

SCHOOL PHYSICAL ENVIRONMENT AND STUDENT LEARNING IN THE UNIVERSITIES IN SOUTH EAST, NIGERIA

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Abstract

The study investigated the relationship between school physical environment and student learning in the universities in South East, Nigeria. Three research questions and three hypotheses guided the study. The study adopted the correlational research design. The population of the study comprised 11,107 Academic Staff. The sample size was 400 Academic Staff representing 3.6% of the population. Proportionate stratified random sampling technique was used to draw the sample. Two instruments were used for the study namely: "School Physical Environment Scale Questionnaire (SDSQ)" and "Student Learning Scale Questionnaire (SLSQ)". The instruments were validated by experts in the Departments of Educational Management, Measurement and Evaluation, and Psychology, Guidance and Counseling. The internal consistency of the instruments was determined with the use of Cronbach alpha method and the final reliability coefficient score was 0.76. Pearson (r) and Multiple Correlation were used to answer research questions while Z-ratio and ANOVA were used to test hypotheses at 0.05 alpha level of significance. The study revealed that there is a positive relationship between school physical environment and student learning in the universities in South East, Nigeria

and the relationship is significant. It was recommended among others that the government and her agencies should make relevant policies on technical specifications to guide the design and planning of school physical environment.

Key Words: School Physical Environment, Student Learning and Universities

Education has become a major tool for development in human society. It leads the individual person and society at large from the dungeon of ignorance, poverty and subjugation to emancipation. Education is the base upon which the foundation of freedom, democracy, good governance and sustainable human and national development hinges. It equips the individual for contribution towards nation building, social-cultural, political and economic growth. Education is a vital instrument for the nation's development and transformation in all aspects of economic, social, and the political activities of the nation (Obasi & Madu, 2019). It is through education that a nation's human capacity building is developed, harnessed and deployed for nation building. In human capacity building of the nation a critical role is played by university education.

University education is a component of higher education. This level of education is referred to as post secondary education. According to the Federal Republic of Nigeria (2014), university education is the level of education people acquire after secondary education. In essence, university education adds to what other forms of education had offered and supplied something better than is provided by them (Peretomode, 2008). This is to say that university education builds on the level of competence, knowledge and skills which students normally acquire from secondary education. It equips the beneficiaries with high level intellectual and professional skills and competences required to make optimum contribution to national development. This goal is achieved through its statutory functions which include: teaching and learning, research and community service. Among these functions, the focus of the study is teaching and learning.

Teaching-learning is a process in the schools system through which learners acquire and internalize values associated with education. According to Hasa (2017), teaching and learning are important processes that are linked to the acquisition of knowledge, values, traditions, skills, behaviors, and so on. These educational values ensure that the learner makes a better adjustment of human nature to the surroundings. Equally, it is the development of all these variables in the individual, which enables him to control his environment and fulfill his possibilities. The primary purpose of the teaching-learning process is to bring about in the learner desirable change in behaviour through critical thinking. Hence, the teaching-learning process modifies the behavior of the learner such that the learner becomes emancipated from illiteracy and ignorance. One important stone for the success of the teaching-learning process is school physical environment.

School physical environment is the physical context which learners come in contact with in the process of learning. It is the surrounding circumstance inclusive of internal and external features which effects learning. In other words, the totality of internal and external influences surrounding a school constitutes its environment. Tshui and Cai (2011) described physical learning environment as an orderly environment in which the school family feels valued and able to pursue the school's mission free from concern about disruptions and safety. Also the concept of school physical environment has been viewed by Sariola (2011) as an environment for the teachers and students activities within which learning is seen as an active process in a multi-information and co-operational network environment. The favorable physical learning environment facilitates the teaching-learning process by providing a place where there is a smooth flow of communication, avoiding some common barriers between the teacher and the learner.

