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## ASSESSMENT OF SCHOOL FACILITIES MAINTENANCE IN NIGERIA FOR THE EFFECTIVENESS OF TEACHING PROCESS. (A CASE STUDY OF NORTH EASTERN PUBLIC SENIOR SECONDARY SCHOOLS)

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### Introduction

School facilities are vital instruments 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. Ejieh, (2010) stated that, development of adequate and functional school facilities has been one of the major problems confronting formal education since its inception in the country. This is mainly because of Poor or inadequate maintenance is a problem which often leads to early deterioration of these facilities making them

### Abstract

*This study assessed the maintenance of school facilities for effective teaching process in public senior secondary schools in north eastern Nigeria . The researcher interested to determine the extent to which public senior secondary schools utilized preventive maintenance, used replacement maintenance, applied periodic maintenance and consideration attached to emergency maintenance. The study employed cross-sectional survey design and proportionate stratified random sampling techniques. The population of the study is 5121 respondents and the study sample stood at 357 respondents. The study covered all public senior secondary schools in north eastern Nigeria. A self-structured questionnaire was used to collect relevant data. To give the general description of the data, frequency and simple*

percentages were used for demographic data; mean and standard deviation were used to answer the four research questions and four null hypotheses were formulated and the testing was done using independent sample t-test. The instrument was validated by four experts, two from educational admin and planning and two were selected from test and measurement. The instrument was pilot tested using test re-test method and the reliability index was 0.808. The study concludes that facilities maintenance was in a moderate extent in some state because of their the good Administration and policies. School facilities were in a good shape but currently deteriorated due to poor maintenance of school facilities. It was recommended that both male and female teachers in every public senior secondary school in the state should be encouraged to utilize preventive maintenance in their respective schools. Day public secondary schools' administrators should use part of their internally generated revenue to support periodic maintenance. Ministry of Education officials should monitor and supervise schools on regular basis to ensure that the four maintenance approaches are put in practice for the effectiveness of teaching process in public senior secondary schools in north eastern Nigeria.

**Keyword:** Assessment, Facilities, Maintenance, Effectiveness, Teaching, and process

grossly inadequate for the process of teaching. Ejie, (2010) who 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 programme and the amount of care exercised in executing it, the need for emergency maintenance may come up at any time due to unforeseen circumstances.

Abdulkareem, (2011) maintained 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. The school curriculum would be meaningful and functional if the required facilities are provided in adequate quantity at appropriate times and maintained properly. The school facilities are the physical expression of the school curriculum. That is, the school curriculum

determines to a large extent the nature of school facilities to be erected and the purpose it will serve. Ajayi, (2007) argued that, school facilities are expected to be adequately and carefully planned, developed and maintained in order to ensure their relevance to the school curriculum and towards improving teaching process in our educational institutions.

The situation on ground with regard to school facilities maintenance is that many schools were renovated and put in place required facilities by the previous administration but today in those school teachers are squatting desk and chairs students are sitting on bear floor, roofs were blown up school buildings collapse and all as a result of poor maintenance culture and lack of adequate knowledge on how to apply the four types of maintenance considered in the present study.

Akinfolarin, (2008) identified school facilities as a major factor contributing to the teaching process in the school system. These include classroom, furniture, and recreational equipment among others. School facilities have three major components these include: Infrastructural facilities, instructional facilities and school physical environment. Infrastructural facilities include: buildings such as administrative block, which comprises the principals' office, staff room, classroom, laboratory, stores, record office, school shop, library, music room, cafeteria, Introductory technology laboratory, security post, staff quarters and school farm as well as storage house, electricity, water supply, sport field among others. Akinfolarin, (2008) maintained that, instructional facilities are teaching materials and equipments, that comprise laboratory equipments, introductory technological equipment, wall clock, puzzles, television, radio, video plates and players, piano, flute, chalkboard, cardboards, duster, apparatus for science practical, models, picture charts among others. According to him a well planned school plant will gear up expected outcomes of education that will facilitate social, political and economic emancipation.. Therefore, this study is out to assess school facilities' maintenance and its effectiveness on teaching process in public senior secondary schools' in north eastern Nigeria.

