

An Evaluation of Traditional Methods of Teaching Architecture Students Building Structures in Nigerian Universities

OYADOKUN J. O.¹, AMAO F. L.², ADEYINKA R.³

^{1, 2, 3}Department of Architecture, Ladoke Akintola University of Technology, Ogbomoso, Oyo state.

Abstract - The importance of Building structures in the study of Architecture cannot be overemphasized due to its immense contributions and applications in Architectural designs and Building construction. The courses provide the students the needed knowledge and theoretical foundation to understand how building stands, rigid, durable, and beautiful. The courses assist the students to understand structural concepts, loads distribution, behavior of materials under different loads, and how to prevent structural failure that may lead to collapse of buildings in Nigeria. As importance as the courses are, traditional methods of teaching are the predominant methods of teaching Building structures across all Nigerian universities despite its shortcomings, and low performance of students in the courses in which the literature acknowledged. Therefore, there is need to evaluate these traditional methods been used in teaching the courses to Architecture students in Nigerian universities in order to improve on the methods used, performance of students and to better their understanding in Building structures. The study employed descriptive survey and the research approach adopted was quantitative. It focused on Architecture students of public universities in Southwestern Nigeria universities fully accredited by National Universities Commission (NUC) and Architects Registration Council of Nigeria (ARCON). Five public universities were sampled out of fifteen approved universities with departments of Architecture in Southwestern Nigeria. The universities were: Federal University of Technology, Akure (FUTA), Ondo state; Obafemi Awolowo University (OAU), Ile – Ife, Osun State; University of Lagos (UNILAG), Lagos, Lagos state; University of Ibadan (UI), Ibadan, Oyo state and Ladoke Akintola University of Technology (LAUTECH), Ogbomoso, Oyo State. Data was collected from both primary and secondary sources. The principal survey techniques used was questionnaire. The population for the study was one hundred and twenty five (125) students. Data was analysed using descriptive statistics such as frequency counts, percentages, and Likert scaling. The study revealed that tradition methods of teaching are purely used to teach Building structures in Nigerian universities. It was also revealed that the methods affected the performance of students' coupled with lack of proper understanding, inadequate teaching materials and aids, and unavailability of building software to teach

the students. The study concluded that there is urgent need to move from traditional to modern methods to teach Building structures in Nigerian universities by adopting a blend of theoretical knowledge, technological proficiency with digital communication such as Building structures software, Artificial Intelligence (AI), Revit, ETABS, SAP2000, Teckla, Digital modeling and 3D stimulation into the curriculum to teach Architecture students in order to improve on their performance..

Keywords: Traditional methods, Teaching, Building structures, Architecture students, Nigerian universities.

I. INTRODUCTION

Building structure is one of the most important courses and critical components in the study of Architecture in Nigerian universities (Oyadoun *et al.*, 2023). It provides the students with needed knowledge and theoretical foundation to understand how building stands, safe, cost effective, resist loads, functional, stable, rigid, durable and beautiful (aesthetics). It helps the students to understand structural concepts such as load distribution, bending moments, shear and axial forces, deflections, settlements (sinking supports), torsion, materials behavior and performance, and safety requirements (Ajayi and Fadamiro, 2021).

The courses encompass the theory of building structures, structural designs, structural analysis and mode of constructions (Olawale, 2019). It forms a fundamental aspect of architecture study, shaping the competence, analytical reasoning and design decisions of the students. The courses also assist the students to understand how structural elements behave under different loads, how stability is maintained and how structural failure that may lead to collapse of buildings is prevented.

As importance and vital the courses are, traditional methods of teaching are the predominant methods of teaching Building structures across all Nigerian

universities. These method of teaching relied heavily on lecture-based methods, chalk-and board delivery, textbooks, notes dictation, notes memorization, didactic teaching style, hand-drawn calculations, and theoretical problems solving. The lecturers served as the principal source of knowledge while students assumed a passive roll absorbing theories on the courses. This limits the extent to which students can visualize real-life structural and materials behaviors.

These methods are as old as Architecture department itself because the methods are inherited from colonial and post colonial eras and still practice till today in all universities in Nigeria despite the lapses and shortcomings. Although, the methods produced many successful and renowned Architects in Nigeria over the years but the methods did not fully engage students or develop skills, and become increasingly inadequate for teaching Building structures in Nigeria due to poor and very low performance of students in the courses which researches acknowledged (Oyadokun *et al.*, 2023).

