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STRATEGIES FOR EFFECTIVE IMPLEMENTATION OF LEARNING FACILITIES IN NIGERIAN UNIVERSITIES

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ABSTRACT

Purpose: Inadequate learning facilities in Nigerian public universities is one of the key factors that affect the overall academic performance of students. This research aims to investigate the underlying learning facilities that contribute best to students' academic performance. It also intends to propose strategies that can be used to implement such facilities, specifically in public universities where educational fund has always been a problem.
Design/methodology/approach: To achieve the aims of the study, the mixed methods research design was adopted. Physical observations, questionnaire and interviews were the instruments used for data collection in the mixed methods research design. Questionnaires were administered to 389 students from three selected public and private universities in the North central region of Nigeria. While interviews were conducted with nine staff of the National Universities Commission (NUC). In addition, archival data sourced from NUC Bench Mark Academic Standard (BMAS) and NUC procedural guide were also used for the study. The data collected were analysed quantitatively and qualitatively using.
Findings: The research showed that constant electricity supply and Information Communication Technology (ICT) were the two learning facilities that contributed best to students' academic performance.
Research limitations/Implications: The limitation of this study is that it was conducted in three universities that have Sciences and Engineering learning facilities such as laboratory and practical workshops in the north central region of Nigeria. The contribution to knowledge is that the study established constant electricity supply and ICT as the two learning facilities that contribute best to students' academic performance.
Practical implications: With the limited education funds in the developing nations such as Nigeria, the outcomes of this study will enable priority to be given to constant electricity supply and ICT in the learning facilities procurement process. Consequently, students' academic performance in government established institution will improve as such facilities will always be made available for their daily use.
Originality: This paper first gain originality in the study context to propose for two learning facilities that contribute best to students' academic success. Furthermore, the paper is original as it has not been previously published and all the information obtained from other sources are duly referenced.

Keywords: Facilities; learning; performance; private driven; strategies.

1. INTRODUCTION

Knowledge dissemination from teachers to students does not only occur in the four walls of the classroom, rather in an overall atmosphere that is effective for teaching and

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learning processes (Issah *et al*., 2016). This confers that knowledge dissemination from educators to scholars is not hinged on academic environment only, but on numerous factors to include learning facilities (Anosike *et al*., 2018). Learning facilities are materials tools that assist knowledge transfer and learning, thereby making the process of knowledge acquisition meaningful and purposeful to students at all levels specifically at tertiary institutions (Issah *et al*., 2016). It is the whole learning environment which academic administrators, staffs and learners' harness, allocate and utilize for smooth and effective control of educational system (Abdulahi and Yusoff, 2018). Further, it can also be expressed as the physical and spatial components of teaching and learning that improve students' academic performance (Anosike *et al*., 2018). Such physical and spatial components consist of all types of buildings used for academic and non-academic purposes (Tadesse & Maeregu, 2014). Globally, learning facilities have been of tremendous assistance in the aspect of quality education to students. They enable students to achieve their educational goals and all-round objectives (Issah *et al*., 2016). Studies by Anosike *et al*. (2016) and (Ekundayo, 2012) revealed that students that are taught in an environment with good facilities scored consistently higher across a range of standardized tests. Hence, the condition of facilities in a learning environment determines teachers' and students' performance. This is because, if facilities are inadequate or dysfunctional, the learning process would be impaired and academic performance will decrease drastically (Anosike *et al*., 2018). Recently, student academic performance measurement has received considerable attention worldwide (Issah *et al*., 2016). For instance, studies conducted by Erum & Ahmad (2011) and Oluwunmi, Durodola & Ajayi (2015) revealed that schools with well-coordinated planning and maintenance practices recorded better student's performance. Also, students in new and well-equipped schools performed better than the students in old schools with inadequate school facilities. Based on the reviewed literature, it can be contended that in institutions where facilities are adequately provided, there seems to be an increase in students' academic performance and vice versa. Consequently, sufficient facilities are likely to enhance the interaction, bring about creative learning, and contribute to a fulfilling university experience (Augustine *et al*., 2016).