### **Statement of the Problem**

The major problem that is likely facing teaching process today is that, facilities are not properly managed and maintained. The physical appearance of most schools proves and speaks. Isaac and Musibau, (2010) opined that poorly

maintained buildings, untidy walls, leaking roofs, over grown compounds may suggest that education within the buildings follow the same pattern. Facilities tend to depreciate, wear and tear as soon as they are put into use. Hence, there is need for maintenance through repairs and servicing of the components and sustaining their working conditions and capacity. The current issue of facilities maintenance in public senior secondary schools in north eastern is that, the school administrators, teachers and students are lacking necessary knowledge require on when, how and what condition warrant the use of preventive, periodic, replacement and emergency maintenance of facilities in their respective schools which affect the aspect of infrastructural and instructional facilities which could not allow teachers to teach well in their different subject areas. The present study aimed at addressing the current phenomena in north eastern secondary schools which is a serious concern to many people and it deserves prompt attention. School managers and teachers who constantly use school facilities may likely lack knowledge of facilities maintenance plan. Consequently, they could fail to integrate facility maintenance into the management of the school.. The extent to which the four types of maintenance of school facilities are used may likely be ineffective. Therefore, this study is out to assess the extent to which school facilities maintenance is carried out using the four different types of maintenance in public senior secondary schools and provide possible recommendations.

### **Purpose of the Study**

The purpose of this study was to assess the maintenance of school facilities for the effectiveness of teaching process in north eastern public senior secondary schools specifically; the study aims at the following:

- i. To assess the extent of utilizing preventive maintenance of school facilities in north eastern public senior secondary schools
- ii. To assess the extent to which replacement maintenance of school facilities are used public north eastern senior secondary schools in Nigeria
- iii. To determine the extent to which periodic maintenance of school facilities are applied in north eastern public senior secondary schools in Nigeria

- iv. To determine the extent to which emergency maintenance of school facilities are considered in north eastern public senior secondary schools in Nigeria

### Research Questions

The following research questions guided the study:

- i. To what extent is preventive maintenance of school facilities utilized in north eastern public senior secondary schools?
- ii. To what extent is replacement maintenance of school facilities used in north eastern public senior secondary schools in Nigeria?
- iii. To what extent is periodic maintenance of school facilities applied in north eastern public senior secondary schools in Nigeria?
- iv. To what extent is emergency maintenance of school facilities considered in north eastern public senior secondary schools in Nigeria?

### Hypotheses

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

- Ho i: There is no significant gender difference between the mean ratings of respondents on the extent to which preventive maintenance of school facilities is utilized in north eastern senior secondary schools
- Ho ii: There is no significant difference between the mean ratings of respondents on the extent to which replacement maintenance of school facilities in terms of school location is used in north eastern senior secondary schools
- Ho iii: There is no significant difference between the mean ratings of respondents on the extent to which periodic maintenance of school facilities relative to school type is applied in north eastern senior secondary schools
- Ho iv: There is no significant difference between the mean ratings of respondents on the extent to which emergency maintenance of school facilities relative to student enrolment is considered in north eastern senior secondary schools

### **Scope and Delimitations of the Study**

This study covered assessment of school facilities maintenance for the effectiveness of teaching process in public senior secondary schools in north eastern in Nigeria. The study was delimited to all principals and teachers of public senior secondary schools in north eastern state of Nigeria.

### **Theoretical Framework**

The theoretical bases underpinning this study were:

#### **Broken Windows Theory System Theory**

##### **Broken Windows Theory (James Q. Wilson and George L. Kelling, 2006)**

Broken Windows Theory was postulated by James Q. Wilson and George L. Kelling (2006). The theory posits that acts of serious vandalism can be prevented by fixing problems when they are small, and fixing them within a short period of time. This example used to demonstrate their theory: "Consider a building with a few broken windows. Eventually, they may even break into the building, and if it's unoccupied, perhaps become squatters light fires inside. Sara Mead (2006) used this theory recently on her study on school facilities maintenance and student academic achievement in secondary schools. A valuable service by highlighting the urgent need to address the growing problem of school facilities maintenance ("Schooling Crumbling Infrastructure") in her zeal to improve maintenance for effective teaching process.

