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School plant management and academic performance of science students in public secondary schools in Yauri local government, Kebbi state, Nigeria

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Abstract
This study sought to examine the relationship between school plant management and performance of science students in public secondary schools in Yauri local government, Kebbi state Nigeria. The co relational study involved 161 respondents from three public senior secondary schools in Yauri local government of kebbi state, Nigeria. Data were collected using self-administered questionnaires which validity and reliability was confirmed through Factor Analysis and Cronbach Alpha test and interview. Multiple regressions were used to test the hypotheses. The quantitative results revealed that Instructional Facilities management has a significant positive relation with academic performance of science students, that circulation space management has a significant relationship with academic performance of science student, and that management of recreational facilities has a significant relationship with academic performance of science students. And the qualitative results also indicate that staff among many schools opine that instructional facilities management, circulation space management, management of recreational facilities to a greater extent, impact on the academic performance of science students. Conclusively, since public schools harbour a large population of the Nigerian children, effort should be made to effectively manage school plant for effective teaching and learning. Some recommendations were proffered, which include updating of school plant whenever the population increases. Education managers should not rest on their oars and quality control should be advocated.

Keywords: school plant, management, performance, secondary schools

1. Introduction

It is a common knowledge that every nation of the world has an obligation to prepare her children and youth for life as adults in a world that is characterized by rapid social, political, economic and technological changes. The federal and state governments have invested huge resources in setting up secondary educational institutions as it is critical to the education of the child, being the bridge between primary and tertiary education (Ngozi & Maria, 2015) [15]. The development, maintenance and operation of these institutions of learning is an important aspect of public schools administration in the country (Ngozika & Maria, 2015) [15].

The democratization of education in the country has led to a remarkable increase in the number of schools all over the nation (Ngozi & Maria, 2015) [15]. Thus secondary education in Nigeria has witnessed continuous increase in students‟ yearly enrolment. With the number of secondary school rising from 400,000 in 1970 to 6 million in 2007 (Source: United Nations Educational Scientific and Cultural Organization (United Nations Educational Scientific and Cultural Organization (UNESCO). Institute for Statistics, 2013) [16]. Students‟ enrolment has also increased accordingly from 3,807,755 in 1985 to 6,536, 038 in 2006 (Mathew, 2013). Also the percentage of enrolment into secondary education has increased as follows 2004 -34.44%, 2008 - 35.09%, 200 --39%, and2010 -44% (Clark and Ausukuya, 2013) [7]. Expectedly, this increment weighs heavily on the available facilities, equipment and material resources with attendant effects on students‟ academic performance (Ngozika & Maria, 2015) [15]. Adesina (1999) in Asiyai (2012) [3] stressed that the quality and quantity of educational facilities available within an educational system positively correlates with the quality and standard of the educational system. Durosaro (1998) [8] examined school plant planning in relation to administrative effectiveness of secondary schools in Oyo state of Nigeria. He found that schools that planned and maintained their facilities had higher students' retention and is more effective than the others.

It has been observed that school facilities are not been maintained by school administrators and hence their depreciation. The administrators appears to spend much time on instructional planning, curriculum development, personnel development and community relations claming that the management and maintenance of school facilities is the sole preserves of the government (Asiyai, 2012) [3]. Yet, several studies revealed that there is students' poor academic performance especially in areas of sciences among secondary students. Bulama (2000) [5] identified poor state of infrastructure in school as one of the principal factors militating against the effective academic achievement in secondary school in South West Nigeria. Thus, modern school requires suitable classrooms, libraries, laboratories, recreational facilities, assembly hall, school farm, staff rooms, offices, vehicles etc for the comfort and conveniences of both staff and students (Ngozika & Maria, 2015) [15].

Many investigations have shown that secondary school students are exhibiting dwindling interest in science

(Esiobu, 2005) [9]. Science has been regarded as the bedrock on which modern technological breakthrough is built. Most countries the world over, especially developing countries like Nigeria are striving hard to develop technologically and scientifically. Science comprises the basic disciplines such as biology, physics, chemistry and mathematics (Ngozika & Maria, 2015) [15]. Bassey (2002) [4] opined that science is resource intensive, and in a period of economic recession, it may be difficult to find some of the electronic gadgets and equipment for its teaching in schools. In addition to well developed curriculum and qualified teachers, school plant must be up to standard to yield the desired goals of education. This study will examine the school plant management and students' performance in area of sciences limited to Biology, Chemistry and physics.

