

School Design and Student Learning in the Universities in South East, Nigeria

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Abstract:- This study examined the relationship between school design and student learning in the universities in South East, Nigeria. Three research questions and three hypotheses were posed to guide the study. The correlational research design was adopted with a population of 11,107 Academic Staff in the ten (10) public universities in South East, Nigeria. The sample size was 400 Academic Staff (Federal = 218; State = 182) representing 3.6% of the population. The sample was drawn using proportionate stratified random sampling technique. Two instruments for data collection were titled: “School Design Scale Questionnaire (SDSQ)” and “Student Learning Scale Questionnaire (SLSQ)”. The instruments were validated by experts in Educational Management and Psychology, Guidance and Counseling. The internal consistency of the instruments was determined using Cronbach alpha and the reliability coefficient was 0.74. Pearson Product Moment Correlation 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 design and student learning and the relationship is significant. It was recommended among others that the government and her agencies should make relevant policies to guide school design and ensure their strict implementation.

Keywords:- School Design, Student Learning and Universities.

I. INTRODUCTION

Education is regarded as a strong basis for human advancement and civilization. Education plays critical roles for the advancement of the respect to human rights and the values of democracy, making ways for equality, harmonious existence and collaboration amidst people in the world. The importance of education is further strengthened by the major role it plays in enhancing economic and social mobility. Education is a catalyst by which the society at large generates necessary knowledge and skills for its survival and sustainable development. Great men and women who are well-educated all over the world are constantly remembered and honoured because such people stand out as epitomes of knowledge and have

used their knowledge and skills to contribute immensely to development around the world. Education is therefore critical for individual, social and economic development. University education contributes significantly to this process of human and socio-economic development.

University education is an aspect of higher education. This level of education comes after secondary education. According to the Federal Republic of Nigeria (2014), university education is the educational level people acquire when secondary education is completed. University education as the highest educational level is designed to widen the horizons of students by giving them the capacity to empathize with new human situations and by preparing them to share in innovative activities. Universities are saddled with the responsibility of contributing to the economic growth and development of human resources of any nation. This entails that the universities develop the high level manpower that underpin the economic, social and political growth and development of any nation. In this wise, Dill and Van Vught (2010) averred that university is an important factor with regard to innovation and the development of human capital and has a critical role in achieving success and sustaining the knowledge economy. Basically, universities exist to accomplish triple mandate as their statutory functions which include: teaching and learning, research and community service. Among these functions, teaching-learning is the thrust of the study.

Teaching cum learning is at the core of education. Teaching is regarded as the process through which learners acquire and internalize the values associated with education. On the other hand, the acquisition and internalization of the values associated with education is regarded as learning. The above explanation shows that the end product of the process called teaching is learning. This thinking tally with the view of Ituen as cited in Dike and Williams (2014) that teaching is an intentional activity which produces another intentional activity called learning. One can infer from the above that teaching and learning are both sides of the same coin. While teaching is said to be the channel without being the end of education, learning is seen as the outcome of education. Teaching-learning therefore denote a planned process in the school system through which teachers ensure that learners acquire educational values in order to live a meaningful and fulfilled life in the society. The teaching-learning process

brings about a change in the behaviour of the learner. Thus, the influence of this process is to modify the behavior of the learner in such a way that he/she may become different from what he/she would have been without education. One important factor that determines greatly the effectiveness and efficiency of the teaching-learning process is school design.

School design is the outcome of construction or renovation where educational enterprise is carried out. It is the structural arrangement of the physical environmental components with which students, staff and the other members of the school community interact. School design includes the pattern of the schoolhouse, the arrangement and the way the interior and exterior environments of the school complement the curriculum (Tanner, 2009). One can rightly say that it is the holistic view of how the school physical environmental components are arranged as to achieve educational goals. School design is an essential aspect of the school environment. It contributes significantly both to the teaching and learning effectiveness and meeting the needs of the students and staff. This implies that although school design alone does not in itself constitute a school, but the design of a school is very critical in the school environment.

➤ *Statement of the Problem*

The teaching-learning process is at the core of education. The process is designed to equip learners with skills, knowledge and competences in order to live a meaningful and fulfilled life in the society. The teaching-learning process ensures the behavioural changes required of the learners. The process is aided by the design of the school. School design is the structural arrangement of the physical environmental components where educational enterprise is carried out. The school design is meant to provide responsive and conducive environment for the teaching-learning process. It is one of the factors inevitably entwined with the teaching-learning process. However, the researcher observed that the school design which is an essential component of the school physical environment is not given its pride of place in the management of the education system. This observation manifests in the obvious poor designs of some schools with respect to the different educational programmes and the safety of the members of the school community. Again, there are very many cases of structures in poor conditions, not adequately maintained. Such a situation compromises the safety and comfort of the students and staff. These observations are what bothered the researchers. A pressing question is whether school design relates to student learning?

