

Infrastructural Development and Quality Assurance in Nigerian Higher Education

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Abstract

The infrastructural facilities and physical environment give educational institutions their appropriate shape and atmosphere for teaching and learning. These facilities and the environment also portray the quality of the institutions in terms of their staff/students friendliness, attraction to outsiders, aesthetics, healthy, safety, currency and relevance. The infrastructural development in higher education is complex and cost intensive. Thus to ensure their quality and maintain global standards is very challenging. The infrastructural development in higher education involves provision of buildings, classrooms, hostels, staff quarters, workshops, laboratories, ICT centers, libraries, health centers and sports facilities. Provision of stimulating learning environment and safety is also a major consideration in infrastructural development. Maintenance, renewal and innovation are other determinants of the quality of the infrastructural development effort of the institutions that will attract the students, staff and foreigners to the institutions. Environmental beautification and sanitation give the aesthetic impression that guarantees the serenity and good climate for teaching, learning and research activities, healthy and secured lives in the school and its communities. Using infrastructural development quality indicators checklist, this study aimed at assessing the level of quality and how staff and students friendly the facilities in the four institutions of higher learning in River State of Nigeria are. This was considered in terms of their availability, adequacy, relevance, student friendliness, staff friendliness, maintenance, renewal and innovation culture and global competitiveness and acceptability. The findings indicate that the level of the quality of infrastructural development in the higher institutions is low: the available facilities are not enough, not maintained and not safe, not clean, not student centered. Thus the quality assurance of these facilities is not guaranteed as they cannot match global standards if nothing urgent is done to improve the quality. Recommendations were made based on these and other findings.

Keywords: infrastructural development quality, physical facilities, environmental safety and sanitation, global acceptability of infrastructural facilities, maintenance culture, higher institutions

INTRODUCTION

Educational facilities are the physical infrastructures that contribute directly or remotely to the teaching and learning process in the educational system. The infrastructural facilities and physical environment give educational institutions their appropriate shape and atmosphere for teaching and learning. These facilities and the environment also portray the quality of the institutions in terms of their staff/students friendliness, attraction to outsiders, aesthetics, healthy, safety, currency and relevance (Okorie and Uche, 2004.). The infrastructural development in higher education is complex and cost intensive. Thus to ensure their quality and maintain global standards is very challenging. The infrastructural development in higher education involves provision of buildings, classrooms, hostels, staff quarters, workshops, laboratories, ICT centers, libraries, health centers and sports facilities. Provision of stimulating learning environment and safety is also a major consideration in infrastructural development. Maintenance, renewal

and innovation are other determinants of the quality of the infrastructural development effort of the institutions that will attract the students, staff and foreigners to the institutions. Environmental beautification and sanitation give the aesthetic impression that guarantees the serenity and conducive climate for teaching, learning and research activities, healthy and secured lives in the school and its communities. Quality assurance of these facilities right from their planning, to development and utilization will ensure effective realization of set goals and objectives in higher education institutions. This study tried to use the infrastructural development quality indicators administered to students to determine their opinion on the quality of the infrastructural facilities in their institutions. Physical observations were used to confirm or disregard these opinions.

Infrastructural Development Quality Indicators

Quality indicators of the infrastructures are those characteristics that the facilities must bear or possess to guarantee their attraction to users and ability to enhance utilization for the achievement of the predetermined goals for which they are being provided. Eneahwo (1999); Buffet, 1980 and McInrcmy, (1987) insist that the quality assurance of the institutional facilities can only be guaranteed if basic conditions and guidelines are followed from the on set. Basically this means that infrastructural development must make provision for adaptability or alteration probability, flexibility in user demands, accessibility to students, staff and society and due regards for aesthetic and clean environment (Enahwo, 1999; Stevenson, 1987). Sallies (2002) has developed a quality indicator checklist which shows what the physical environment and facilities in higher educational institutions must require both in qualitative and quantitative terms. These include availability of infrastructural development programmes (facility provision), adequacy of the facilities in terms of currency and relevance to purpose; students friendliness and centeredness of the infrastructural facilities (attractive to students and suitable for their needs); regular maintenance of the facilities and renewal of the dilapidated ones; the infrastructural development must be of international standard (global acceptable) to attract foreign students, staff and recognition; and must be environmentally safe and of high sanitary standard.

