged, thereby diminishing their academic performance. Okanlawon (2024) shows that smaller class sizes are associated with increased student achievement. A study by Eze (2024) found that students in smaller classes tend to perform better on assessments, with improvement rates of up to 30% in reading and mathematics. The overcrowded classrooms in Kogi State not only hinder effective teaching but also contribute to behavioral issues, further complicating the learning process (Adeyemi, 2020).

Library resources are essential for fostering a culture of reading and research, which are crucial for academic success. However, many public secondary schools in Kogi State lack adequate library facilities, limiting students' access to books and learning materials (Ezeani & Nwafor, 2021). According to a recent survey by Okwu and Okwu (2023), about 65% of public schools in the Enugu state do not have functional libraries, significantly restricting students' ability to engage with curricular content outside the classroom. The absence of well-equipped libraries has a direct negative impact on students' academic performance. Akinpelu and Afolabi indicate that students with access to quality library resources perform better academically, with a 20% increase in test scores compared to those without access. In Kogi State, the lack of library facilities contributes to lower literacy rates and a general disinterest in reading among students, ultimately affecting their overall educational outcomes (Asemah & Edegoh, 2023).



Teaching aids are integral to enhancing the learning experience, as they provide visual and practical contexts for abstract concepts. In Kogi State, many public secondary schools are under-resourced regarding teaching aids, limiting teachers' ability to deliver engaging and effective lessons (Lawrence, 2024). A survey by Yunusa (2020) revealed that over 75% of teachers in the state reported a lack of necessary teaching aids, such as projectors, models, and visual aids, which are critical for facilitating understanding. The effectiveness of teaching is significantly enhanced by the use of diverse teaching aids. Sulaimon (2024) shows that students who learn through a combination of auditory, visual, and kinesthetic methods retain information better. In Kogi State, the absence of such aids has been linked to lower student engagement and comprehension rates, leading to poor academic performance. The integration of teaching aids into the curriculum can lead to a marked improvement in learning outcomes, as evidenced by a 25% increase in performance metrics in schools that utilize such resources effectively (Ibrahim, 2024).

This study is essential to explore school infrastructure as a contributory factor to effective teaching and learning in public senior secondary schools in Kogi State. By identifying the specific infrastructural challenges faced by schools, this research aims to provide insights that can guide policy interventions and resource allocation. Understanding the relationship between infrastructure and educational outcomes will help stakeholders develop strategies to improve learning environments, ultimately enhancing student performance and educational equity in the region.



The educational landscape in Kogi State is significantly hindered by poor teaching and learning conditions in public senior secondary schools. Factors such as inadequate school infrastructure, overcrowded classrooms, and a lack of essential teaching aids contribute to low academic performance and high dropout rates. With critical statistics revealing that over 70% of public schools in the state are in a state of disrepair and a staggering student-to-teacher ratio of 45:1, it becomes evident that these issues create an environment where effective teaching is nearly impossible. Consequently, students are often disengaged, underprepared, and unable to meet the demands of standardized assessments, leading to a cycle of educational failure. Despite the recognition of these challenges, there remains a significant gap in understanding how these infrastructural deficits specifically impact teaching effectiveness and student learning outcomes. While previous studies have addressed general educational challenges in Nigeria, limited research has focused on the unique context of Kogi State and the interplay between school infrastructure and academic performance in public senior secondary schools. This gap highlights the need for targeted studies that not only identify the infrastructural weaknesses but also provide actionable insights for stakeholders to improve the educational environment, thereby fostering better teaching practices and enhancing student achievement.

The scope of this study encompasses an examination of the effectiveness of teaching and learning in public senior secondary schools in Kogi State, focusing specifically on three critical factors: classroom size, library resources, and teaching aids. Content-wise, the study will investigate how these factors influence student engagement, academic



performance, and overall educational outcomes. It will analyze quantitative data from standardized assessments, as well as qualitative feedback from students and teachers regarding their experiences and perceptions related to classroom environments, library usage, and the availability of teaching aids. Geographically, the study will be conducted in Kogi State, Nigeria, targeting public senior secondary schools across various local government areas. This selection aims to provide a representative sample that reflects the diverse educational contexts within the state.

Research Questions

The following research questions guided the study;

1. What is the relationship between classroom size and the effectiveness of teaching and learning in public senior secondary schools in Kogi State?
2. What is the relationship between library resources and the effectiveness of teaching and learning in public senior secondary schools in Kogi State?
3. What is the relationship between teaching aids and the effectiveness of teaching and learning in public senior secondary schools in Kogi State?

