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SMART PEDAGOGY: FOCUS ON THE PROSPECTS AND CHALLENGES OF THE FLIPPED CLASSROOM APPROACH IN NIGERIAN ARCHITECTURAL EDUCATION

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ABSTRACT

Architectural education in a developing country like Nigeria has remained largely dependent on the traditional learning approach/module where the architectural educator is the centre of knowledge in executing activities such as lectures, studio instructions, lab work, among others. A shift away from this method has been advocated especially in this era of information technology advancement. This study through a questionnaire survey of four higher institutions of learning in Nigeria, evaluates the prospects and challenges of implementing the flipped classroom approach. Using purposive sampling techniques, the well-structured questionnaire was used to gather data from both students and lecturers in (University of Lagos, Federal University of Technology Owerri, Federal Polytechnic Nekede Owerri and Yaba College of technology Lagos) regarding the subject of this study. The gathered data were analyzed using appropriate descriptive statistical tools and ANOVA. It was found that 80% of the lecturers are computer literate but only 20% opted for the use of the flipped classroom approach. Also 85% of the students prefer the use of the flipped classroom approach in architecture education. A significant relationship was observed in the perception of the students and lecturers regarding the use of flip classroom approach in Architecture education in Nigeria. The challenges and implications of implementation of flip classroom pedagogical approach for architectural education in Nigeria were also highlighted. Sustainable solutions were proffered for making architectural education more responsive to the rapid global technological development in the pedagogical approach in architectural education.

I. INTRODUCTION

The goal of architectural education is subsumed in the general concept of education, which is to prepare people to improve and perpetuate their society. This is achieved by taking due cognizance of the society's political, social and economic circumstances in the design of the educational programme [1, 2]. Architectural education in Africa and by extension Nigeria has been found to be plagued by three issues highlighted by [3] to include the inadequacy of the existing curriculum to deal with emerging urban problems as well as rural ones and insufficiency in the number of trained architects which emanates from the dearth of teaching resources and facilities in the schools. More fundamental is the inability to adapt architectural education to the changing socio-economic and global advancement of the built environment particularly in the method of dissemination of this education [4]. From the inception of architectural education in Nigeria, the traditional learning approach/module in which the architectural educator is seen as the center of knowledge in executing activities such as lectures, studio instructions, laboratory work, formulation and review of homework and administration of examinations has been adopted.

However over the years, it has been discovered that this module of learning has failed as posited by [5] who succinctly

argued on the need for a new approach in the delivery of architectural education, stressing that in view of information technological changes, the increasing complexity in building projects and vagaries in the economy, a paradigm shift in the method of delivery of architectural education in Nigeria is necessary. This notion is supported by [6] who claimed that the quality of architectural education in Nigeria is low compared with international standards; hence, there is a need to enhance the quality of education in terms of learning and teaching methodology. [7] and [8] in their submission asserts that if the profession of architecture's body of knowledge is to be enhanced, learning excellence must become the essence of architectural education. The students not the educators must become the focus of the learning experience where they participate actively in the teaching-learning practice in higher education [9, 10].

This active participation of students in learning according to [11] is known as the flipped classroom concept; a student-centred approach to learning where the students are more active than the instructor in the classroom activity. In this case, the instructor acts as a facilitator to motivate, guide, and give feedback on students' performance. This type of activity also increases students' collaborative learning outside the class [12].

The curriculum contents and specific subjects of study of schools of architecture in Nigeria are categorized into seven instruction modules namely: Architectural Design; Arts and Drawing; Historical and Theoretical Studies; Building Systems Technology; Humanities and Social Studies; Environmental Control System; and Physical Sciences. Many of our current teaching practices assume that students are "empty vessels" and the role of architectural educators is to fill them with knowledge. However research by [13] and [14] on student learning suggests that dialogue is more appropriate in that it emphasizes the interactive, cooperative and rational aspects of teaching and learning. He further posited that once faculty shift from the empty vessel model to a dialogic and communal one which is what the flip pedagogical approach is all about, a lecture class will no longer entail simply a scripted delivery of information but will then include a variety of active learning techniques that truly engage students in collective dialogue.

