An Evaluation of Factors Affecting Architecture Students Performance in Building Structure in Southwestern Nigerian Public Universities

Oyadokun J.0., Odunjo O.O., Amao F.L

Department of Architecture

Ladoke Akintola University of Technology, Ogbomoso, Oyo state.

Email: jooyadokun@lautech.edu.ng

ooodunjo@lautech.edu.ng; flamao@lautech.edu.ng

ABSTRACT: *Building structure courses are compulsory courses in the study of Architecture as application of the knowledge obtained is necessary for building design stability. As important as these courses is, the performance of the students is observed to be generally low. There are many factors that are responsible for this low performance in the courses and this has not been adequately investigated. This study therefore evaluates the factors affecting academic performance of Architecture students in Building structure courses in Southwestern Nigerian public Universities, with a view to proffer solution to this problem and improving on students' performance in the courses. Quantitative research approach was adopted. Five factors were selected namely: Students background characteristics, teaching style, learning style, classroom environment and structure curriculum. The study employed multistage sampling procedure. Five public universities approved by the National Universities Commission and Architects Registration Council of Nigeria namely: FUTA, LAUTECH, OAU, UNILAG and OOU were purposively selected and sampled. A total of 702 questionnaires were administered to all the pre-final and final year students in the Department of Architecture of the sampled universities, while only 541 questionnaires were adequately completed and considered fit for analysis. Cross tabulation with chi-square was used to summarize the data. Regression analysis was used to evaluate the itemize factors on students' performances. The study revealed that there was a strong relationship between the level of students' performance in the courses and the five selected factors combined. It was also revealed that the factor that affected students most was teaching styles. The study concluded that the performance in Building structure courses rests on teaching and learning styles, therefore, when a better performance in courses is desired, a strong priority should be given to the quality of teaching and learning, the two are inseparable.*

KEYWORDS: architecture students, performance, building structure, public universities.

INTRODUCTION

Building structure is one of the courses taken by Architecture students in the study of Architecture in Universities. The course is necessary and compulsory in order to design stable

buildings and to avoid building collapse. However, a number of factors are responsible for students' academic performances. These are demography, active learning, students' class attendance, involvement in extracurricular activities, peer influence and course assessment (Ali *et al.*, 2009). Other factors include teachers' experience and educational qualifications, internal and external classroom factors such as socio-economic status of students, household composition and size of students, home environment, personal characteristics of students (attitude), social structures including parents' involvement in child's education, gender, aptitude and motivation (Ereme and Ekpete, 2008; Mambo, 2011; Opok*o et al.,* 2014). Also, other factors affecting students' performance are communication, learning facilities, teaching facilities, teaching style, learning style, classroom environment, guidance, financial constraints, size, population, ages and prior qualification (Engle and Theokas, 2010; Zezekwa and Mudavanhu, 2011).

On the other hand, the review of related literature indicates that teaching and learning styles are the primary keys to students' academic performance; therefore, there is a need to study students' academic performance in Building structure in order to proffer solution to the problem of Architecture students in Building structure. This is because the impartation of the knowledge of Building Structure into students is essential and germane to the production of competent, skilled and versatile Architects that are capable of understanding the need for functional and stable buildings to house the teeming population of Nigerians (Afolami, Olotuah, Fakere & Omale, 2013).

Thus, this study analysed five selected factors which strongly influence students' academic performance in Building structure such as students' background characteristics, teaching styles, learning styles, classroom environment and Building structure curriculum in order to determine the factor affecting students' performance most in the courses.

LITERATURE REVIEW

Factors affecting Academic Performance of Students in Building structure
Many researchers have discussed the various factors that affecting the students' academic performance. These include internal and external classroom factors such as socioeconomic status of students, household composition and size of students, home environment, personal characteristics of students (attitude),social structures including relationship with peers, parents' involvement in child's education, gender, aptitude, motivation, quality and quantity of teachers (Ereme and Ekpete, 2008; Mambo, 2011; Opoko *et al*, 2014, Oyadokun, 2021).

