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Assessing the Underlying Strategies for Facilities Management Practice in a Nigerian Polytechnic

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Abstract. The level of facilities provided in Higher Education Institutions (HEIs) has a corresponding influence on the performance of the students. However, the deplorable conditions of facilities in most HEIs cannot sustain successful teaching and learning experiences among lecturers and students alike. Effective facilities management Therefore, this study was conducted to investigate the present condition of physical and learning facilities in Federal Polytechnic Bida Niger State, and to find out how the management of such facilities can be improved. Mixed method research design was adopted via the use of quantitative and qualitative approaches for the study. Both questionnaire and interview were used for data collection. 50 questionnaires were administered to selected staff of physical planning/work department in Bida Polytechnic out of which 35 were returned and used for data analysis. The data obtained in the interview phase of the study was analysed through content analysis while the one obtained from the questionnaire was analysed quantitatively. The study revealed that the physical and learning facilities in the institution are in a deplorable condition due to poor maintenance culture by the physical planning/work of the institution. Hence for effective facility maintenance, the study recommends the adoption of a proactive strategy such as cost-focused/control technique for both physical and learning facilities in the institution.

INTRODUCTION

The contribution of built assets and facilities to the performance of learners has been elucidated severally [1-3]. Also, the presence of certain kinds of physical infrastructure or facilities has been identified as a major contributor to the choice of higher education institution to attend by prospective undergraduates[3-6]. Furthermore, universities have used the procurement of infrastructure and facilities to enhance their institutional reputation and brand[7]. This has been commonplace with the emergence of the sustainable university concept among others[8, 9]. Accordingly, the significant contribution of built assets and facilities within university contexts can easily be discerned. This understanding has highlighted the relevance of facilities management practice in ensuring that the facilities on university campuses are not only fit for purpose but remain primed to deliver on the abovementioned mandates, globally. Many studies have explored the state of facilities management practice in the higher education setting, in developed and developing countries respectively [8, 10-15]. These studies have sought to contribute not only to proffering solutions which would facilitate effective and efficient FM practice but to also evolve the state of knowledge relating to the discipline.

In Nigeria, scholars have extensively adumbrated the nexus between the state of infrastructure in universities and the performance of the students therein[16, 17]. The rising number of studies focusing on facilities management within the Nigerian HEI context may be attributed to the realization of the relevance of FM practice towards improving the state of these facilities, and by extension, improved learning experiences and academic performance. Such studies

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have focused on an identification of the following: challenges negating effective FM practice[1, 18] and, strategies for improving FM practice performance[18]. However, it has been observed that these studies have focused on universities with limited focus on polytechnics and other HEI variants in the country[19-21]. This is the gap which this study seeks to bridge as it explores the impact of the current FM practices on the state of facilities at a Nigerian polytechnic.

The National Board for Technical Education [22] provides minimum standards of physical and non-physical facilities that polytechnics in Nigeria should acquire before they can be permitted to offer National Diploma (ND) and Higher National Diploma (HND) programmes. Among the plethora of facilities required by NBTE for setting up of polytechnics consist of a campus with a well-designed master plan, encompassing academic buildings such as classroom/lecture halls/theatres, laboratories, workshops, studios, and libraries. Others include administrative/ staff offices, experimental farms, equipment (e.g., Plant, hard and soft furniture items, hand, and machine tools), student seats and desks, lecturers' chairs and tables, information, and computer technology (ICT) centers, marker/chalk boards, well fenced campus free from hazards and suitable for learning and research [22]. In addition, it has been reported that in some countries, staff quarters and students' hostel, recreation and open space infrastructure, transportation (roads for vehicular circulation, pedestrian/ bicycle sidewalks and security services), utility framework (electric power, water, and sewerage systems), information and telecommunication technology infrastructure remain essential conditions for securing approval to operate such institutions [23-25].