STATEMENT OF PROBLEM

Another equally important component for assuring the quality of higher education is the quality infrastructural development, apart from the teacher and students input. This is because the operations of staff and students will be worthless if adequate preparation is not made for relevant facilities, equipment and materials to be made available when they are needed by the users. Thus infrastructural facilities are the essential tools with which activities and operations of the institutions are carried out. This main focused of this study to on determine the existence of those qualities in the infrastructural development of the institutions under study. These include: availability, adequacy, student friendliness, maintenance culture, global accessibility and environmental safety and sanitation of the institutions.

PURPOSE OF STUDY

The purpose of this is to measure the quality of the infrastructural development in higher institutions by:

1. ascertaining the infrastructural development programmes (facility provision) available in the higher institutions
2. assessing the adequacy of the
3. determining how students centered and friendly the infrastructural facilities are

4. assessing the level of maintenance culture in higher institutions
5. assessing the level of global acceptability of the infrastructural development in the higher institutions
6. examining the environmental safety and sanitation of the higher institutions

RESEARCH QUESTIONS

1. What are the infrastructural development programmes existing in the institutions
2. How adequate are the infrastructural development in Higher Education?
3. How student centered/friendly are the infrastructural facilities?
4. What are the types of maintenance practices in higher education?
5. What is the level of global acceptability of infrastructural development in higher education?
6. How environmentally safe are the Higher Education institutions?

Hypothesis

1. There is no significant difference btw male and female students in their opinion about the adequacy of infrastructures
2. There is no significant difference between male and female students in their opinion about student friendliness of infrastructural facilities
3. There is no significant difference between male and female students in their opinion about the level of global acceptability of infrastructural development.
4. There is no significant difference between male and female students in their opinion about the environmental safety of higher education institutions.

METHODOLOGY

This is a descriptive survey designed to collect data from students opinions to measure the quality of infrastructural development in four institutions of higher learning in Rivers States of Nigeria. Two thousand from 4000 final year students were randomly selected for the study (1140 males and 860 females). Final year students were used because they have been in school long enough to possess enough experience about the environment and therefore had adequate experience to respond intelligently to the checklist. The results are presented in the tables according to the order of the research questions and hypotheses. Infrastructural development indicators' checklist and questionnaire Infrastructural Development Quality Questionnaire (IDQQ) were the instruments used for data collection. IDQQ contains 30 items based on the infrastructural development quality indicators' checklist addressing the research questions. Research Question 1 addresses the infrastructural development programmes (facilities) available as contained in items 1 to 7; items 8 to 11 supplied answers to research question 2 (adequacy of infrastructural development); research question 3 (student-centeredness of the infrastructural

development) was address with items 12 to 15; items 16 to 20 focused on research question 4 (the level of maintenance culture in the institutions); items 21 to 26 answered research question 5 (global acceptability of the facilities) while items 27 to 30 addressed research question 6 (environmental safety and sanitation of the institutions). The expected mean

of 2.50 assigned to the grade for agree or disagree was used. Any grade of 2.50 and above was taken to agree with the point while below 2.50 was disagree. Statistical tools such as mean scores were used to answer the research questions and t-test was used to test the hypotheses at 0.05 alpha levels

RESULTS AND DISCUSSION

Research Question 1

What are the infrastructures development programmes in higher education institutions?