Despite the importance of learning facilities on students' academic performance, it was observed in the reviewed literature that many of the Nigerian institutions specifically the public ones operate with inadequate or poor learning facilities. For instance, Dike and Salisu (2015) examined the inadequacies of school facilities in educational industry in Nigeria and revealed that at every level (primary, secondary, technical and tertiary institutions), there is abundant and evidence of pervasive decay in values and standards of education. Further, a survey study conducted in Nnamdi Azikiwe University, Awka to evaluate the facilities available in the institution revealed that though some facilities were provided, but the quantities provided were inadequate (Okafor and Onuoha, 2016). Anifowose and Lawal (2013) also examined the state of physical facilities in Nigerian tertiary institutions and discovered that the physical facilities in the Nigerian universities are inadequate. Some of the existing facilities in Nigerian public tertiary institutions are at the dilapidated state, while some seemed to have lacked good maintenance. The cost of maintenance expended in the institution has a great impact on the state of the structures. Fuertes et al (2020) added that lack of maintenance culture of buildings in Nigerian universities has led to unproductive learning environments in the System.

Based on the previous studies, it can be argued that many of the facilities provided in Nigerian public institutions are obsolete, substandard and poorly maintained due to non-compliance with the policy guidelines for infrastructural development of National University Commission (NUC). With the remarkable increase in the number of students in

Nigerian universities coupled with the global economic recession that have led to over crowdedness and overstretched carrying capacity of the public institutions, it is necessary to investigate if the present students' placement specifically in the public institutions corresponds with the facilities required for their academic goal (Anosike *et al*., 2018), establish the facilities that contribute best to students' academic success, investigate the level of compliance of Nigerian universities with such facilities in term of NUC requirement standards, find out the factors that hinder some of the institutions to fully comply with NUC standards, investigate how such factors can be overcome for effective compliance, and propose for a strategy that can be used to adopt such facilities in all Nigerian universities. With the need for higher institution of learning in Nigeria to produce graduates that can compete in the global/international labour market, there is need to pay adequate attention to the compliance of tertiary institution with NUC recommended standard with respect to learning facilities. Thus, this study will serve as guides for educational policy makers towards ensuring compliance of tertiary institutions with the NUC standard requirement. In addition, there is a direct relationship between achievement in education and technology on economic growth of any given country. This study will also enable tertiary institutions planning and budgeting units of a nation to understand the area to channel the available resource or fund with respect to learning facilities that could contribute best to students' academic achievements.

2. Literature Review

2.1. The National Universities Commission

In Nigeria, the National Universities Commission (NUC) plays a major role in ensuring that facilities in universities meet minimum standards as prescribed in the Benchmark Minimum Academic Standards (BMAS) and National University Commission Procedural Guide and Physical Development Manual documents against which facilities are assessed. NUC is a body set up by the Federal Government to deal with overall policy which includes**: s**trategy of universal education**;** programming the implementation policy**;** budgeting**; s**etting academic standard**;** accrediting academic programs, and liaising with government at ministry level particularly at National Planning, Finance and Health. Some of the important learning facilities as speculated by NUC guides are constant electricity supply within the school premises, adequate internet facility, standard lecture room/class room and staff offices, standard laboratory that is well equipped, recreational facilities, standard and well equipped library, public address system, toilet facility, health care facilities and sport facilities. In this study, other facilities such as interactive white boards, adequate students' security within the school premises and school cafeteria were also considered as the perceived that they are important and could have effect on students' academic performance.

2.2. Strategies Used by NUC to Regulate Academic Standards in Nigerian Institutions

Accreditation of academic programmes, monitoring/visitation and admission quota are some of the strategies initiated by NUC to regulate academic standards and enhance quality university education in Nigeria. But the dwindling quality of our university education has become a matter of great concern to the nation, whether the NUC accreditation strategically exercise actually achieves its purpose. Accreditation of academic programs in Nigerian universities dated back to 1990 when the first accreditation exercise

was carried out. Since then, accreditation of academic programmes has become a culture and a continuous process to ensure that the provision of the minimum academic standards by NUC is adhered to. NUC (2012) described accreditation as a process of examining the availability and adequacy of resources, merit rating of resources and programmes in order to enhance quality of output.

This implies that accreditation involves the process of ensuring that curricula, physical facilities, personnel, funds and the likes meet the needs of the university to achieve its stated philosophy and objectives. Hence, it is a measure of quality of academic programmes and it is aimed at strengthening academic programmes for quality assurance and quality improvement. Accreditation focuses on the production of quality graduates with needed skills, technical and professional knowledge that would enable them to contribute to national development and compete favourably in employment market. The NUC (2012) outlines the criteria for accreditation of academic programmes which includes philosophy and objectives of the programmes, the curriculum, teaching staff (quality and quantity), students' admission and graduation requirements, standard of degree examination, financial support, status of physical facilities, administration of department and employers rating of graduates.