Based on the utility of these assets, and the nexus with student performance, the regular assessment of the state of functionality to meet the standards expected by the NBTE during these inspections remains imperative. Accordingly, the NBTE conducts regular inspection of both physical and academic facilities before the approval and accreditation of ND and HND programmes in Nigerian polytechnics. Despite the effort of NBTE to ensure the availability of standard facilities in Nigerian polytechnics, the reviewed literature indicates that the state of physical and academic facilities in Nigerian polytechnics remains appalling [17]. For instance, students have continued to express dissatisfaction with hostel facilities in some of the schools [19, 21, 26]. Academic facilities such as, information and communication technology and library resources in some of the institutions were assessed to be deplorable [23, 27, 28]. The root cause of the abysmal conditions of the facilities might not be limited to poor funding [16, 18]. Several studies including Oladokun[16] have also outlined the various challenges militating against effective management of facilities in Nigerian institutions of higher learning. Olatunji[20] reported that the performance of physical buildings and their elements depend not only on funding but to a large extent on their planned and continuous maintenance.

It should be noted that whereas certain tertiary educational in Nigeria have adopted in-house maintenance and property management techniques for the maintenance of their facilities [10, 29], whilst some have utilized outsourcing, multidisciplinary and integrated techniques [30, 31] , these practices have yielded mixed results within the context.

This implies that further studies are needed to investigate the strategies that can be deployed by facilities management professionals with limited fund for effective management of the facilities in the institution, within the limited resources or constraints. Therefore, investigating strategies to be deployed in the management of standard facilities in Federal Polytechnics such as the one in Bida, Niger State, Nigeria for promotion of students' academic performance is considered a means of contributing towards resolving this challenge. This is what this study seeks to achieve.

FACILITY MANAGEMENT IN NIGERIAN UNIVERSITIES

The quest to bridge the increasingly dwindling resources available to HEIs globally has increased the competition among these institutions for the students from various locations. The provision of a conducive environment for teaching and learning as well as research remains one of the salient means of gaining competitive advantage[23, 32]. Extant literature buttresses the direct relationship between the nature of facilities (Built and otherwise) available at HEIs and the student choice of institution[3, 11, 32]. As such, HEIs have witnessed considerable investments in infrastructure development to attract students.

Furthermore, facilities have been deployed for branding purposes to sustain institutional reputation among peers[7, 33]. This has been the case with the emergence of the sustainable university concept. This concept has seen many HEIs modelling themselves as sustainability champions through the development of net-zero, sustainable facilities, etc[9, 33]. However, associated with the burgeoning need to develop new facilities and/or built assets is the need to manage them effectively to engender utility and end-user satisfaction[13]. Accordingly, this can be discerned from the increasing allocation made to maintenance of assets in HEI budgets in recent times.

The need to ensure the effective management of these facilities contributed significantly to the emergence of facilities management (FM) practice in the HEI context[14, 18, 25]. FM has been described as the management of an organization's non-core activities in a manner that supports the organization's ability to actualize its core objectives[34]. Based on this definition, it is apparent that that the management of facilities in HEIs would naturally situate within the FM praxis. A plethora of literature have elucidated the benefits associated with the adoption of FM practice in HEIs[10, 11, 18, 35]. Similarly, extant FM policies, practices and processes in HEIs have been identified[10, 18]. Also, previous studies have focused on the identification of the success factors, barriers and drivers for effective FM practice in HEIs globally[11, 12, 16]. Others have interrogated the utility of different contracting approaches (outsourcing or insourcing) to enable effective FM practice[35]. Scholars have also concerned themselves with the development of indicators for measuring FM performance in HEI contexts [12]. The foregoing suggests that literature concerning FM practice in HEI has since attained maturity. In an attempt to evolve with the times and happenings within the HEI context, notice has been taken of the evolution of literature relating to Sustainable, Green and Smart FM practices respectively.

