E-ISSN: 1115 - 8425 P-ISSN: 3027-012X
MPRI-JAEE | INTERNATIONAL JOURNAL OF ASSESSMENT & EVALUATION IN EDU.
VOL. 03 NO. 8 – JANUARY. 2024

SCHOOL BUILDINGS MAINTENANCE STRATEGIES FOR IMPROVING TEACHING AND LEARNING IN DEGREE AWARDING INSTITUTIONS IN BAUCHI STATE

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Keywords: School, Buildings, Maintenance, Strategies, Teaching and Learning.

Abstract

The aim of this study is to determine Schools Buildings maintenance strategies for improving teaching and learning of building technology education in degree awarding institutions in Bauchi State, Nigeria. The Study had two Research objective, two Research question's and two hypotheses tested at 0.05 level of significance. The study adopted survey research design and total sample population was used in this study. one hundred and fifty-seven (157 respondents were used in the study comprising of eleven (11) lecturers and one hundred and forty-six (146) student from the two building technology degree awarding institutions in Bauchi State. The instrument used for the study was a structured questionnaire and was validated by three experts. The reliability coefficient of the instrument was found to be 0.806 and hence the instrument was found to be reliable. [redacted]

Statistical Package for Social Sciences (IBM SPSS) was used to analyze the data collected. The data obtained was analyzed using Descriptive Statistics of Mean and Standard Deviation. The finding of this study include among others, that all the items are agreed by the respondent as Preventive Maintenance strategies for improving teaching and learning of Building Technology Education; and all the items are

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agreed upon as Condition Based Maintenance strategies for improving teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi State. The Study recommend that All Preventive maintenance strategies should be adopted for improving the teaching and learning of Building Technology Education; and All Condition-based strategies should be adopted for improving the teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi State.

Introduction

School Buildings are vital facilities for implementing educational programmes. School administrators and teachers have important roles to play in developing and making them function effectively. Their effectiveness in the implementation of an educational programme, meeting the physical needs of a school and their impact on teacher's productivity depends on its physical condition or quality. Uduak, (2018) stated that, development of adequate and functional school building has been one of the major problems confronting formal education since its inception in the country.

Uduak, (2018) further emphasized that, different types of maintenance serve different specific purposes in school facilities management, they are all necessary for keeping school facilities in as near its original state as possible. Again, regardless of the nature of the maintenance program and the amount of care exercised in executing it, the need for emergency maintenance may come up at any time due to unforeseen circumstances. Maintenance is any activity that is carried out on any facility either to restore to or to retain the facility in a good and acceptable working conditions. Maintenance involves all technical and other procedures performed in order to retain the satisfactory working condition of a building or part or restoring it to an acceptable working condition so that the set tasks can be performed duled time and under given conditions. Abdulkareem, (2011) Stated that, in order to fulfill educational objectives, educational facilities are required and should be central to the extent that teachers and other personnel will enjoy their stay and perform their duties effectively. Poor maintenance of educational facilities has been examined by educationist (Badau, 2010; Danjuma & Adeleye, 2015), in the different states of Nigeria and concluded that States have not been able to plan, allocate, utilize and maintain educational facilities even where there is evidence of funding of capital projects. Schools face the combined challenges of deteriorating conditions, out-of-date design, allocative and

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administrative inefficiencies of educational, resources (Saad, 2014; Abubakar, 2016).

It is noteworthy that decent school buildings enhance teaching and learning thereby making the process meaningful and purposeful. Thus School buildings are crucial because they foster effective pedagogy and boost good result (Iyamu,Imasuen, &Osakue, 2018).Due to lack of maintenance practice in Nigeria Ekpoh, (2018), identified important maintenance strategies and though they sometimes overlap each other, and they include; preventive maintenance, risk-based maintenance, condition-based maintenance, emergency maintenance, corrective maintenance, predictive maintenance, and shutdown maintenance.

These combined deficiencies impair the quality of teaching and learning in schools and create problems for students. The effects of deteriorating condition and poor management of school buildings are threats to school management, curriculum delivery and students' academic performance (Takwate, 2018). One of the issues of great controversy among educators in different institutions of leaning today is the issue of the poor state of teaching and learning buildings (Danjuma, 2015). However, the history of school facilities could be traced to the era of formal system of education. It changes due to the system of education, even though, such other buildings like money and human resources are required. Over the years, enrolment into the tertiary education has been on the increase, following series of educational programs introduced. In addition, successive governments have and are still allocating an appreciable percentage of their annual budgets to the provision and maintenance of school buildings meant to improve the sector (Takwate, 2018).