School physical environment is needed by schools or institutions in order to function effectively and to fulfill the purpose for which it was established. It provides the pre-conditions necessary for teaching and learning to take place. When physical learning environment offers resources and possibilities that support teaching methods and learning goals, schools are much more prompt to change their operational culture. In other words, school physical environment is important when developing school operational culture, as well as work environments. Consequently, the circumstances of the school physical environment and its associated physical features can have a significant influence on student learning. On the basis of the above, the study sets out to examine the relationship between school physical environment and student learning.

Statement of the Problem

The teaching-learning process is the central activity in education. The process is meant for the acquisition and internalization of skills, knowledge and competences by the learners in order make optimum contribution in the society. The teaching-learning process ensures the change of behaviour as required of the learners. The process is facilitated by the school physical environment. School physical environment provides the pre-conditions necessary for teaching and learning to take place. However, the researchers observed that the school physical environment which is an aspect of the school environment is not given much attention as though, it is not important in the management of education. The observation manifests in the environment often shaped with mediocre design and building standards. Also, there are cases of deterioration and defects on the school facilities, not adequately maintained. Such inadequacies in the physical environment affect the comfort levels of learners. A pertinent question raised is whether there is a connection between the physical learning environment in schools and student learning?

Aim and Objectives of the Study

The aim of the study was to determine the relationship between school physical environment and student learning in the universities in South East, Nigeria. Specifically, the study sought to:

1. find out the relationship between interior environment and student learning in the universities in South East, Nigeria.
2. examine the relationship between exterior environment and student learning in the universities in South East, Nigeria.
3. determine the joint relationship between school physical environment variables and student learning in the universities in South East, Nigeria.

Research Questions

The following research questions were posed to guide the study:

1. What is the relationship between interior environment and student learning in the universities in South East, Nigeria?
2. What is the relationship between exterior environment and student learning in the universities in South East, Nigeria?
3. What is the joint relationship between school physical environment variables and student learning in the universities in South East, Nigeria?

Hypotheses

The following hypotheses were tested at 0.05 alpha level of significance

5. There is no significant relationship between interior environment and student learning in the universities in South East, Nigeria.
6. There is no significant relationship between exterior environment and student learning in the universities in South East, Nigeria.
7. There is no significant joint relationship between school physical environment variables and student learning in the universities in South East, Nigeria.

Literature Review

Theoretical Framework

The study was based on the Systems Theory propounded by Ludwig Von Bertalanffy (1968). The systems theory states that organizations or systems are made up of parts or subsystems and several other components and units in which the subsystems or component parts perform various tasks that are all geared towards the achievement of the goals of the organization or system. In its analysis, systems are made up parts or subsystems. Each of these parts or subsystems functions independently but collectively to drive the entire system as if the entire system is one system. From the foregoing, two basic threads serve as a common denominator. These are that a system comprises: (a) parts or subsystems and (b) the use of the terms 'independently and collectively' which indicates that parts or subsystems are tied together towards the achievement of the goals

of the organization or system. It is the totality of the activities and functions of the parts/subsystems that lead to the overall achievement of the organization as an entity. Relating this theory to this work, it is pertinent to note that a school is a system with many interacting subsystems or components that lead to the achievement of educational goals. The components can be categorized into physical, social, psychosocial, cultural and political. The physical factor relates to school physical environment which is the physical context which learners come in contact with in the process of learning. The interrelation of these components will create a conducive environment for teaching and learning which will then yield a positive result in achieving the desired goal.