➤ *Aim and Objectives of the Study*

The study aimed at investigating the relationship between school design and student learning in the universities in South East, Nigeria. The specific objectives thus are to:

- Examined the relationship between academic learning space and student learning in the universities in South East, Nigeria.

- Find out the relationship between specialized learning space and student learning in the universities in South East, Nigeria.
- Determine the joint relationship between school design variables and student learning in the universities in South East, Nigeria.

➤ *Research Questions*

The following research questions were posed to guide the study:

- What is the relationship between academic learning space and student learning in the universities in South East, Nigeria?
- What is the relationship between specialized learning space and student learning in the universities in South East, Nigeria?
- What is the joint relationship between school design variables and student learning in the universities in South East, Nigeria?

➤ *Hypotheses*

The following hypotheses were tested at 0.05 alpha level:

- There is no significant relationship between academic learning space and student learning in the universities in South East, Nigeria.
- There is no significant relationship between specialized learning space and student learning in the universities in South East, Nigeria.
- There is no significant joint relationship between school design variables and student learning in the universities in South East, Nigeria.

II. LITERATURE REVIEW

➤ *Theoretical Framework*

The Field Theory and Concept of Life Space propounded by Kurt Lewin (1935) underpinned the study. The theory states that an individual's development was as a result of the connection between inborn predispositions (nature) and experiences in life (nurture). Lewin put this articulation in a mathematical equation formula otherwise called Lewin's Equation for behaviour, $B=f(P,E)$, where behaviour is the function of the person interacting within his environment. According to the theory, behaviour exists in totality of interacting factors in a dynamic field. The circumstances or conditions in any part of the field are influenced by and depend on every other part of the field. This psychological field is otherwise known as the life space which comprises the individual and his psychological or behavioural environment also known as facts that affect the behaviour or thoughts of the individual at a certain point. Life space is most frequently determined by the physical and social environment that the individual finds himself in. It may include places where he goes, events that occur, feelings about places and people encountered, what he sees on TV or reads in books, his imagined thoughts and goals. In relation to the study, school design is part of the physical environment a student finds himself. This environment impacts on the student

learning. Their theory provided a framework that bolstered the investigation of the problem of the study.

➤ *School Design and Student Learning*

School design is an important component of the school environment. Essentially, school design ensures that the school carries out educational activities effectively and efficiently for the achievement of positive educational outcomes. School design has critical variables which exert measurable influence upon student learning. According to Sivunen, Viljanen, Nenonen and Kajander (2014), variables of school design are the physical components that make up the design which ensure that the required specific functions in the school are satisfied. The school design variables include but not limited to academic learning space, specialized learning space, support space, social space, exterior environment and interior environment. The study focuses on formal and informal learning spaces and these spaces have been found to impact on student learning. Hughes (2005) carried out a study on the relationship between school design variables and student achievement in a Large Urban Texas School District and found that school design variables had a statistically significant positive relationship with student achievement. The study of Ariani and Mirdad (2016) on the influence of school design on student performance in Mashhad city, Iran showed that design characteristics had significant effects on students' performance. Earthman (2002) stated that school design features have a measurable influence upon student learning. The above is corroborated by the submission of Plotka (2016) that the importance of good school design to teaching-learning process is unimaginable. School design is therefore very crucial to the teaching-learning process.

➤ *Academic Learning Space and Student Learning*

Academic learning space is a defined space where teaching and learning takes place without the undue interruption of external influences. One can see it as the controlled environment which facilitates the teaching-learning process. Formal learning space exists in different institutions of learning, from preschool to universities and could equally be seen in areas that education or training is given, as in the case of corporations, religious and humanitarian organizations (Sondai, Muffuh, Kandeh, & Lahai, 2017). Academic learning space is an essential tool which influences learning. A study on the impact of formal learning environments on student learning carried out by Brooks (2011) revealed that formal learning environment has a positive significant impact on student learning outcomes. Also a study on making the case for space: the effect of learning spaces on teaching and learning carried out by Byers, Imms and Hartnell-Young (2014) revealed that the learning spaces have a measurable effect on how students perceived their learning experiences and their engagement levels. Rands and Gansemer-Topf (2017) study on physical design of the active learning classroom (ALC) impact on student engagement showed that the classroom design created affordances which support learning behaviors and pedagogical practices for student engagement. The findings revealed the critical role

academic learning space plays in student learning. Learn Well Education (n.d) gave credence to this that how a classroom is built and set-up and how the space functions all play an important role on how well students are able to learn, and how motivated the students are in the environment to do so. No wonder, Thomsen (2014) argued that students need to be in a classroom that is designed to benefit them by making sure there are minimal distractions and maximal opportunities for quality learning.

