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IMPACT OF LIBRARY AND LABORATORY ON QUALITY TEACHING AND LEARNING IN PUBLIC SECONDARY SCHOOLS IN NORTH CENTRAL NIGERIA.

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Abstract

The study investigated the impact of library and laboratory on quality teaching and learning in public secondary schools in North Central, Nigeria. Two research questions guided the study, two hypotheses were formulated and tested for the study. Ex post factor survey design was adopted. The population of the study was 42,235 teachers from 6,601 public secondary schools in the study area with a sample of 1, 252 respondents. The sample size was through multi-stage random sampling procedure. The instrument for data collection was a questionnaire titled "library and laboratory management on Quality Teaching and Learning Questionnaire (LLMQTLQ)". It was validated by three experts, two in Educational Management and one in Science and Mathematics Education in the Faculty of Education, Benue State University, Makurdi. The reliability of the instrument was carried out on 30 respondents from Government Secondary School Jos North, Plateau State and Ilorin, Kwara State. The reliability test was conducted using Cronbach Alpha reliability and the result yielded a reliability coefficient of 0.93. Data were analysed using mean and Standard Deviation to answer the research questions while Chi-square (χ^2) to test the two hypotheses at 0.05 level of significance. The findings of the study showed that office and classroom facilities have significant positive impact on quality teaching and learning in public secondary schools in North Central, Nigeria. And concluded that it has significant positive impact on quality teaching and learning. It was recommended that Ministry of Education, policy makers, school administrators and donor agencies should ensure library and laboratory facilities are provided and well managed in order to achieve quality teaching and learning in public secondary schools in North Central, Nigeria.

Key words*:* Library, Laboratory, Educational Management, teaching and learning.

Introduction

Globally, Quality teaching and learning has emerge as an ultimate key concept of debate among scholars and educators. It has become an evaluative goal in education system. The increasing demand for human capital development to tackle the world challenges in our contemporary society such as: economic challenges, social, political and religious problems calls for quality teaching in schools. As such, developed countries like United Kingdom, Japan and China have improve the quality of teaching and learning in their schools by prioritizing regularly training, provision instructional materials and robust inspection and supervision, while developing countries such as Nigeria nevertheless seems to be struggling with achieving quality teaching and learning (Organization for Economic Cooperation and Development (OEDC), 2014). In North Central Nigeria, quality teaching and learning seems to be declining in various subjects as students seem to be performing poorly in external examinations bodies such as West African Examinations Council (WAEC), National Examinations Council (NECO) and National Business and Technical Examinations Board (NABTEB).

In recent past years, the performance of students in public secondary schools in North Central Nigeria compared to other parts of Nigeria seems to be discouraging. Many students seem to fail key subjects such as English and Mathematics. If school plant is not well managed, it could affect quality teaching and learning in schools. Ibrahim, Umar and Igbaji (2017) maintain that high level of students' academic performance may not be guaranteed where there is poor school plant management such as, libraries and laboratories. Effective management of these facilities it may enhance quality teaching and learning.

Teaching and learning is an interaction between the teacher and the learners whereby the teacher imparts knowledge to learners in organized or unorganized settings (Flanders, 2019). It is a close connection between a more mature personality and a less mature one, which is aimed to further the education of the latter (Morrison, 2018). Quality teaching and learning on the other hand is a dynamic and interactive process of creating, fostering, adapting and negotiating learning environments in which all students are supported in activities that have a good chance of improving learning (OECD, 2014). It also means taking into consideration the moral defense and logical principles of teaching and learning practice. The content being taught meets the standards of discipline in terms of both adequacy and completeness.

Quality teaching and learning does not occur in a vacuum, it occurs as a result of the combination of many factors such as teachers' mastery of subject matter, use of instructional materials, school plant planning and school plant management (Flanders (2019). This is why Bua and Ada (2018) maintain that unless schools are well established, buildings are adequately constructed and equipment are adequately utilized and maintained, quality teaching and learning could be guaranteed. However, quality instruction in schools particularly in public secondary schools especially in North Central Nigeria over the past few

years till date seems to be ineffective. The passing of instruction to students, fostering interactive class, engaging students in class activities, providing learning support to students, using appropriate teaching methods, carrying out effective class assessment, using instructional materials and monitoring students' learning progress have some of the key challenges bedeviling quality teaching learning in public secondary schools (Dogara & Adam, 2017). These key challenges could be linked to Library and Laboratory facilities management.