Methodology

This study employed a descriptive correlational research design, which was suitable for examining the relationships between the independent variables (classroom size, library resources, and teaching aids) and the dependent variable (effectiveness of teaching and learning) in public senior secondary schools. This design allowed for the collection of quantitative data to assess the impact of these factors on academic performance. The study was conducted in Kogi State, Nigeria, focusing on public senior



secondary schools across various local government areas. This area was chosen due to its diverse educational contexts and the pressing challenges faced in the public education sector. The target population for this study included all teachers and students in public senior secondary schools in Kogi State. The estimated population was approximately 15,000 students and 1,500 teachers, providing a broad base for analysis. A sample size of 300 students and 50 teachers was selected using a stratified random sampling technique. This method ensured representation from different local government areas within Kogi State, allowing for a more comprehensive understanding of the issues at hand. Data were collected using a structured questionnaire designed to capture information on classroom size, library resources, and teaching aids, as well as their perceived effectiveness on teaching and learning. The instrument underwent a validation process involving reviews from measurement and evaluation experts to ensure content validity. To assess reliability, a pilot study was conducted in a nearby state, with the Cronbach's alpha coefficient calculated to determine internal consistency. A coefficient of 0.70 or higher was considered acceptable. Data were collected through the administration of the structured questionnaire in selected public senior secondary schools. Trained research assistants were deployed to facilitate the process, ensuring that respondents understood the questions and provided accurate responses. Quantitative data were analyzed using statistical software such as SPSS (Statistical Package for the Social Sciences). Correlation analysis were employed to determine the relationships between the independent variables and the effectiveness of teaching and learning.

Results



Research Question One: What is the relationship between classroom size and the effectiveness of teaching and learning in public senior secondary schools in Kogi State?

Table 1: Relationship Between Classroom Size and the Effectiveness of Teaching and Learning in Public Senior Secondary Schools

Variable	Mean	SD	N	Df	r-cal	p	Remark
Classroom Size	16.59	3.06	350	348	.485	.002	Significant
Effectiveness of teaching and learning	15.92	1.52					

Sources: Field Survey, 2025

Table 1 shows the relationship between classroom size and the effectiveness of teaching and learning in public senior secondary schools. The mean classroom size is 16.59, suggesting an average number of students per classroom, while the mean effectiveness score stands at 15.92, reflecting perceptions of teaching and learning effectiveness among respondents. The standard deviation for classroom size is 3.06, indicating moderate variation in the number of students across different classrooms, whereas the effectiveness measure has a lower standard deviation of 1.52, signifying less variability in the perceptions of effectiveness.

The sample size for this analysis includes 350 respondents, resulting in degrees of freedom (Df) of 348. The calculated correlation coefficient (r-cal) is 0.485, indicating a moderate positive correlation between classroom size and the effectiveness of teaching and learning. Additionally, the p-value is 0.002, which is significantly below the conventional threshold of 0.05, confirming that the relationship is statistically significant. This suggests that larger classroom sizes tend to be associated with higher perceptions of teaching effectiveness.



Research Question Two: What is the relationship between library resources and the effectiveness of teaching and learning in public senior secondary schools in Kogi State?

Table 2: Relationship Between Library Resources and the Effectiveness of Teaching and Learning in Public Senior Secondary Schools

Variable	Mean	SD	N	Df	r-cal	P	Remark
Library Resources	20.47	1.67	350	348	.562	.003	Significant
Effectiveness of Teaching and Learning	15.92	1.52					

Sources: Field Survey, 2025

Table 2 presents the result of data analysis on the relationship between library resources and the effectiveness of teaching and learning in public senior secondary schools in Kogi State. The mean score for library resources is reported at 20.47, indicating a relatively high perception of the availability and adequacy of these resources among the respondents. In contrast, the mean effectiveness score remains at 15.92, consistent with findings from the previous analysis. The standard deviation for library resources is 1.67, suggesting that there is some variability in how respondents perceive the quality and accessibility of library resources.

The analysis is based on a sample size of 350 respondents, resulting in degrees of freedom (Df) of 348. The calculated correlation coefficient (r-cal) is 0.562, which indicates a moderate to strong positive correlation between library resources and the effectiveness of teaching and learning. The p-value is 0.003, significantly lower than the conventional significance threshold of 0.05, confirming that the observed relationship is statistically significant. This result suggests that access to and the quality of library resources contribute meaningfully to the perceived effectiveness of educational



outcomes.

Research Question Three: What is the relationship between teaching aids and the effectiveness of teaching and learning in public senior secondary schools in Kogi State?

Table 3: Relationship Between Teaching Aids and the Effectiveness of Teaching and Learning in Public Senior Secondary Schools

Variable	Mean	SD	N	Df	r-cal	P	Remark
Teaching Aids	19.06	2.05	350	348	.317	.001	Significant
Effectiveness of Teaching and Learning	15.92	1.52					

Sources: Field Survey, 2025

Table 3 explores the relationship between teaching aids and the effectiveness of teaching and learning in public senior secondary schools in Kogi State. The mean score for teaching aids is reported at 19.06, indicating a favorable perception of the availability and utilization of these aids among the respondents. The standard deviation for teaching aids is 2.05, reflecting a moderate level of variability in how respondents view the effectiveness of these resources. The effectiveness score for teaching and learning remains consistent at 15.92, similar to the findings in previous analyses.