The authors hypothesized that if a broken window in a building is repaired, people will be likely to assume that no one cares about the building, and soon more windows will be broken. Carried to its logical extreme, the theory posited that it eventually become acceptable to trash an entire neighborhood. Perhaps the broken windows theory helps explain the vandalism and associated disrespect for school facilities. The theory is certainly in line with school facilities maintenance. I think the broken windows theory can be applied to other things, specifically school facilities which are part of educational administration and planning and is relevant to the present study..



### **System Theory (Von Bertalanffy, 1972)**

The system theory was propounded by Von Bertalanffy (1972) According to him a system is a unit with series of interrelated and inter-dependent parts, such that the interplay of any part affects the whole. A system can therefore, be regarded as a structure with inter-dependent parts. The system theory is relevant to educational administration because the entire educational setup is a system. The school is a social system and does not exist in a vacuum. The operations in the school are mutually dependent on its internal and external environments. The system theory is characterized by the following properties, output, and feedback. Within the educational system, all the various parts operate to achieve the overall objectives of education. The theory was used in a study conducted by Rukayya in Yola Metropolis in 2014. This theory has relevance to physical resource which includes school facilities and is therefore relevant to the present study.

### **METHODOLOGY**

This chapter discussed the methodology of the study which includes the research design, area of the study, population of the study, sample and sampling techniques, instrument for data collection, validity of the instrument, reliability of the instrument, the pilot study, and test result for reliability, method of data collection and method of data analysis.

### **Research Design**

For the purpose of this study, the researcher used a cross-sectional survey design. Cross-sectional survey research design are procedures in quantitative research in which investigators administer a survey to a sample or to the entire population of people to describe the attitudes, opinions, behaviors or characteristics of the population..

### **Area of the Study**

The area of the study covered the North-east geopolitical zone of Nigeria. The North Eastern state of Nigeria occupies slightly less than one- third of Nigeria's total area had a projected population of 23,558,674 or 13.5% According to census (2011),

### Population of the Study

The population of this study is 5121 respondents which are principals and teacher selected from north easter schools in nigeria.

### Sample and Sampling Techniques

Research advisor (2006) was used to determine the minimum sample value used in generalizing the result of the study. The population of the study was 5121 respondents while the sample value for the population was 357 respondents, using confidence intervals of 95%. Proportionate stratified random sampling techniques were used to determine the sample value.

**Table: 1 Population and Sample of school in north eastern nigeria**

S/N	Education Zone	Population	Sample
1	Bauchi state	1025	86
2	Yobe state	552	42
3	Borno state	1050	62
4	Adamawa state	1100	68
5	Taraba state	622	56
6	Gombe state	500	42
<b>Total</b>		<b>5121</b>	<b>357</b>

**Source: (FMOE) Annual School Census 2017/2018**

### Instrument for Data Collection

The instruments for data collection titled "School Facilities Maintenance Questionnaire SFMQ" was adopted from R.S Ahmed in 2014 and were sub-divided into five (5) sections A to E. Section A, Demographic information, section B, with 4 questions. Question one with fifteen (15) items solicited information on preventive maintenance of school facilities, question two with four (4) items on replacement maintenance school of facilities, question three with four (4) items on periodic maintenance of school facilities' and question four with six (6) items on emergency maintenance of school facilities in north eastern public senior secondary schools. All items in section B used five (5) point rating scale of Very Large Extent (VLE) = 5, Large Extent (LE) = 4, Moderate Extent (ME) = 3, Small Extent (SE) = 2, and Very Small Extent (VSE) = 1.



### **Method of Data Collection**

The instrument was administered and retrieved on the spot by the researcher; the questionnaire was administered on the respondents in the north eastern state with the use of six research assistants which their qualification was the basis for selection. They were also trained and instructed on how to distribute and later retrieve the questionnaires from the principals' in the schools. Instruments administered were 360 across the six political zone of the state respectively. The instrument was administered to the sampled secondary school principals in their various schools and collection was made on the spot after their completion. The essence is to ensure that the entire questionnaire administered and completed were collected. Three hundred and sixty (360) copies of the questionnaire were distributed to the sampled secondary schools, while 356 questionnaires were retrieved representing ninety eight percent (98.9%).