Table 1: Mean Scores Analysis on the Available Infrastructures in Higher Education Institutions

S/N	Available Infrastructures in Higher Education	Male Students			Female Students		
		N	\bar{X}	Remark	N	\bar{X}	Remark
1	Building of Classrooms and other multipurpose houses	1140	3.06	Agreed	860	3.04	Agreed
2	Provision Libraries and library resources	1140	2.89	Agreed	860	2.75	Agreed
3	Provision of Classroom furniture	1140	1.50	Disagreed	860	2.11	Disagreed
4	Provision of students hostels and staff residential quarters	1140	1.94	Disagreed	860	2.37	Disagreed
5	Provision of Light and Power Generation	1140	2.75	Agreed	860	1.89	Disagreed
6	Provision of ICT centers and facilities	1140	1.75	Disagreed	860	2.22	Disagreed
7	Provision of Visual and other learning aids	1140	2.86	Agreed	860	2.72	Agreed
	Aggregate mean		2.39			2.44	

(Source: Authors Survey, 2000)

Table 1 shows the mean scores on the available infrastructures in higher education institutions. Male students agree on items 1, 2, 5 and 7 with high mean scores of 3.06, 2.89, 2.75, and 2.86 accordingly. They disagree on items 3, 4 and 6 with low mean scores of 1.50, 1.94 and 1.75 accordingly. Female students agree on items 1, 2 and 7 with high mean scores of 3.04, 2.75 and 2.72 respectively; they disagree on

items 3, 4, 5, and 6 with low mean scores of 2.11, 2.37, 1.89, and 2.22 respectively.

The aggregate mean scores of 2.39 for male students and 2.44 for female students are less than the criterion mean of 2.5. Therefore, there are no available infrastructures in High education institutions. Only buildings/ classrooms, libraries and visual learning aids are agreed by the students to be available, though without furniture

Research Question 2

How adequate are the infrastructural development in Higher Education?

Table 2: Mean Scores Analysis on the Adequacy of Infrastructural Development in Higher Education Institutions

S/N	Adequacy of Infrastructures Development	Male Students			Female Students		
		N	\bar{X}	Remark	N	\bar{X}	Remark
8	Infrastructural development is not student centered	1140	3.33	Agreed	860	3.18	Agreed
9	Library materials are obsolete	1140	3.46	Agreed	860	3.24	Agreed
10	ICT resources do not benefit students	1140	2.46	Disagreed	860	2.65	Disagreed
11	The computers are not adequate	1140	3.22	Agreed	860	3.51	Disagreed
	Aggregate mean		3.12			3.15	

(Source: Fieldwork, 2000)

Table2 shows the mean scores on the adequacy of infrastructures in higher education institutions. Male

students agree on items 8, 9 and 11 with high mean scores of 3.33, 3.46, and 3.22 accordingly. They disagree on item 10 with low mean score of 2.46. Female students agree on items 8, 9, 10 and 11 with

high mean scores of 3.18, 3.24, 2.65 and 3.51 respectively. The aggregate mean scores of 3.12 for male students and 3.15 for female students are greater than the criterion mean of 2.5. Therefore, it is agreed

that infrastructural development is not student centered, library materials are obsolete, computers are not adequate and ICT resources do not benefit students.

Research Question 3

How student centered/friendly are the infrastructural facilities?

Table 3: Mean Scores Analysis on the Student Centeredness/Friendliness of Infrastructural Facilities.

S/N	Student Centeredness/ Friendliness of Infrastructural Facilities	Male Students			Female Students		
		N	\bar{X}	Remark	N	\bar{X}	Remark
12	Facilities support students safety	1140	2.56	Agreed	860	2.76	Agreed
13	Facilities are student friendly	1140	2.78	Agreed	860	2.41	Disagreed
14	Facilities are staff friendly	1140	2.94	Agreed	860	2.98	Agreed
15	Facilities are relevant to their course of studies	1140	2.61	Agreed	860	2.58	Agreed
	Aggregate mean		2.72			2.68	

(Source: Fieldwork, 2000)

Table 3 shows the mean scores on the student centeredness/friendliness of infrastructural facilities in higher education institutions. Male students agree on items 12 -15 with high mean scores of 2.56, 2.78, 2.94 and 2.61 accordingly. Female students agree on items 12, 14 and 15 with high mean scores of 2.76,

2.98, and 2.58 respectively; they disagree on item 13 with mean score of 2.41.