The rapid advancement in technology and building industries raise alarm and questions on effectiveness of continuing using of these methods. The situation now demands a blend of theoretical knowledge, technological proficiency with digital communication such as Building structures software, Artificial Intelligence (AI), Revit, ETABS, SAP2000, Tekla, Digital modeling, and 3D stimulation

The gap between global teaching and traditional method of teaching Building structures in Nigerian universities have expanded due to static and dominant traditional methods that remain the primary teaching methods due to long standing institutional culture and infrastructure limitation. Nevertheless, traditional methods have historical value but the methods are insufficient for contemporary needs of students coupled with global standards. Therefore, this study evaluate the traditional methods of teaching Building structures in Nigerian universities in order to improve on the quality of teaching Building structures and for the students produce to have better understanding and performance in the courses so as to prepare them for better future in the building industries and complexities of the 21st century built environment.

II. LITERATURE REVIEW

2.1 Previous Research in the Teaching Building structures

Traditional teaching methods refer to instructional approaches where the lecturer is the authority, the primary source of knowledge, and the controller of classroom activities, while Building structures refer to the system of interconnected elements such as beams, slabs, columns, walls and foundations that support and transmit loads safely to the ground without loss of strength and rigidity and give buildings stability, shape, and enclosure against environmental forces such as wind, rain, and temperature.

Several studies were carried out to examine the state of architectural education in Nigeria generally but very view in the area of Architecture students and Building structures especially in the area of methods used in teaching the courses. Few researches have been done in the area of teaching and learning of Building structures, and these researches focused on various issues with the ultimate aim of improving performance in Building structures courses (Aniza *et al.*, 2010; Oakley and Bailey, 2013, and Oyadokun *et al.*, 2023).

Oyadokun *et al.* (2024) observed that the courses are predominantly taught using teacher- centered method where lecturer delivers information while students passively receive it. Although, it is effective in covering large curriculum contents, it fails to encourage critical thinking and creativities among students of Architecture. Adetunji (2014) stated that the theory of the courses are taught mainly through lectures and assignments without modern visual aids.

Olatunji (2019) observed that many Nigerian universities still rely on traditional methods of teaching that emphasize theory over practice resulting on students struggling to understand Building structures contents deeply. He further stated that the methods provide fundamental understanding of the courses but lack experimental depth. Ajayi and Fadamiro (2021) emphasized that while the methods help students build foundation knowledge, they are insufficient in preparing them for real-life professional practice where digital tools such as Structural detailing software, Revit structure, Tekla, STAAD Pro, SAP2000 dominate

the building industries. Egbe (2020) and Oloyede and Fadamiro (2018) noted that students taught solely through traditional methods tend to rely heavily on memorization and lack deeper structural intuition.

Few researches have been done using other methods to teach Building structures. One of such authors was Vassigh (2005) and his team of researchers from various schools of Architecture in United States of America (USA). The aim was to test whether visual tools will improve performance in teaching Building structures. All the course works such as examinations, assignments and class projects were graded and recorded according to the evaluation program grading criteria. The team also measured the impact of digital media learning by using questionnaire and Interactive Structural Software (ISS).

The result showed significantly positive results for all the tests and increase improvement in the students' performance as their exposure to the ISS increased. It helped the students with lower scores and weaker mathematics skills at a greater extent because the weaker mathematics students were impacted the most.

Another author who used the experiment was Sylvain (2013). Students were taught three times using 4D modeling and simulation 3D modeling with Google Sketch Up[™] courtesy of the D – Studio Company. The main hypothesis was to test the usability and applicability of this software for Building structures. The finding revealed that the students appeared to be very interested in the opportunity offered by 4D technologies for the simulation of construction projects. They understood the interest of construction planning

analyses supported by 3D visualisation. 4D modeling helped the students to better understand what really lied behind the planning of task and also appreciated learning about high – rise design and construction.

Finally, students justified the main aim of the 4D simulation which was to improve visualisation in the application of high – rise structural principles. 4D simulation assisted and was useful for the work of students but remain difficult for them to understand although its added value in real professional life. This research not only showed that the performance of students improved, but also that the attitudes of students towards Building structures changed. Researchers like Beldarran (2006) focused on integrating new technology to improve learning and teaching.

In Nigerian universities, the traditional methods which relies heavily on lectures and theoretical explanations has remained the dominant methods for decades and no longer match the realities of modern teaching methods therefore the methods need serious improvement, amendment or possibly total shift to modern methods of teaching the courses.