According to Takwate,(2018). Education in Nigeria began to expand first gradually, and then dramatically. Saad (2014), post that the consequence is the demand for education in general and school buildings in particular can be unusual. This is supported by the fact that; the quality of education can be greatly affected if schools are deficient in essential facilities in the teaching/learning process (Saad, 2014). School buildings, comprises of buildings, machines and equipment, which is vital in the implementation of education programs, as well as, attainment of school goals. School buildings maintenance involves all the activities carried out to sustain the use value of school buildings (Takwate, 2018). This becomes necessary since continuous utilization of buildings, equipment's play grounds result in their wear and tear.

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To ensure uninterrupted usage of school buildings, maintenance therefore essential. Aworanti (2016) have acknowledged that school buildings at all levels of education are poorly maintained. Attitude of school personnel to maintenance culture is generally very negative. Repairs only take place when a problem arises due to down time (Uduak, 2018). Similarly, Xaba (2012) noted that it is evident that maintenance work at school is "Unsystematic, uncoordinated and not holistic. Xaba continued that, it is a common sight in our school environment to see dilapidated buildings, broken tables and chairs, unkept school compound, abandoned broken down school vehicles and equipment. There is therefore the need to conduct this research, to ascertain whether the degree awarding institutions that offers building technology education in Bauchi state, maintain their school buildings to improve teaching and learning of building technology education in Bauchi state.

Statement of the Problem

It is noteworthy that decent school buildings enhance teaching and learning thereby making the process meaningful and purposeful. Thus School buildings are crucial because they foster effective pedagogy and boost good result (Iyamu, et al, 2018). Due to lack of maintenance practice in Nigeria Ekpoh, (2018), identified important maintenance strategies and though they sometimes overlap each other, and they include; preventive maintenance, risk-based maintenance, condition-based maintenance, emergency maintenance, corrective maintenance, predictive maintenance, and shutdown maintenance.

The dilapidated and deteriorating state of physical buildings in public schools is quite disturbing. Degree-awarding institutions face the combined challenges of deteriorating conditions due to poor administrative inefficiencies of educational resources (Abubakar, 2016). Abubakar continued that, deficiencies impair the quality of teaching and learning in schools and create problems for students. There is the belief that if the buildings in the school are well-maintained and the grounds well kept, the same level of care, seriousness and high quality will also be extended to the academic programme of the school (Enefu, *et al,* 2016). Enefu, *et al,* said that, poor state of maintenance of school facilities might not only be seen as a manifestation of poor management to perform its services and showcasing a poorer buildings management outlook of the schools (see also Jackline, 2014). The laudable motives, which seemed to justify the very high cost of managing the

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educational system, in Bauchi State are not effective engines for the diverse functions for which they are set up.

The poor performance of students in practical skills in building technology in the state had been largely attributed to poor school Buildings (Jackline & John 2014), and it has been a source of concern to government and stakeholders though the claim cannot be upholding without an investigation to authenticate if it is true as observed by previous studies. It is against this background that the present study intends to determine "Schools Buildings Maintenance Strategies for Improving Teaching and Learning of Building Technology Education in Degree Awarding Institutions in Bauchi State, Nigeria.

Aim and Objectives of the Study

The aim of the study is to examine School building Maintenance Strategies for Improving Teaching and Learning of Building Technology Education in Degree Awarding Institutions in Bauchi State. Specifically, this study seeks to:

1. To identify preventive maintenance strategies of school buildings for improving teaching and learning of Building Technology Education in Degree Awarding Institutions in Bauchi State
2. To examine corrective maintenance strategies of school's buildings for improving teaching and learning of Building Technology Education in Degree Awarding Institutions in Bauchi State

Research Questions

In line with the research objective the following research question was used to guide the study;

1. What are the preventive maintenance strategies on school building for improving teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi state?
2. What are the corrective maintenance strategies on school buildings for improving teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi state?

Research Hypotheses

This study was being guided by the following hypotheses:

1. H_{01}. There is no significant difference between the mean responses of Lecturers and Student on preventive maintenance strategies of school

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buildings for improving teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi state.

2. H_{02}.There no significant difference between the mean responses of Lecturers and Student on corrective maintenance strategies of school buildings for improving teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi state.