The aggregate mean scores of 2.72 for male students and 2.68 for female students are greater than the criterion mean of 2.5. Therefore, it is agreed that the available few infrastructural facilities in higher education are friendly to students and staff, relevant to their course of study and support students' safety.

Research Question 4

What is the types of maintenance culture in higher education?

Table 4: Mean Scores Analysis on the Types of Maintenance Practices in Higher Education

S/N	level of maintenance culture in higher education	Male Students			Female Students		
		N	\bar{X}	Remark	N	\bar{X}	Remark
16	Renovation	1140	2.21	Disagreed	860	2.23	Disagreed
17	Rehabilitation	1140	2.11	Disagreed	860	2.41	Disagreed
18	Facilities are regularly monitored for maintenance	1140	2.32	Disagreed	860	2.07	Disagreed
19	Replacement	1140	2.14	Disagreed	860	2.05	Disagreed
20	Regular supervision and inspection of materials	1140	1.89	Disagreed		2.19	Disagreed
	Aggregate mean		2.14			2.19	

(Source: Fieldwork, 2000)

Table 4 shows the mean scores on the level of maintenance culture in higher education. Male students disagree on items 16 -20 with low mean scores of 2.21, 2.11, 2.32, 2.14 and 1.89 accordingly. Female students also disagree on items 16-20 with low mean scores of 2.23, 2.41, 2.07, 2.05 and 2.19 respectively.

The aggregate mean scores of 2.14 for male students and 2.19 for female students are less than the criterion mean of 2.5. Therefore, it is agreed that the level of maintenance culture is low: facilities are not regularly monitored for maintenance, no rehabilitation, no renovation, no replacement and no regular supervision and inspection of materials.

Research Question 5

What is the level of global acceptability of infrastructural development in higher education?

Table 5: Mean Scores Analysis on the Level of Global Acceptability of Infrastructural Development in Higher Education

S/N	Level of Global Acceptability of Infrastructural Development	Male Students			Female Students		
		N	\bar{X}	Remark	N	\bar{X}	Remark
21	Facilities are available	1140	1.89	Disagreed	860	2.00	Disagreed
22	Facilities are adequate	1140	1.52	Disagreed	860	1.71	Disagreed
23	Facilities are relevant	1140	2.32	Disagreed	860	2.11	Disagreed
24	Facilities are staff friendly	1140	2.78	Agreed	860	2.98	Agreed
25	Facilities are student friendly	1140	2.75	Agreed	860	2.41	Disagreed
26	Facilities have global standard	1140	1.06	Disagreed	860	1.37	Disagreed
	Aggregate mean		2.05			2.10	

(Source: Fieldwork, 2000)

Table 5 shows the mean scores on the level of global acceptability of infrastructural development in higher education. Male students agree on items 24 and 25 with high mean scores of 2.78, and 2.75 accordingly: they disagree on items 21, 22, 23, and 26 with low mean scores of 1.89, 1.52, 2.32 and 1.06 respectively. Female students only agree on item 24 with mean score of 2.98: they disagree on items 21, 22, 23, 25

and 26 with low mean scores of 2.00, 1.71, 2.11, 2.41 and 1.37 respectively.

The aggregate mean scores of 2.05 for male students and 2.10 for female students are less than the criterion mean of 2.5. Therefore, it is agreed that the level of global acceptability of infrastructural development in higher education is low: facilities are not available, available ones are not adequate and relevant and therefore, do not meet global standard.

Research Question 6

How environmentally safe are the Higher Education institutions?