Based on the forgoings, this study aims to determine the prospects and challenges of incorporating the flipped classroom approach in Nigerian Architectural Education. The objectives of this study are; 1) to determine the infrastructural readiness of the architecture schools studied for the smart flipped pedagogy, 2) to ascertain if there is a significant difference in the students' preference for the smart flipped pedagogy across architecture schools studied, and 3) to ascertain if there is a significant difference in the lecturers' preference for the smart flipped pedagogy across architecture schools studied.

Much of the pedagogy of architectural education in Nigeria today is guided by implicit assumptions based on the notion that students are empty containers that need to be filled by the architectural educators who are at the center of the learning activities. This paper is based on the need to fill the knowledge gap currently existing in the literature of the flip architectural pedagogy in order to contribute to the larger conversation occurring in architectural education research.

II. LITERATURE REVIEW

II.1 THE FLIPPED CLASSROOM CONCEPT

Flipped classroom is also known as a student-centred approach to learning where the students are more active than the instructor in the classroom activity. In this case, the instructor acts as a facilitator to motivate, guide, and give feedback on students' performance [15]. It is also defined as a model of delivering instruction that shifts lectures from a class time activity to an at home activity and shifts "homework" from an at home activity to an in-class, critical thinking set of activities.

Flipped learning in the words of [16] is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter. Traditional teaching on the other hand is the practice of a teacher led, in-class lecture as the primary learning activity in the classroom and comprehension activities assigned as homework. [17] succinctly submitted that the intention of a flipped classroom approach is to provide students with the opportunity to become engaged with the learning process, as students work on a question or task designed to help them understand a concept. Theoretically, the flipped classroom approach allows students to follow a flexible learning process which intends to give them the opportunity to improve their achievements supported by a more creative and innovative teaching approach compared to traditional way of teaching [18].

II.2 TYPES OF FLIPPED CLASSROOM

II.2.1 The Standard Inverted Classroom

Students are assigned the "homework" of watching video lectures and reading any materials relevant to the next day's class. During class time, students practice what they've learned through traditional schoolwork, with their teachers freed up for additional one-on-one time.

II.2.2 The Discussion-Oriented Flipped Classroom

Teachers assign lecture videos, as well as any other video or reading related to the day's subject. Class time is then devoted to discussion and exploration of the subject. This can be an especially useful approach in subjects where context is everything like architectural history, or Humanities.

II.2.3TheDemonstration-Focused Flipped Classroom

Especially for those subjects that require students to remember and repeat activities exactly — think chemistry, physics, and just about every math class — it is most helpful to have a video demonstration to be able to rewind and re-watch. In this model, the teacher uses screen recording software to demonstrate the activity in a way that allows students to follow along at their own pace.

II.2.4The Faux-Flipped Classroom

This flipped classroom model has students watching lecture video in class — giving them the opportunity to review materials at their own pace, with the teacher able to move from student to student to offer whatever individual support that is needed.

II.2.5 The Group-Based Flipped Classroom

This model adds a new element to help students learn — each other. The class starts the same way others do, with lecture videos and other resources shared before class. The shift happens when students come to class, teaming up to work together on that day's assignment. This format encourages students to learn from one another and helps students to not only learn what the right

answers are but also how to actually explain to a peer why those answers are right.

II.2.6 The Virtual Flipped Classroom

The flipped classroom can in some cases eliminate the need for classroom time at all. Some college and university professors now share lecture video for student viewing, assign and collect work via online learning management systems, and simply require students to attend office hours or other regularly scheduled time for brief one-on-one instruction based on that individual student's needs.

II.3 FLIPPING THE TEACHER

In the flipp classroom approach videos are not only created by the teacher but by the students as a means of demonstrating proficiency and passing on their own ideas to the teacher.

Table 1: Traditional versus the flip Pedagogy.