2.3. The Influence of Academic Facilities on Quality Education in Nigeria

Facilities are products or services that support an organization to achieve its objectives and goal. Within the context of education, such as school, facilities are aimed at creating support to teaching and learning environment for students, teachers, and other users around the school (Akomolafe and Adesua, 2016). Occupants of inadequate school facilities may fail to perceive a clear focus on academic purposes, and the learning environment is less likely to be thought of as orderly and serious (Uline, 2008). The literature indicates that additional aspect of school facilities that affect academic learning are spatial configurations, noise, heat, cold, light, and air quality (Anifowose & Lawal, 2013). The way academic facilities have been organized and established provide the place where the whole academic process is being provided. Well-equipped and up to date academic facilities lead to better education process and its overall quality in achieving better outcome (Glen, 2012). Facilities are an essential component of education in an institution. This is because they have great contribution to important aspects such as making of comprehensive curriculum/scholarly resources, creating excellent faculty, creating exceptional and motivating students, and therefore directly influencing the promotion of quality education in the institution (Dike and Salisu, 2015). Condition of buildings and its environment directly affects educational outcomes. The academic facilities support learning process and depending on priorities given to them by the management, they can provide an environment that is safe, secure, and comfortable and thus ensuring provision of quality education and improving students' academic performance (Augustine *et al.*, 2016).

2.4. Problems of the Physical Facilities in Nigerian Tertiary Institutions

Obviously, public universities in Nigeria are facing problem of inadequate facilities (Abdullihi and Yusoff, 2018). Study conducted by Ainon & Bharu (2012) where 86.5% of the respondents agreed that there was shortage of conducive offices for academic staff, shortage of instructional materials for teaching and learning (79.5%), inadequate class rooms for lectures (88%), inadequate laboratories to carry out experiments (73.5%), epileptic supply of electricity (82.5%), inadequate water supply for use (76.5%), lack of good road network (74%) and lack of information services (70.5%). On the average, 78.9%

of the respondents agreed that the universities face the problem of facilities. The National Universities Commission in 2005, recorded that out of 25 Federal universities, 18 represent 72% were overenrolled. While 13 out of the 19 state universities (representing 68.4%) also overcrowded. Only one of the seven private universities then (14%) was reported to have overenrolled. Top ten overcrowded universities include five of Federal universities and five state universities. With this worst situation no doubt that facilities may be overstretched which affects students' academic performance (Abdullihi and Yusoff, 2018).

3. METHODOLOGY

This research aims to investigate the strategies that can be used for effective adoption of standards learning facilities for students' academic performance in Nigerian public universities. To achieve the aim of the study, the research adopted the mixed methods research design. This design was adopted as it enabled the researchers to obtain a robust data from different sources and at a wide population. (Onwuegbuzie & Johnson, 2006; Schwardt, 2007; Creswell and Tashakkori, 2007). For comparison, the study population was drawn from purposively selected federal, state and private universities in the North central region of Nigeria. The institutions to be selected for this type of study are those that offered courses such as Engineering, Science and Agriculture that enable such institutions to regularly make use of educational facilities such as laboratory, library, and workshop (Okebukola, 2006). To be succinctly put, the population for the study is limited to only three universities that have Engineering, Sciences and Agriculture faculties in the study context. The study further focused on 200, 300, 400 and 500 level students from the three different faculties in the various universities. The students at the various higher levels were randomly selected as the researchers perceived that they had been in the learning system for a while and have the requisite experience to respond intelligently to the study questions. The NUC members that were in charge of physical facilities in NUC office and professors in each faculty in the three universities were also interviewed during the study. Not less than 22 NUC staff and 16 professors were available during the study. However, the numbers of participants of the interview were 18 in all (nine NUC staff and 9 professors). The NUC staff and 9 professors are those that were ready and willing to participate in the study. The physical observation check list that was used for the study was prepared using NUC BMAS (Agricultural Science, Engineering and Science, 2014) guide. The archival data was obtained from NUC Procedural Guide which contains the standard requirements of every aspect of educational facilities for institutions in Nigeria. Anemometer, a sound level meter, a photometer and a plan meter were used to measure the ventilation, acoustic, lighting and size of the available facilities in the various universities.