Table 6: Mean Scores Analysis on the Environmental Safety of Higher Education Institutions

S/N	Environmental Safety of higher Education Institutions	Male Students			Female Students		
		N	\bar{X}	Remark	N	\bar{X}	Remark
27	Environment is clean	1140	2.32	Disagreed	860	2.23	Disagreed
28	Trees and flowers are planted to boost the environmental health and safety	1140	3.26	Agreed	860	2.98	Agreed
29	No hazard is found in the school environment	1140	2.12	Disagreed	860	2.07	Disagreed
30	Level of hygiene and environmental sanitation is high	1140	2.11	Disagreed	860	2.05	Disagreed
	Aggregate mean		2.45			2.41	

(Source: Fieldwork, 2000)

Table 6 shows the mean scores on the Environmental Safety of higher Education Institutions. Male and female students agree on item 28 with high mean scores of 3.26 and 2.98 respectively. The male students disagree on items 27, 29 and 30 with mean scores of 2.32, 2.12 and 2.11 accordingly. Female students also disagree on items 27, 29 and 30 with low mean scores of 2.23, 2.07 and 2.05 respectively.

The aggregate mean scores of 2.45 for male students and 2.41 for female students are less than the criterion mean of 2.5. Therefore, it is agreed that environmental safety of higher education institutions is low.

Hypothesis 1

There is no significant difference btw male and female students in their opinion about the adequacy of infrastructures

Table 7: Mean Difference between male and female students in their opinion about the adequacy of infrastructures

Sex	N	\bar{X}	Δ	S.E.M	p-value	Critical value	T-calculate	Remarks
Male	1140	3.12	1.59	0.071	0.05	2.00	0.42	Accepted
Female	860	3.15	1.58					

Table 7 shows the mean score difference between btw male and female students in their opinion about the adequacy of infrastructures. The result shows that there is no significant difference between the mean score of male and female students in their opinion about the adequacy of infrastructures. This is

Hypothesis 2

There is no significant difference between male and female students in their opinion about student friendliness of infrastructural facilities

evidenced from the fact that the t-calculated value of 0.42 is less than the t-tabulated value of 2.00 at 0.05 significant level. Hence, the null hypothesis is accepted. Therefore, there is no significant difference between male and female students in their opinion about the adequacy of infrastructures.

Table 8: Mean Difference between btw male and female students in their opinion about student friendliness of infrastructural facilities

Sex	N	\bar{X}	Δ	S.E.M	p-value	Critical value	T-calculate	Remarks
Male	1140	2.72	1.44	0.065	0.05	2.00	0.62	Accepted
Female	860	2.68	1.45					

Table 8 shows the mean score difference between btw male and female students in their opinion about student friendliness of infrastructural facilities. The result shows that there is no significant difference between the mean score of male and female students in their opinion about student friendliness of infrastructural facilities. This is evidenced from the

Hypothesis 3

There is no significant difference between male and female students in their opinion about the level of global acceptability of infrastructural development.

fact that the t-calculated value of 0.62 is less than the t-tabulated value of 2.00 at 0.05 significant level. Hence, the null hypothesis is accepted. Therefore, there is no significant difference between male and female students in their opinion about student friendliness of infrastructural facilities.

Table 9: Mean Difference between btw male and female students in their opinion about the level of global acceptability of infrastructural development

Sex	N	\bar{X}	Δ	S.E.M	p-value	Critical value	T-calculate	Remarks
Male	1140	2.05	1.77	0.079	0.05	2.00	0.38	Accepted
Female	860	2.10	1.75					

Table 9 shows the mean score difference between btw male and female students in their opinion about the level of global acceptability of infrastructural development. The result shows that there is no significant difference between the mean score of male and female students in their opinion about the level of global acceptability of infrastructural development.

Hypothesis 4

There is no significant difference between male and female students in their opinion about the environmental safety of higher education institutions.

This is evidenced from the fact that the t-calculated value of 0.38 is less than the t-tabulated value of 2.00 at 0.05 significant level. Hence, the null hypothesis is accepted. Therefore, there is no significant difference between male and female students in their opinion the level of global acceptability of infrastructural development.