S/N	Traditional pedagogy	Flip pedagogy
1	Teacher-Centered	Learner-Centered
2	Focus is on instructor	Focus is on both students and instructor
3	Focus is on language forms and structures (what the instructor knows about the language)	Focus is on language use in typical situations (how students will use the language)
4	Instructor talks; students listen	Instructor models; students interact with instructor and one another
5	Students work alone	Students work in pairs, in groups, or alone depending on the purpose of the activity
6	Instructor monitors and corrects every student utterance	Students talk without constant instructor monitoring; instructor provides feedback/correction when questions arise
7	Instructor answers students' questions about language	Students answer each other's questions, using instructor as an information resource
8	Instructor chooses topics	Students have some choice of topics
9	Instructor evaluates student learning	Students evaluate their own learning; instructor also evaluates
10	Classroom is quiet	Classroom is often noisy and busy

Source: [19].

II.4 PROSPECTS AND CHALLENGES OF FLIP PEDAGOGY

Researchers [20], [21] have submitted that the flipped pedagogy allows for greater freedom and learning flexibility of students. It has the capacity to promote cross-national and multidisciplinary perspectives in the educational practice thereby equips students and faculty with tools and resources that would enable them to successfully engage the academic world of the 21st century. The research by [22] show that electronically based systems like audio or video materials such as instructional videos, YouTube, screencast,podcast etc. for out-of-class learning and regular (instead of optional) face-to-face class meetings as the two necessary elements of flipped classroom approach.These however require internet access which is still at its infancy stage coupled with unsteady electricity supplies are challenges that can get in the way of learning and knowledge dissemination using the flip mode in Nigeria. In the words of [23]adopting the flip mode will require considerable initial start up preparations infrastructurally and in training and re-training of facilitators, which may be burdensome for institutions operating on tight budgets.

III. RESEARCH METHODOLOGY

This study employed a descriptive research methodology with four case studies; University of Lagos, Federal University of technology Owerri, Federal Polytechnic Nekede Owerri and Yaba College of technology Lagos. A well-structured questionnaire based on a 5-point Likert scale was adopted in the study. The target participants in the study were students and lecturers of Architecture, in the built environmental faculties/schools of the case studies. Two sets of questionnaires were adopted; the first was administered to 240 students (60 in each school) using a purposive sampling technique; to ascertain the students' perception of the flipped classroom approach. The second set of questionnaires (20 in each school) were purposively administered to the architecture lecturers (From the ranks of technologists to senior lecturers) to find out their state of preparedness in terms of infrastructural and curriculum appropriateness for the implementation of the flipped classroom approach.

A total of 186 usable questionnaire responses were obtained for the students group in the 4 higher institutions of learning. The break down shows that 49 responses were obtained from UNILAG, 45from FUTO, 44 from YABATECH, and 48 from FED.POLY NEKEDE. The 186 responses represent an effective response rate of 77.50%. For the Lecturers group, a total of 60 usable questionnaire responses were obtained from the 4 higher institutions of learning. The break down shows that 14 responses were obtained from UNILAG, 19 from FUTO, 12 from YABATECH, and 15 from FED.POLY NEKEDE. The 60 responses represent an effective response rate of 75.00%. Prior to th actual analysis, the gathered data were subjected to reliability test. The data reliability test was executed using Cronbach's alpha test which shows that the alpha's value is above 0.70; thus, implying high internal consistency and reliability. Data analysis were done using descriptive statistical tools and ANOVA.

IV. RESULTS AND DISCUSSIONS

IV.1 DEMOGRAPHIC INFORMATION OF RESPONDENTS

The result of the analysis of respondents demographic data is shown in Table 2 and 3. Table 2 displays the demographic profiles of the student respondents. From the table, 67.20% of the students are between 18-24 years of age, 29.57% are between 25-30, 2.69% are above 30 years of age. With regards to their gender, 81.18% are males, and 18.82% are females. With this, the students participants are of age and can give reliable information to aid meeting the study objective.

Table 2: Students' demographic profile.

	Variables	Freq.	%
Age	18-24	125	67.20
	25-30	55	29.57
	30 and above	5	2.69
	Missing	1	0.54
	Total	**186**	**100.00**
Gender	Male	151	81.18
	Female	35	18.82
	Total	**186**	**100.00**

Source: Author (2021).