2.2. Approaches of teaching Building Structures

The teaching approach of Building structures is like a tree (Oyadokun *et al.*, 2023). The lectures, like the rigid trunk support all the structures, the flexible branches are the activities split in different directions in order to make teaching and learning effective and attractive and the roots are cultural and historical treatment because structures extend from the past to the present and into the future as a continuous process (Figure1).

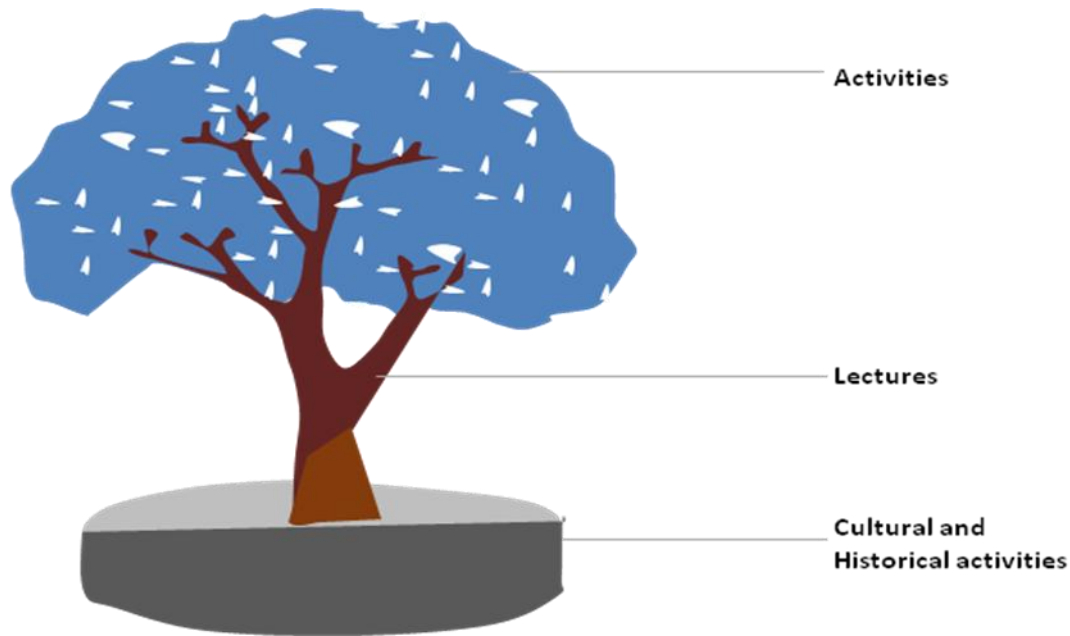


Figure 1: Approaches of Teaching Building structures

Source: Oyadokun *et al.*, 2023.

2. 4 The Traditional Methods of Teaching Building structures

Apart from the general methods of teaching which are also applicable to the teaching of Building structures, the traditional methods used in teaching Building structures include:

(i) *Lecture method*: Sajjad (2010) reiterated that the lecture method of teaching is a talk or verbal presentation delivered by teacher, lecturer or speaker to teach students. This method is widely used in teaching Building Structures. Osakinle, Onijingin and Falana (2010) described this method of teaching as one that is suitable for pre – university level of education while Olotuah and Adeniji (2005) stated that the method involves teacher – students’ interactions.

(ii) *Assignment method*: Lecturers use this method to check the level of understanding of students and how well the students understand a particular topic. According to Afolami *et al.* (2014), assignment is given to students at strategic times within the period of learning to determine students’ level of understanding since the students are not expected to submit the answers immediately. This gives the students opportunity to be actively involved in learning while in their respective residences.

(iii) *Test quiz method*: This method is similar to assignment method. The students are given limited time to proffer solutions to questions given by the lecturer. This method is best to determine the

instantaneous understanding the students have derived from the topic taught.

(iv) *Case study method*: This method is a powerful student – centered approach capable of imparting students with critical thinking, communication and interpersonal skills. The students are allowed to work through complex, ambiguous and real world problems. Acquaint them with course materials, encourage them from an action perspective rather than analyse it from a distance (Schwartz, 2012). This method is multi-disciplinary and allows the application of theoretical concepts taught in class; it therefore bridges the gap between theory and practice. Eigbeonan (2013) stated that case study method increase students’ proficiency with written and oral communication as well as collaboration and team work.

