

Science Education Status and Challenges in A Tertiary Institution, Port Harcourt

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Article History	Abstract
Original Research Article	<p><i>This research focused on Science Education status and challenges in a tertiary institution, Port Harcourt. The study determined prevailing Science Education status, identified challenges against adequate Science Education facilities, evaluated any prevention and control measures to checkmate the challenges facing Science Education services and endeavoured to compare past and present perceived Science Education status in the tertiary Education institution. A descriptive research design was adopted. The population for the study was 869 and a sample size of 383 drawn out as its 44.07%. The major instrument for data collection was a well-structured and validated questionnaire with reliability index of 0.99. Observation with checklist was an added instrument for primary data collection. A multi-stage sampling procedure was applied in this study. The data obtained were tallied, summarized, coded and presented in frequency Tables and analysed using percentage. Findings on current Science Education status included deteriorating state of students' hostels (82.40%), delayed removal of heaped refuse (78.67%), prolonged blockage of drainage channels (76.80%), crowded office accommodation for staff (84.53%), worsening state of staff offices and class-rooms (79.73%), non-regular maintenance of offices and class-rooms, e.g. rare cleaning of the few functioning fans (80.27%), non-conductive offices and class-rooms especially due to unreliable electric power supply (91.47%), and irregular water supply to all parts of students' hostels and many staff offices (97.87%). The above findings pose a great challenge to optimum Science Education besides inadequate environmental sanitation exercises (95.20%), poor flood control (96.00%), little or no funding of the institution of learning by the authority concerned (76.27%) and inadequate government provision of modern equipment to the schools and demonstration clinic (85.07%). The study also revealed on-going control and prevention on issues militating against adequate Science Education services to comprise ensuring improved waste management (54.40%), opening alternative drainage channels (77.87%), maintaining good sanitary status of the operating public convenience (63.20%), engaging in regular grass cutting to avoid biological hazards (71.73%), and encouraging students' participation in Education care (69.87%). There was clear difference in Science Education status in the institution between 2015 and 2021, $p > 0.05$ with the former standard being high. Therefore, it was recommended that the management of the institution should regularly clear the main drainage channel linking it to larger gutter at its end, engage on constant surveying to discover water-logged areas and act accordingly, embark on quick removal of solid wastes, employ more qualified personnel at the demonstration clinic and vigorously pursue attracting funding to the institution along with providing improved Science Education services for its workers.</i></p> <p>Keywords: Science Education status, Science Education services, campus scenery, water-logged sites and flooding.</p>
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Introduction

Authorities in Science Education have averred that several challenges have contributed to the constraints faced by the public which has exerted negative impact on the Education of the people mostly in developing countries. According to Bibiye (2013), these challenges ranges from paucity of some basic public amenities like lack of appropriate waste receptacles, lack of effective and efficient pipe-borne water supply, non-serene environment, ineffective sanitation practices, poor lighting system, inadequate good roads, lack of sound regulated premises (food vendor, restaurants etc.), non-conducive staff offices among others. For example, Bibiye et al., (2021) maintained that in a typical city like Port Harcourt, solid waste is being seen scattered all over the city creating an aesthetic inhibition, encouraging fly and rodent infestation, odour nuisances etc. These conditions are prejudicial to Science Education according to Science Education Law Cap 106 of Rivers State as amended in 1999. Therefore, there is need for stern action both from government and corporate bodies to eliminate where necessary or reducing its effect. This, the government can achieve through the integration of the populace via sensitization, awareness campaign, and environmental education (Jonathan, 2019).

Most worrisome is the Science Education status of our tertiary institutions where people across all sector converges for the sake of knowledge. Learning environment means and include diverse physical locations, contexts, and cultures in which the students learn (Williams, 2014). Developing a particular course or programme in a college system goes beyond the physical institutional learning environment (lecture theatres, classrooms and laboratories) or the technologies used to create online personal learning environment. Learning environments are broader than just these physical components. According to Williams (2014), they include the characteristics of the learners, the goals for teaching and learning, the activities that will best support learning, the assessment strategies that will best measure and drive learning, and culture that infuses the learning environment. These challenges could influence the academic, Education and social life of the students including lecturers and the entire college community. However, in 1948 the World Education Organization (WHO) submitted that Education is not merely the absence of infirmities rather it takes into cognizance psychological, physical, social and mental well-being.