Methodology

The study used a survey research design and the area of the study was Bauchi Metropolis of Bauchi State. The population of the study consisted of 11 Lecturers of the two building technology education degree awarding institutions of Bauchi State and 146 Student of the two building technology education degree awarding institutions of Bauchi State and total sample population was use. The instrument for data collection in this study was a structured questionnaire developed by the researcher and the instrument was validated by three experts and the instrument was subjected to reliability test using the crunch bach Alpha. The data was collected with help of trained research assistant and descriptive statistics mean and standard deviation was used to analysed the data was collected while t-test was used to test the hypothesis at 0.05 level of significance.

RESULTS AND DISCUSSION

This chapter presents data obtained, the results and findings of the study.

Data Presentation

Research Question One: What are the preventive maintenance strategies of school Building for improving teaching and learning of building technology education in degree awarding institutions in Bauchi State?

Table 1: Mean and standard deviation of the respondents on the preventive maintenance strategies of school Building for improving teaching and learning of building technology education in degree awarding institutions in Bauchi State.

S/N	Items	X_L	SD_L	X_S	SD_S	X_G	Remark
1.	Periodic building cleaning system in place that identifies potential problems before they become downtime issues	1.73	.786	4.25	.854	4.07	Agreed

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2.	Periodic building inspection system in place that identifies potential problems before they become downtime issues	1.45	.522	4.04	.751	3.86	Agreed
3.	Carryout Inspections as at when due in the lay down procedures	1.36	.505	3.90	1.091	3.72	Agreed
4.	Periodic assessment school building as a preventive major before failure occurs	1.18	.405	3.90	.853	3.71	Agreed
5.	There are measures in place to monitor the performance of preventive maintenance process in the school	1.00	.000	3.51	1.122	3.33	Agreed
6.	Work orders of preventive maintenance are entered to correct identified possible malfunction in equipment or tools	1.27	.467	3.60	1.123	3.44	Agreed
7.	Regular maintenance of school buildings as a preventive strategy should be carryout at regular interval	1.36	.505	3.71	1.308	3.55	Agreed
	Cluster Mean	**1.34**	**.456**	**3.84**	**1.014**	**3.67**	**Agreed**

Source: Field work, 2023

Key

N_L=11

$N_{S=}$146

Table 2 shows the Mean and Standard Deviation of the respondents on the preventive maintenance strategy on school building Improve Teaching and Learning of Building Technology Education in degree awarding Institutions in Bauchi State. The Table showed that cluster mean of 1.34 for lecturers and 3.84 for students, the grand mean of the respondents (Both Lecturers and students) is 3.67 which means all the preventive maintenance strategies on school building are agreed on in improving Teaching and Learning of Building Technology Education in Degree awarding institutions in Bauchi State.

Research Question Two: What are the Corrective maintenance strategies on school buildings for improving teaching and learning of building technology education in degree awarding institutions in Bauchi State?

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Table 2: Mean and standard deviation of the respondents on the Corrective maintenance strategies on school buildings for improving teaching and learning of building technology education in degree awarding institutions in Bauchi State.

S/N	Items	X_L	SD_L	X_S	SD_S	X_G	Remark
8.	Buildings are maintained to make it useable.	3.00	.775	3.98	1.079	3.91	Agreed
9.	There is Regular replacement of component of a building before it become completely unusable	2.27	.647	3.87	.912	3.76	Agreed
10.	Building are regularly repaired before they collapse.	2.73	.647	3.44	1.010	3.39	Agreed
11.	Expenses are budgeted during the school year for equipment repair and/ or replacement	2.00	.447	4.12	1.021	3.83	Agreed
12.	Maintenance work is usually carried out on dilapidated buildings within the school environment.	3.36	.809	3.82	.940	3.79	Agreed
13.	All broken windows are usually repaired or replaced.	1.91	.831	3.71	1.249	3.58	Agreed
14.	Maintenance is carried out on all broken doors.	1.36	.505	3.73	1.316	3.56	Agreed
15.	Corrective maintenance is carried out on all the roofing members when affected.	1.73	.786	3.77	1.125	3.63	Agreed
16	Corrective maintenance activities are mostly carried out on the football pitch in order to avoid injury to the users.	4.45	.820	3.97	1.144	4.00	Agreed
	Cluster Mean	**2.53**	**.696**	**3.82**	**1.088**	**3.72**	**Agreed**

Source: Field work, 2023

N_L=11

$N_{S=}$146

Table 2 shows the Mean and Standard Deviation of the respondents on the Corrective maintenance strategies on school buildings for improving Teaching and Learning of Building Technology Education in degree awarding institution of

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Bauchi State. The Table showed that cluster mean of 2.53 for Lecturers and 3.82 for Students, the grand mean of the respondents (Both Lecturers and Students) is 3.72 which means all corrective maintenance strategies on school buildings are useful for improving Teaching and Learning of Building Technology Education in degree awarding institution of Bauchi State.