Facilities Management in Nigerian HEIs

The Nigerian HEI is not an exception to the increasing adoption of FM practices in HEI contexts. The reasons which had been advanced for the increasing focus on FM within the HEI sector remain germane for the Nigerian context. Various scholars have investigated FM practice in Nigerian HEIs from different perspectives and made salient contributions towards fostering fit-for-purpose facilities for teaching and learning in these institutions[10, 17, 26]. However, a cursory look at most of the studies focusing on FM practices within the Nigerian HEIs appear fixated on the university context with limited consideration being accorded to other HEI variants like polytechnics and colleges of agriculture and education respectively. For instance, Gbadegesin and Babatunde [35] carried out their study relating to the perceptions of relevant stakeholders on the utility of the outsourcing decision in public universities in Nigeria, relying on data from five universities. Similarly, Odediran et al [18] investigated FM practices in Nigerian Universities using only data collected from universities. Recently, a study by Abdullahi and Yusoff,[1] into the influence of facilities on student's satisfaction relied on empirical evidence obtained from universities situated in Northern Nigeria.

Yet, evidence abounds which are indicative of the underwhelming performance of the facilities at these institutions[22]. This study culminates from this observation. In subsequent sections, this study will collect, analyze and present the findings relating to an assessment of the various FM practices in Nigerian polytechnics using the Bida Federal Polytechnic exemplar.

RESEARCH METHOD

In this study, the researchers utilized case study research design as supported by Creswell [36] which includes the utilization of both qualitative and quantitative techniques for data collection. This is supported by the view of Kothari and Garg [37] that scientific data for a scientific enquiry can be obtained from two sources, which are quantitative and qualitative respectively.

Study population and sample size

For this study, data was elicited in three phases through participant observation using an observation checklist, semi-structured interviews and questionnaires to assess the efficacy of the underlying FM practices adopted at Bida Federal Polytechnic which served as the case study. Whereas the participant observation was carried out by the 1st and the 3rd authors respectively. The study population consist of facilities stakeholders in Bida federal polytechnic which are categorized as follows:

1. Academic staff, technical staff in the works and maintenance department, physical planning &development unit (PPDU), security unit, and ICT center.
2. Heads of Departments (HODs) & Deans of Schools

The academic staff were selected to represent the staff-user category since they use facilities such as classrooms, offices, and library staff quarters. Further, professionals such as Estate Surveyors, Engineers, Builders, Town Planners, Quantity Surveyors, and Architects in the built environment were selected because of their experience in participation in FM services over the years.

The sample size is a smaller representation of the whole group under study [38]. Morenikeji [38] further suggested between 70% and 100% for small population. Morenikeji [38] further put forward ratio 1:15 for moderate population and 1:30 for large population. In this study, the sample size was projected to range from 20% for academic staff; 25% for WMD, PPDU, SU & ICT and 80 % for Heads of Departments (HODs), and Deans of Schools.

Data collection

The following methods were adopted to collect the necessary data for this study:

i. For objective 1, field survey and direct personal observations. This involves building condition survey and capturing pictorials of the physical facilities in the polytechnic.
ii. For objectives 2, 3 and 4, Face-to-face interview with semi-structured questions were used to obtain the primary data from the participants of the study.
iii. Questionnaire: This was used to validate the outcomes of the interview study conducted to obtain data on objectives 2, 3 and 4 respectively.

Physical observation

Physical observation in qualitative studies enables one to build a picture of the situation of those things under investigation. It also enables one to gain insights into the performance or conditions of a group of people or an environment [39]. Therefore, the physical observation conducted in this study was the first exercise in the qualitative research and it enabled the researcher to obtain information on the present conditions of both physical and learning facilities. The un-obstructive observation method was adopted. Creswell [36] opine that this method allows the researcher to observe the unit of interest without the knowledge of those been observed. Therefore, Gibson and Ifenthaler [40] posited that un-obstructive observation method help to minimize a major problem in research by excluding the awareness of the subject from behavior change that will distort the results. Consequently, Gibson and Ifenthaler [40] are of the view that this method allows the researcher to collect data in its actual state without any distortion or bias from the subject under investigation. The unit of observations that were being checked for in the facilities in the study polytechnic are lecture rooms/theatre buildings, hostels/ staff quarters, administrative buildings, Library, ICT, water supply system and recreation in the case study institution.