(v) *Discussion method*: Sajjad (2010) defined this method as a free verbal exchange of ideas between group members or teacher and students. For effective discussion, the students have a prior knowledge and information about the topic to be discussed. Adetunji (2014) stated that one of the strengths of this method is encouragement of various ideas and experiences from group and it allows everyone to participate actively in the topic under discussion.

(vi) *Practical example method*: In this method, students ask for more industrial and practical examples in the teaching of Building structures. This helped to connect structural theory with

practical examples in the classroom and in learning. The use of practical examples in the classroom is targeted to help illustrate and explain new concepts introduced and to teach the students how to apply them. The examples are clear and straight forward and as simple as possible. It is designed in a way that the students' senses are brought to play.

2.5 Shortcomings of Traditional Methods

Literature acknowledges many shortcomings of traditional methods in Nigeria education ranging from poor funding, influence of institutional constraints, rigidity of curriculum, technological limitation, limited exposure to real-world conditions, notes memorization, reduce both motivation and renovation, lack of training opportunities for lecturers, spatial limitations, time consuming, slow adaptation of modern needs, one-size-fit-all approach, outdated training materials, overcrowding, and systematic academic disruption. The methods of teaching have resulted in a mismatch between what is taught to the students and what the building industries need and the methods did not develop students who are critical thinkers (Bransford and Donovan, 2005). In the traditional methods of teaching Building structures, a lecturer uses chalk, board and talk; this is one way flow of passing information to students. The lecturer often talks for hours without students' response and feedback and the materials presented are only based on lecturer's notes and textbooks. The handwriting of the lecturer decides the fate of the subject since there is insufficient interaction with the students in the classroom. More emphasis is given to theory without any practical and real life time situations. The students learn from memorization without understanding. These methods of teaching did not encourage students to question what they learn or associate with previously acquired knowledge (Damodharan and Rengarajan, 2007, Oyadokun *et al.*, 2023).

These methods are successful in the past but the minds of the current generation of Architecture students vary from those of the previous generations. Therefore, the efficiency of those methods has reduced due to the short attention and attitude of students towards the courses coupled with non interaction between the teachers and the students. Majority of the students lose focuses and their minds wandered about during teaching and

learning of Building structures (Olotuah *et al.*, 2013; Afolami, 2014).

Many schools of Architecture face the same problem of teaching Building structures worldwide and the ability of Architecture students to integrate structure elements in conceptual designs and practices is very low (Aniza *et al.*, 2010; Afolami, 2014). There are calls from many researchers for new innovation of teaching the courses to cater specially for the Architecture students. Some even call for radical change in the old methods of teaching and suggest that advantages of these old methods, if possible, be transferred to the new methods of teaching.

Trinidad (2005) also supported the need for academics researches in the area of modern teaching methods. Vjera *et al* (2012) stated that in the last couple of decades, the paradigm of teaching and learning changed from a lecturer centered approach, that is, from an input base to an output base approach. It is concluded that for the success of students in professional life, knowledge is needed as well as the soft skills (Vjera *et al*, 2012). Milton (2008) posited that the instructional model of the teachers and the textbooks as the primary sources of teaching Building structures convey through traditional methods has proven to be ineffective and showed signs of wear in teaching the courses.

III. METHODOLOGY OF THE STUDY

The study employed descriptive survey and the research approach adopted was quantitative. It focused on Architecture students of public universities in Southwestern Nigeria universities fully accredited by National Universities Commission (NUC) and Architects Registration Council of Nigeria (ARCON). The reason for focusing on public universities was because public universities are similar in their academic environment.

Five public universities were sampled out of fifteen approved universities with departments of Architecture in Southwestern Nigeria. These five universities were the only public universities approved by NUC and ARCON; the remaining ten universities were private universities representing 33.3% of total approved departments of Architecture and 100% of public universities in Southwestern

Nigeria. The universities were: Federal University of Technology, Akure (FUTA), Ondo state; Obafemi Awolowo University (OAU), Ile – Ife, Osun State; University of Lagos (UNILAG), Lagos, Lagos state; University of Ibadan (UI), Ibadan, Oyo state and Ladoke Akintola University of Technology (LAUTECH), Ogbomoso, Oyo State.

Data was collected from both primary and secondary sources. The primary data was obtained through questionnaire given to Architecture students. The secondary data was derived from multiple sources as published and unpublished materials in books, journals, encyclopedia, and internets. The unit of analysis was the student who

had registered in an accredited public department of Architecture in Southwestern Nigeria. The principal survey techniques used was questionnaire.