Other factors that affect students' performance are communication, learning facilities, guidance and family stress (Muster and Khan, 2012), gender disparity (Fiqueroa, 2000), financial constraints (Bailey, 2002), psychological, size, population, ages and prior qualification (Engle and Theokas, 2010; Zezekwa and Mudavanhu, 2011).

Ali *et al* (2009) stated that factors like demography, active learning, students' class attendance, involvement in extracurricular activities, peer influence and course assessment strongly affect students' performance. Previous studies of students' performance were conducted on various issues, factors and variables. The findings vary from region to region

and their results differed in cities and rural areas (Ali *et al*, 2009). Many studies found that teachers' experience and educational qualifications significantly influence students' performances (Njeru and Orodho, 2003; Ankomah *et al*, 2005; Ugbe and Agim, 2009; Asikhia, 2010; Yala and Wanjobi, 2011; Olaleye, 2011).

Obomanu (2011) found that lack of qualified teachers has led to consistent poor performance of students. Scholars also found that teachers' professional qualifications and teaching experience are significantly related to students' performance (Rivkin *et al,* 2005; Buddin and Zamaro, 2009; Aregbeyen, 2011; Masau *et al,* 2013). Leigh and Mead (2005) found that teacher's quality matters a lot in students' performance because teacher's knowledge and skills are the most vital in school factors influencing learning. Harb and El – Sahaarawi (2006) found that the most important factor with positive effect on students' performance is student's competence. Karamera (2003) stated that students' performance is significantly correlated with satisfaction with academic environment and facilitation of library and computer laboratory in the institution. Similarly, Robert and Sampson (2011) found that students who are actively engaged in the learning process are observed to have a positive correlation with students' performance and Cumulative Grade Point (CGP) and that a good match between student learning style and learning facilities positively affect students' performance (Ali *et al*, 2009).

Young (1999) held the view that students' performances are linked with the use of library and the level of their parental education. Kimani and Siddiquah (2008) observed that the academic environment is the effective variable for students and has positive relationship with students' performance., while Noble (2006) found that students' performance and perceptions of their coping strategies, positive attributions and background characteristics (e.g. family income, parents' level of education, guidance from parents and number of negative situations in the home) are directly relegated to the academic performance in higher institutions. However, Agus and Makhbu (2002) indicated that students from families of higher level income perform better in academics as compared to those who come from families of lower income brackets.

On the other hand, Hijazi and Naqvi (2006) found that there is a negative relationship between students' performance and family income, while the research done by Beblo and Laver (2004) found that parents' income and labor market status have a weak impact on students' performance. Agus and Makhbul (2002) indicated that the level of education of mother has been found to exert the stronger influence on students' performance as compared to level of education of father. Morover, Popoola (2002) stated that students show positive attitudes after being exposed to self learning strategy such as computer and test assisted programme instructions, self learning devices and self-instructed problem-based. Researchers believed and concluded that active learning leads to better students' attitudes and performances. Wilke (2003) and Felder *et al* (2000) therefore recommended that active learning is one of the teaching methods that work while Delong (2008) posited that active learning base teaching methods affect positive change in students' performance but Adesoji (2008) maintained that problem solving strategy is the basic means of changing students' attitude and academic performances. Opoko *et al* (2014) found that there exists no correlation between admission qualification and academic performance of Architecture students in

Building structure. Many researchers recognised class attendance as an important aspect in improving students' performance. Chow (2003), Stanca (2006), Collett *et al* (2007), found that attendance has small, but statistically significant effect on students' performance.