Science Education is the science and art of preventing disease, prolonging life, and improving the quality of life via an organized effort and informed choices of individual, community, society, organization, public and private (Haggett, 2015). The basis of Science Education is to improve the quality of life of the citizen at all times via the prevention and control of diseases among others. This is being carried out by way of surveillance, sensitization of the public, providing some basic facilities that are accessible and affordable to all etc. (Achal, 2012; Omodu, 2011). According to the American Centre for Disease Control and Prevention (CDC) (2015), a number of complementary activities including the construction and maintenance of sanitary infrastructure, the provision of social services, public education, community and individual action, regulation and legislation of man's activities in the environments is needed for the promotion of human Education. Science Education services embrace this view of CDC (2015) along with provision of functional Education care, conducive staff offices and good, desiring lecture halls/rooms that are well-lighted with proper ventilation and functioning fans/alternating current (AC) cooling system for usage in hot weather. These should regularly be adequately maintained.

Poor environmental sanitation due most probably to paucity of waste management infrastructure, and poor regulated premises (unscreened eatery, public convenience, etc.) are rampant in the campuses of most Nigeria higher institutions of learning. This may have contributed to the increase and the incessant flooding and the murkiness of some parts of the campuses, inhibition of aesthetic beauty, fly infestation sometimes noticed therein. For example, there could be observed grubbiness around the hostels, epileptic power supply, inconsistent water supply, over grown shrubs in proximal relation to the hostel, bad roads, incessant flooding, poor toilet facilities in the hostel etc. The human behaviour for homogeneous compliance to the rules and regulation as enshrined in the Science Education Law Cap 106 has become another phase of problem. Those saddled with the responsibility of enforcement may have also compromised in no little measure which may have precipitated to the dearth of the system and thereby increasing the untold impact on the populace. Good evidence are the COVID-19 pandemic, Ebola disease and cholera, as well as the respective prevention strategies (Elechi & Offiah, 2021). The question is how well have we provided the needed facilities (e.g., face mask, hand sanitizer etc.) and how well have we judiciously utilized these facilities if provided within and among the students and staff community? Many diseases are preventable through simple, nonmedical and non-

pharmaceutical methods. For example, the simple act of hand washing with soap can prevent the spread of many contagious diseases in the school. In other cases, treating a disease or controlling a pathogen can be vital to preventing its spread to others, either during an outbreak of infectious disease or through contamination of food or water supplies.

Science Education and its services play an important role in disease prevention efforts in any institutions where basic Science Education facilities are being provided and are effectively utilized. Hari (2011) maintained that Science Education knowledge and services in an institution aim to prevent the diseases rather than treating them. Science Education enhances the good behavioural attitudes in the public and other allied importance (Hotez et al., 2014; Cosmacini, 2015; True, 2020). In an academic institution such as Rivers State College of Education Science and Management Technology, there have been observed Science Education challenges to include incidents of rushing ill-students out at night for emergency medical attention, pile of refuse at dump site, inadequate staff offices, flooding, irregular water supply among others. There is need to find out more of these challenges and to recommend possible solution thereto. It is against this backdrop that the researchers' resolve to look at the Science Education status and its challenges in Rivers State College of Education Science and Management Technology in 2021 becomes inevitable.

Specific objectives

The following specific objectives were set to help achieve the aim of this study. These are to:

1. determine the Science Education status of Rivers State College of Health Science and Management Technology 2021.
2. identify the challenges militating against adequate Science Education facilities in Rivers State College of Health Science and Management Technology.
3. investigate on-going prevention and control measures of the Science Education services in College of Health
4. qualitatively compare past and present Science Education status.

1.4 Research Questions

1. What is the Science Education status in Rivers State College of Health Science and Management Technology?
2. What are the challenges militating against adequate Science Education facilities?
3. What are ongoing prevention and control measures of the Science Health services?
4. What is the qualitative difference between past (six years ago) and present Science Education status in college of health?

