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Assessment of Learning Environment of Undergraduates in the Faculty of Engineering in Higher Institutions of Learning

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Abstract:- The review researched the learning climate of Designing understudies in higher foundation of learning in Nigeria. The motivation behind the review was to decide the accessibility and usefulness of educational assets for showing designing courses in schools. The concentrate likewise explored the impact of these assets on the scholarly execution of understudies as well as their pioneering abilities. The review embraced the unmistakable examination of an overview type. The example for the review comprised 200 college understudies chosen through the multistage testing method from chose higher establishments in SouthWest, Nigeria. Two exploration questions were raised and three speculations were created for the review. Information were investigated utilizing both illustrative and inferential measurements. The outcome from the understudies' reactions showed that educational assets were accessible yet not satisfactory, hence, the usefulness level is low. Nonetheless, the accessibility of educational assets and language of guidance doesn't impact the presentation of understudies or level of appreciation in the class.

Keywords:- *Assessing, Learning Environment, Undergraduates, Engineering.*

I. INTRODUCTION

Designing is the bedrock of mechanical progression in the entire world. Designing is connected with innovation, science, thoughts hypotheses and discernments; for that reason its job can't be overemphasized most particularly in people in general and confidential areas. Subsequently there is no part of human undertaking without a designing touch. This calling is critical to the general public in light of the fact that the gathered information procured proffers arrangements and addresses our social-financial issues (Data, Correspondence and Innovation (ICT), Assembling, Bio-Clinical among others). The essential things we do at home, in schools, love focuses, market squares and other public and confidential areas require designing data sources. Little marvel, understudies seek to become engineers in future in any designing fields (Mechanical, Electrical, Bio clinical, PC, Common and Compound).

In any case, the waning of the sufficiencies of the learning climate and the setting in which understudies are presented to over going through their different designing courses in tertiary establishments are of extraordinary worries. As per Starcic and Turk (2013), four significant components should be viewed as in understudies' learning climate. These components are: (I) the causing of natural inspiration in the understudies; understudies' energy about learning (ii) student commitment and action (iii) collaboration with others and (iv) a very much organized information base of content which is shown in coordinated wholes and where information is expected to be connected with other information.

This study focuses on the third component which has to do with 'connection'. Throughout learning, understudies interface with their course mates, instructors, research center/studio specialists and accessible assets at their removals. These assets incorporate internet providers, exceptional homeroom, labs, and libraries to make reference to a couple. Thusly, learning must be successful when a specific understudy tracks down himself/herself with course mates that are on the same page, cooperating to accomplish a similar objective. Other than this reality, teachers should have been visible as a main consideration that adds to the general accomplishments of the understudies in their different disciplines. They act as guides and educators. Consequently, a teacher assumes a significant part in the 'making' of a designer. The channel of data, for example, language of guidance and approach of the teachers assists with building certain and economical architects.

Likewise, the gear or instructing helps that is accessible for learning in the designing class matters a ton for the satisfactory guidelines and abilities. Learning could be disintegrated or having a great deal of shortages between a tireless understudy and focused educator on the off chance that there is no sufficient educational materials and favorable learning climate. This might result to shortcomings and packing. This may not forecast well as these understudies