### **Validation of the Instrument**

The instruments for data collection were subjected to face-validation by four experts, two from Test and Measurement, while the remaining two choose from Educational Administration and Planning programme of Abubakar Tafawa Balewa University, Bauchi. These experts examined the instrument to ascertain their appropriateness as to whether the content and construct are relevant to the purpose of the study. Based on their corrections suggestions and amendments were made on the instruments before the final copies were produced and used for the study.

### **Reliability of the Instrument**

The validated instrument was trial tested with thirty two (32) subjects, two (2) principals and thirty (30) teachers in two (2) selected private schools in Bauchi metropolis. To ascertain the internal consistency of the instrument Cronbach's Alpha Reliability was used in computing the reliability index. Reliability results for the instrument were as follows; construct 1: 0.946, construct 2: 0.497, construct 3: 0.889 and construct 4: 0.903 the instrument has an overall reliability result of 0.808. This result indicated that the instrument was reliable and therefore considered appropriate for use. Therefore shows that the research instrument has a good level of internal

consistency and is reliable because it surpasses the threshold of 0.7 (Hair et al., 2010).

### **Method of Data Analysis**

The research questions for this study were answered using Mean and Standard Deviation. This is because the mean is used in representing the center of a distribution of scores and standard deviation finds out how far every score is deviated from the mean. The mean is the most reliable and accurate measure of central value, while the four (4) hypotheses were formulated in null form seeking to find out the significant of the difference between mean ratings of respondents. The  $H_0$  was tested using independent sample t-test. Data analysis was done using the statistical package for social sciences (SPSS).

### **RESULTS**

This chapter presents the results of data collected and findings were discussed. The total numbers of questionnaires distributed were 360. These questionnaires were distributed with the aid of field assistants in assessing school facilities' maintenance in north eastern public senior secondary schools and 356 of these questionnaires were returned and 356 of the retrieved questionnaires were found to be valid for analysis. This figure represents 98.9% response rate. Data was collected using a self-structured questionnaire of five (5) point rating scale of "Very Large Extent" to "Very Small Extent". The instrument was divided into section A and B. Section A presents questions regarding the respondents opinion on demographic information and section B contained principals' and teacher's response and the test were subjected to statistical analysis using the appropriate tools and procedures in Statistical Package for Social Sciences (SPSS) version. 21.0 And the result was presented in a tabular form in the following paragraph

### **Answer to Research Questions**

Table 5 below presents the extent to which, preventive maintenance of school facilities is utilized in public senior secondary schools. With regard to the utilization of periodic equipment cleaning/inspection system in place that identifies potential problems before they become downtime issues is accepted judging by the analyzed data with a mean of 3.71 and standard

deviation of 1.04, Equipment listing and procedure are current and accurate of 3.45 mean and SD of 1.12, Inspections are carried out exactly as specified and when specified of 3.47 mean and SD of 1.18, Preventive maintenance work has the highest priority in the school of 3.50 mean and SD of 1.18, There are procedures in place to make sure that preventive maintenance procedures, which do not happen as scheduled, are not forgotten and still get done with a mean of 3.40 and SD of 1.30, Potential problems are identified and work orders are entered to correct them of 3.32 mean and SD of 1.36, Majority of repair work orders are generated from preventive maintenance inspection of 3.62 mean and SD of 1.09, The essential principle of “clean to inspect” is well understood by those performing preventive maintenance work of mean 3.69 and SD of 1.14,

Then when a breakdown occurs, preventive maintenance procedure are reviewed and adjusted as necessary to prevent the problem from re-occurring of mean 3.52 and SD of 1.24, where the Preventive maintenance procedures are reviewed and updated when there are changes in equipment or practices of 3.41 mean and SD of 1.37. Lubrication program that makes sure equipment is lubricated routinely and properly with the proper lubricant of 3.29 mean and SD of 1.39, Lubricants and lubrication equipment are stored and maintained properly, to avoid contamination of mean 3.38 and SD of 1.38, measures in place to monitor the performance and the result of the preventive maintenance process in the school of 3.42 mean and SD of 1.35, The operating personnel have most of the responsibility for preventive maintenance work that is done when equipment is running with a mean of 3.29 and SD of 1.25, An ongoing review process involving operators and maintenance personnel to move as much preventive maintenance from a downtime to a routine activity of 3.26 mean and SD of 1.35 from the table above which justifies that, from item one to fifteen shows that the amount of utilizing preventive maintenance of school facilities in the selected public senior secondary schools in Bauchi state was accepted with majority mean of above 3.00.