2. Problem Statement

The way science is taught in Nigeria is not producing the desired effects (Muhammad, *et al,* 2015) [14]. This means that students' performance on science subjects is poor. Public secondary schools in Nigeria are observed to be faced with combined challenges of deteriorating school plant, out–of-date design and capacity utilization pressures (Ngozika & Maria, 2015) [15]. The effects of these deteriorating conditions and poor maintenance of school infrastructure are threats to school management, curriculum delivery and students‟ academic performance (Ngozika & Maria, 2015) [15]. Many studies have revealed that students‟ academic achievement lags in shabby school buildings, poor or ill-equipped science laboratory and technical workshops, inadequate and poorly maintained instructional facilities and overcrowding (Ngozika & Maria, 2015) [15]. Rapid increased in population in the country, and kebbi state in particular, has led to increasing demand for education. Thus, there is a big gap in the quality of education resulting from large number of students in crowded classrooms, using inadequate and obsolete equipments and disillusioned teachers (Ngozika & Maria, 2015) [15]. These factors constitute important challenges to the teaching learning process and may prevent the system from achieving the desired secondary science education goals (Ngozika & Maria, 2015) [15]

This study will therefore, examined if effective school plant can improve academic performance of science students in public secondary schools.

3. Research Hypotheses

The following null hypotheses are formulated to guide the study.

1. There is no significant relationship between instructional facilities management and academic performance of science students.
2. There is no significant relationship between circulation space management and academic performance of science students.
3. There is no significant relationship between management of recreational facilities and academic performance of science students.

4. Theoretical Perspective

This study was guided by the systems theory also called a systems approach to management propounded by Ludwig Bertalanffy (1968) which is a process whereby a set of interrelated parts operate together to convert energy, information and materials from the organization's environment into a product aimed at achieving a certain objective. A system such as organization, is a set of interrelated parts that operates as a whole in pursuit of common goals. When one part of the system is removed or does not function properly, the entire system is affected.

According to system theory, a system behavior depends on its entire structure rather than the independent parts. It is for this reason that an organization is viewed as a system that operates on the basis of four elements namely inputs, transformation, output and feedback. The school is a system made up of various interrelated parts including the curriculum, teachers implementing the curriculum, school administrators, students, school plant name it name it, all of which relate to one another in the process of providing quality education to students for the development of individuals and the nation as a whole. The school plant is considered paramount in the process of providing quality education. Science disciplines require practical facilities for its effective implementation. Therefore, for science education to yield the desired result, appropriate facilities must be well managed, otherwise the aim will be defeated.

5. Methodology

The study employed descriptive co relational survey designs. The target population of the study comprised all teachers from three out of seven public secondary schools (G.S.S. Yelwa Yauri, G.G.S.S. Yelwa Yauri & A.S.S. Yelwa Yauri) in Yauri local government of kebbi state, Nigeria. These schools were selected to represent not only the entire local government, but also the state as G.S.S. Yelwa Yauri and G.G.S.S Yelwa Yauri are boarding schools for boys and girls respectively in which students from every part of the state study while A.S.S. Yelwa Yauri is a mixed (boys & girls) school. According to the Zonal education office (2017), there were 170 teachers in these (selected) schools which were taken to be the sample size, from which 161 responses were retrieved.

Three research instruments were used in the study: School Plant Management Questionnaire (SPMQ) and students academic performance questionnaire for teachers to assess both the school management effort to manage the school plant and Students' academic performance. An interview schedule was used to collect qualitative data.

6. Findings

6.1 School Plant Management and academic performance of science students

The first objective of the study aimed at establishing the relationship between school plant management and level of academic performance of students in science subjects. Multiple regression was computed to answer the study questions.

Table 1: Regression analysis: relationship between instructional facilities management, circulation space management, management of recreational facilities and academic performance of science students

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	15.679	1.437		10.912	.000
IFM	.886	.067	.701	4.017	.000
CSM	.792	.057	.651	3.621	.001
MRF	.675	.054	.631	2.445	.000

a. Dependent Variable: Academic Performance of science students
b. Independent Variables: IFM, CSM and MRF

***Source*:** Researcher's Computation from Primary Data (2017)

Table 4.6 presents a summary of the findings on the relationship between instructional facilities management, circulation space management, management of recreational facilities and academic performance of science students. Using the standardized coefficients, the coefficient for Instructional Facilities Management (PU) (β=0.701, t=4.017 and Sig. =0.000). The coefficient is positive and the significance level (Sig. =0.000) is less than 0.05 implying that Instructional Facilities management has a significant positive relation with academic performance of science students. The coefficient also implies that Instructional Facilities management influences academic performance in science subjects by 70.1%.