TABLE 1: Scale of building condition rating and definitions

Condition Status	General Description	Building Condition	Condition Rating (c)
Very poor	Asset has deteriorated badly; serious structural problems; general appearance is poor with eroded protective coatings; elements are broken, services are not performing; significant number of major defects exists.	0.00 to 0.19	1
Poor	Asset is in poor condition; deteriorated surfaces require significant attention; services are functional but failing often; significant backlog maintenance work exists.	0.20 to 0.49	2
Fair	Asset is in average condition; deteriorated surfaces require attention; services are functional but require attention; backlog maintenance work exists.	0.50 to 0.74	3
Very poor	Asset has deteriorated badly; serious structural problems; general appearance is poor with eroded protective coatings; elements are broken, services are not performing; significant number of major defects exists.	0.00 to 0.19	1

TABLE 1: Scale of building condition rating and definitions (continued)

Condition Status	General Description	Building Condition	Condition Rating (c)
Poor	Asset is in poor condition; deteriorated surfaces require significant attention; services are functional but failing often; significant backlog maintenance work exists.	0.20 to 0.49	2
Fair	Asset is in average condition; deteriorated surfaces require attention; services are functional but require attention; backlog maintenance work exists.	0.50 to 0.74	3
Good	Asset exhibits superficial wear and tear, minor defects, minor signs of deterioration to surface finishes; but does not require major maintenance; no major defects exist.	0.75 to 0.94	4
Excellent	Asset has no defect; appearance is as new.	0.95 to 1.00	5

Source: Adopted from Department of Housing and Public Works, (2012)

During the study, the researcher moved round each of the above-stated facilities one after the other to take record of their present condition. This was achieved by using a building condition survey form as indicated in Table 1 and taking pictures of each facility one after the other. The physical observation exercise lasted for approximately one week in the study. Not less than 22 buildings were assessed during the exercise.

The Interview Guide

In this study, face-to-face interview in accordance with Saunders *et al.* [39] was adopted to obtain the primary data from the interviewees. The interview guides prepared before the commencement of the exercise consist of 6 structured questions. Participants of the interview study were mainly staff of the polytechnic. As earlier explained, some of these participants were randomly selected, while some of them were selected through stratified method. During the study, the researcher visited each of the participants in their respective offices to conduct the interview study. Each of the interviews conducted ranges between 35 to 40 minutes in duration. The entire interview conducted took approximately three months. They were all recorded through tape record and transcribed accordingly. Notes were also taken during the interviews to support the interviews transcription. In all, 40 participants participated in the interview study.

The Questionnaire Design

The literature shows that questionnaire is a decent exploration instrument for gathering normalized information mainly for validity and generalizations of information [39]. It was used in this study for further data analysis and to validate the outcomes of the interview exercise. This implies that immediately after the interview exercise, semi-structured questionnaire was prepared and administered to some selected staff of the Federal Polytechnic Bida. The academic qualification of the participants of the questionnaire study ranges from ND to Ph.D. Before the main survey study, pilot study was first conducted with some of the higher-level staff in the physical/work department of the institution to determine the reliability of the questions in the questionnaire. The outcomes of the pilot test showed that there was no ambiguity in set questions. Therefore, the researcher proceeded straight to the main survey exercise. The prepared questionnaires were distributed to the participants of the study hand-to-hand and were also collected back in the same format.

Data Analysis

The data obtained in the physical observation was analysed using Facility Condition Index (FCI) FCI is a widely used indicator for evaluating the condition of a constructed facility by incorporating deferred maintenance [41]. The data obtained in the interview phases of the study was analysed through content analysis. Prasad [41] averred that “content means what is contained and content examination is the investigation of what is contained in a message". From an overall point of view content examination might be perceived as a technique where the substance of the

message shapes the reason for reaching inductions and determinations about the substance. Prasad [41] further declare that the goal of substance examination is to change over recorded "crude" wonders into information, which can be treated in basically a logical way so an assemblage of information might be developed. Further, content examination falls in the interface of perception and record investigation.