School Physical Environment and Student Learning

School physical environment is the physical context and its associated features where teaching and learning occurs. Allen and Hessick (2011) referred to the physical environment as the 'silent curriculum', an essential factor leading to the optimal education and learning experience. The main purpose of a 'physical environment' is to support and enhance the physical aspects of human understanding, such as visual, auditory and kinetic elements (Kopec, 2006). A school's physical environment plays a vital role in enhancing learning and teaching experiences. The school physical environment has critical variables that exert measurable influence on student learning. Robins as cited in Aloyo (2015) surmised that school physical environment variables are the internal, external and neighbouring spatial infrastructure matrix that nurtures or inhibits learner growth. It is the surrounding circumstance inclusive of internal and external features which effects learning. Studies have shown that school physical environment have impacts on human behaviour, learning, productivity and perception. The study of Aloyo (2015) on the relationship between physical environment and academic achievement in public secondary schools in Nairobi City, Kenya indicated that there is a positive relationship between the school physical environment and academic achievement. Equally, the study of Ali (2017) on the influence of the physical environment on learning behavior revealed that physical environment has a positive impact on learning and teaching performance and behavior. A study on how design of the physical environment impacts early learning: educators and parents perspectives carried out by Berris and Miller (2011) revealed that educators and parents viewed the physical environment as important to a child's development and learning. Kuh, Kinzie, Schuh, Whitt and Associates as cited in Kim (2014) submitted that the campus physical environment contributes to student learning, personal development and engagement.

Indoor Physical Environment and Student Learning

Indoor physical environment is the internal physical embodiment of any building. It is most simply described as the conditions inside the building. It encompasses all the internal elements that interact together to facilitate teaching by teachers and learning by students (Onyemerekeya, in Asuk, 2011). The constituent

elements are ventilation, indoor air quality, thermal comfort, acoustics, electric lighting, and quality of view out of the windows. Others include size, shape, space, interior lighting, finishes-color, thermal condition, noise level, furniture and seating arrangement, as well as location and availability of modern technology (Innovotek, 2016). Studies have shown that the interior environment impacts on physical well-being, social and educational aptitude. A study on the influence of design on the learning environment in the Wake Forest University School of Business carried out by Knoll (2015) revealed that there were positive relationships between elements of the indoor environment and students' satisfaction and enjoyment when using the spaces for individual study, group work, classroom learning and informal learning among peers. The study of Choi, Guerin, Hye-Young, Brigham and Bauer (2013) on indoor environmental quality of classrooms and student outcomes revealed that there is a significant relationship between student outcomes and thermal conditions, indoor air quality (IAQ), acoustic conditions, lighting conditions, furnishings, aesthetics, technology and view conditions of classroom environment. Swati (2015) in a study on classroom physical environment and academic achievement of students found that there is significant effect of classroom physical environment on the academic achievement scores of students. Abisuga, Famakin and Oshodi (2016) are of the view that building services (such as lighting, air conditioning, and so on) are provided in learning spaces so as to improve comfort, health and safety of the occupants, and facilitate the learning process between the teacher and the students.

Outdoor Physical Environment and Student Learning

Outdoor physical environment is the immediate surroundings of the school. It is also referred as exterior environment. According to Matluba (2012), outdoor environment refers to the spaces in the school premise excluding the school building in the ownership of school authority. Exterior environment is formed by the relationship between the architectural facility and the surrounding environment. The exterior environment contains the natural and synthetic components of the campus (Kim, 2014). The natural and man-made components make up the exterior environment. Thus, in this environment exists a mix of plant, trees, flowers, grasses, sun, shade, colour, texture, fragrance, and softness of enclosure, wings of buildings, hedges, fences, fields, arcades or walk-ways. The environment creates space for students learning outside of the classroom. Studies have discovered that students find an outdoor, nature-centered environment for education supportive and meaningful in their learning. A study on the relationship between the outdoor physical environment and students' social behaviour in Urban Secondary School in Shah Alam, Selangor, Malaysia carried out by Shuhana, Hanim and Norsiah (2012) revealed that positive relationship exists between the outdoor physical environment of the school and the students' social behaviour. Matluba (2012) in a study on outdoor as learning environment for Children at a primary school of Bangladesh found that children showed increased engagement, motivation and

enthusiasm about learning in outdoor environment of their school. In a study on the influence of the outdoor learning environment on student engagement, Crowder (2010) found that the students appreciated the fresh air, green environment, open spaces, views, ease of movement, and close relationship to nature. Sobol as cited in Crowder (2010) surmised that just as the indoor learning environment can affect how students learn, the outdoor landscape of playgrounds, meeting areas, plants, and environmental features has an impact upon how students learn, behave, develop personally, and gain a respect for the environment.