Management entails bringing together individuals as a group that will control, coordinate and articulate activities to achieve tangible and holistic learning for the overall benefit of the society (Uko, 2015). Library and Laboratory facilities management involves a number of on-going and related activities in provision of the need for facilities management. Educational programmed planning, school facility or building design, building construction, furnishing and equipping the school, school plant operation, utilization, maintenance and modernization or renovation when the need arises (Uko, 2015). Many schools seem to be challenged by decaying buildings that threaten health, safety and learning opportunities of students. Asiegbu (2014) identifies poor management of librarary and laboratory facilities in school as one of the principal factors militating against quality teaching and learning in secondary schools in Nigeria.

Library facilities are those items in the library that provide teachers and students with access to information for quality teaching and learning. Okoro (2013) states that a library is the home of knowledge, the house of all reading materials, the area where necessary piece of information are obtained and a laboratory of all laboratories. Management of library facilities such as books, bookshelves, computers and internet connectivity is essential for quality teaching in public secondary schools. A library that lacks good facilities may demoralize teachers in conducting search to access relevant information which will promote quality teaching in public secondary schools. The usefulness of a library depend on how well it is equipped in terms of books, journals, sitting facilities, computers, periodicals and newspapers to provide information to library users like teachers and students. If the school library is properly managed and used, it may help the teachers in their teaching, research and professional development. Onyenachi (2014) maintains that quality teaching and learning may only take place in a school that has a well-stocked library illuminated by laboratory facilities.

Laboratory facilities constitute the environment in which the teaching and learning of science and other science related activities are carried out in schools. A laboratory is a facility that provides controlled conditions in which scientific or technological research, experiments and measurement are performed (Yakubu & Sowumi, 2017). These facilities include pipettes, scales, centrifuges, Bunsen burners, freezers, hot plates, incubators, coolers, stirrers, water baths and fume hoods. Management of laboratory facilities may contribute greatly to quality teaching and students' academic performance in secondary schools because most experiments are carried out in the laboratory. This implies that science teaching and

learning cannot be effectively carried out in a secondary school where there is no equipped laboratory. Hence, management of laboratory facilities cannot be emphasized in promoting quality teaching and learning especially in science subjects. However, teaching of science subject can be more effective when teachers carry out research using library facilities.

OBJECTIVES OF THE STUDY

Specifically, the study sought to:

1. examine the impact of library facilities management on quality teaching and learning in public secondary schools.
2. ascertain the impact of laboratory facilities management on quality teaching and learning in public secondary schools.

RESEARCH QUESTIONS

The following research questions guided the study.

1. What is the impact of library facilities management on quality teaching and learning in public secondary schools?
2. What is the impact of laboratory facilities management on quality teaching and learning in public secondary schools?

HYPOTHESES

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

1. Library facilities management has no significant impact on quality teaching and learning in public secondary schools.
2. Laboratory facilities management has no significant impact on quality teaching and learning in public secondary schools.

RESULTS

Research Question 1: What is the impact of laboratory facilities management on quality teaching and learning in public secondary schools in North Central, Nigeria?