Content investigation is a strategy for deciding the substance of composed, recorded, or distributed interchanges by means of a deliberate, objective, and quantitative technique [37]. Along these lines, it's anything but a bunch of systems for gathering and coordinating data in a standard arrangement that permits experts to draw deductions about the qualities and importance of recorded material. As per Merriam and Tisdell [42] the motivation behind coding such inquiries is to lessen the enormous number of individual reactions to a couple of general classifications of answers that can be doled out a mathematical code. Content investigation was utilized to dissect the meeting information for this examination. The accompanying cycle as featured by Merriam and Tisdell [42] was embraced for the substance examination of information for the investigation; recognize the inquiry, distinguish comparable subjects, lessen the content to classifications and code for words or examples, investigate the connections between ideas (strength, sign and course), code the connections and lastly, report the deductions. The data obtained in the questionnaire used to validate the outcomes of the interview was validated through statistical means of data analysis using Statistical Package for Social Science (SPSS).

RESULTS AND DISCUSSION

The findings are structured according to the three objectives mentioned in previous parts of this paper. The presentation which comprises of a mix of the presentation of data and discussion, will be delineated into the qualitative and quantitative strands respectively.

Results of physical observation exercise and interviews (Qualitative strand)

In the qualitative study conducted, physical observation was first carried out to enable the researchers clearly understand the present condition of the various facilities in the study context. The outcome of the building condition survey is presented in Table 2.

TABLE 2. General ranking of conditions of building components

Building Components	Overall Rating	Building Condition Status	No of Buildings	Ranking
Roofing	0.73	Fair	15	1
Fittings and furniture	0.67	Fair	13	2
External services	0.67	Fair	13	3
Windows and Doors	0.67	Fair	13	4
Floor	0.60	Fair	12	5
Wall	0.60	Fair	12	6
Ceiling	0.53	Fair	11	7
Structural Elements	0.47	Poor	10	8
Electrical	0.47	Poor	10	9
Plumbing	0.40	Poor	9	10

Source: Authors' field survey (2020)

The building observed include staff Quarters, classrooms, laboratories, workshops lecture theatres students hostel etc. Table 2 highlight the ranking of condition rating of building components in Federal Polytechnic Bida building, roofing, fittings and furniture, external services, windows and doors, floor, wall, and ceiling are in fair conditions with the building ratings of 0.73, 0.67, 0.67, 0.67, 0.60, 0.60 and 0.53 respectively. Plumbing, electrical, and structural elements are in poor condition with the building ratings 0.40, 0.47 and 0.47 respectively. These three (3) buildings components are the most used components by both staff and students of the Federal Polytechnic Bida and are very essential services. It can be emphasized that the present conditions of many of the physical and academic facilities available in Federal Polytechnic, Bida is in deplorable condition while compared to NBTE recommendations which can be said to be awful. This might have negatively influenced the academic performance of both graduated and the present students of the institution over the years. This implies that as at when this study was conducted, the levels of

facilities provided in Federal Polytechnic Bida had a negative relationship with the performance of the students which correspond to the findings of Alimi *et al.* [2], Isa and Yussoff [17].

Conditions of physical and academic facilities

Most of the participants of the interview study agreed that the physical and academic facilities of the polytechnic such as student's lecture theatre/classrooms, hostel accommodations, staff offices, toilet facilities (students/staff), internet facilities, teaching aids and the likes are inadequate while compared to NBTE recommendation. This is consisted with what has earlier been observed during the physical observation exercise in the study. The opinions of the participants of the study also concurred with the findings of Sawyerr et al. [19] Akinpelu [21], Isa and Yussoff [17].