Moore (2006) indicated that class attendance enhances learning. Arulampalam *et al* (2009) found that there is a causal effect of absence on performance of students missing class which leads to poorer performance while Martins and Walker (2006) submitted that there is no significant effect on class attendance and students' performance. Extracurricular activities have proven to be beneficial in building and strengthening students' performance even, if the activities are not obviously related to academic subjects (Marsh and Kleitman, 2002; Lavren, 2004). Extracurricular participation is positively associated with success indicators in students' performance like consistent attendance (Bruh, 2002; Darling, Caldwell and Smith, 2005).
Bruh (2002) and Kimiko (2005) conducted a longitudinal study concerning extracurricular activities and the results shows that students who participated in school-based extracurricular activities have higher grades, academic aspirations and better academic attitudes. Researchers agreed that extracurricular activities influence students' performance and have positive effect on their performances. Various studies also found that peers' influence have impact on students' performance (Goethals, 2001; Hanushek *et al,* 2002). Wilkinson and Fung (2002) concluded that grouping students in heterogeneous learning ability shows an improvement in learning process and outcome. Top students can positively affect less students (Schindler (2003). Giuliodori, Lujan and Dicarlo (2006) stated that with peer interaction, students' can increase their abilities on solving qualitative problem questions. Peer instruction also promotes students participation and improve students' performance (Torke, Abraham and Upadhya, 2007).

Aregbeyen (2011) in his study stated that there are expected differences in students' performance across selected universities and the difference in the teaching styles of the teachers and learning styles of the students account for the variations in students' performance. Ervina and Md Nor (2005) discovered that not every subject taken by the students before entering the university has a positive relationship with their performances in the degree programme. However, in conclusion, Hussaiah (2006) stated that the guidance from parents and teachers indirectly affect the performance of the students.

METHODOLOGY OF THE STUDY

The study focused on selected factors that affect the performance of Architecture students in Building structure in public universities in Southwestern Nigeria. Only schools of Architecture in selected public universities in Southwestern Nigeria were studied and five universities were sampled namely: Federal University of Technology, Akure (FUTA); Obafemi Awolowo University (OAU), Ile – Ife, Osun State; University of Lagos (UNILAG), Lagos; Olabisi Onabanjo University (OOU), Ago – Iwoye, Ogun State and Ladoke Akintola University of Technology (LAUTECH), Ogbomoso, Oyo State.

These five universities were sampled out of twenty approved public universities schools of Architecture in Nigeria and they are from Southwestern Nigeria representing 20% of total

approved schools of Architecture in Nigeria and 100% of total approved in Southwestern Nigeria by National Universities Commission (NUC) and Architects Registration Council of Nigeria (ARCON). The study also focused on students in higher classes, that is, the final and semi-final year students of the selected universities.

The study employed a descriptive survey. It focused on data obtained from Architecture students of all the five public universities in Southwestern Nigeria. The research approach adopted for this study was quantitative approach. The principal survey techniques used was questionnaire. The choice of these survey techniques was to enable the collection of data that would respond to the objectives of this study from the Architecture students of all the public universities in Southwestern Nigeria. Data was collected from both primary and secondary sources.

The population of the study was seven hundred and two (702) students, that is, one hundred and two (102) students from LAUTECH, eighty nine (89) students from OOU, two hundred and forty five (245) students from FUTA, one hundred and seventeen (117) students from OAU and two hundred and forty five (245) students from UNILAG. The distribution is depicted in Table 1.

Table 1: Population of the Study

S/N	Name of University	Duration	Level	Number of students sampled	Total number of students sampled
1	Federal University of Technology, Akure (FUTA)	5yrs	400 500	125 120	245
2	Ladoke Akintola University of Technology (LAUTECH), Ogbomoso.	5 yrs	400 500	47 55	102
3	Obafemi Awolowo University (O.A.U), Ile Ife.	4yrs	300 400	62 55	117
4	University of Lagos (UNILAG), Lagos.	4yrs	300 400	72 77	149
5	Olabisi Onabanjo University (O.O.U), Ago - Iwoye.	5yrs	300 400	45 44	89
	Total				**702**

Source: Author's Compilation, 2022

The survey was a total or complete sample survey. The sample comprises of all students who were in 500 level and 400 level (finalists and semi-finalists) in selected universities of Technology and OOU and all 400 level and 300 level students (finalists and semi-finalists) of conventional universities. Purposive sampling method was used in selecting the students. The reason for selecting these sets of students is because they have passed through the basics of Building structure courses for at least two semesters. They were thus in the best position to give the necessary information needed for the study. A hypothesis was thus set for the study which states thus: Students' background characteristics, Teaching style, Learning style,

Classroom environment and Curriculum influenced students' academic performance in Building structure courses'. Here, the hypothesis was tested using the instrument of multiple linear regression analysis. The data were prepared in a manner that made them amenable to parametric testing. Students' background characteristics were measured using many variables. Both the teaching style and learning outcome were rated by the respondents; hence the data was collected in ordinal form. The ordinal data was transformed to interval scale. The same goes for the data on classroom environment and curriculum.