The data collected from the field was analysed with the use of different statistical tools such as Cronbach's alpha (for reliability test) and relative Importance Index (RII). It should be remembered that one of the essences of the questionnaire study was to investigate the impacts of the available learning facilities on the academic performance of the students in the various universities. Therefore, ANOVA test was conducted during the analysis to ascertain the importance of each learning facilities on students' academic performance. In the ANOVA test, the dependent variable is the current CGPA of the students which was obtained from the academic offices of the various institutions. While the independent variables are the various low standard facilities. They were categorized into 13 components in the ANOVA test. Further, relative Importance Index (RII) was used to rank the learning facilities that contributes best to students' academic performance in the three universities. With the nature of data obtained and scale of measurement used, the reliability of the

measured responses from the items was tested using Cronbach's alpha (α) coefficient technique which is the lowest possible value that a scale's reliability can have (Doloi *et al*., 2012). The minimum recommended acceptable level of this test for Social Sciences research is 0.06 (Sekaran, 2003).

Face to face semi-structured interviews were used to obtain qualitative data for this study. The essence of the interview exercise was to find out some of the factors that hinder Nigerian universities to fully comply with NUC standards and how such factors can be overcome. The interview was also conducted so as to find out the strategies that can be used to adopt standards learning facilities in Nigerian Universities. Hence, the data needed for this aspect of the study was obtained through interview conducted with NUC staff in physical facilities unit, Abuja, Nigeria. All the interviews conducted ranged between 30 to 45 minutes. The interviews were tape recorded and transcribed accordingly. Thus, thematic content analysis was used to analyse the interview data. It is essential to note that for any form of interview to be successful, it must have a major theme of the interviewers (Fuertes *et al*., 2020). Therefore, the researchers closely examined the data to identify common themes that come up repeatedly in the interviews. Base on the content of the interviews, the researchers used phrase to arrange the content into categories and sub categories (Krippendorff, 2012).

4. PRESENTATIONAND DISCUSSION OF RESULTS

4.1. Archival Results

Tables 1, 2, 3 and 4 summarize the information obtained regarding some of the standard requirements of educational facilities in Nigerian institutions. Details of the information can be obtained in NUC BMAS (2012).

Table 1: NUC standard for staff offices

Various Staff offices	Office size	Ventilation condition of the offices	Acoustic condition of the offices (dBA)	Lighting condition of the offices (Lux)
Professors Office	18.50 m^2	20^0 C -34^0C	50-55	250-500
Head of Department's Office	18.50 m^2	20^0 C -34^0C	60-65	250-500
Senior lecturer	13.50 m^2	20^0 C -34^0C	60-65	250-500
Other Lecturer Office	12.00 m^2	20^0 C -34^0C	60-65	250-500
Technical Staff Space	7.00 m^2	20^0 C -34^0C	60-65	250-500
Secretarial Space	7.00 m^2	20^0 C -34^0C	60-65	250-500

Source: Field survey

Table 2: Sanitary provision for laboratory, staff offices, classroom and library

Number of persons	WC M	WC F	Urinal M	Urinal F	Wash-hand Basin
1-10	1	1	2	2	
11-25	2	2	2	2	One Per 50 Person
26-50	3	4	2	2	
51-70	4	5	3	3	
71-90	5	6	4	4	
91-110	6	7	5	5	

Source: Field survey

Table 3: NUC standard facility for classroom and acceptance level of luminous

No of Seats	Square metre per student	Accommodation	Mean Illumination (Lux)
1-30 seats	1.20	Classroom, Music rooms, Gymnasiums, lecture hall	120-250
30-60 seats	1.00	Chemical and Physical Laboratories	250-500
60-126 seats	0.90	Art Studio, Needlework rooms	250-1,000
125-250 seats	0.80	Toilets	120-250
Over 250 seats	0.75	Reading, Writing Tables (Library)	250-500
Over 500 seats	0.65	Offices Work	250-500
Over 1000 seats	0.50	Technical Drawing	600-1,000

Source: Field survey

Table 4: NUC Acceptable Internal Noise Levels and ventilation level

Location	Noise level (dba)	Ventilation
Lecture Rooms	35-40	20^0C -34^0C
Classrooms	45-50	20^0C -34^0C
Private Study	35-40	20^0C -34^0C
Library	35-40	20^0C -34^0C
General Office	60-65	20^0C -34^0C
Private Office	50-55	20^0C -34^0C