Table 3 displays the demographic profiles of the lecturers group. In terms of their ranks, 23.33% are senior lecturers and Lecturer 1 each, 20.0% are Lecturer 11, 18.33% are assistant lecturers, and 15.0% are technologist. This shows a fair representation of the lecturers of the sampled institutions. Concerning the gender of the lecturers, 58.33% are males and 41.67% are females. This also shows a fair representation of the male and female genders in the sampled institution.

Table 3: Lecturers' demographic profile.

Variables	SCHOOLS				Total	%
	A	B	C	D		
Rank						
Senior Lecturers	4	5	2	3	14	23.33
Lecturer 1	4	2	4	4	14	23.33
Lecturer 11	2	6	2	2	12	20.00
Asst. lecturer	2	4	2	3	11	18.33
Technologist	2	2	2	3	9	15.00
Total	**14**	**19**	**12**	**15**	**60**	**100.00**
Gender						
Male	8	11	6	10	35	58.33
Female	6	8	6	5	25	41.67
Total	**14**	**19**	**12**	**15**	**60**	**100.00**
A= UNILAG; B=FUTO; C=YABATECH; D=FEDPOLY NEKEDE						

Source: Author (2021).

IV.2 LECTURERS' PEDAGOGICAL PREFERENCE

The lecturers' pedagogical preference of the lecturers is shown in Table 4. It can be seen that a greater number of the lecturers preferred the flip pedagogical approach (71.43% at UNILAG, 63.16% at FUTO, 75.0% at YABA TECH., and 66.67% at FED POLY NEKEDE) to the traditional lecture mode (28.57% at UNILAG, 36.84% at FUTO, 16.67% at YABA TECH., and 26.67% at FED POLY NEKEDE).

Overall, 41(68.33%) of the sampled lecturers prefer flip pedagogical approach, 17(28.33%) prefer the traditional lecture mode, and 2(3.33%) prefers a combination of the flip pedagogical approach and the traditional lecture mode.

Table 4: Lecturers' Pedagogical Preference.

School	Preferred Pedagogy	Freq.	%
UNILAG	flip	10	71.43
	traditional	4	28.57
	Total	**14**	**100.00**
FUTO	Flip	12	63.16
	traditional	7	36.84
	Total	**19**	**100.00**
YABA TECH	Flip	9	75.00
	traditional	2	16.67
	Combined	1	8.33
	Total	**12**	**100.00**
FED POLY NEKEDE	Flip	10	66.67
	traditional	4	26.67
	Combined	1	6.67
	Total	**15**	**100**

Source: Author (2021).

IV.3 ASSESSMENT OF LECTURER'S COMPUTER LITERACY

Furthermore, the computer literacy of the lecturers was assessed, and the results show that most of the lecturers are computer literate (100% at UNILAG, 78.9% at FUTO, 100% at YABA TECH. and 80% at FED POLY NEKEDE). This to a large extent shows the state of readiness of the lecturers to adopt the smart flip pedagogical approach.

Table 5: Computer literacy.

School	Response	Frequency	%
UNILAG	Yes	14	100.00
	No	0	0.00
	Total	**14**	**100.00**
FUTO	Yes	15	78.9
	No	4	21.1
	Total	**19**	**100**
YABA TECH	Yes	12	100.0
	No	0	0.00
	Total	**12**	**100.00**
FED POLY NEKEDE	Yes	12	80.0
	No	3	20.0
	Total	**15**	**100.00**

Source: Author (2021).

IV.4 STUDENTS' PERCEPTION OF INFRASTRUCTURAL SUITABILITY FOR FLIPPED PEDAGOGY

The students were asked to rate the infrastructural suitability for flipped pedagogy in their schools. The analysis of the responses are shown in Table 6. The scale for deciding the suitability of infrasturcture for suitability for flipped pedagogy in percentage are; 81 to 100% = Very high suitability; 61 to 80%= High suitability; 41 to 60% =Moderately suitable; 21 to 40% =Low suitability; and below 20% = Very Low suitability.