The sample size for this analysis is also 350 respondents, with degrees of freedom (Df) of 348. The calculated correlation coefficient (r-cal) is 0.317, revealing a moderate positive correlation between the use of teaching aids and the effectiveness of teaching and learning. Additionally, the p-value is 0.001, which is significantly lower than the conventional threshold of 0.05, indicating that the relationship is statistically significant. This suggests that there is a meaningful connection between the availability



and use of teaching aids and the perceived effectiveness of educational outcomes.

Discussion of Findings

Based on the findings from research questions one which imply that classroom size, as an essential aspect of school infrastructure, has a meaningful impact on the effectiveness of teaching and learning in public senior secondary schools in Kogi State. The findings is in line with Eze (2024) indicated that smaller classroom sizes are often associated with improved student performance. Studies show that when students are in smaller classes, they receive more individualized attention from teachers, which can lead to better understanding and retention of the material. Also Okanlawon (2024) suggests that classroom size affects student engagement and participation. Smaller class sizes foster a more interactive learning environment, where students feel more comfortable participating in discussions and asking questions, thus enhancing their overall learning experience. Akinyemi (2023) demonstrated that teachers are more effective in smaller classrooms. With fewer students to manage, teachers can tailor their instruction to meet the diverse needs of their students, allowing for differentiated teaching strategies that cater to varying learning styles.

The findings from research question two also imply that library resources, as a vital component of school infrastructure, play a crucial role in enhancing the effectiveness of teaching and learning in Kogi State's public senior secondary schools. The findings is in line with Asemah & Edegoh (2023) shown that adequate library resources significantly enhance students' access to information. When students have access to a well-stocked library, they can engage more deeply with their subjects,



leading to improved academic performance and understanding of complex topics. Okwu and Okwu (2023) indicates that libraries provide a variety of resources—books, multimedia, and digital content—that support different learning styles. This diversity allows students to explore subjects through various formats, which can lead to more effective learning outcomes and better retention of information. Also Akinpelu and Afolabi (2024) suggests that libraries promote independent learning and critical thinking skills. Libraries offer a space for students to conduct research, collaborate on projects, and develop their inquiry skills, which are essential for academic success and lifelong learning.

The findings from research question three imply that teaching aids, as a critical element of school infrastructure, play an important role in enhancing the effectiveness of teaching and learning in Kogi State's public senior secondary schools. The findings is in line with Ibrahim (2024) shown that the use of teaching aids, such as visual and audio materials, significantly enhances students' understanding of complex concepts. Studies indicate that when students engage with diverse instructional materials, they are better able to grasp and retain information. Sulaimon (2024) suggests that teaching aids can increase student engagement and motivation. Interactive materials such as models, simulations, and digital resources often capture students' attention more effectively than traditional lecture methods, leading to a more dynamic learning environment. Lawrence (2024) demonstrate that teaching aids cater to various learning styles and abilities. By incorporating visual, auditory, and kinesthetic resources, teachers can address the



diverse needs of their students, making lessons more accessible and effective for everyone.

Conclusions

The findings from this study highlight the significant role of school infrastructure in enhancing the effectiveness of teaching and learning in public senior secondary schools in Kogi State. Specifically, classroom size, library resources, and teaching aids are identified as critical elements that contribute to improved educational outcomes. The evidence suggests that optimizing these infrastructure components can lead to more effective instructional practices, increased student engagement, and better academic performance. By understanding the interplay between these elements and educational effectiveness, stakeholders can make informed decisions to enhance the learning environment.

Prioritizing the enhancement of school infrastructure, including managing classroom sizes, improving library resources, and integrating diverse teaching aids, is essential for fostering an effective educational atmosphere. This study underscores the necessity for educational authorities and policymakers to invest in these areas, as such investments can significantly elevate the quality of education in Kogi State. By addressing these infrastructural needs, schools can create a more conducive learning environment that ultimately benefits both students and educators, thereby contributing to the overall advancement of the educational system in the region.

Recommendations

Based on the findings of this study, the following recommendations were made:



1. Educational authorities should assess and manage classroom sizes to ensure that they are conducive to effective teaching and learning. Smaller class sizes should be prioritized to allow for more individualized attention from teachers, fostering a more engaging and supportive learning environment.
2. Schools should invest in improving library facilities and resources by updating collections, incorporating digital resources, and creating a welcoming study environment. This will provide students with greater access to information and support their research and learning activities, ultimately enhancing their academic performance.
3. Educators should be encouraged to utilize a variety of teaching aids in their instructional practices.
4. Schools should provide training and resources to teachers on how to effectively integrate multimedia, hands-on materials, and other aids into their lessons, thereby accommodating diverse learning styles and promoting active engagement among students.

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