Source: Field survey

4.2. The Present Condition of Learning Facilities in Nigerian Universities

In the physical observations exercise conducted in this study, it was observed that the size of professors and head of department offices in the three faculties in the three selected universities meet NUC requirement standards, while other lecturers' offices and technical

staff in the federal and state universities did not meet the learning facility standards recommended by NUC. It was also observed in the federal and state universities visited that most lecturers (from assistant to senior lecturers) in the three faculties share offices with limited space available for them. This makes it difficult for the lecturers to have private times/discussions with some of their students specifically on matter that may affect their studies. In addition, the acoustic level conducted (sound measuring method) with the aid of a sound level meter in all the staff offices did not meet the requirement standards of NUC. This may be due to external pollution from student's noise passing at the corridor. While ventilation conditions, lighting condition and sanitary provision for staff offices in the three faculties in the three universities were adequate with respect to NUC learning facilities standards.

Further, the conditions of furniture in all the class rooms in federal and state universities were observed to be inadequate for students learning. Though the sanitary provision recommended for classroom by NUC were found in all the universities. However, the hours at which students have access to the facility in federal and state universities were restricted to only working hours. Also, the sizes of classroom were found to be inadequate for the students' population while the number of projectors and writing boards were also not adequate. With the tremendous increase in students' enrolment in tertiary institutions, one would have expected government authorities in the country to match the large numbers of students with appropriate and adequate facilities. As this problem of poor learning environment has lingered for a long time in Nigerian universities, there is need for study on strategies for provision of standards facilities for effective students learning so that the quality and standards of education in Nigeria will not be compromised (Fabiyi and Uzoka 2011).

Further, the number of laboratories/size in federal and state universities covered fairly meet NUC standards requirement of laboratory facilities, while that of private university was adequate. The library facility in the three selected universities meet NUC standard requirements except acoustic condition of one of the universities (federal). This is likely due to the fact that the faculties libraries that were observed to be close to the classrooms. One of the universities (state) did not have faculty libraries but the university has a general library which was newly constructed by the institution and is being used as a general library by all the three faculties. It should be noted that NUC BMAS (2012) specifies that each faculty in a tertiary institution should be provided with fully equipped library and information technology centre with computers and Internet connectivity and quick reference books, periodicals, journals and audio-visual materials. Based on the survey exercise conducted in the three selected universities in Nigeria, it can be said that with the exception of private university, the level of compliance of Nigerian universities with NUC learning facilities requirements is very poor. The is similar to the study of Ainon & Bharu (2012) where 86.5% of the respondents agreed that there was shortage of conducive staff offices for academic staff and shortage of instructional materials for teaching.

4.3. The Factors that Inhibit Nigerian Universities to Fully Comply with NUC Standard

From the interview conducted, all the participants emphasized that the remarkable increase in the number of students in Nigerian public universities that have led to over crowdedness and overstretched carrying capacity coupled with the global economic recession that has led to inadequate support in term of fund by the government are the major factors that hinder many of the Nigerian universities to fully comply with NUC

recommended standards on learning facilities. Some of the participants of the interview also argued that lack of government agencies that will monitor the little fund given out by government to public universities, scheduled/inadequate visitations by NUC or it representative, lack of or inadequate enforcement by NUC and poor or rough handling of the available facilities by staff and students in the public universities are other challenges that need to be overcome in Nigerian university system for provision of effective/standards students learning facilities.

4.4. The Effects of Low Standard Facilities on Student Academic Performance

In the questionnaire study, all the respondents agreed that there are low standard facilities in Nigerian public universities in comparison with the private ones The respondents were of the view that the low standard facilities affect the students' academic performance. ANOVA analysis was carried out on the data obtained on the impacts of the available facilities on the academic performance of the students. ANOVA analysis was carried so as to validate the view of the respondents on the effect of low standard facilities on the academic performance of the students in the three study universities (Table 6). In the ranking of the variables, Cronbach's Alpha coefficient ranges from 0.867 to 0.93 were obtained in all the case study universities. These are greater than the minimum recommendation of 0.60 by Agresti and Franklin (2007). Therefore, the data obtained in all the case studies are reliable. Thus, the test result suggests that respondents were more consistent both internally and externally (Croasmun and Ostrom, 2011; Tadesse & Maeregu, 2014).