Methodology

It is a descriptive research design with cross-sectional study. A total population of 869 from the 11 Schools of the College. The final year students were from 10 Schools with none from School of Foundation Studies. A proportion (44.07%) of 869 was taken as sampling size (383). The final year students and lecturers are the respondents. Multi-stage sampling procedure was used involving stratified random sampling, systematic random sampling and simple random sampling. Well-structured, validated questionnaire as well as observation with checklist were used. The pilot study was at Elechi Amadi Polytechnic using 10 copies of the instrument with reliability index of 0.87. Out of three hundred and eighty-three (383) copies of the questionnaire that were produced and distributed, three hundred and seventy-five (375) copies of it were retrieved and was used for the analysis. The data was presented in frequency tables and analyzed using simple percentage and Chi Square inferential test statistics.

Results

Tables 1 - 4 contained the results showing Science Education status in Rivers State College of Education Science and Management Technology 2021, challenges against adequate Science Education facilities in Rivers State College of Education Science and Management Technology 2021, ongoing prevention and control on issues militating against adequate Science Education services in the Rivers College of Education Science and Management Technology, and qualitative difference between past six years (2015) and present (2021) Science Education status in Rivers State College of Education Science and Management Technology.

Table 1: Science Education status in Rivers State College of Health Science and Management Technology 2022

Variable	Response Frequency		Total (%)
	Yes (%)	No (%)	
Deteriorating state of student hostels	309 (82.40)	66 (17.60)	375 (100)
Delayed removal of piled-up refuse	295 (78.64)	80 (21.33)	375 (100)
Prolonged blockage of drainage channels	288 (76.80)	87 (23.20)	375 (100)
Crowded office accommodation for staff	317 (84.53)	58 (15.47)	375 (100)
Poor ventilation of some staff offices	182 (48.53)	193 (51.47)	375 (100)
Increased number of non-functioning fans in the classrooms and in staff offices	299 (79.73)	76 (20.27)	375 (100)
Non-regular maintenance including cleaning of fans in staff offices and classrooms	301 (80.27)	74 (19.73)	375 (100)
Inadequate public conveniences near the classrooms	212(56.53)	163 (43.47)	375 (100)
Inadequate classrooms for lectures with resultant overcrowding issues	198 (52.80)	177 (47.20)	375 (100)
Unreliable electrical power supply to most staff offices and classrooms	361 (96.27)	14 (3.73)	375 (100)
Frequent flooding of some parts of the campus during heavy rainfall	343(91.47)	32 (8.53)	375 (100)
Irregular water supply to all parts of students' hostels and staff offices	389 (77.07)	86 (22.93)	375 (100)
Poor state of the only functioning public convenience near classrooms for students	367 (97.87)	8 (2.13)	375 (100)
Worsening state of staff offices and class rooms	206 (54.93)	169 (45.07)	375 (100)

In Table 1, 309 (82.40%) represents the total respondents affirming to the deteriorating state of the hostels while 66 (17.60%) do not affirm. The affirmative response for delayed removal of piled-up refuse was 295 (78.67%) while 80 (21.33%) do not affirm to it and 288 (76.80%) represents the total number of respondents who affirmed to blockage of drainage channels while 87 (23.20%) represents respondents who do not affirm to it. Again, 317 (84.53%) represents the number of affirmative for crowded office accommodation for staff while 58 (15.47%) represents those who did not affirm to it. The positive responses for increased number of non-functioning fans in the classrooms and in staff offices were 299 (79.73%) for increased number of non-functioning fans in the classrooms and in staff offices while 76 (20.27%) represents those who did not affirm to it. Also, 301 (80.27%) represents the number of affirmative for non-regular maintenance of staff offices and classrooms while 74 (19.73%) represents those who did not ascribe to it. Those who ascribed to 'inadequate public conveniences near the classrooms' were 212 (56.53%)

while 163 (43.47%) represents those who did not ascribe to it. 198 (52.80%) represents those who supported inadequate classrooms for lecturers whereas 177 (47.20%) represents those respondents who do not support that idea. Furthermore, 361 (96.27%) represents the number of respondents who agreed to unreliable electrical power supply to most staff offices and classrooms while 14 (3.73%) do not agree to it. The number of respondents who agreed to 'frequent flooding of some parts of the campus during heavy rainfall' were 343 (91.47%) while 32 (8.53%) represents those who did not succumb to it and 289 (77.07%) represents the number of respondents who agreed to irregular water supply to all parts of the students' hostels and staff office while 86 (22.93%) of the respondents do not agree to the statement. More so, 367 (97.87%) averred that the only functioning public convenience near the classrooms for the students is in poor state. Finally, 206 (54.93%) of the respondents maintain that the staff offices and the class room are in a worse state whereas 169 (45.07) maintained that they are not in a worse state.