The total number of questionnaire distributed was seven hundred and two (702) and the total feedback was five hundred and forty-one (541) representing 77.1% as shown in Table 2.

Table 2: Questionnaire Distributed and Retrieved

S/N	Name of University	Duration	Level	Questionnaire Distributed	Questionnaire Received	Total Distributed	Total Received
1	Federal University of Technology, Akure (FUTA)	5yrs	400 500	125 120	80 92	245	172
2	Ladoke Akintola University of Technology (LAUTECH), Ogbomoso.	5 yrs	400 500	47 55	45 55	102	100
3	Obafemi Awolowo University (O.A.U), Ile Ife.	4yrs	300 400	62 55	45 50	117	95
4	University of Lagos (UNILAG), Lagos.	4yrs	300 400	72 77	52 50	149	102
5	Olabisi Onabanjo University (O.O.U), Ago - Iwoye.	5yrs	300 400	45 44	33 39	89	72
	Total					**702**	**541**

Source: Author's Compilation, 2022

Data collected were analysed based on the information obtained from completed questionnaire and analysed using descriptive statistics such as frequency counts, percentages, Likert scaling and Chi-square. The factors responsible for the variation in students' academic performance in the courses such as students' background characteristics was analysed, as well as, teaching and learning styles, classroom environment, Building Structure curriculum in order to arrive at the predominant factor effecting the performance of Architecture students in Building structure.

FINDINGS AND DISCUSSIONS

The background characteristics of Architecture students were investigated as well as the teaching styles adopted by teachers and the learning styles imbibed by the students. The study

went further to appraise the classroom environment where the students learn and the curriculum used to train the students. The question that follows are: is the level of performance in Building structure courses dependent on students' background characteristics, teacher's teaching style, students' learning style, classroom environment and curriculum factors? Can one say that each of the factors jointly or independently affect students' performance? If so, by what proportion does each of the factors impact students' performance in Building structure?

Thus, the study regressed five (5) independent variables: Students' background characteristics, Teaching style, Learning style, Classroom environment and Curriculum on students' academic performance in Building structure (dependent variable). The linear multiple regressions produced the coefficient of joint correlation (R) of 0.885, coefficient of determination (R^2) of 0.783 with the p-value of 0.065 at the confidence level of 95% as shown in the table below.

Table 3: Regression Analysis

Dependent	Independent	R	R^2	F	P-value	B		p-value
Building Structure Performance	Students' Background Characteristics	0.885	0.783	0.503	0.065	Constant	8.716	0.207
	Teaching Style					Student Background	0.021	0.663
	Learning Style					Teaching Styles	0.326	0.345
	Classroom Environment					Learning Style	0.082	0.616
	Curriculum					Classroom Environment	0.152	0.021

Source: Author's computation, 2022

This implies that there is a strong relationship between the level of students' performance in Building structure courses and the five independent variables combined. In other words, the reason behind an Architecture student's success in the courses is hinged on student's background characteristics, teachers' teaching style, students' learning style, classroom environment and curriculum. The coefficient of determination (R^2) indicated that 78.3% of the reasons why students perform well in Building structure can be attributed to the five independent variables. However, the description of the relationship though valid, is not significant at 95% confident level (p-value = 0.065).