Table 5: Over all relative importance index and ranking of the effects of low standards learning facilities on student academic performance

Facilities	Wf	RII	Ranking
Constant electricity supply within the school premises	1052	0.914	1st
Access to Information Communication Technology	1019	0.886	2nd
Lecture room/Class room	1007	0.876	3rd
Staff offices	987	0.841	7th
Laboratory facilities such as laboratory equipment and lighting	986	0.858	4th
Recreational facility such as constant water supply	978	0.850	5th
Public address system	961	0.848	6th
Adequate library facilities	947	0.824	8th
Health care facilities such as clinic, sick bay, drugs and first aid box	944	0.820	9th
Access to toilet facilities within the school premises	940	0.718	10th
Security within the school premises	906	0.688	11th
Interactive white board	879	0.587	12th
Projector	854	0.582	13th
Sport facilities such as football field and volleyball court	849	0.538	14th
School cafeteria	742	0.546	15th

Based on the RII values, 11 learning facilities were identified from the three universities to have significant effects on students' academic performance as their RII are above 0.6 (Digital Bridge Institute (DBI), 2018). The discovered learning facilities were used to run an ANOVA analysis (Table 6). In the analysis, the various learning facilities served as the independent variables while a student Sessional CGPA was the dependent variable. The outcomes of the ANOVA analysis indicate that the F-value is 6.974 and the p-value is 0.000 (P-value) at a 0.05 level of significance. This implies that all the 11 learning facilities have noteworthy effects on students' academic performance.

Table 6: ANOVA analysis of the significance of learning facilities on students' academic performance

Model		Sum of squares	Df	Mean square	F	Sig.
1	Regression	0.523	1	0.497	6.974	0.000
Residual		1.457	11	0.687		
Total		1.879	14			

The ANOVA result also show that there is a statistically significant relationship between the facilities and the students' academic performance in the three study universities. This also infers that the level of students' academic performance is greatly impacted by the availability or non-availability of standard learning facilities. Therefore, the assumption that certain learning facilities such as constant electricity/water supply, 24 hours internet and adequate laboratory facilities may have more significant impacts on students' academic performance than other facilities such as sport facilities, projector and school cafeteria should be accepted in this study. This finding is consistent with the results of some other researchers in the field of facilities management. Therefore, if the standards of the available facilities in a university are low or if the facilities are poorly maintained over the years, the performance of the students will be negatively affected and 'verse vasa'.

4.5. The Facilities that Contribute Best to Students' Academic Performance

Results in Table 7 indicate that in all the three universities, electricity supply, access to ICT, lecture rooms, staff offices, hostel and library facilities are among the top ranked facilities that contribute best to the students' academic performance, Also, rank low in the universities are facilities such as projector, interactive white board, sport facilities and recreational facilities.

The outcomes of the analysis also show that students from the various universities have varying opinions to the facilities that contribute best to their academic performance. However, there exist similarities between the three universities. The respondents in the three universities agreed that stable electricity supply is the number one factor that contributes best to their academic performance followed by ICT. Similarly, respondents in all the case study institutions perceived those recreational facilities are insignificant regarding the factors that contribute to students' academic performance. Hence, students in all the three institutions ranked electricity and ICT facilities very high, reflecting the usefulness of power supply and 24 hours internet for research purposes which help in enhancing students' achievements. This links well with the high ranking of the learning resource centre where ICT facilities can be accessed and books and journals sourced in "hard" copy or electronic copy. The availability of these facilities implies an increase in the level of students' academic performance and vice versa. Recreational facilities, interactive white board, sport facilities and projector ranked low among the facilities. The implication

of this is that the availability or non-availability of these facilities will not necessarily affect or have substantial impact on the level of the students' academic performances and with the problem of inadequate fund, little attention should be placed on such facilities by federal or state government while procuring for learning facilities. Priority should be based on other facilities such as constant electricity, 24 hours internet, conducive staff offices, well equipped laboratory and school/faculty libraries.

Table 7: Over all relative importance index and ranking of the best facilities on students' academic performance (universities A, B and C)

Facilities	Wf	RII	Rank
Constant electricity supply	1052	0.914	1st
Access to Information Communication Technology	1019	0.886	2nd
Lecture room/Class room	1007	0.876	3rd
Staff offices	987	0.858	4th
Laboratory facilities such as laboratory equipment and lighting Hostel facilities such as power supply, efficient internet	986	0.858	4th
Facility, cafeteria, recreational facility, constant water supply and wardrobe	978	0.850	6th
Public address system	961	0.836	7th
Library facilities such as furniture, internet facilities, ventilation, lighting and textbook	947	0.824	8th
Health facilities such as clinic, sick bay, drugs and first aid box	944	0.820	9th
Access to toilet facilities	940	0.818	10th
Security within the school premises	932	0.810	11th
Interactive white board	771	0.588	12th
Projector	761	0.582	13th
Sport facilities such as football field, volleyball court	754	0.538	14th
Recreational facilities	742	0.546	15th

4.6. Strategies for Effective Implementation of Standard Facilities in Nigerian Universities

The opinions of the participants (NUC staff in physical facilities unit, Abuja, Nigeria) of the interview study with respect to strategies that can be adopted to implement standards facilities specifically constant power supply, 24 hours internet, conducive staff offices and well equipped laboratory/library in Nigerian public universities are abridged in Table 8.