Results of Null Hypothesis

Null Hypothesis One Null Hypothesis One

There is no significant difference in the mean response of lecturers and student on preventive maintenance strategies of school buildings for Improving Teaching and Learning of Building Technology Education.

The result of the independent t-test is presented in Table 3 showed that there is significant difference in the mean response of lecturers and student on preventive maintenance strategies of school buildings for Improving Teaching and Learning of Building Technology Education within the df of 156, t-value = -15.53, p = .001. Since the p value is less than the confidence level (P<.05) therefore, the null hypothesis was rejected. This implied that there was significant difference in the mean response of lecturers and student on preventive maintenance strategies of school buildings for Improving Teaching and Learning of Building Technology Education.

Table 3 t-test analysis of the mean responses of lecturers and student on preventive maintenance strategies of school buildings.

	N	X	S.D	Df	t-cal	P-val	Decision
Lecturers	11	1.34	.456				
				156	-15.53	0.001	Rejected
Students	146	3.84	1.014				

Null Hypothesis Two

There is no significant difference in the mean response of lecturers and student on corrective maintenance strategies of school buildings for Improving Teaching and Learning of Building Technology Education.

The result of the independent t-test in table 4 showed that there is no significance difference between the mean response of Administrators and Maintenance Officers on the components of maintenance suitable for inclusion into maintenance framework for Science and College buildings within the df of 156, t-

value = -5.658, p = .0001 and since the p value is less than the confidence level (P<0.05) therefore, the null hypothesis was rejected. This implied that there is significant difference in the mean response of lecturers and student on corrective maintenance strategies of school buildings for Improving Teaching and Learning of Building Technology Education.

Table 4 t-test analysis of the mean responses of lecturers and student on corrective maintenance strategies of school buildings'

	N	X	S.D	Df	t-cal	P-val	Decision
Lecturers	11	2.53	.696				
				156	-5.658	.0001	Rejected
Students	146	3.82	1.088				

Summary of Findings

The following are the findings of this study:

1. The finding of research question one indicated that all the items are agreed upon as Preventive Maintenance strategies such as cleaning, washing, inspection among others for improving teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi State. Hence the result of null hypothesis one (H_{01}) was rejected. This implied that there was significant difference in the mean response of lecturers and student on preventive maintenance strategies of school buildings for Improving Teaching and Learning of Building Technology Education.
2. The finding of research question two indicated that all the items are agreed upon as Corrective Maintenance strategies such as replacement of part of the buildings, among others for improving teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi State and hence therefore, the null hypothesis three(H_{03}) was rejected. This implied that there is significant difference in the mean response of lecturers and student on corrective maintenance strategies of school buildings for Improving Teaching and Learning of Building Technology Education.

Discussion of Findings

The finding of research question one indicated that all the items are agreed upon as Preventive Maintenance strategies for improving teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi State. This finding agrees with that of Akpan (2011) who maintained that, preventive

maintenance strategies are planned maintenance services and involves periodic inspection of facilities and equipment and immediate repair of damages. The aim is to prevent total breakdown of the facilities on ground. In the same vein the findings in agreement with that of Amirize in Akpan (2008) who stated that that preventive maintenance enhances the longevity of school building and keep them in serviceable condition thereby improving teaching and learning in schools.

The finding of research question two indicated that all the items are agreed upon as Corrective Maintenance strategies for improving teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi State. This finding is concord with that of Adaku and Okpala (2018) who found out that there seven corrective maintenance strategies and these strategies include arrangement are made for servicing building and facilities after use, routine maintenance exercise such as sweeping, renovation and cleaning of building facilities is carried out by those in charge under close supervision and schedule of duty is used to enable students to actively participate in the maintenance of school building for future classes and other school activities.

Conclusion

From the findings of this study it shows that preventive, corrective, conditioned-based and risk- based maintenance strategies are highly needed for the maintenance of school building for improving teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi State.

Recommendations

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

i. All Preventive maintenance strategies should be adopted for improving the teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi State.
ii. All Corrective Maintenance strategies should be adopted for improving the teaching and learning of Building Technology Education in Degree Awarding Institution of Bauchi State'

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