Methodology

The study adopted the correlational research design. The population of the study comprised 11,107 Academic Staff. The sample size of was 400 Academic Staff representing 3.6% of the population. Proportionate stratified random sampling technique was used to draw the sample. Two instruments were used for this study namely: School Physical Environment Scale Questionnaire (SDSQ) and Student Learning Scale Questionnaire (SLSQ). The two were developed by the researchers and validated by experts in the Departments of Educational Management, Measurement and Evaluation, and Psychology, Guidance and Counseling. To ensure reliability of the instruments especially the internal consistency of the instruments, the Cronbach Alpha procedure was used. The result for cluster A, B, and C were 0.75, 0.68 and 0.85 respectively and the final reliability coefficient score was 0.76. Pearson (r) and Multiple Correlation were used to answer research questions while Z-ratio and ANOVA were used to test hypotheses at 0.05 alpha level of significance.

Results

Research Question One: What is the relationship between indoor physical environment and student learning in the universities in South East, Nigeria?

Ho₁: There is no significant relationship between indoor physical environment and student learning in the universities in South East, Nigeria.

Table 1: Pearson Product Moment Correlation (r) Summary on the Relationship between Indoor Physical Environment and Student Learning in the Universities in South East, Nigeria.

Categories		n	df	r	r ²	zrcal	p-value	Sig lev.
	Remarks							
Indoor Physical Environment								
400	398	0.698	0.487	16.205	0.000	0.05	Significant	
Student Learning								

Table 1 showed that the coefficient value is 0.698. This indicated that there is a positive relationship between indoor physical environment and student learning. The coefficient

of determination (0.487 X 100) showed that 48.7% of the variation in student learning is accounted for by indoor physical environment. The table revealed the probability value to be 0.000 which is less than the alpha level of 0.05. On the basis of the above, the null hypothesis is rejected. Therefore, the relationship is significant.

Research Question Two: What is the relationship between outdoor physical environment and student learning in the universities in South East, Nigeria?

Ho₂: There is no significant relationship between outdoor physical environment and student learning in the universities in South East, Nigeria.

Table 2: Pearson Product Moment Correlation (r) Summary on the Relationship between Outdoor Physical Environment and Student Learning in the Universities in South East, Nigeria.

Categories	n	df	r	r ²	zrcal	p-value	Sig lev.
Outdoor Physical Environment	400	398	0.677	0.458	15.411	0.000	0.05
Student Learning							Significant

Table 2 revealed that the coefficient value is 0.677. This showed that there is a positive relationship between outdoor physical environment and student learning. The coefficient of determination (0.458 X 100) revealed that the contribution of outdoor physical environment to student learning is 45.8%. The table indicated the probability value to be 0.000 which is less than the alpha level of 0.05. Sequel to this, the null hypothesis is rejected; hence, the relationship is significant.

Research Question Three: What is the joint relationship between school physical environment variables and student learning in the universities in South East, Nigeria?

Ho₃: There is no significant joint relationship between school physical environment variables and student learning in the universities in South East, Nigeria.

Table 7: Multiple Correlation and ANOVA Model Summary on the Joint Relationship between School Physical Environment Variables and Student Learning in the Universities in South East, Nigeria.