It can be seen that accross the schools, students in UNILAG considered the infrastructure suitability for flip pedagogy to be low, those at FUTO, YABATECH and FED.POLY. NEKEDE students consider it moderately suitable. Overall, it can be concluded that available infrastructures are not suitable enough for the implementation of the flip pedagogy.

Table 6: Infrastructural suitability for flipped pedagogy.

S/N	Schools	1	2	3	4	5	N	Total	Mean	%
1	UNILAG	1	47	1	0	0	49	98	2	40.00
2	FUTO	1	35	8	1	0	45	99	2.2	44.00
3	YABATECH	2	32	5	4	1	44	102	2.32	46.36
4	FED.POLY. NEKEDE	4	35	6	1	2	48	106	2.21	44.17

Source: Author (2021).

IV.5 LECTURERS' PERCEPTION ON THE CURRICULUM SUITABILITY FOR FLIPPED PEDAGOGY

Lecturers were asked to rate the curriculum suitability for flipped pedagody on a 5-point Likert scale. The resutl of the analysis is shown in table 7. The present curriculum suitability of the schols sampled revealed that the lecturers considered the curriculum adequate for the implementation of the flip pedagogy (71.60% at UNILAG, 62.60% at FUTO, 80% at YABATECH and 72% at FED.POLY. NEKEDE.

Table 7: Curriculum suitability for flipped pedagogy.

S/N	Schools	1	2	3	4	5	N	Total	Mean	%
1	UNILAG	1	0	5	4	4	14	52	3.58	71.6
2	FUTO	1	2	6	6	4	19	67	3.13	62.6
3	YABATECH	1	0	1	5	5	12	49	4.00	80.0
4	FED.POLY. NEKEDE	0	0	8	5	2	15	54	3.60	72.0

Source: Author (2021).

IV.6 LECTURERS' PREFERENCE FOR THE SMART FLIPPED PEDAGOGY

The result of the descriptive statistics of the data gathered from lecturer on their preference for smart flipped pedagogy is displayed in Table 8. The cut-off points for determining the level of preference/agreement for the smart flipped pedagogy based on the mean values as modified from [16] are; mean value of ≥ 4.50= "very strongly"; 3.50-4.49 = "strong"; 2.50-3.49 = "moderate"; 1.50-2.49 = "weak"; and 1.00-1.49 ="very weak".

The lectrurers at UNILAG and FUTO have a very strongly preference for smart flipped pedagogy with mean vbalues of 4.75 and 4.63 respecttively. Furthermore, Lecturers at YABATECH and FED.POLY. NEKEDE have a strong preference for smart flipped pedagogy. Overall, the preference for smart flipped pedagogy is high; this shows agreement among the lecturers of high institutions of learning in Nigeria. Furthermore, a look at column 6 and 7 of table 8 shows the skewness and kurtosis values. Data are considered to be in excellent form where the skewness range is fewer than 2 and kurtosis fewer than 7. These further strengthen the evidence the gathered data are accurate and reliable.

Table 8: Descriptive Statistics of Preference for the smart flipped pedagogy.

S/N	Schools	Mean Statistic	Std. Devi.	Rank	Skewness	Kurtosis	Decision
3	UNILAG	4.75	0.43	1	-1.168	-0.646	Very Strong
1	FUTO	4.63	0.86	4	-0.395	-0.438	Very Strong
4	YABATECH	4.06	1.26	2	-0.929	-0.829	Strong
2	FED.POLY. NEKEDE	3.79	1.14	3	-1.407	1.448	Strong

Source: Author (2021).

IV.6.1 Test of Homogeneity of Variances

The assumption for ANOVA which is Homogeneity of Variance was carried out to validate the instrument used in the analysis. A value greater than 0.05 means that the variability is about the same. That the scores in one condition do not vary too much more than the scores in the second condition. Scientifically, it means that the variability in the conditions studied is not significantly different. Using Levene statistic, a significant value of 0.075 was obtained. This shows that the homogeneity assumption was fulfilled (see Table 9).