Current strategies applied to manage the available *facil*ities

When this question was raised in the interview conducted, participants in all the units emphasized that there was a time that in-house policy was being adopted by the management of the institution. The participants further stated that there were also laid down techniques for proper FM through the in-house policy. Such techniques or methods include cost control and materials management. However, the participants of the interview study also pointed that due to some challenges (which are discussed in the next section) encounter in the management of the institution facilities over the years, presently, there is no pro-active method or approach that is being adopted by all the staff in the various units to manage the available facilities. The participants contended that the available facilities are not being inspected regularly. This implies that unplanned or corrective maintenance (waiting for breakdown before taking action) is being adopted in the case study institution. This might have led to the deplorable conditions of the facilities in the institution. The information obtained from the participants of the interview study is consisted with the findings of Isa and Yussoff [17]and Oladokun [16] regarding facilities management practices in Nigerian polytechnics.

Challenges militating against FM strategies

All the participants of the interview study in the various units emphasized that negligence or poor attitude of the institution heads toward effective FM practice and inadequate funds are the two main challenges of effective facility management practice by the FM staff of the case study institution. The participants of the interview study expressed that appropriate fund is a key factor when it comes to facility management. However, the heads of the institution always found it difficult to release such fund timely. They prefer to wait until damages have been noticed before taken the necessary action (corrective maintenance). Other challenges as pointed by the participants of the interview study are lack of management interest when it comes to standard, lack of skilled labour, lack of employees training, too many unskilled/semi-skilled labour (which were employed by the head of the institution), poor quality of the available facilities, incessant strike action that often make the facilities to be abandoned for a long time before use and poor record keeping.

Results from the questionnaires (quantitative strand)

Demographical information of the respondents

Table 3 shows the demographic information of the respondents of the study. The table also concise the breakdown of the questionnaires that were sent out and returned.

TABLE 3. Number of questionnaire administered/returned

Participants	Academic qualifications	Working experience	No of questionnaires distributed	No of questionnaires returned
Architects	ND	More than 10 years	2	2
	HND	7 years	2	1
	B. Tech	5 years	1	1
	M. Tech/MSc	2 years	2	1
Builders	ND	More than 8 years	2	2
	HND	8 years	3	1
	B. Tech	6 years	2	2
	M. Tech/MSc	More than 3 years	2	1
Quantity Surveyors	ND	More than 6 years	1	1
	HND		2	1
	B. Tech	7 years	2	2
	M. Tech/MSc	More than 10 years	1	1
Civil Engineers	ND		2	1
	HND	5 years	1	1
	B. Tech	More than 10 years	2	2
	M. Tech/MSc		2	1
Mechanical Engineers	ND	5 years	1	1
	HND	More than 10 years	2	1
	B. Tech	5 years	2	1
	M. Tech/MSc		2	2
Electrical Engineers	ND	5 years	2	1
	HND	7 years	2	1
	B. Tech		2	1
	M. Tech/MSc	5 years	1	1
Technologist	ND		2	1
	HND	More than 10 years	2	1
	B. Tech	5 years	2	2
	M. Tech/MSc		2	1
TOTAL			50	35

Challenges to effective facility management practice

Table 4 presents the result of the opinions of the respondents on the challenges of effective facility management in the study context. The respondents ranked the challenges earlier discovered in the literature and interview phases of the study on a Likert Scale of 1 to 5. These factors were ranked according to their severity where 1 shows firmly deviate, 2 dissent, 3 impartial, 4 concur and 5 unequivocally concur. As can be seen in the table 4.4, the high Cronbach's (α) values acquired for every one of the respondents (0.921: incredible) shows the dependability and worthiness of the information [43]. The Kendall's connection Coefficient of concordance (W) determined likewise shows the degree of understanding of the multitude of respondents in the overview work out.

It is imperative to note that W ranges from $0 \leqslant 1$, where 0 (H2) suggests that there is no understanding among the respondents, while 1 (H1) assign that there is agreement among the respondents of the questionnaire study [43]. In this research, W ranges from 0.721 to 0.891 which is adequate [43]. This construes that there was a general concession to the positioning of the respondents in the approval study. Further, the standard deviations (SD) determined reaches from 0.821 to 1.307 which are likewise inside the worthy reach, as they show that there was low minor departure from the reactions among the respondents.