Model	R	R ²	R ² _{adj}		Sums of Squares	df	Mean Squares	fcal
1				Regression	1895.667	2	947.833	994.159
	0.760	0.578	0.576	Residual	1141.000	397	2.871	9.531
Total		3036.667	399					

a. Predictors: (Constant) indoor physical environment and outdoor physical environment,

b. Dependent Variable: Student learning

Table 3 revealed that the coefficient value is 0.760, which indicated a positive joint relationship between school physical environment variables and student learning. More so, the coefficient of multiple determination (0.578×100) showed that school physical environment variables jointly contribute 57.8% to student learning. 42.2% is accounted for by other factors. Furthermore, the table revealed that the sums of squares are 1895.667 and 1141.000 while the mean squares are 9475.333 and 9.531 respectively. With degrees of freedom of 2 and 397, fcal value of 994.159 is significant at 0.000 which is less than the alpha level of 0.05. Based on the above, the null hypothesis is rejected. Hence, there is a significant joint relationship between school physical environment variables and student learning.

Discussion of Findings

The Relationship between Interior Environment and Student Learning

The result indicated that there is a positive relationship between indoor physical environment and student learning. The relationship is significant. The result is in tandem with Knoll (2015) whose study revealed that there were positive relationships between elements of the indoor environment and students' satisfaction and enjoyment when using the spaces for individual study, group work, classroom learning and informal learning among peers. The finding is consistent with the study of Choi, Guerin, Hye-Young, Brigham and Bauer (2013) which revealed that there is a significant relationship between student outcomes and thermal conditions, indoor air quality (IAQ), acoustic conditions, lighting conditions, furnishings, aesthetics, technology, and view conditions of classroom environments. The result is in line with the findings of Swati (2015) which revealed that there is significant effect of classroom physical environment on the academic achievement scores of students. The finding is corroborated by Abisuga, Famakin and Oshodi (2016) on their views that building services (such as lighting, air conditioning, and so on) are provided in learning spaces so as to improve comfort, health and safety of the occupants, and facilitate the learning process between the teacher and the students.

The Relationship between Exterior Environment and Student Learning

The finding showed that there is a positive relationship between outdoor physical environment and student learning. The relationship is significant. The result tallies with the result of Shuhana, Hanim and Norsiah (2012) which revealed that a positive relationship exists between the outdoor physical environment of the school and the students' social behaviour. The finding agrees with Matluba (2012) who found that children showed increased engagement, motivation and enthusiasm about learning in outdoor environment of their school. The finding is equally in agreement with the study

of Crowder (2010) which revealed that the students appreciated the fresh air, green environment, open spaces, views, ease of movement, and close relationship to nature. Sobol as cited in Crowder (2010) surmised that just as the indoor learning environment can affect how students learn, the outdoor landscape of playgrounds, meeting areas, plants, and environmental features has an impact upon how students learn, behave, develop personally, and gain a respect for the environment.

The Joint Relationship between School Physical Environment Variables and Student Learning

The finding revealed that there is a positive joint relationship between school physical environment variables and student learning. The joint relationship is significant. The finding tallies with the findings of Aloyo (2015) which indicated that there is a positive relationship between school physical environment and academic achievement. The finding is in line with Ali (2017) whose study revealed that physical environment has a positive impact on learning and teaching performance and behavior. The result is in accord with the findings of Berris and Miller (2011) which revealed that educators and parents viewed the physical environment as important to a child's development and learning. More so, the finding revealed that school physical environment variables jointly contribute 57.8% to student learning in the universities in South East, Nigeria. The finding supports the submission of Kuh, Kinzie, Schuh, Whitt and Associates as cited in Kim (2014) that the campus physical environment contributes to student learning, personal development and engagement.

Conclusion

Based on the findings, the study concluded that there is a positive relationship between school physical environment and student learning and the relationship is significant. School physical environment therefore plays an important role in student learning.

Recommendations

On the basis of the findings, the study recommended:

- The government and her agencies should come up with relevant policies on technical specifications to guide the design and planning of school physical environment.
- University Management should ensure that school physical environment is adequately maintained for efficient operation of a safe learning environment.
- National Universities Commission should ensure that school physical environment is designed to high standard performance and facilities constructed of quality materials that will stand the test of time.

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