Threats to Effective Building Maintenance Management in Nigerian Public Universities: A Case Study of Nnamdi Azikiwe University, Awka

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Abstract: - Built assets are crucial to the attainment of the objectives for establishing universities-research, teaching and learning. Poorly maintained buildings stand against the achievement of organizational goals and as well negatively impact their image. This study is aimed at establishing the threats to effective maintenance management of Nnamdi Azikiwe University buildings, Awka Campus. The study adopted a survey research approach using structured questionnaire. A total of 108 responses were gotten from the Works and services Department of the university out of 144 distributed questionnaires, being a 75% response rate. Data were analyzed in tables using frequencies, percentages and weighted means. The hypothesis was tested using Pearson's parametric Chi-square. From the research findings, it was revealed that construction errors, building with substandard materials, inadequate funding, and abuse of buildings by building users, lack of regular conduct of building condition surveys, among others, are threats to effective maintenance management of buildings in the study area. The study therefore recommends an investigation into the prospects for effective building maintenance management in the study area.

Key Words: — *Building Maintenance Management, University Buildings, Nnamdi Azikiwe University.*

I. INTRODUCTION

Universities are established with the objectives to promote teaching, learning and research activities. Unfortunately, these peculiar set of objectives cannot be satisfactorily achieved without buildings. Hence buildings should be within top priorities of institutions of higher learning (Olanrewaju and Abdul-Aziz, 2015; Simpeh, 2013). According to Olanrewaju, Khamidi, and Arazi (2011), buildings stand out as critical factors for the achievement of desired outcomes for tertiary institutions in terms of staff productivity and students performance. Ogunoh, Mbanusi and Okoye (2018), opinioned that buildings are essential facilities that represent a substantial percentage of most tertiary institutions assets, user needs and operating costs. Buildings contribute immensely to the

functioning, ultimate performance and realization of the goals and objectives of education (Ogunoh, 2014).

However, in order to create conducive environment that supports and stimulates innovative research, teaching and learning, tertiary institution buildings require maintenance (Lateef, 2010; Onyili, Okolie and Ezeokoli, 2020). In the same line of thought, Ogunoh *et al* (2018) asserted that the maintenance levels of these buildings are very crucial to educational effectiveness. In spite of the crucial role of these buildings in the education and construction sector of the economy, most educational buildings in Nigeria are in deplorable conditions as a result of lack of maintenance (Ogunoh *et al*., 2018).

Direct observations carried out within the study area showed that there are a number of buildings with sagged and defective suspended ceiling boards, rising dampness causing peeling of paints and the growth of molds on the walls, severe cracks on walls, columns and beams seen on buildings within the water-logged areas of the study area, among other defects. Some of these building defects were mild when observed by Ogunoh

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(2014) but have developed into big concerns as of the time of this study, hence first motivation for this study. On the other hand, very few researchers like Ogunoh (2014); Okafor and Onuoha (2016) and Okolie (2011), had made effort to assess the maintenance management practices in Nnamdi Azikiwe University.

This study seeks to establish the threats to effective maintenance management of buildings in Nnamdi Azikiwe University, Awka, Nigeria.

II. LITERATURE REVIEW

A. Threats to Effective Maintenance of University Buildings

The ideal situation is that university buildings should be properly maintained in a planned and very organized manner. It is imperative therefore to find out the possible threats to effective maintenance management of buildings on public university campus, as there is an alarming record of poor maintenance culture observable from some of the campuses as reported by Ofide, Jimoh and Achuenu (2015), Ogunoh (2014) and Okafor, Ugwu and Nwoji (2018). In the study by Ogunoh (2014), of building maintenance practice in Nnamdi Azikiwe University, Awka, it was revealed that the university has an established maintenance department. The maintenance department according to the findings of the study lacked competent craftsmen with gross insufficiency in tools and equipment. The study also pointed out that delay in releasing funds from government for maintenance of buildings hinders maintenance activities in the university and that the available funds are inadequate for the volume of maintenance works emanating from the university due to high intensity of use of the buildings on campus. This is in line with the inference by Okafor *et al*. (2018) that lack of maintenance policy and funding is the major cause of public building deterioration in University of Nigeria, Nsukka.