To understand the degree to which each of the five independent variables influenced the performance of students in the courses, the regression model is calibrated. The equation is given as:

$$Y_1 = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Y_1 = Building structure performance, a= Constant of the regression model
b_1= Coefficient of partial regression of x_1, b_2= Coefficient of partial regression of x_2
b_3= Coefficient of partial regression of x_3, b_4= Coefficient of partial regression of x_4
x_1= students' background characteristics, x_2= Teaching style
x_3= Learning style, x_4= Classroom environment
Substituting for the equation therefore:

Building structure Performance = 8.716 + 0.021 (Student background characteristics) + 0.326 (Teaching styles) + 0.082 (Learning style) + 0.152 (Classroom environment). This equation implies that; holding other things constant, a unit increase in the quality of students background characteristics will produce a corresponding 0.021 increase in Building structure performance; a unit increase in the quality of teaching style will produce a corresponding 0.326 increase in Building structure performance; a unit increase in the quality of learning style will produce 0.082 increase in Building structure performance, and in the same vein, a unit increase in the quality of classroom environment will produce a corresponding 0.152 increase in Building structure performance.

It follows that when a better performance in Building structure courses is desired, a strong priority should be given to the quality of teaching and learning, the two are inseparable. The next to teaching and learning styles is the conducive classroom environment. Next to this is the curriculum used to train the students. The better the curriculum, the better the students both in theory and practical in the training of Architecture. The last but not the least is the students' background characteristics and it is not to be relegated to the background. However, students with average background can compete and do well among peers, if best teaching style and conducive learning environment are provided.
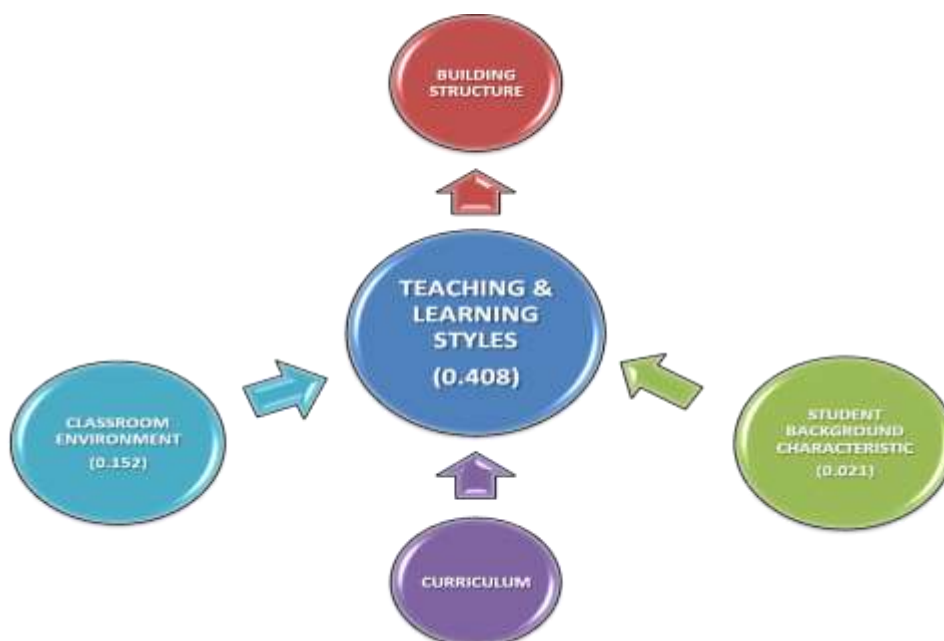

Figure 1: Contribution of each Factor on Building Structure Performance
Source: Author's Compilation, 2022.

CONCLUSION

This study has evaluated the effects of Students' background characteristics, Teaching and Learning styles, Classroom environment and Curriculum on academic performance of Architecture students in order to know the factors affects the students most in Building structure.