Table 8: Strategies that can be used to implement standards facilities in Nigerian public universities

Categories	Sub-categories	Frequency	%	Response
Awareness	Proper utilization	1	11.11	Universities should periodically organize massive enlightenment campaigns and educate the students and staff on proper utilization of the available resources
Sector	Private driven	1	11.11	Institutions should be private driven and oriented such that government will have no business equipping facilities in the universities
Facilities Management	Outsourcing	2	22.22	Outsourcing of facilities management practices should be encouraged in Nigeria public universities
Funding		1	11.11	Adequate funding should be made available in Nigerian public universities and government should create agency that will monitor the funds for effective procurement of standard learning facilities. Facilities management fund could also be generated through NGO. For this opinion to be effective, public universities must be a research driven institutes (universities and industrial collaboration)
Regulation		4	44.44	Unscheduled and periodic visits should be conducted by NUC to all Nigerian universities and any university that is not up to standard regarding learning facilities should be penalized immediately. This will make all the institutions to always be on their toes. Further, like other agencies such as BMAS, the NUC and professional bodies that conduct accreditation exercise should adopt a minimum requirement for standard facilities. Any institution found wanting should also be reprimanded or fined. In other words, a single framework or template in line with the master plan for standard facilities can be proposed by NUC and regulatory professional bodies

Source: Field survey

5. CONCLUSION AND RECOMMENDATIONS

In Nigeria, the NUC plays a major role in ensuring that facilities in Nigerian universities meet some minimum standards as prescribed in the Benchmark Minimum Academic Standards (BMAS) and National University Commission Procedural Guide, documents against which facilities are assessed. It appears that efforts aimed at improving the quality of facilities in the universities, particularly the public ones have not yielded tangible results. As rightly observed from the study public higher institutions in Nigeria are still confronted with inadequate facilities. This inadequacy of facilities in public Universities in Nigerian has effects on students' academic performance. Also, the studies concludes that electricity supply and ICT are the major facilities that contribute best to students' academic performance. Such facilities and the others can be implemented through massive enlightenment campaigns/education of students and staff on proper utilization of the available resources, procurement and maintenance of learning facilities in universities by private organization and unscheduled/periodic visitations to the universities by NUC. Based on the findings of this study, the recommendations were put forward:

1. Development of institutional facilities that is in compliance with NUC requirement is urgently needed. This can be achieved by prioritizing the fund from government to provide facilities such as stable electricity and ICT that contributes best to students' academic performance.

2. Public institutions should come up with an idea that can generate revenue internally to equip universities in term of learning facilities.

3. Accreditation committees should be constituted in the universities to assess the condition of available facilities periodically/unexpectedly and to suggest to the management means the facilities can be regularly improved.

6. LIMITATION OF THE STUDY

It is essential to note that students from any university with adequate learning facilities will perform better than those with inadequate learning facilities. However, many universities in Nigeria specifically the state and federal established ones are still operating with inadequate or low standards learning facilities over the years due to lack of strategies that can be used to effectively implement such facilities in the institutions. Nevertheless, this study investigated the underlying learning facilities that contribute best to students' academic performance and proposed for the strategies that can be used to implement such facilities in government institutions. Hence, the study would improve the performance of students in Nigerian universities which will consequently increase the number of competent graduates (skilled labours) in the global production and manufacturing industries. The study was limited to universities in the north central region of Nigeria and can be tested in other regions of the country.

REFERENCES

Abdullahi, I. &Yusoff, Z. W. (2018). Effect of the performance of physical and non-Physical facilities on higher institutional facilities. *Journal of Facilities Management,* 1-13.

Akomolafe, C. O., & Adesua, V. O. (2016). The Impact of Physical Facilities on Students' Level of Motivation and Academic Performance in Senior Secondary Learnings in South West Nigeria. *Journal of Education and Practice, 7*(4), 38-42.