Okafor *et al*. (2018) identified the following as the problems confronting the effective maintenance of buildings in University of Nigeria, Nsukka: Lack of maintenance policy; Inadequate provision of funds for maintenance, Lack of timely response to maintenance request, Poor maintenance work done by the maintenance unit of the institution, Corruption, Lack of experienced and well trained building maintenance engineer, Misuse of facilities by occupants, Change of government, Over-crowding, Poor architectural/structural design.

Ofide *et al*, (2015) found out that funds are not always sufficient for maintenance works. Maintenance is only carried out subject to availability of funds which automatically puts off cyclical maintenance until when funds are available to perform the tasks. Furthermore, they found out that most of the maintenance departments in the higher education institutions in Niger state do not conduct user satisfaction surveys; 83.3% do not follow maintenance standards in carrying out maintenance works; 33.3% combine both the use of telephone and memo writing as media for complaints and maintenance calls, and that most of the institutions do not have maintenance manuals for their buildings. Over 80% of the institutions studied by Ofide *et al*. (2015) adopted reactive and corrective approaches to maintenance.

From their findings, lack of maintenance policy ranked highest among these threats to effective building maintenance management while poor architectural/structural design was ranked the lowest.

From the findings of Ofide *et al*. (2015), the following were identified as the threats to effective building maintenance management in public universities: Inadequate funds, shortage of staffs (professional & tradesmen), users delay in reporting maintenance problems, electrical power fluctuation, lack of maintenance culture/misuse of building facilities by users, bottlenecks/loopholes in management. From the study, inadequate funding and shortage of staff (professional & tradesmen), ranked highest for all the institutions they sampled.

III. METHODOLOGY

This study adopted a survey research method. This method according to Nworgu cited in Ogunoh (2014) is the approach in which group of people or items are studied by collecting and analyzing data from only few people or items considered being representative of the entire group. The study was quantitative and was aimed at establishing the threats to effective maintenance management of Buildings in the study area. A structured questionnaire used for data collection were sent to a random sample of 144 personnel of the Works and Services department of the institution on professional cadre with 108 successfully filled and returned, being a response rate of 75%.

The questionnaires were analyzed using descriptive statistics technique such as percentages and tables. The issues in the questionnaire used in this research were structured on a 5–point Likert scale: Strongly agree (SA=1), Agree (A=2), Undecided (UN=3), Disagree (D=4) and strongly disagree (SD=5). The

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analysis here is done using mean, with an acceptance benchmark of 3 and above. This implies that any issue that has the mean of the responses to be 3.0 will be regarded as "agreed", while those whose mean of their responses are less than 3.0 will be regarded as "disagreed". Mean and standard deviation of each item was determined, and ranking were then assigned to them. The threats studied were generated from the review of related literature.

IV. RESULTS AND DISCUSSION

Table.1. reveals the distribution of responses on threats to effective building maintenance management in the study area. The responses here were elicited from the works department.

The analysis was done using mean, with an acceptance benchmark of 3 and above. From the analysis, all the questionnaire items are seen as threats to effective building maintenance management in the study area, with construction with substandard building materials and construction errors being the most significant threats as they came as joint tops in the ranking followed by inadequate funding and budget constraints, misuse of buildings and reckless and nonchalant attitudes by users. The lowest ranked threat, however, is inadequate training and skills development for maintenance staff. This study corroborates with the findings of Ofide *et al.* (2015) with regards to students' poor attitudes to buildings usage as one of the major threats to effective building maintenance management. The findings of this study with regards to inadequate funding is in agreement with the findings of Okafor *et al.* (2018) and Ofide *et al.* (2015) where it was ranked amongst the top threats to effective maintenance management of public higher education buildings.