Result shows that the factor that affected students most in the courses was teaching styles. It follows that when a better performance in Building structure courses is desired, a strong priority should be given to the quality of teaching. The next to teaching and learning styles was the conducive classroom environment, followed by the curriculum use to train the students. The last but not the least is the students' background characteristics. The factors affecting academic performance in Building structure can be liken to human being: the head, body, hand and leg (Figure 2).
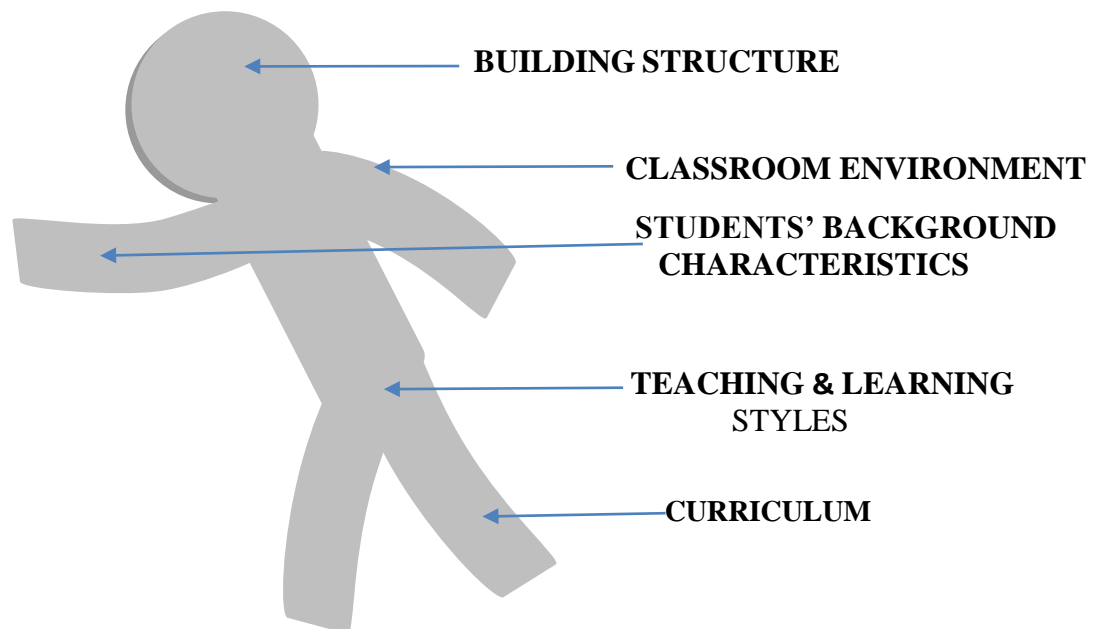

Figure 2: Relationship between Factors affecting Performance and Building structure Source: Author's Compilation, 2022

The performance in Building structure rests on teaching and learning styles which are the body that hold the head (Building structure). The two factors: Background characteristics and Classroom environment are the hands supporting the body (teaching and learning styles), while the curriculum is the leg that carries all other factors to the peak. The better the curriculum, the better the students when other factors are on ground.

REFERENCES

Afolami, A.J., Olotuah, O.A., Fakere, A.A. and Omale, R.P. (2013). Comparative analysis of student performance in Architecture Department of a Nigerian university. *International Journal of Education and Research*, **1**(6). http://www.ijerns.com/jornal/June-2013/30.pdf.(1-2)10/2.pdf. 2015.06.010

Akinsolu, A.O. (2010). Teachers and Students' Academic Performance in Nigerian Secondary Schools: Implications for Planning. *Florida Journal of Education Administration and Policy,* **3**(2): 86-103.

Ali, N., Josoff, K., Ali, S., Mokhtan, N., Salamat, A.S.A. (2009). The factors influencing students' performance at universiti teknologi Mara Kedah, Malaysia. *Management science and Engineering Journal,* **3**(4): 81 – 90.

Dufresne, J.R., Gerace, J.W., Leonard, W.J., Mestre, J.P, and Wenk, L. (2010). Classroom talk: A classroom communication system for active learning, **7**(2): 3 – 27.

Ervina, A. and Md Nor, Othman (2005). Undergraduate students' performance: The case of university of Malaya. *Quality Assurance in Education*, **13**(4): 329 – 343.

Farooq, M. S., Chavdhry, A.H., Shafiq, M. and Berhany, G. (2011). Factors affecting students' quality of academic performance: A case of secondary school level. *Journal of Quality and Technology Management,* **1**(2): 79 – 92.

Harb, N and El- Shaarwi, A. (2006). Factors affecting students' performance. *MPRA,* (1362).