➤ *Specialized Learning Space and Student Learning*

Another school design variable is informal learning space otherwise called specialized space. Specialized learning spaces are learning spaces outside of the classroom. Keppell, Souter and Riddle (2012) defined informal learning spaces as "spaces that have been explicitly designed to encourage students to engage in both independent learning and peer learning that is often unscripted". These spaces, though informal serve greatly in the academic work of students. Good amount of students' time is equally spent in the specialized spaces just as in the case of formal classrooms. The time spent here depends on the leisure time of the student outside of the time for regular classes. The main types of university specialist learning spaces are libraries (learning resource centres, information commons), workshops, art and design studios, and performance/practice areas for the performing arts (Solution for Active Learning, n.d). Specialized spaces have been shown to measurably improve the personal and social aspects of learning, as well as academic achievement. The study of Beatty (2016) on students' perception of informal learning spaces in an academic library; an investigation into the relationship between learning behaviours and space design revealed that the correlation of type of space, type of activity and their way of learning enable them to be comfortable and open to learning. Ngoc (2015) in a study on the relationship between current college students and informal learning spaces, specifically the college students' choice of informal learning spaces in higher education campuses found that current college students adopted a unique relationship with the physical environment as they chose informal learning spaces on campus to study. Kumar and Bhatt (2015) in a study on students' opinion regarding the use of informal learning spaces for academic purpose found that majority of the students use informal learning spaces for academic purpose and feels that library plays an important role in making them to use the informal learning spaces for academic purpose. Malcolm (2018) stated that informal learning spaces, those outside the classroom present particularly intriguing opportunities for pioneering and cultivating new teaching and learning practices. Corroborating the above thinking, Painter et al. (2013) expressed that most of us are likely to focus on classrooms when talking about how the environment affects learning, yet a considerable portion of student learning happens outside of formal spaces.

III. METHODOLOGY

The correlational research design was adopted for the study. The population of this study comprised 11,107 Academic Staff in the ten (10) public universities in South East, Nigeria. The sample size was 400 Academic Staff (Federal = 218; State = 182) representing 3.6% of the population. The sample was drawn using proportionate stratified random sampling technique. Two instruments for data collection were titled: School Design Scale Questionnaire (SDSQ) and Student Learning Scale Questionnaire (SLSQ). The two were developed by the researchers and validated by experts in Educational Management and Psychology, Guidance and Counseling. To ensure the instruments' reliability especially the internal consistency, the Cronbach alpha was used. The results for cluster A, B, C were 0.71, 0.67, 0.85

respectively and the overall reliability coefficient score was 0.74. This was considered adequate enough for the study. Pearson Product Moment Correlation and Multiple Correlation were used to answer research questions while Z-ratio and ANOVA were used to test the null hypotheses at 0.05 alpha level of significance.

IV. RESULTS

➤ **Research Question One:** What is the relationship between academic learning space and student learning in the universities in South East, Nigeria?

- **Ho₁:** There is no significant relationship between academic learning space and student learning in the universities in South East, Nigeria.

Categories	n	df	r	r ²	Zrcal	p-value	Sig lev.	Remarks
Academic Learning Space Student Learning	400	398	0.707	0.499	16.559	0.000	0.05	Significant

Table 1:- Pearson Product Moment Correlation Summary on the Relationship between Academic Learning Space and Student Learning in the Universities in South East, Nigeria.

Table 1 revealed that the coefficient value is 0.707, showing a positive relationship between academic learning space and student learning. The coefficient of determination (0.499 X 100) indicated that academic learning space contributes 49.9% to student learning. The table showed the probability value to be 0.000 which is lower than 0.05 level of significance. Based on the above, the study rejected the null hypothesis. Hence, the relationship is significant.

➤ **Research Question Two:** What is the relationship between specialized learning space and student learning in the universities in South East, Nigeria?

- **Ho₂:** There is no significant relationship between specialized learning space and student learning in the universities in South East, Nigeria.

Categories	n	df	r	r ²	Zrcal	p-value	Sig lev.	Remarks
Academic Learning Space Student Learning	400	398	0.691	0.477	15.935	0.000	0.05	Significant

Table 2:- Pearson Product Moment Correlation Summary on the Relationship between Specialized Learning Space and Student Learning in the Universities in South East, Nigeria.