**Research question one: To what extent is preventive maintenance of school facilities is utilized in north eastern public senior secondary schools**

**Table: 5 Respondent's opinion on preventive maintenance of school facilities**

Item	N	Mean	SD	Remark
1. There is utilization of periodic equipment cleaning/inspection system in place that identifies potential problems before they become downtime issues	356	3.71	1.04	Accepted
2. Equipment listing and procedure are current and accurate	356	3.45	1.12	Accepted
3. Inspections are always carried out exactly as specified and when specified	356	3.47	1.18	Accepted
4. Preventive maintenance work has the highest priority in the school	356	3.50	1.18	Accepted
5. There are procedures in place to make sure that preventive maintenance procedures, which do not happen as scheduled, are not forgotten and still get done	356	3.40	1.30	Accepted
6. Potential problems are identified and work orders are entered to correct them	356	3.32	1.36	Accepted
7. The majority of repair work orders are generated from preventive maintenance inspections	356	3.62	1.09	Accepted
8. The essential principle of "clean to inspect" is well understood by those performing preventive maintenance work	356	3.69	1.14	Accepted
9. When a breakdown occurs, preventive maintenance procedure are reviewed and adjusted as necessary to prevent the problem from re-occurring	356	3.52	1.24	Accepted

10.Preventive maintenance procedures are reviewed and updated when there are changes in equipment or practices	356	3.41	1.37	Accepted
11.There is a lubrication program that makes sure equipment is lubricated routinely and properly with the proper lubricant	356	3.29	1.39	Accepted
12.Lubricants and lubrication equipment are stored and maintained properly, to avoid contamination.	356	3.38	1.38	Accepted
13.There are measures in place to monitor the performance and the result of the preventive maintenance process in the school	356	3.42	1.35	Accepted
14.Operating personnel have most of the responsibility for preventive maintenance work that is done when equipment is running	356	3.29	1.25	Accepted
15.There is an ongoing review process involving operators and maintenance personnel to move as much preventive maintenance from a downtime to a routine activity	356	3.26	1.35	Accepted
<b>GRAND MEAN</b>	<b>36.24</b>			

**Source: (Field work 2018)**

To assess the extent to which replacement maintenance of school facilities' are used in north eastern public senior secondary schools. The table 8 below show the degree of acceptance at moderate extent which indicating on mean and standard deviation of the collected data response failed within the centre. In regard to items 1 mean is 3.62 and SD 1.27, item 2 with the mean of 3.24 and SD 1.28, item 3 with mean score of 3.32 and SD 1.41 and also in items 4 the average mean 3.26 respectively.

**Research questions two: To what extent is replacement maintenance of school facilities used in north eastern public senior secondary schools**

**Table: 6 Respondent's opinion on the replacement maintenance of school facilities**

Items	N	Mean	SD	Remark
1. Equipment or parts are regularly renovated, replaced and used when due	356	3.62	1.27	Accepted
2. Some machine and vehicle parts and some plumbing fixtures are regularly replaced before they brakes down	356	3.24	1.28	Accepted
3. Regular replacement of an item of equipment or machine before it become completely unusable	356	3.32	1.41	Accepted
4. Expenses are budgeted during the school year for equipment replacement	356	3.26	1.34	Accepted
<b>GRAND MEAN</b>	<b>34.57</b>			

**Source: (Field work 2018)**

This is an interesting question which attracted question 1, 2 and 3 in table 7 shows that the periodic maintenance of school facilities is done on regular interval of time with the mean of 3.50, 3.13, and 3.05 and also question item 4, with the means of 2.91 and 1.55 which was rejected from the result obtained.