Table 1:

Mean Scores and Standard Deviation Rating on Impact of Laboratory Facilities Management on Quality Teaching and Learning in Public Secondary Schools in North Central, Nigeria

S/No	Item Description	N	SA	A	D	SD	$\overline{X}$	*SD*	Decision
11	Adequate tables facilitate practical exercise in the laboratory by teachers and students.	1252	363	432	265	192	2.77	1.03	Agree

12	Chairs provide sitting arrangement for students to learn science subjects effectively in laboratories.	1252	372	440	239	201	2.79	1.04	Agree
13	Fume hoods help me to prevent students' exposure to hazards during experiments in teaching science subjects.	1252	391	437	226	198	2.82	1.04	Agree
14	Laboratory chemicals enable me to teach students how to conduct experiments of organic substances.	1252	362	397	289	204	2.73	1.04	Agree
15	I use test tubes to carry out qualitative observations of biochemical reactions for effective experiment or students.	1252	373	451	237	191	2.80	1.02	Agree
	Cluster Mean						**2.78**		**Agree**

Source: Researcher's Field Work, 2025

Table 3 shows mean ratings of 2.77, 2.79, 2.82, 2.73, 2.80 and cluster mean of 2.78 with a corresponding Standard Deviation ratings of 1.0, 1.04, 1.04, 1.04 and 1.02 respectively. The result indicated that the respondents agreed that adequate tables facilitate practical exercise in the laboratory by teachers and students, chairs provide sitting arrangement for students to learn science subjects effectively in laboratories, fume hoods help them to prevent students' exposure to hazards during experiments in teaching science subjects, laboratory chemicals enable them to teach students how to conduct experiments of organic substances and they use test tubes to carry out qualitative observations of biochemical reactions for effective experiment or students. The cluster mean value of 2.78 was above the mean score benchmark of 2.50. This shows positive impact of laboratory facilities management on quality teaching and learning in public secondary schools in North Central, Nigeria.

Research Question 2: What is the impact of library facilities management on quality teaching and learning in public secondary schools in North Central, Nigeria?

Table 2:

Mean Scores and Standard Deviation Rating on Impact of Library Facilities Management on Quality Teaching and Learning in Public Secondary Schools in North Central, Nigeria

S/No	Item Description	N	SA	A	D	SD	$\overline{X}$	*SD*	Decision
16	Internet helps me in searching for information to deliver effective instruction.	1252	374	451	221	206	2.79	1.04	Agree
17	Current journals enable me to access information for lesson plan.	1252	381	431	225	215	2.78	1.06	Agree

18	Current books provide valuable information for me to develop lesson notes for teaching.	1252	407	391	253	201	2.80	1.06	Agree
19	Available computers enable me to browse information to prepare students notes.	1252	388	424	260	180	2.81	1.02	Agree
20	Maps help me for effective instructional delivery.	1252	401	415	248	188	2.82	1.04	Agree
	Cluster Mean						**2.80**		**Agree**

Source: Researcher's Field Work, 2025

Table 4 shows mean ratings of 2.79, 2.78, 2.80, 2.81, 2.82 and cluster mean of 2.80 with a corresponding Standard Deviation ratings of 1.04, 1.06, 1.06, 1.02 and 1.04. The result indicated that the respondents agreed that internet helps them in searching for information to deliver effective instruction, current journals enable them to access information for lesson plan, current books provide valuable information for them to develop lesson notes for teaching, available computers enable them to browse information to prepare students notes and maps help them for effective instructional delivery. The cluster mean value of 2.80 was above the mean score benchmark of 2.50. This shows positive impact of library facilities management on quality teaching and learning in public secondary schools in North Central, Nigeria.

Test of Hypotheses

In this section, chi-square statistical tool was used to test hypotheses at 0.05 level of significance.

Hypothesis : Laboratory facilities management has no significant impact on quality teaching and learning in public secondary schools in North Central, Nigeria.

Table 3:

Chi-square Analysis of Impact of Laboratory Facilities Management on Quality Teaching and Learning in Public Secondary Schools in North Central Nigeria

Responses	**Observed Frequency**	**Expected Frequency**	χ^2	**Df**	*P*	**Decision**
SA	372	313				
A	432	313	107.367[a]	3	0.000	Sig.
D	251	313				
SD	197	313				
Total	**1252**					

Source: Researcher's Field Work, 2025

Table 10 shows Chi-square calculated value of 107.367[a] at 3 degree of freedom; P=0.000 is less than 0.05. With this result, the null hypothesis which states that laboratory facilities management has no significant impact on quality teaching and learning in public

secondary schools in North Central, Nigeria was therefore, rejected. This means that laboratory facilities management has significant positive impact on quality teaching and learning in public secondary schools in North Central, Nigeria.