Table 2: Challenges against adequate Science Education facilities in Rivers State College of Health Science and Management Technology 2022

Variable	Response Frequency		Total (%)
	Yes (%)	No (%)	
Dirty and non-conducive holistic view of students' hostels	298 (79.47)	77(20.53)	375(100)
Non-conducive staff offices	303 (80.80)	72 (19.20)	375 (100)
Non-conducive lecture halls/rooms	211 (56.27)	164 (43.73)	375 (100)
Inadequacy of environmental sanitation exercise and less student's participation in environmental sanitation activities	282 (75.20)	93 (24.80)	375 (100)
Poor flood control	375 (95.20)	18 (4.80)	
Poor funding of the institution	360(96.00)	15 (4.00)	375 (100)
Inadequate government provision of equipment	286 (76.27)	89 (23.73)	375 (100)
Poor, no-consistent maintenance of existing infrastructure e.g. drainage	319 (85.07)	56 (14.93)	375 (100)

In Table 2, 298 (74.47%) of the respondents represents those who agreed for dirty and non-conducive holistic view of student's hostel while 77 (20.53%) represents those who do not agree to it, 303 (80.80%) represents the respondents who supported non-conducive staff offices while 72 (19.20%) of the respondents represents those who did not support it. Also, 211 (56.27%) represents non-conducive lecture halls/rooms 164 (43.73%) represents those who did not support it. The respondents for 'inadequacy of environmental sanitation exercise' were 282 (75.20%) whereas 93 (24.80%) represents those who did not support it. 357 (95.20%) of the respondents represents poor flood

control and student's participation in environmental activities while 18 (4.80%) represents those who did not support this. The respondents for 'poor funding of the institution' were 360 (96.00%) while 15 (4.00%) represents those who did not support this. Furthermore, 286 (76.27%) of the respondents represents inadequate government provision of equipment while 43 89 (23.73%) represents those who do not agree to it. The respondents for 'poor non-consistent maintenance of existing infrastructure e.g., drainage' were 319 (85.07%) while 56 (14.93%) represents those who did not agree to it.

Table 3: Ongoing prevention and control on issues militating against adequate Science Education services in the College of Health Sciences and Management Technology

Variable	Response Frequency		Total (%)
	Yes (%)	No (%)	
Ensuring improved waste management	204 (54.40)	171 (45.60)	375(100)
Opening alternative drainage channels	292 (77.80)	83 (22.13)	375 (100)
Enhancing the horticultural status of the College environment	185 (49.33)	190 (50.67)	375 (100)
Provision of adequate public conveniences near the classrooms	111 (29.60)	264 (70.40)	375 (100)
Ensuring excellence of College scenery, e.g. by regular grass cutting	237 (63.20)	138 (36.80)	375 (100)
Maintaining good sanitary status of the operating convenience provided	269 (71.73)	106 (28.27)	375 (100)
Maintaining good environmental sanitation activities on campus	48 (12.80)	324 (87.20)	375 (100)

In Table 3, 204 (54.40%) of the respondents represents the affirmative for ensuring improved waste management while 171 (45.60%) represents those who did not ascribe to this statement. The respondents, 292 (77.80%) ascribed to 'opening alternative drainage channels' while 83 (22.13%) represents those respondents who did not ascribe to it. Moreso, 185 (49.33%) of the respondents represents those who succumb to enhancing horticultural status of the College environment while 190 (50.67%) of the respondents did not succumb to this statement. Going further, 111 (29.60%) represents those respondents who ascribed to the provision of adequate public conveniences

near the classrooms while 264 (70.40%) of the respondents did not ascribe to it. The respondents who supported 'maintaining good sanitary status of the operating public convenience provided on campus' were 237 (63.20%) while 138 (36.80%) of the respondents do not agree to it. Respondents who averred for 'ensuring excellence of College scenery, e.g. by regular grass cutting' were 269 (71.73%) while 106 (28.27%) represent those who do not support the idea. Finally, 48 (12.80%) represent those who 'maintaining good environmental sanitation activities on campus' while 324 (87.20%) represent those who do not agree to it.