Table 9: Levene statistic.

Levene Statistic	df1	df2	Sig.
2.458[a]	3	56	0.075

Source: Author (2021).

If the Sig (2-Tailed) value is greater than .05, then one can conclude that there is no statistically significant difference among your conditions. One can conclude that the differences between condition Means are likely due to chance. If the Sig (2-Tailed) value is less than or equal to 0.05 one can conclude that there is a statistically significant difference between your two conditions. One can conclude that the differences between condition Means are not likely due to chance. Also, ANOVA shows the output of the ANOVA analysis and whether there is a statistically significant difference between the architecture schools studied. We can see that the significance value is 0.057 (i.e., p = .057), which is greater than 0.05. and, therefore, there is no statistically significant difference in the lecturers' preference for the smart flipped pedagogy across architecture schools studied (see table 10).

Table 10: ANOVA.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	108.296	4	27.07	0.057	0.994
Within Groups	21814.1	56	389.5		
Total	21922.4	60			

Source: Author (2021).

V. CONCLUSION AND RECOMMENDATION

The purpose of this study is to determine the infrastructural readiness, prospects and challenges of the smart-flip pedagogy in Nigerian Architecture schools. The study sampled students and lecturers in four higher institutions using a questionnaire survey and purpsive sampling techniques. The four instautions are; University of Lagos (UNILAG), Federal University of Technology Owerri (FUTO), Federal Polytechnic Nekede Owerri (FED.POLY NEKEDE) and Yaba College of technology Lagos (YABATECH). The gathered data were analyzed using appropriate descriptive statistical tools and ANOVA, and critical findings were made.

It was found that architectural educations in Nigeria are infrastructurally ill equipped for the implementation of the flipped pedagogy. The curriculum was found to be adequate for the flip mode. It further shows that there is no significant difference in the lecturers' or students' preference for the smart flipped pedagogy across the architecture schools studied. Furthermore, the prospects and challenges are homogeneous across the schools studied.

The study recommends the incorporation of computer labs and media centers into architecture schools to enable students have access to technology for off class work. Offline media such as flash drives/DVDS can be explored for pre-recording of lectures for after school assignments/review particularly in situations where the students lack access to the internet.

This study adds to the few exsiting studyes on architectural pedagogy education in Nigeria and other developing countires of the world. It will also be useful to key players in the education sector of Nigeria, expecially for the architectural education in making decisions that will impact the teaching and learning of architecture in the Nigerian higher institutions of learning. Lectuers would benefit from the outcome of this study as they would have seen areas were their performance and productivity can be improved upon.

Notwithsanding the importance of this study, it is limited by geographic boundary and sample size, therefore, cae should be taken in generalising the findings. Based on this, a similar study could be undertaken in other states of nigeria or developing countries so that results will be available for comparison. In addition, a further research needs to be carried out on the effect of the use of the flip pedagogy on architecture students performance across the Nigerian or other developing countries higher institutions of learnings.

VI. AUTHOR'S CONTRIBUTION

Conceptualization: CHUKWUMA-UCHEGBU, Miriam.
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Approval of the final text: CHUKWUMA-UCHEGBU, Miriam.

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VIII. REFERENCES

[1] A.O. Olotuah, and O.S. Adesiji, "An appraisal of architectural education in Nigeria". Proceedings of the built environment education conference,CEBE,London UK,5-6th September, 2005.

[2] P. Sattrup, architectural research paradigms- an overview and research example. 2012. Available online at http://www.read.dk/ws/files/32966119/peter_andreas_sattrup_ Architectural_research_paradigms_rev.pdf assessed on 4th june 2017.

[3] S.S. Mulumba, "Need for Educational Change", Nigerian Institute of Architects Journal, vo. 4, no. 2 pp. 8–9, June 1988.

[4] A.Z. Uji, "Beyond the critiques of the curriculum of Architectural education inNigeria-A tribute to Prof.E.A.Adeyemi Akure", AARCHES Shalom Publishers, pp.109-122, 2001.