Table 10: Mean Difference between btw male and female students in their opinion about the environmental safety of higher education institutions

Sex	N	\bar{X}	Δ	S.E.M	p-value	Critical value	T-calculate	Remarks
Male	1140	2.45	1.46	0.066	0.05	2.00	1.67	Accepted
Female	860	2.41	1.48					

Table 10 shows the mean score difference between btw male and female students in their opinion about the environmental safety of higher education institutions. The result shows that there is no significant difference between the mean score of male and female students in their opinion about the environmental safety of higher education institutions. This is evidenced from the fact that the t-calculated value of 1.67 is less than the t-tabulated value of 2.00 at 0.05 significant level. Hence, the null hypothesis is

accepted. Therefore, there is no significant difference between male and female students in their opinion the environmental safety of higher education institutions.

SUMMARY OF FINDINGS

1. Infrastructural development programmes (facilities provisions) are not available especially classroom furniture, students hostels, and information and communication technology (ICT) facilities

2. Infrastructural development is not adequate because it is not student centered, library materials are obsolete, computers are not enough and ICT resources do not benefit students.

3. The level of students centeredness of the available infrastructural facilities is low

4. The level of maintenance culture is low: facilities are not regularly monitored for maintenance, no rehabilitation, no renovation, no replacement and no regular supervision and inspection of materials.

5. Level of global acceptability of infrastructural development in higher institutions under study is low: facilities are not available, available ones are not adequate and maintained and therefore, do not meet global standard.

6. The level of environmental safety and sanitation of higher education institutions is low. Generally, the quality of infrastructural development is low and so cannot guarantee the quality assurance of the institutions

7. All the four null hypotheses tested were accepted. Therefore, no significant difference between male and female students existed in their opinions about the adequacy of infrastructures, students' friendliness, global acceptability and environmental safety of the infrastructural facilities in their institutions.

DISCUSSION OF FINDINGS

The overall findings of this study show that the quality of the infrastructural development in higher institutions in the area under study is low. The facilities available are not adequate in terms of quantity and quality. For instance the ICT facilities such as computers are not enough for students. This is not acceptable in this era of globalization and internet usage. The physical observation made in the institutions confirmed these results as most of the facilities are dilapidated and in very poor condition that suggests lack of maintenance for a long time. The few edifices springing up either house the administrative activities or belong to banks and other firms existing in the campus. The general outlook of the environment depicts a poor sanitation and safety practice. It is therefore not surprising that both male and female students agree that the infrastructures are not below global standards. The findings in this study are in agreement with Uche, 2007; Amasuomo, 1999; Damme, 2001; Enaohwo, 1990 and other researchers who have repeatedly pointed out that the infrastructural development priorities in the higher institutions need refocusing to match global standards and acceptability to put the institutions in a better position to face the challenges of global competitive.

Conclusion and Implication for Quality Assurance in Higher Institutions of Learning

Quality assurance proponents emphasize the achievement of zero error situation by ensuring that the organization lays down exactly how production

should be carried out and the standards that should be maintained from the conception of the organization. Infrastructural development and physical environment of the institutions are also significant in the quality assurance of the higher institutions. If the quality of the facilities is low as indicated from the findings of the study, then the quality of the staff and students who need them to work for the achievement of effective teaching and learning that will produce quality outcome will also be in doubt.

RECOMMENDATIONS

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

1. There is need to get the political will power and support for higher education especially in funding to massively embark on infrastructural development that will measure the global standards. More classroom furniture, hostels and other facilities that benefits students directly are urgently needed
2. Development of institutional environment that is safe, clean and conducive to give students a sense of belonging, pride and beauty is urgently needed
3. Developing a high level of maintenance culture
4. Improving the facilities to be more student centered
5. Providing enough computers and other ICT resources for the students and staff
6. In controlling allocation and utilization of resources, the institutional administrators should ensure that due process is maintained in utilizing the benefits accruing from development partners especially as it concerns environmental hygiene and safety
7. Promoting an institutional culture of quality and sincere self-analysis to guide both planners, implementers and users of infrastructural development programmes in higher institutions
8. The quality of the infrastructural facilities must be improved for quality assurance of the higher institutions.

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