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probably won't acquire sufficient information for the limit constructing that can be utilized to engage themselves in this mechanical age. Presumptions that advancing naturally happens in relationship with just going to class have generally vanished. The Relationship to Progress University Schools of Business' (AACSB 2003) new guidelines incorporates an understudy instructive obligation' standard expressing that understudies have a commitment to effectively take part in their instructive encounters, and that learning results ought to plainly show proof of huge understudy commitment. Essentially, understudies taking their own parts in growing experiences improve their affinity for learning and better plan for quickly changing advancements and business standards; by fostering their capacity to figure out how to address professions that request long lasting acquiring abilities. Lawrence B. Chonkoet al. (2003) recommended that the main thing promoting teachers can accomplish for their understudies is to persuade them to get a sense of ownership with their schooling. Loranger, A.W. et al. (1994) referenced that assuming a sense of ownership with learning requires dynamic interest by the students to start and control their way of learning alongside steady learning methodologies. Meece, Blumenfeld, and Hoyle (1988) planned significant learning includes the dynamic course of coordinating and sorting out data, building importance and observing perception to foster a sound comprehension of a topic .UrikeStadler(2017) analyzed the hypothetical and experimental learning climate with the view to uniting various customs like the field of engineering and Social Brain research and to assess the associations between educator understudy connections and the environmental factors in which those communication occur. Among the principal studies to talk about the possible impacts of the learning climate are those of Moos (1979), Steele (1973) and Bronfenbrenner (1981, 2005). These examinations present models of the connection among conditions and understudies' results, as well as pondering the significance of the climate where learning happens. The model created by Moos stresses the pertinence of the actual setting, as a component of the natural framework, to understudy results. Moos expresses that 'engineering and actual plan can impact mental states and social way of behaving' (Moos 1979: 6). Throughout the long term, Moos' model has affected research on design and training that has distinguished different impacts that the actual climate can have on understudy accomplishment and conduct. Anyway when requested in additional detail - for instance in the examinations from Woolneret al. (2007, 2011, 2012, 2013) - instructors and understudies had the option to convey the school structures and study halls they wanted. Assuming we pondered better circumstances for educating and learning in our schools and study halls, we would learn climate and understand that an emphasis on the built climate and its prospects would uphold instructing and learning. Most investigations of science learning conditions have been correlational examinations of the connections between individual understudies' impression of different parts of their current circumstance and various significant results, Among the principal studies to examine the expected impacts of the learning climate are those of Moos (1979), Steele (1973) and Bronfenbrenner (1981, 2005). These investigations present models of the connection among conditions and understudies' results, as well as considering the significance of the climate where learning happens. The model created by Moos underlines the pertinence of the actual setting, as a component of the ecological framework, to understudy results. Moos expresses that 'engineering and actual plan can impact mental states and social way of behaving' (Moos 1979: 6). Throughout the long term, Moos' model has impacted research on engineering and schooling that has distinguished different impacts that the actual climate can have on understudy accomplishment and conduct. Anyway when requested in additional detail - for instance in the examinations from Woolneret al. (2007, 2011, 2012, 2013) - instructors and understudies had the option to impart the school structures and study halls they wanted. On the off chance that we pondered better circumstances for educating and learning in our schools and homerooms, we would learn climate and understand that an emphasis on the developed climate and its prospects would uphold educating and learning. Most investigations of science learning conditions have been correlational examinations of the connections between individual understudies' view of different parts of their current circumstance and various significant results to be gainfully employed, or even become employers of labor or become self – employed This study therefore, pays a closer look into Engineering Learning environment.

II. STATEMENT OF THE PROBLEM

Engineering learning environment has to enhance the accuracy of the volume of information and ideal cognitive and affective learning process. The dependent on engineering for survival in the world cannot be overemphasized. To this end, adequate, competent, well –skilled and effective engineers should be produced in our various tertiary institutions, most especially in Southwest, Nigeria. There appears to be no adequate assessment procedure put in place to ascertain conducive learning environment for engineering students in tertiary institutions.

A. Research Questions

The following research questions were raised to guide the study

- How available are instructional resources in your department?
- Are the available instructional resources functional?

B. Hypotheses

- The language of instruction does not significantly influence students' comprehension.
- Availability of instructional resources does not significantly influence students' academic performance
- Studying Engineering does not significantly influence students' entrepreneurial skills.

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III. METHODOLOGY

The study is a descriptive research design of the survey type in which a questionnaire was used to collect data for the purpose of interpreting and describing the learning environment of undergraduate engineering students in Southwest, Nigeria.

The population for the study is comprised of all undergraduate engineering students in 18 universities and 19 polytechnics in Ondo, Ekiti, Osun, Oyo, Lagos and Ogun states.