Table 2 indicated that the coefficient value is 0.691, revealing a positive relationship between specialized learning space and student learning. The coefficient of determination (0.477 X 100) indicated that 47.7% of the variation in student learning is accounted for by specialized learning space. 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 study rejected the null hypothesis. Thus, the relationship is significant.

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

- **Ho₃:** There is no significant joint relationship between school design 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	fcrit	Sig.
1	0.767	0.588	0.585	Regression	14636.667	2	7318.333	640.218	3.018	.000 ^b
				Residual	1368.000	397	11.431			
				Total	16004.667	399				

Table 3:- Multiple Correlation and ANOVA Model Summary on the Joint Relationship between School Design Variables and Student Learning in the Universities in South East, Nigeria.

Table 3 revealed that the coefficient value is 0.767, indicating a positive joint relationship between school design variables and student learning. More so, the coefficient of multiple determination (0.588 X 100) showed that school design variables (academic learning space and specialized learning space) jointly contribute 58.8% to student learning. 41.92% is accounted for by other factors. Furthermore, the table revealed that the sums of squares are 14636.667 and 1368.000 while the mean squares are 7318.333 and 11.431. With degrees of freedom of 2 and 397, fcal value of 640.218 is significant at 0.000 which is lower than 0.05 level of significance. Sequel to this, the study rejected the null hypothesis. Hence, there is a significant joint relationship between school design variables and student learning.

V. DISCUSSION OF FINDINGS

➤ *The Relationship between Academic Learning Space and Student Learning*

The finding revealed that there is a positive relationship between academic learning space and student learning. The relationship is significant. The finding tallies with the finding of Brooks (2010) which revealed that formal learning environment has a positive significant impact on student learning outcomes. The result is also in line with Byers, Imms and Hartnell-Young (2014) who equally found that the learning spaces have a measurable effect on how students perceived their learning experiences and their engagement levels. The result also is in agreement with the findings of Rands and Gansemer-Topf (2017) which showed that the classroom design created affordances which support learning behaviors and pedagogical practices for student engagement. The findings revealed the critical role academic learning space plays in student learning. Learn Well Education (n.d) gave credence to this that how a classroom is built and set-up and how the space functions all play an important role on how well students are able to learn, and how motivated the students are in the environment to do so. No wonder, Thomsen (2014) argued that students need to be in a classroom that is designed to benefit them by making sure there are minimal distractions and maximal opportunities for quality learning.

➤ *The Relationship between Specialized Learning Space and Student Learning*

The result showed that there is a positive relationship between specialized learning space and student learning and the relationship is significant. The result is in agreement with Beatty (2016) whose study revealed that the correlation of type of space, type of activity and their way of learning enable them to be comfortable and open to learning. The finding is in accord with the findings of Ngoc (2015) which showed that current college students adopted a unique relationship with the physical environment as they chose informal learning spaces on campus to study. The result is in consonance with the finding of Kumar and Bhatt (2015) which revealed that

majority of the students use informal learning spaces for academic purpose and feels that library plays an important role in making them to use the informal learning spaces for academic purpose. The result is not farfetched. This could be attributed to the fact that these spaces, while informal are key areas for student academic work. The finding is in line with Malcolm (2018) who stated that informal learning spaces, those outside the classroom present particularly intriguing opportunities for pioneering and cultivating new teaching and learning practices. Corroborating the above thinking, Painter et al. (2013) expressed that most of us are likely to focus on classrooms when talking about how the environment affects learning, yet a considerable portion of student learning happens outside of formal spaces.

➤ *The Joint Relationship between School Design Variables and Student Learning*

The finding revealed that there is a positive joint relationship between school design variables and student learning. The joint relationship is significant. The finding is in line with Hughes (2004) whose study revealed that school design variables had a statistically significant positive relationship with student achievement. The result is in accord with the findings of Ariani and Mirdad (2016) which showed that design characteristics had significant effects on student performance. The result corroborates Earthman (2002) who stated that school design features have a measurable influence upon student learning. More so, the finding revealed that school design variables jointly contribute 73.1% to student learning in the universities in South East, Nigeria. The finding supports the submission of Plotka (2016) that the importance of good school design to teaching-learning process is unimaginable. School design is therefore very crucial to the teaching-learning process.

VI. CONCLUSION

On the basis of the findings, the study concluded that there is a positive relationship between school design and student learning and the relationship is significant. School design therefore plays a crucial role in student learning.

RECOMMENDATIONS

Based on the findings, the following recommendations were made:

- The government and her agencies should make relevant policies to guide school design and ensure their strict implementation.
- The services of relevant professionals (planners, architects, designers, educationists) should be maximally utilized in the design of schools by those saddled with the responsibility.
- School design should be reviewed regularly based on the dynamic nature of academic programme by the University Administration.

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