[5] E.A. Adeyemi, "Structure of part II education", Nigerian Institute of Architects Journal, no. 4, pp.34–36, 1988

[6] M. Masaruf, and S. Muhammad, "The Architectural Education Curriculum in the Architecture", IOSR Journal of Research & Method in Education (IOSR-JRME), vol.6, no.6, pp.13-17, 2016.

[7] T.Alexande, "Architectural Education at the cross roads"Frontiers of Architectural Research.Science Direct.Com.vol.3 ,pp76-78,2014.

[8] N. Hamdan, P. McKnight, K. McKnight, and K.M. Arfstrom, "The flipped learning model: A white paper based on the literature review titled", A Review of Flipped Learning,‖ Flip. Learning Netwwork,, 2013. http://www.sciepub.com/reference/164528.

[9] A. Sams, and J. Bergmann, "Flip your classroom: Reach every student in every class every day". Washington, DC: International Society for Technology in Education, 2012.

[10] U. Rawat , V. Karmakar , and S. Kumar , "importance of research in architecture", International journal of engineering research & technology (ijert) vol. 10,no. 01 ,January 2021.

[11] A. Sams, and J. Bergmann, "Flip your classroom: Reach every student in every class every day". Washington, DC: International Society for Technology in Education, 2012.

[12] Y.Matsuyama, M. Nakaya, and H.Okazaki, "Does changing from a teacher-centered to a learner-centered context promote self-regulated learning: a qualitative study in a Japanese undergraduate setting" . BMC Med Educ 19, 152, 2019.

[13] R.G. Tiberius, "Metaphors underlying the improvement of teaching and learning". British Journal of Educational Technology, vol.17, no.2, pp.144–156, 1986.

[14] T.Garrett, "Student-Centered and Teacher-Centered Classroom Management: A Case Study of Three Elementary Teachers". Journal of Classroom Interaction, ISSN 0749-4025. © 2008, Vol 43.1, pages 34 - 47 rider UNIVERSITY, Lawrenceville, New Jersey.

[15] A. Sams, and J. Bergmann, "Flip your classroom: Reach every student in every class every day". Washington, DC: International Society for Technology in Education, 2012.

[16] J.Yarbro, K.M., Arfstrom, K. McKnight, and P. McKnight, "Extension of a Review of Flipped Learning", Flipped Learning Network, 2014. Retrieved from http://goo.gl/jZ2yBf. Accessed 5 Mar 2016.

[17] T. Andrews, M. Leonard, C. Colgrove, and S. Kalinowski, "Active learning not associated with student learning in a random sample of college biology

courses", Life Sciences Education, 10(4), 394–405, 2011. doi: 10.1187/cbe.11-07-0061.CrossRefGoogle Scholar.

[18] C. F. Herreid, and N. Schiller, "Case Studies and the Flipped Classroom", Journal of College Science Teaching , 42(5), pp.62-66, 2013.

[19] National capital language Resource centre (NCLRC) "Capital Language Resource Center (NCLRC)", CAL worked with Georgetown University and The George Washington University to operate the NCLRC, 2017. http://www.cal.org/what-we-do/projects/nclrcNational

[20] D. Osei, and M. Fikile, " Creating virtual learning communities inAfrica:Challenges and Prospects", 2007. Available at: http//www.firstonday.org.issues/issue5_5/darkwa/index.htm//author on 16th September 2007.

[21] V.Ozoke,"Flipping Nigeria's Public School Classrooms for the Twenty-First Century: a Problem-Solving Approach", Journal of Educational Policy and Entrepreneurial Research, 2016

[22] C.K. Lo, and K.F. Hew, "A critical review of flipped classroom challenges in K-12 education: possible solutions and recommendations for future research" . *RPTEL* **12,** 4, 2017. https://doi.org/10.1186/s41039-016-0044-2.

[23] A.C.Cheung, and R.E.Slavin, "The effectiveness of educational technology applications for enhancing mathematics achievement in K-12 classrooms: a meta-analysis". Educational Research Review, 9, pp.88–113,2013.