**Research questions three: To what extent is periodic maintenance of school facilities applied in north eastern public senior secondary schools**

**Table: 7 Respondent's opinion on periodic maintenance of school facilities**

Items	N	Mean	SD	Remark
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1. Periodic work is applied and done on regular intervals of time yearly or biennially	356	3.50	1.13	Accepted
2. Work were done on contract basis at predetermined times	356	3.13	1.29	Accepted
3. Adequate servicing of offices, laboratory, workshop and other equipment in the school periodically.	356	3.05	1.35	Accepted
4. Adequate painting and repair of leaking roofs periodically as building continue ageing daily	356	2.91	1.55	Rejected
<b>GRAND MEAN</b>	<b>32.45</b>			

**Source: (Field work 2018)**

The results presented in table 8 below shows the emergency maintenance of school facilities in public senior secondary schools. According to the table, the emergency maintenance in order of importance are: There is consideration for emergency work done when a system or an item unexpectedly breaks down with mean of 3.36 and SD 1.18; There is provision for planned programme adhered to unforeseen or unexpected emergencies mean 3.13 and SD 1.28; There is consideration for emergency work when part of building collapses due to natural disaster and other reasons with mean of 3.54 and SD 2.02; Operational emergency maintenance programmes were incorporated in the school system with mean of 3.96 and SD 1.24; Safety and health are the first concern of the occupants of the facility involved 3.43 and SD 1.20 and All school staff and students are given adequate instructions on what to do what not to do in emergency situations with the mean of 3.46 and SD 1.33 respectively.

**Research questions four: To what extent is periodic maintenance of school facilities is considered in north eastern public senior secondary schools**

**Table: 8 Respondent's opinion on emergency maintenance of school facilities**

Items	N	Mean	SD	Remark
1. Consideration for emergency work done when a system or an item unexpectedly breaks down	356	3.36	1.18	Accepted
2. Provision for planned programme adhered to unforeseen or unexpected emergencies	356	3.13	1.28	Accepted
3. Consideration for emergency work when part of building collapses due to natural disaster and other reasons	356	3.54	2.02	Accepted
4. Operational emergency maintenance programmes were incorporated in the school system	356	3.96	1.24	Accepted
5. Safety and health are the first concern of the occupants of the facility involved	356	3.43	1.20	Accepted
6. All school staff and students are given adequate instructions on what to do what not to do in emergency situations	356	3.46	1.33	Accepted
<b>GRAND MEAN</b>		<b>23.25</b>		

*Source: (Field work) 2018*

### Hypotheses Testing

Four null hypotheses were raised in to give statistical validation to findings from research questions of the study. In order to test them for acceptance or rejection, data were collated from sampled participant (principals and teachers); these hypotheses are tested as follows:

**Ho1: There is no significant gender difference between the mean ratings of respondents on preventive maintenance of school facilities in north eastern public senior secondary schools.**

Male and female were significantly different in the preventive maintenance of school facilities in north eastern Secondary schools. Independent sample t-test procedure was used for the test and the summary is presented in table 11 below: The outcome of independent sample t-test (table 11) indicates that there was a significant difference in the preventive maintenance of school

facilities in north eastern secondary school between male ( $M = 3.33$ ,  $SD = 0.96$ ) and female ( $M = 3.63$ ,  $SD = 0.94$ ),  $T$  value = 3.015,  $P$  value = 0.003. The null-hypothesis is thus rejected because there was a significant gender difference in the mean ratings of the respondent's on preventive maintenance of school facilities in north eastern Secondary schools. By implication, the test revealed that preventive maintenance of school facilities exposed by male exceed that of female in north eastern senior secondary schools

**Table: 9 Independent sample t-test showing difference on preventive maintenance between male and female group**

Group	N	$\bar{X}$	SD	Df	t-value	p-value	Decision
Male	201	3.33	0.96	354	3.015	0.003	Ho Rejected
Female	155	3.63	0.94				

*Source: (Field work 2018)*

**Ho2: There is no significant difference between the mean ratings of respondents on replacement maintenance of school facilities relative to school location in north eastern public senior secondary schools**