Table 4: Difference between past six years (2016) and present (2022) Science Education status in College of Health Sciences and Management Technology

Parameter and Rating (%)	Respondents (Staff) perception on Science Education Status (N=104)	
	2015 (%)	2021 (%)
Very high standard (80-100)	27 (25.96)	0 (0)
High standard (60-79)	62 (59.61)	6 (5.77)
Moderate standard (50-59)	11 (10.58)	13 (12.50)
Low standard (41-49)	4 (3.85)	72 (69.23)
Very low standard (21-40)	0 (0)	3 (2.88)
Poor standard (0-20)	0 (0)	3 (2.88)

$X^2_{Cal} = 20.68$, $X^2_{Critical} = 11.07$, Confidence Interval = 0.05, $p > 0.05$

Table 4 shows the difference in Science Education status (PHS) in College of Health Science and Management Technology between the past six (6) years (2016) and present (2022). Qualitatively, there exist significance difference between the past six years and the present Science Education status in the College of Education Science and Management Technology. The result in 2015 was that the Science Education status had high standard between 60-79% as affirmed by 62 (59.61%) respondents. This standard has not been sustained as 2021 had low standard of 41-49% affirmed by 72 (69.23%) respondents. The change in percentage standard reduction observed in this study could be that the ongoing efforts have not produced the desired result in Science Education status of the College. Simply comparing the first three for the two revealed that 2015 was higher than 2021. This implied that Science Education status was better in 2015 than 2021 in the said institution ($p > 0.05$).

Discussion

The discussion of findings is being carried out in accordance with the specific objectives as expressed below:

Science Education status in Rivers State College of Health Science and Management Technology 2022

The current Science Education status in Rivers State College of Education Science and Management Technology is poor and is comparable to that carried out by The Guardian (2021) in Benin, South-South Nigeria. There are observed Science Education issues ranging from perennial flooding to poor waste disposal (mostly at the hostel premises, etc.), epileptic power supply, water shortages, overgrown shrubs, lack of lecture halls, poor drainages, insanitary shopping complexes, poor toilet facilities among several others. Most of these observed factors are not only peculiar to the college, they may also exist in other institutions. The very deteriorating status of the hostels is a pointer that such situation can predispose ailment which could be communicable epidemiologically. This corroborates with the view of Achalu (2012) that dirty and deplorable public utilities (public toilets etc.,) can be a source of vehicle for the transmission of communicable diseases. Furthermore, offices being overcrowded with staff and poor ventilation including poor illumination is anti

the Science Education Law Cap 106 Law of Rivers State of Nigeria. This can affect the vision of staff which could lead to poor performances of staff on one hand and a temporal or permanent incapacitation of staff on the other hand. The staff canteen in this college is always worst hit by flood during the rainy season. The place is more or less an eye-saw. There are always overgrown shrubs both at the front, rear, left and right-hand side of the building including School of Science Education Building. The blocked service drainages may increase the amount of surface water presence (Johnson, 2018) on campus. This may have been responsible for the incessant flooding experienced year-in year-out on the campus, most especially at every heavy down pour.

Challenges militating adequate Science Education facilities in Rivers State College of Health Science and Management Technology 2021

The study unfolded that there were lack of appropriate furniture, Lack of Government improved funding, improper record of mortality and morbidity, lack of standard Education facility and non-consistency of maintaining existing infrastructure among others. In an academic environment, infrastructural deficit is not one of the expected goals of the millennium development goals (MDG). Good infrastructure helps promote good reading culture in an academic environment. It also helps the academic and non-academic staff to contribute meaningfully. The deplorable public infrastructure as observed in this study may have contributed to low academic performance on the part of students and inhibitory aesthetic beauty of the campus.