The population for the study was one hundred and twenty five (125) students, that is; twenty five students from each university were purposely sampled since the aim of the study was to ascertain if traditional methods of teaching were used to teach the courses in the departments of Architecture, and then evaluate the methods. The total number of questionnaire distributed was also one hundred and twenty five (125) and the total feedback was the same as depicted in Table 1.

Table 1: Population for the Study, Questionnaire Distributed and Retrieved

S/N	Name of University	Number of Students Sampled	Questionnaire Distributed	Questionnaire Retrieved
1	Federal University of Technology, Akure (FUTA)	25	25	25
2	Ladoke Akintola University of Technology (LAUTECH), Ogbomoso.	25	25	25
3	Obafemi Awolowo University (O.A.U), Ile Ife.	25	25	25
4	University of Lagos (UNILAG), Lagos.	25	25	25
5	University of Ibadan (UI), Ibadan	25	25	25
Total		125	125	125

Source: Authors Compilation, 2025.

This study utilised the total population of the students (125students) since it was not too large and was more representative than a sample; therefore, the survey was a total or a 100% sample survey. Data was analysed using descriptive statistics such as frequency counts, percentages, and Likert scaling.

IV. FINDINGS AND DISCUSSION

In order to make the analysis a bit more comprehensible and for the possibility of summative indexing for further parametric analysis, the study scale the ordinal data into interval form, using a method reminiscent of Likert scaling. Basically, this involves attachment of weights or points to the ordinal ratings of the respondents. In the study,

‘Agree’ attracts three points, ‘indifferent’ attracts two, and ‘disagree’ attracts one. These points were used to multiply the corresponding frequency of rating to produce a weight value for the variable as distributed among the sampled universities. By this, it is possible to measure each ordinal variable more decisively and produce a more summarised data on each variable of measurement for each of the university.

In the study, the measurement of twenty one variables led to the opinion formed on the outcome of teaching methods used to teach Building structures in Architecture.

These variables are major characteristics of traditional methods as shown in Table 2.

Table 2; Outcome of Teaching methods used to teach Building structures

S/N	Variables	Disagree (%)	Indifferent (%)	Agree (%)	Method used
1	Lecturers do all talking and students listen in Building structures class.	2.4	0.6	97.0	Traditional method
2	Lecturers explain all points and provide all knowledge.	6.5	5.4	88.1	Traditional method
3	Lecturers provide answers to questions in Building structures class.	8.1	5.6	86.3	Traditional method
4	Lecturers encourage students' participation in class.	71.4	7.0	21.6	Traditional method
5	Lecturers encourage new ideas when teaching Building structures.	70.8	14.0	25.2	Traditional method
6	Lecturers teach by giving notes and handouts.	2.2	2.1	95.7	Traditional method
7	Lecturers use audio-visual aids to teach in class	89.0	4.6	6.5	Traditional method
8	Lecturers use slides and power points to teach Building structures.	88.3	3.0	8.7	Traditional method
9	Lecturers give assignments and home works.	7.3	5.3	87.4	Traditional method
10	Lecturers use structures software to teach	98.5	1.1	0.4	Traditional method
11	Lecturers use Revit/ ETAS/SAP2000/AI tools to teach Building structures.	98.8	2.2	0.0	Traditional method
12	Building structures class always overcrowded.	11.2	4.4	84.4	Traditional method
13	Lecturers always use chalk and board to teach.	1.4	0.5	98.1	Traditional method
14	Lecturers use projectors and teaching aids to teach the courses.	86.3	6.0	7.7	Traditional method
15	Lecturers always dictate notes and students copy.	1.5	0.4	98.1	Traditional method
16	Lecturers solve structures calculations manually.	2.1	0.6	97.3	Traditional method
17	Both lecturers and students use calculators to solve problems	1.3	0.5	98.2	Traditional method
18	Lecturers teach with practical examples and life projects.	88.7	1.2	10.1	Traditional method
19	Lectures on Building structures are mostly theoretical explanations and approaches.	1.7	0.4	97.9	Traditional method
20	Pass all your Building structures examinations with at least (50%).	65.3	9.1	25.6	Traditional method
21	Understanding Building structures properly with the methods use by the lecturers to teach the courses.	70.2	7.4	22.4	Traditional method

Source: Authors Computation, 2025

From Table 2, all (100%) the variables ascertained to the use of traditional methods in the teaching of

Building structures in all the universities sampled. This is the affirmation that traditional methods were

predominant methods used to teach Building structures in Nigerian universities starting from lecturers do all the talking and students listen to the last variable, understanding Building structures properly with the methods use by the lecturers to teach the courses. Majority (97.0%) of the students agreed that lecturers do all talking while the students listen in class, majority (88.1%) agreed that lecturer explain all points and provide all answers, majority (86.3%) agreed that lecturers provide answers to questions in class and many (95.7%) agreed that they teach by giving notes and handouts while very few (2.4%, 6.5%, 8.1% and 2.2%) respectively disagreed.