The school location were taken and the T-test were used in testing the hypothesis. The Summary of data collected and analyzed in respect to null hypothesis two is presented in table 12 The outcome of independent sample t-test (table 12) indicates that there was a significant difference in the replacement maintenance of school facilities in north eastern secondary school between rural ( $M = 2.99$ ,  $SD = 1.09$ ) and urban ( $M = 3.58$ ,  $SD = 1.11$ ),  $T$  value = 5.421,  $P$  value = 0.000 ( $P < 0.005$ ). The decision was to reject the null-hypothesis because there was a significant difference in the mean ratings of the respondents on replacement maintenance of school facilities in terms of school location in north eastern secondary schools

**Table: 10 Independent sample t-test showing difference on replacement maintenance between urban and rural group**

Group	N	$\bar{X}$	SD	Df	t-value	p-value	Decision
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Urban	242	3.58	1.11						
				354		5.421		0.000	Ho Rejected
Rural	112	2.99	1.09						

*Source: (Field work 2018)*

Significant at  $\alpha$  0.05

**Ho3: There is no significant difference between the mean ratings of respondents on periodic maintenance of school facilities relative to school type in north eastern public senior secondary schools.**

In the test of this null hypothesis, independent sample t-test was used in establishing if there is significant difference in the mean ratings of respondents of periodic maintenance of school facilities relative to school type in north eastern secondary schools. The result was summarized in Table: 11 below: The outcome of independent sample t-test (table 13) indicates that there was a significant difference in the periodic maintenance of school facilities in north eastern secondary school between day (M = 3.21, SD = 1.07) and boarding (M = 2.99, SD = 1.08), T value = 1.769, P value = 0.786. This implies that there was a significant difference in the mean ratings of the respondents on periodic maintenance of school facilities and it has a significant difference relative to school type in north eastern secondary schools. Therefore, the null hypothesis of no significant difference in the mean ratings of respondents of periodic maintenance of school facilities relative to school type on the nature was rejected.

**Table: 11 Independent sample t-tests showing difference on periodic maintenance between day and boarding group**

Group	N	$\bar{X}$	SD	Df	t-value	p-value	Decision
Day	251	3.21	1.07				
				352	1.769	0.786	Ho Rejected
Boarding	105	2.99	1.08				

*Source: (Field work 2018)*

Significant at  $\alpha$  0.05

**Ho4: There is no significant difference in the mean ratings of respondents on emergency maintenance of school facilities relative to student's enrolment in north eastern public senior secondary schools.**

Table 12 below revealed that there was a significant difference in the mean ratings of respondents on emergency maintenance of school facilities relative to student enrolment in north eastern secondary schools. The outcome of independent sample t-test (table 14) indicates that there was a significant difference in the emergency maintenance of school facilities in north eastern secondary school between student enrolment of 1000-2000 ( $M = 3.44$ ,  $SD = 1.02$ ) and student enrolment of 3000-4000 ( $M = 3.10$ ,  $SD = 1.01$ ),  $T$  value = 2.875,  $P$  value = 0.004. This implies that there was a significant difference in the mean ratings of respondent's on emergency maintenance of school facilities relative to student's enrolment in Bauchi state public senior secondary schools. Therefore, the null hypothesis of no significant difference in the mean ratings of respondents of emergency maintenance of school facilities on the student enrolment group was rejected.

**Table: 12 Independent sample t-test showing difference on emergency maintenance for school enrolment in public senior secondary schools**

Group	N	$\bar{X}$	SD	Df	t-value	p-value	Decision
1000-2000	242	3.44	1.02	352	2.875	0.004	Ho Rejected
3000-4000	112	3.10	1.01				

**Source: (Field work 2018)**

**Significant at  $\alpha$  0.05**

### **Summary of Major Findings**

The following findings emerged from the study based on the analyzed data collected from the study;

1. Findings revealed a significant difference in the mean ratings of respondents on preventive maintenance of school facilities between male

and female group in north eastern Secondary schools ( $t\text{-cal} = -3.015$ ,  $P = .003$ ).