Table.1. Respondents Perceptions on Threats to Effective Building Maintenance Management

S.No.	Threats to effective maintenance of university buildings	SA	A	UN	D	SD	Mean	Ranks	Remarks
1	Inadequate funding and budget constraints	81	9	9	-	9	4.42	2nd	Accept
2	shortage of maintenance staff	18	45	9	27	9	3.33	10th	Accept
3	Users delay in reporting	18	72	9	-	9	3.83	6th	Accept
4	Absence of reporting channel	18	54	9	18	9	3.50	9th	Accept
5	Misuse of buildings	45	45		9	9	4.00	3rd	Accept
6	Reckless and nonchalant attitude of users	27	72	-	-	9	4.00	3rd	Accept
7	non application of user satisfaction survey	18	81	-	-	9	3.92	5th	Accept
8	lack of regular building condition survey	9	72	18	-	9	3.67	7th	Accept
9	Poor contract management	45	36	18	-	9	3.92	5th	Accept
10	changes in site conditions	36	45	9	9	9	3.83	6th	Accept
11	shortage of materials	18	45	9	27	9	3.33	10th	Accept
12	design changes	18	54	9	18	9	3.50	9th	Accept
13	construction errors	81	18	-	-	9	4.50	1st	Accept
14	lack of maintenance manual for buildings	9	72	9	9	9	3.58	8th	Accept
15	Inaccurate maintenance estimation	36	45	9	9	9	3.83	6th	Accept
16	Delays	36	54	-	9	9	3.94	4th	Accept
17	Complexity of building characteristics	18	81	-	-	9	3.92	5th	Accept
18	construction with substandard building materials	81	18	-	-	9	4.50	1st	Accept
19	professional incompetency	18	54	27	-	9	3.67	7th	Accept
20	lack of experts' involvement in the development of maintenance manuals	9	72	18	-	9	3.67	7th	Accept
21	inadequate training and skills development for maintenance staff	9	45	-	45	9	3.00	11th	Accept
22	Undefined maintenance goals	18	36	45	-	9	3.50	9th	Accept

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A. Test of Hypothesis

$H_{01}=$ there are no significant threats to the effective maintenance management of buildings in Nnamdi Azikiwe university.

Table.2. Chi-Square Tests

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1170.926[a]	84	.000
Likelihood Ratio	1144.919	84	.000
Linear-by-Linear Association	12.217	1	.000
N of Valid Cases	2430		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.33.

The chi-square result for threats to effective building maintenance management in the study area is shown in Table 2. The result reveals that there are statistically significant threats to effective Building maintenance management in the study area. The Pearson Chi-Square Coefficient obtained after the analysis is 1170.926 and the asymptomatic significance which is the p-value is 0.000 (p-value < 0.05). The hypothesis is rejected when the p-value is less than 0.05. Going by this, therefore, the alternate hypothesis is accepted which states that there are statistically significant threats to effective building maintenance management in the study area.

V. CONCLUSION

Most of the buildings in Nnamdi Azikiwe University, Awka campus are not well maintained as evidenced by the defective condition of some building components. This ineffectiveness in the maintenance management of buildings in the study area is caused by a number of significant threats. Some of the threats emanate right from the construction stage, while others were traced to the building users, the University management and the maintenance department. Some building components begin to fail immediately after construction as a result of construction errors and the use of substandard building materials during construction. Some building users lack the right orientation towards healthy maintenance culture; hence they seem to be reckless with the use of buildings and would not want to report building defects on time. The maintenance department on the other hand fails to carry out regular building condition survey to identify the defects at their infancy stage. There is also a problem with the communication channel between the building users and maintenance department. The use of only official memo writing as a means of maintenance calls or reporting is too rigorous and delays the response to issues that demands immediate attention. There is a serious need for regular trainings for the maintenance personnel for updated capacity development. These threats impede the effectiveness of the maintenance management of buildings in the study area, which in turn militates against the core interest of a university (innovative research, quality teaching and learning). This study therefore recommends a study to establish the prospects for effective maintenance of buildings in the study area.

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