On the issue of lecturers give assignments and home works, majority (87.4%) of the students agreed, likewise, majority (84.4%) agreed that class always overcrowded during teaching of the courses by the lecturers and very many (98.1) agreed that lecturers use chalk and board to teach structures while few (7.3%, 11.2% and 1.4%) respectively disagreed.

The study went further to rate whether lecturers always dictate notes and the students copy. Very many (98.1%) agreed to this assertion. Majority (97.3%) also agreed that lecturers solve calculations manually likewise, very many (98.2%) of the students agreed that both lecturers and students use calculators to solve problems in Building structures and that very many (97.9%) agreed that lectures on the courses are mostly theoretical explanations and approaches while very few (1.5%, 2.1%, 1.3% and 1.7%) of the students respectively disagreed.

Encourage students participation in class by the lecturers was also investigated to ascertain if lecturers use traditional methods to teach. It was observed to be generally the same in all sampled universities. Few (21.6%) of the students agreed to this while majority (71.4%) disagreed. It was investigated if lecturers encourage new ideas from students when teaching the courses. It was observed that they do not encourage new ideas when teaching. Majority (70.8%) disagreed while few (25.2%) agreed. On the issue of using audio-visual to teach the courses, the responses of the students were very poor. Only few (6.5%) agreed on this while (89.0%) disagreed. Students were asked to rate the use of slide and power points, very many (88.3%) of students disagreed that lecturers use slide and power points to teach the courses while few (8.7%) agreed.

Likewise, on the use of Building structures software to teach the courses, very few (0.4%) agreed while very many (98.5%) of the students disagreed. This leads the study to investigate whether the tools (software) are available for use. Very many (98.8%) of the students disagreed to the availability of the software while no student (0.0%) agreed.

Students were also asked to rate the use of projectors and teaching aids to teach the courses, majority (86.3%) of the students disagreed with this, while few (7.7%) agreed. The study went further to rate if lecturers use practical examples or life projects to teach. In the same manner, a greater proportion (88.7%) of students disagreed and few (10.1%) agreed. The students were then asked to rate if they passed all Building structures examinations they have sat for or done from the beginning till date with at least 50% which is an average mark but surprisingly many (65.3%) of the students disagreed while very few (25.6%) agreed. This shows that the performance of the students using these methods was very low. There is need to review, modernize or move away from the methods in order to assist the students to perform better in the courses. Finally, the study went further to investigate whether the students understand the courses properly with the methods the lecturers use to teach the courses. It was observed that many (70.2%) of the students' disagreed and few (22.4%) agreed.

V. CONCLUSION

The study revealed that tradition methods of teaching are purely and solely used to teach Building structures in Nigerian universities. These methods affected the performance of students' coupled with lack of proper understanding. It also revealed inadequate teaching materials and aids, unavailability of building software to teach the students to enhance the quality of teaching to better understanding and performance of students in the courses. The methods fall short in practical engagement, technology integration, low performance and critical thinking with little exposures to real-life structural behavior. Therefore, the study recommends a change from traditional to modern methods for teaching Building structures in Nigerian universities.

The study further recommends that the teaching of the courses need a hybrid approach shift if traditional methods cannot be abolished by integrating Building structures software such as SAP2000, ETABS STAAD, digital technology, and improving practical exposures into the curriculum to teach the students in Architecture for the demand of 21st century. The modern methods of teaching which include advanced critical thinking, problem-solving, and digital visualization skills, active participations, hand-on-lab (laboratory demonstration), innovative, and interactive stimulation will definitely enhance students' creativity, reasoning, reduce examination anxiety, and better performance. It will also enhance better understanding of the courses and prepare the students for future challenges in the field of Architecture.

Implementing these recommendations into teaching Building structures in Architecture will definitely preserve the strengths of lecturers teaching the courses and improve skills and comprehension of students in the courses. The universities and Departments of Architecture will be able to produce students who possess not only theoretical knowledge, but students with higher competency, sound knowledge in structural designs, employable and capable of contributing meaningfully to the development of building construction in Nigeria, and the whole world at large.

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