Minnesota, Measure (2007). Report on Higher Education Performance. www.opencongress.org/bill/110.s/642/show–139k. 2015.05.024.

Mlambo, V. (2011). An Analysis of Some Factors Affecting Student Academic Performances in an Introductory Biochemistry Course at University of West Indies. *Caribbean Teaching Scholar,* **1**(2): 79 – 92

Mushtaq, I. and Khan, S.N. (2012). Factors affecting students' academic performance. *Global Journal of Management and Business Research,* (9): 16 – 22.

Oyadokun, J.O. (2021). Analysis of Academic Performance of Architecture Students in Building Structures in Southwestern Nigerian Public Universities, PhD Thesis, the Department of Architecture, LAUTECH, Ogbomoso (Unpublished).

Raychaudhury, A, Debnath, M., Sen. S. and Majumder, B.G. (2010). Factors affecting academic students' performance: A case study in Agartala municipal council Area, Bangladesh. *e- Journal of Sociology*, **7**(2).

Sansqiry, S.S., Bhosle, M. and Sail, M.S. (2006). Factors that affect academic performance among pharmacy students. *Amencal Journal of Pharmaceutical Education*, **70**(5):104.

Scott, K. (2012). What is the Meaning-of-Academic-Performance? http://www.studymode.com/essays/meaning-of-academic–performance1107119.html. 2015.05.024

Syed, T.H. and Raza, Naqvi (2006). Factors affecting students' performance: A case of private colleges, Bangladesh. *Journal of Sociology*, **3**(1).

APPENDIX A

List of Approved Architecture by NIA and ARCON in Public Universities in Nigeria
1. University of Jos, Jos, Plateau State
2. Federal University of Technology, Yola, Adamawa State
3. University of Lagos, Akoka, Lagos (S/W Nigeria)
4. Obafemi Awolowo University, Ile – Ife, Osun State (S/W Nigeria)
5. Olabisi Onabanjo University, Ogun State (S/W Nigeria)
6. Federal University of Technology, Akure, Ondo State (S/W Nigeria)
7. Federal University of Technology, Minna, Niger State
8. Abubakar Tafawa Balewa University – Bauchi
9. Ambrose Ali University, Ekpoma, Edo State
10. Ahmadu Bello University, Zaria
11. Kano University of Science and Technology, Kano
12. Ladoke Akintola University of Technology, Oyo State (S/W Nigeria)
13. Abia State University, Uturu, Abia State
14. University of Nigeria, Nsukka, Enugu State
15. Cross River University of Technology, Calabar, Cross River State
16. Rivers State University of Science and Technology, Port – Harcourt
17. Imo state University, Owerri, Imo State
18. Enugu State University of Science and Technology, Enugu State
19. University of Uyo, Akwa Ibom state
20. Anambra State University of Science and Technology Anambra
   Source: Interachitiv.com/architects/list – of – schools, 2022

APPENDIX B

Regression

Variables Entered/ Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Student Background Characteristics, Teaching Styles, Learning Style, Classroom Environment, Curriculum,	.	Enter

a. Dependent Variable: Scaled Building Structure Performance
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Standard. Error of the Estimate
1	0.885[a]	0.783	0.609	1.34621

a. Predictors: (Constant), Student Background Characteristics, Teaching Styles, Learning style, Classroom Environmental, Curriculum.

ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	32.646	4	8.161	4.503	0.065[b]
Residual	9.061	5	1.812		
Total	41.707	9			

a. Dependent Variable: Scaled Building structure Performance
b. Predictors: (Constant), Student Background Characteristics, Teaching Styles, Learning Style, Classroom Environment, Curriculum.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	8.716	6.018		1.448	0.207
Student Background Characteristics	0.021	0.045	0.105	0.463	0.663
Teaching Styles	0.326	0.312	1.065	1.043	0.345
Learning Outcome	0.082	0.153	0.547	0.534	0.616
Classroom Environment	0.152	0.046	0.762	3.303	0.021
Curriculum	0.000	0.000	0.000	0.000	0.000

a. Dependent Variable: Scaled Building structure Performance