The sample for the study comprised 200 undergraduate students from three (two federal and one state) universities and two (one state and one federal) polytechnics. The sampling procedure was multistage. The first stage involved the random selection of three out of six states in Southwest, Nigeria. The states selected were Ekiti, Oyo and Lagos States. The second stage involved the purposive selection of three universities and two polytechnics from these three states. The institutions selected were: Ekiti State University, Ado – Ekiti(Ekiti State, State); University of Lagos (Lagos State, Federal); University of Ibadan (Oyo State, Federal); Adeseun Ogundoyin Polytechnic, Eruwa (Oyo State, State); and Federal Polytechnic, Ado – Ekiti (Ekiti State, Federal). The final stage involved the identification of various departments in the Faculty of Engineering of each of the selected institutions and random selection of 40 students across the departments of Electrical/Electronic Engineering, Mechanical Engineering, Civil Engineering and Chemical Engineering. This makes a total of 200 undergraduate students in the five institutions.

A self-developed instrument tagged "Questionnaire on Adaptation of Faculty of Engineering Students to Learning" was used for data collection. The instrument consisted of three sections. Section A elicited personal information about the respondents like name of school, state in which school is situated, gender, department, faculty, level among others. Section B sought information on availability, adequacy and functionality of instructional resources while section C contained items on a four point liker scale in which the respondents were asked to indicate the level of agreement (Strongly Agree, Agree, Disagree, Strongly Disagree) of each of the items raised. Items 1-5 generated information on language of instruction, items 6-15 generated information on instructional resources while items 16-20 generated information on entrepreneurial skills.

The content validity of section C was ascertained using Lawshe (1975)'s method of measuring content validity. Copies of the section C of the questionnaire was administered on six registered Engineers to rate each of the item whether it is essential or not essential. Items with less than 0.5 content validity ratio were discarded while those above 0.5 were included in the instrument. The instrument was adjudged to be valid for data collection.

The reliability of the instrument was determined using internal consistency method of Alpha – Cronbach because the instrument contained items that are measuring along a continuum. The instrument was administered on 50 undergraduate engineering students outside the target sample. The reliability coefficient obtained was 0.71. The instrument was adjudged to be reliable for data collection.

Copies of the instrument were administered by the researchers and data collected from the field was analyzed using both descriptive and inferential statistics. Simple percentage, bar charts and frequency counts were used to answer general questions while the hypotheses postulated were subjected to inferential statistics using Analysis of Variance (ANOVA).

IV. RESULTS AND DISCUSSION

Analysis of data was based on the 188 copies of instruments that were properly filled and retrieved from the respondents.
The research questions were analyzed using frequency counts and percentages.

- *Question 1: How Available are Instructional Resources in the department?*

  The result is presented in the table below:

Table 1: Availability of instructional resources in Engineering Departments

Instructional resources	**Available**		**Not Available**	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Lecturers	158	84.0	30	16.0
Library	93	49.5	90	50.5
Lecture Room	141	75.0	47	25.0
Internet Services	50	26.6	138	73.4
Slides/ Projectors	112	59.6	76	40.4
Laboratory/ Workshop	146	77.7	42	22.3
Lab/ workshop Assistants	108	57.4	80	42.6
Necessary Tools	111	59.0	77	41.0

Table 1 above shows that lecturers (84%), lecture rooms (75%), laboratory/ workshop (77.7%) are readily available in Engineering Departments across the institutions.

Slides / projectors (59.6%), laboratory/ workshop assistants (57.4%) and necessary tools (59.0%) are available but not adequate.

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However, internet services (26.6%) is not available in most of the institutions.

- *Question 2: Are the Available Instructional Resources Functional?*

The result is presented in the table

Table 2: Functionality of Instructional Resources in Engineering Departments

Instructional resources	**Functional**		**Not Functional**	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Lecturers	106	56.4	82	43.6
Library	116	61.7	72	38.3
Lecture Room				
Internet Services	91	48.4	97	51.6
Slides/ Projectors	91	48.4	97	51.6
Laboratory/ Workshop	89	47.3	99	52.7
Lab/ workshop Assistants	109	58	79	42
Necessary Tools	120	63.8	68	36.2

The result in table 2 revealed that nearly all the available resources are not functioning appropriately. Library (61.7%) , necessary tools (63.8%), lecturers (56.4%) and workshop assistants (58%) are functioning averagely. other resources are not functioning as expected.