Furthermore, the standardized coefficient for circulation space management (β=0.651, t=3.621 and Sig. =0.001). The coefficient is positive while the significance value is also less than 0.05; we therefore observe that circulation space management has a significant relationship with academic performance of science student. The coefficient β=0.651 implies that circulation space management accounts for 65.1% of the variation in academic performance of science students.

Also, the findings indicate that management of recreational facilities has a significant relationship with academic performance of science students (β=0.631, t=2.445 and Sig. =0.000). The coefficient β=0.541 implies that management of recreational facilities accounts for 63.1% of the variation in academic performance in science subjects.

The analysis of the qualitative responses from some of the interview guides also indicate that staff among many schools opine that instructional facilities management, circulation space management, management of recreational facilities to a greater extent, impact on the academic performance of science students. One of the participants noted that:

"We have observed that the quality of education that children receive bears direct relevance to the availability or lack, thereof of physical facilities and overall atmosphere in which learning takes place. If the physical facilities are in short supply, teachers would not be equipped to carry out their duties effectively, hence quality learning would not be expected." [Respondent].

The above excerpt indicates that over ally, there is a very strong impact of school plant management on academic performance of science students. Therefore if school plant management is improved, academic performance would most likely increase.

7. Discussion

Learning is a complex activity that puts student's motivation and condition to the test. (Lyons, 2002 in Mcgowen 2007) [13]. It has been a long held assumption that curriculum and teaching only have an impact on learning. However it is becoming apparent that the physical conditions of school can influence students' achievement. As per the first objective of this study, it was found that Instructional Facilities management has a significant positive relation with academic performance of science students. The coefficient also implies that Instructional Facilities management influences academic performance in science subjects by 70.1% which is corroborated by Chan and van Berkan (1996) [6] who found that 2nd grade students in standard school buildings scored higher in science subjects as measured by the comprehensive test of basic skill than did their counterparts attending class in sub-standard facilities. They also found that air conditioning, absence of graffiti, condition of labouratories, classroom furniture correlated with students' achievement in sciences at a significant level. In Nigeria, analysis of the WAEC and NECO exams results show that students in well equipped schools (mainly private and urban) do better than those in poorly equipped schools (mainly public and rural). It can be concluded that technologies and adequate school plant better equip students for success in achievement tests.

In light of the second objective, the study discovered that circulation space management has a significant relationship with academic performance of science student with a coefficient of β=0.651 implying that circulation space management accounts for 65.1% of the variation in academic performance of science students. As a result of underfunding of education in Nigeria, the government has been encouraging proper maintenance of available school facilities to increase circulation space. This has enormously positively impacted on the academic performance of students (Asiyai, 2012) [15]. Another study by Akinsolu (2004) [2] also corroborated the findings of this study while reiterating that circulation space is critical especially with the universal basic education programs that has seen a surge in enrollment, it would be absurd if the learners were kept in a confined space that would herald the spread of communicable diseases among many other threats.

The fundamental purpose of teaching and learning practice is to bring about in the learner desirable transformation in behavior through critical thinking. The process does not take place in a vacuum but rather in an environment set aside to facilitate learning. In line with the third objective of this study, The coefficient β=0.541 implies that management of recreational facilities accounts for 63.1% of the variation in academic performance in science subjects. This finding is in line with Adeboyeje (2000) [1] who found a strong positive relationship between recreational facilities and academic performance, noting that In Nigeria, public school enrolment has continued to increase without a corresponding increase in facilities for effective teaching and learning.

8. Conclusion

Science and technology has become an integral part of the blood stream of modern civilization and is the major driving force for economic growth and development (Khan, 1995) [10]. Nigeria, like other countries, depends on science in striving hard to advance technologically and scientifically to compete in the modern world. However, the teaching, learning of science, as well as students' academic

achievement become sources of concern to all stakeholders. School plant is very essential to achieving positive outcomes in the teaching – learning process. The school plant is the pillar and support of all teaching and learning activities. The site, size, arrangement and other aspects of the classroom, support facilities such as labs, toilets and other equipment can either be welcoming or repulsive to teachers and students alike. This simple fact has been noted to profoundly influence the acts of teaching and learning

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