2. The study indicated that there was a significant difference in the mean ratings of respondents on replacement maintenance between urban and rural school in north eastern secondary school ( $t\text{-cal} = 5.421$ ,  $P = 0.000$ ,  $P < 0.005$ ).
3. There was a significant difference in the mean ratings of respondents on periodic maintenance between day school and boarding school in north eastern secondary School ( $t\text{-cal} = 1.769$ ,  $P = 0.786$ ).
4. There was a significant difference in the mean ratings of respondents on emergency maintenance of school facilities' in north eastern secondary School between 1000-2000 students enrolment and 3000-4000 students enrolment ( $t\text{-cal} = 2.875$ ,  $P = .004$ ).

### **Implications of the Findings on Effective Teaching Process**

The findings of this study have implication for school managers, teachers, educational planners and the entire teaching process. Having discovered that utilization of preventive maintenance of school facilities in public senior secondary schools is in moderate extent which is in acceptance range. School managers and teachers should adopt the use of various maintenance approaches in teaching process.

The findings on the extent to which replacement maintenance of school facilities is used, indicated that the opinions of respondents is in moderate extent which falls within the acceptance range, despite this equipment or parts are not regularly renovated, replaced and used when due. Some machines and vehicle parts and some plumbing fixtures are regularly not replaced before they brakes down. This attitude of some school managers is not helping effective teaching process. School managers should consider preventive maintenance of school facilities as a normal routine, or feels that delegation of authority and responsibility motivate teachers for teachers to satisfy with the level of delegation of authority and responsibility in their respective schools for effective teaching process to flourish.

The findings revealed that consideration attached to emergency maintenance of school facilities in public secondary schools is in moderate extent which falls within the acceptance range. Despite this development issues like emergency work done when a system or an item unexpectedly breaks down,



operational emergency maintenance programs were not incorporated in the school system. This implies that when there is no effective school facilities maintenance the aims and objectives of education are defeated and it will affect effective teaching process negatively, for effective teaching process in north eastern Secondary school the facilities maintenance plan need to be strengthened and incorporated in school system at all cost.

### **Limitations of the Study**

This study is limited with in security because when the researcher was about to collect data there were few areas where the researcher could not reach to get the respondents opinion targeted for the study as well as failure by some respondents to give out what is expected.

### **Conclusion**

Therefore the researcher concludes that maintenance of school facilities during recent administration was quite appreciating there was no cases of dilapidation of school facilities but the present administration came in the issue of school facilities maintenance took a new dimension. Many school building irrespective of their location collapse and their roofs blown by heavy win which results that many secondary school students do receive lesson in an outside environment and lesson and other classroom activities be suspended until after the rainy season there by negatively affects the performance of these students and bring about negative set back for achieving the full length of curriculum implementation as stipulate by the national policy on Education. There is a call for an immediate intervention for the maintenance of school facilities. School managers play their parts only when there is adequate provision of these facilities.

### **Recommendations**

On the basis of the findings and conclusions of the study the following recommendations are made:

1. It was recommended that both male and female teachers in every public senior secondary school in the state should be encouraged to utilize preventive maintenance and work closely with the utility office for necessary guidance.

2. On the basis of replacement maintenance the findings of the study indicated that, there was a significant difference in the application of replacement maintenance between the urban and rural schools. Therefore the researcher recommends that ministry of education should organized an award winning event on school facilities maintenance by setting a cut- up point for facilities inspection every six months and bursary should be given to every two teachers from the winning schools
3. It is also recommended that since boarding schools use periodic maintenance better than day school based on the findings of the study, day public secondary schools administrators should use some part of their internally generated revenue to support periodic maintenance in their respective schools.
4. The findings of this study reveals that schools with 3000-4000 enrolment considered emergency maintenance, there is need of sensitizing the managers on the effect and consequences of neglecting emergency maintenance of school facilities through workshops and also seek for public private partnership in conjunction with the state ministry of education .

### **Suggestions for Further Studies**

Based on the findings and conclusion of this study the following suggestions for further studies were made:

1. Effect and consequences of neglecting emergency maintenance of school facilities
2. This study should be repeated in other schools nature (private schools') not covered by this study, or in other state of Nigeria in order to confirm or disconfirm the findings.
3. Nationwide study of this nature (assessment of school facilities maintenance in public senior secondary schools in north eastern) is a step forward.
4. Research on poor maintenance culture by the users of such facilities in both private and public secondary schools is also encouraged.

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