Government efficient and effective funding is strategic in the development of the academic environment. Funding helps change the academic status of the campus (The Guardian, 2021). For example, it helps accreditation of courses run in the colleague and this increase the population of the college as student fate is been define. Accreditation is accompanied with infrastructural development. Again, information is key in society but appropriate record keeping of Science Education related issues in an academic environment helps effective planning because memory may fail but well-kept record never fails. This is in line with the view of Nabwami (2022). Learning environments shape the experiences of learners and practitioners, making them an important component of programme evaluation (Irby et al., 2021). The low infrastructure status observed in this study could be due to lack of recording which on the long run may have influenced effective planning. This also corroborate with the view of Sinclair et al. (2015). Conclusively, lack of standard Education facility and maintenance culture are two driver factors that can be fatal to any organization. Standard Education facility helps

cushion emergency situation whereas good maintenance serves as save-heaven. Adequate and standard Education facility exposes students mostly those on practical experience, it brings increase in finances as more customers turn-up because of the facility and personnel's etc. This in-turn could boost the revenue and economic status of the college.

Ongoing control and prevention issues militating against optimum Science Health services in Rivers State College of Education Science and Management

It was revealed that there is need to open alternative drainage channels, enhance horticulture activities, provision of adequate public conveniences, maintaining good environmental sanitation and other social activities (facilities) on campus. These could help maintained the desired serenity on campus as it affects Science Education. However, a drainage system is an essential part of the living. It is an infrastructure to dispose of liquid waste, excess water, and also used to get rid of human waste through a well-arranged network of drainage pipes which can be called a sewage system. It is imperative to drain the water for clearing the system as well as pipes since it might otherwise lead to leaking, flooding, filthy smells, slow draining, in addition to water damage. Effective drainage system accounts for good Education in any environment (White, 2019). Drainage when not managed effective leads to flooding and flooded environment increases the rate of ill-Education which in most time affect children as the most vulnerable (Bibiye, 2020; Johnson, 2018) as observed in this study.

The strategies put in place are good and fine theoretically, however, the college authority is face with serious factors that militate against optimum utilization. This boiled down to lack of finance to execute desired activities that will cushion the effects promptly. This could be the reason why the college authority is trying to attract government attention. To enhance the aesthetic beauty of the environment, there is need to improve the horticultural status of the environment. This promotes the serenity of the academic environment. However, this is not so in the current study (campus) even though there is an indication of such. This may have contributed to the hue and cry of most lecturers during the dry season whenever dry is no light. Also, the provision of public conveniences in an academic setting is a *sine-qua-num* in any setting. Public conveniences help prevent lots of communicable diseases mostly those diseases that are transferable through poor toilet system. Furthermore, a clean environment interrupts the transmission of diseases. Maintaining a clean environment is creating an aesthetically pleasing and socially friendly environment. The environmental

sanitation activity in the school is generally weak as observed. It may have been responsible for the unkempt surrounding mostly along the hostel vicinity.

Comparison of past and present Science Education status in College of Health Sciences and Management Technology

Qualitatively, there exist significance difference between the past six years and the present 2021 Science Education status in the College of Education Sciences and Management Technology. The finding in 2015 was that the Science Education status had high standard between 60-79% as affirmed by 62 (59.61%) respondents. This standard has not been sustained as 2021 had low standard of 41-49% affirmed by 72 (69.23%) respondents. The change in percentage standard reduction observed in this study could be that the ongoing efforts by the College authority have not produced the desired result in Science Education status of the College. This implied that Science Education status was better in 2015 than 2021 in the said institution ($p>0.05$).

Recommendations

Based on the findings of the study the following recommendations were made:

1. Management should send their staff and students on training and retraining programmes through seminars, conferences and workshop to enhance their knowledge to achieve good performance in college cleaning to avoid Education problems.
2. Government should be able to provide fund periodically through yearly budget to enhance further infrastructure build-up and other necessities for optimal function by staff along with normal operation of the college.
3. The facility management should be able to make recommendations to government on employment of more qualified staff.
4. Government, Non-Governmental Organizations (NGOs) and various individuals should be able to donate funds and equipment to support quality work.
5. Proper provision of modern equipment needs to be provided by the school top management for the purpose of catching-up with the world developmental trend.
6. Personal protective equipment should be put on by staff during maintenance and operations.
7. There should be constant surveying to determine water-logged places and manage.
8. The College management need to post more qualified personnel to its demonstration clinic.
9. The institution management need to encourage students' participation in Educationcare as part of their training.

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