TABLE 4. Challenges of effective facility management practice

Various challenges	MIS	SD	A	W	Ranking
Poor attitude of the institution heads	4.27	0.821	0.921	0.749	1st
Lack of management interest	4.23	0.921		0.876	2nd
Lack of employees training,	4.21	0.769		0.721	3rd
Lack of skilled labour	4.18	0.764		0.732	4th
Several unskilled/semi-skilled labour in the system	3.58	1.121		0.891	5th
Poor quality of the available facilities	3.21	0.929		0.819	6th
Frequent strike action	3.12	1.307		0.792	7th
Poor or inadequate funding	3.07	1.293		0.767	8th
poor record keeping	2.17	0.988		0.874	9th

Source: Authors' field survey (2020)

As can be observed in the table, all the respondents of the survey study agreed that factors such as negligence of the institution heads, poor funding, lack of management interest/regular employees' trainings and the likes are the significant challenges of effective facility management in most of the Nigerian polytechnics. This is like what has been observed in the physical observation exercise that was first conducted during the study. The opinions of the respondents are also consisted with what views of the participants of the interview exercise in the study.

Strategies for effective facility management practice

TABLE 5: Strategies for effective facility management practice

Various strategies	MIS	SD	A	W	Ranking
Cost focused/control	4.41	0.831	0.989	0.741	1st
Post occupancy evaluation	4.38	0.741		0.745	2nd
Combination of in-house & outsourcing	4.35	0.891		0.712	3rd
Multidisciplinary	3.71	0.782		0.871	4th
Performance focused	3.51	1.314		0.895	5th
Workplace focused	2.23	1.221		0.817	6th
Business value focused	2.07	0.293		0.749	7th

Table 5 presents the opinions of the respondents on the strategies that can be adopted for effective facility management in the case study institution. The values obtained for all the respondents (0.989: excellent) also affirms the reliability and acceptability of the data. The W calculated (0.712 to 0.895) also imply the extent of agreement of all the respondents in the validation survey exercise. As can be observed in the table, cost focused/control technique for effective facility management in the study polytechnic came first on the ranking scale. This was followed by post occupancy evaluation. While combination of both in-house / outsourcing came third. This implies that these three factors with MIS above 4.0 are the significant measures that can be adopted by the study institution for effective facility management. This is consistent with view of Tookaloo [44], Olatunji [20] and Abdullah *et al.* [29] on the strategies for effective facility management in Nigerian institutions.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study set out to bridge the gap in the literature as it pertains to the lack of studies on FM practice in Nigerian polytechnics. Accordingly, the study examined the utility of various FM strategies in engendering effective FM practice and by extension, improved learning environment in these institutions using a single case study research design. Data was collected from a purposively selected sample of participants within the case study (Bida Federal Polytechnic) using a juxtaposition of the following techniques: participant observation, semi-structured interviews and questionnaire survey. The findings of the study indicate that physical and learning facilities in the study institution

are not properly maintained by the management of the institution and are in a deplorable state. This is due to certain challenges such as poor attitude of the institution heads, Lack of management interest, Lack of employees training and lack of skilled labour. Additionally, it was found that unplanned maintenance is being used in the institution for management of their facilities. Hence, strategies with MIS above 4.0 are the significant strategies that can be adopted by the study institution for effective facility management. These strategies are cost focused/control, post occupancy evaluation and combination of in-house and outsourcing. These strategies were discovered through the mixed methods of data collection conducted in the study.

Recommendations

Based on the conclusion of the study with respect to the status of physical and learning facilities in the study area for effective maintenance, strategies such as cost focused/control, post occupancy evaluation and a combination of in-house & outsourcing are hereby recommended for the case study institution. Therefore, all heads/management of the institution should adopt proactive method of tackling maintenance need in the institution.

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