Anifowose, M. O., & Lawal, P. O. (2013). State of physical facilities in Nigerian tertiary educational institutions: case study of the Federal University of technology, Minna, Niger state Nigeria. *Nigerian Journal of Technological Research*, *8*(1), 56-60.

Anosike, M., David, O., Peter, A., Olufemi, B., & Olusoji, M. (2018). Appraisal of the state of Health of Residential Building Facilities In a Private University In Nigeria. *International Journal of Engineering Technologies and Management Research*, *5*(4), 153-167.

Augustine, M. K., Jeremiah M. K. and Edward, K. T. (2016). Quality of Academic Resources and Students' Satisfaction in Public Universities in Kenya. *Middle Eastern & African Journal of Educational Research*, 11, 17-21.

Creswell, J. (2008). Educational research: Planning, conducting, and evaluating quantitative and qualitative research (3rd ed.). Upper Saddle River, NJ: Pearson Education.

Croasmun J. T., & Ostrom. L. (2011). Using Likert-Type Scales in the Social Sciences *Journal of Adult Education*, 40(1), 456-460.

Dike, N., and Salisu, H. (2015). Inadequate Laboratory Facilities and Utilization: Pedagogical Hindrance to Students' Academic Performance in Biology in Senior Secondary Certificate Examination in Zaria Metropolis, Kaduna State, Nigeria. *International Business Research*, 8(1), 9.

Doloi, H., Sawhney, A., Iyer, K.C. & Rentala, S. (2012). "Analysing factors affecting delays in Indian construction projects", *International Journal of Project Management*, 30(4), 479-489.

Ekundayo, H. T. (2012). Learning facilities as correlates of students' achievement in the affective and psychomotor domains of learning. *European scientific journal*, *8*(6), 208-215.

Erum, S., & Ahmad, Z. (2011). A study on academic performance of university students. *Recent Advances in Statistics*, 255(1), 27-31.

Fabiyi, A., & Uzoka, N. (2009). State of physical facilities in Nigerian universities: Implication for repositioning tertiary institutions for global competition. *Proceedings of Towards Quality in African Higher Education. Higher Education Research and Policy Network (HERPNET)*, 180-187.

Fuertes, G., Alfaro, M., Vargas, M., Gutierrez, S., Ternero, R., & Sabattin, J. (2020). Conceptual Framework for the Strategic Management: A Literature Review—Descriptive. *Journal of Engineering*, 2(3), 171-192.

Glen, I. E. (2012). *Learning Facility Conditions and Student Academic Achievement.* Virginia Polytechnic Institute.

Issah, E., Abubakari, A. R., & Wuptiga, J. (2016). State of academic facilities and its influence on teachers job stress in Tamale polytechnic. *African Journal of Business Management,10* (2), 24-31.

Krippendorff, K., 2012. *Content analysis: an introduction to its methodology*. London: Sage.

National University Commission (2012). *Procedural Guide and Physical development Manual for the University system in Nigeria*, Third edition.

Okafor, B. N. & Onuoha, D. C. (2016). Facility Management in Educational Institutions: A Study of Nnamdi Azkiwe University Awka. *International Journal of Interdisciplinary Research Method*, 2(2), 14-27.

Oluwunmi, A. O., Durodola, O. D., & Ajayi, A. C. (2015). Comparative Analysis of Students' Satisfaction with Classroom Facilities in Nigerian Private Universities. *Journal of Studies in Education*, *5*(4), 242-257.

Onwuegbuzie, A. J., & Johnson, R. B. (2006). The validity issue in mixed research. *Research in the Learnings*, *13*(1), 48-63.

Schwardt, L. (2007). *Efficient mixed-order hidden Markov model inference*, *Doctoral Dissertation*, University of Stellenbosch, South Africa.

Sekaran, U. (2003). Towards a guide for novice research on research methodology: Review and proposed methods. *Journal of Cases of Information Technology*, *8*(4), 24-35.

Tadesse, H. A. & Maeregu, B. A. (2014). The availability of learning facilities and their effects on the quality of education in government primary learnings of Harari Regional Stale and East Hararghe Zone, Ethiopia, Middle Eastern & African. *Journal of Educational Research*, 2(2), 11-59.

Uline, C. M, (2008). "The walls speak: the interplay of quality facilities, learning climate, and student achievement". *Journal of Educational Administration*, 46(1), 55-73.