Hypothesis 4: Library facilities management has no significant impact on quality teaching and learning in public secondary schools in North Central, Nigeria.

Table 4:

Chi-square Analysis of Impact of Library Facilities Management on Quality Teaching and Learning in Public Secondary Schools in North Central Nigeria

Responses	Observed Frequency	Expected Frequency	χ^2	Df	*P*	Decision
SA	390	313				
A	422	313	136.351[a]	3	0.000	Sig.
D	242	313				
SD	198	313				
Total	**1252**					

Source: Researcher's Field Work, 2025

Table 11 shows Chi-square calculated value of 136.351[a] at 3 degree of freedom; P=0.000 is less than 0.05. With this result, the null hypothesis which states that library facilities management has no significant impact on quality teaching and learning in public secondary schools in North Central, Nigeria was therefore, rejected. This means that library facilities management has significant positive impact on quality teaching and learning in public secondary schools in North Central, Nigeria.

Discussion of Findings

This section presents discussion of findings as follows:

The first finding of the study showed that laboratory facilities management has significant positive impact on quality teaching and learning in public secondary schools in North Central, Nigeria. This finding means that laboratory facilities such as adequate tables, chairs, fume hoods, chemicals, and test tubes enable teachers to conduct practical science lessons and experiments, fostering hands-on learning for students. This finding agreed with the findings of Musah and Bah (2017) who found that availability and utilization of biology/chemistry laboratory facilities have positive significant impact on students' academic achievements in secondary schools in Yobe State, Nigeria. The findings also correspond with the findings of Dike and Salisu (2019) who found that utilization of laboratory facilities has positive significant influence on quality teaching of biology in senior secondary certificate examination in Zaria Metropolis, Kaduna State, Nigeria. The researcher also agreed that laboratory facilities management has significant positive impact on quality teaching and learning in public secondary schools because laboratory facilities play a crucial role in the teaching of science subjects by providing students with opportunities for hands-on experiments. This practical exposure helps in developing critical thinking, problem-

solving skills, and a deeper understanding of scientific concepts, enhancing overall learning quality.

The second finding of the study showed that library facilities management has significant positive impact on quality teaching and learning in public secondary schools in North Central, Nigeria. This finding indicated that library facilities such as current books, journals, maps, and computers provide teachers with valuable resources for lesson preparation and effective instructional delivery. This finding is in line with the findings of Olabisi (2018) who found that library facilities have positive significant influence on instructional activities in secondary schools in Kwara State, Nigeria. The findings also agreed with the findings of Ademola (2016) who found that there was a positive significant influence of school library facilities on quality instructional delivery in social studies in junior secondary schools in Ondo State, Nigeria. The researchers also agreed that library facilities have positive significant impact on quality teaching and learning in public secondary schools because library facilities enrich teaching and learning by giving students and teachers access to diverse resources such as textbooks, journals, and research materials. Libraries encourage self-directed learning, improve literacy skills, and support teachers in preparing well-informed lessons, contributing to academic excellence.

Conclusion

Based on the results of the study, it was established that the library and laboratory facilities have significant positive impact on quality teaching and learning in public secondary schools in North Central Nigeria.

Recommendations

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

1. The Ministry of Education should allocate sufficient funding for the provision and maintenance of library and laboratory facilities such as computers, desks, photocopiers, fans and chairs among others. Additionally, they should establish policies for periodic upgrades to ensure these facilities meet modern standards. This may enable teachers to plan lessons effectively, leading to improved quality of teaching and learning in public secondary schools in Nigeria
2. Policy makers should prioritize the formulation and enforcement of policies that may ensure adequate provision and maintenance of library and laboratory facilities, including laboratory tables, reading tables, desks, chairs, smart boards, and projectors among others. They should also set standards for library and laboratory space to accommodate students comfortably. This will create a conducive environment for effective teaching and learning, enhancing students' engagement and academic performance in public secondary schools in North central Nigeria.

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