Hypotheses were tested using Analysis of Variance (ANOVA)

- *Hypothesis 1: The language of instruction does not significantly influence students' comprehension.*

The result is presented in Table 3.

Table 3: ANOVA of Students' Comprehension by Language of Instruction

	Sum of Squares	**df**	**Mean Squares**	**F**	**P**
Between Groups	21.506	3	7.169	6.217	2.6049
Within Groups	212.170	184	1.153		
Total	233.676	187			

p>0.05 (not significant)

Table 3 shows that the calculated value of F was 6.217 while its corresponding table value at 0.05 was 2.6049. Since p> 0.05, it implies that the language of instruction has no significantly influence on students' comprehension. The null hypothesis is not rejected.

- *Hypothesis 2: Availability of instructional resources does not significantly influence the students' academic performance. The result is presented in Table 4.*

Table 4: Students' Academic Performance by Availability of Resources

	Sum of Squares	**df**	**Mean Squares**	**F_{cal}**	**F_{tab}**
Between Groups	45.016	3	15.005	30.656	2.6049
Within Groups	90.064	184	.489		
Total	135.080	187			

p>0.05

Table 4 reveals that F – calculated was 30.656 while its corresponding table value at 0.05 was 2.6049. Since p> 0.05, it implies that the academic performance of engineering students is not influenced by availability of instructional materials. The null hypothesis is not rejected.

- *Hypothesis 3: Studying Engineering course does not significantly influence students' entrepreneurial skill. The result is presented in the table .*

Table 5: Students' Entrepreneurial Skills by Engineering Course

	Sum of Squares	**df**	**Mean Squares**	**F_{cal}**	**F_{tab}**
Between Groups	32.523	3	10.841	23.666	2.6049
Within Groups	84.286	184	. 458		
Total	116.809	187			

p>0.05

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Table 5 shows that the calculated value of F was 23.666 while its corresponding table value at 0.05 was 2.6049. Since p> 0.05, it implies that the students' entrepreneurial skills are not influenced by the study of engineering course. The null hypothesis is not rejected.

V. DISCUSSION

The findings from this study showed that some of the resources needed by engineering students in schools are available but not adequate. The few materials that are available are not functioning as expected. The students do not have access to recent textbooks in the library. Besides, the internet services that supposed to cater for this is not functioning as expected. Even some of the resources that would have been put to use may not work or due to power failure. This corroborates the findings of Adebule, S. O., &Ayoola, O. O. (2016), Faize and Dahan (2011).The strategic function of instructional resources in the successful delivery of instruction to Engineering students in higher institutions of learning cannot be over – emphasized. This is quite evident in the outcome of this research since it was found that students' academic performance is not influenced by instructional resources. The researcher will like to state emphatically that instructional resources that are not adequate or functioning properly may not influence the academic performance of students.

Further, the study revealed that the language of instruction does not influence students' comprehension. Well, this lies majorly with the instructors. Lecturers and instructors generally must device clear means, which includes methodology, in the teaching – learning process. This will enhance their performance, quest for knowledge and also improve their entrepreneurial skills.

VI. CONCLUSION AND RECOMMENDATION

A. Conclusion

The significance of this paper shows that the initiated crack in the engineering learning environment has given way to a larger gap. It was recorded that the average percentage indices for the functionality and non-functionality is 50- 50%.

This is consequential upon the subtle or little attention paid by the regulatory bodies of engineering(NUC, NBTE, CORENN etc). Besides, it is the attitudes of the government and other entrepreneurs of educational sector, seeing engineering as capital intensive project and gulping a lot of fund in this era that education has one of the locative businesses.

B. Recommendation

- There must be routine inspections of the facilities and resources by the regulatory bodies of engineering (NUC, NBTE, CORENN etc) besides accreditation exercise
- The government and other entrepreneurs of educational sector should initiate an engineering monitoring task force to complement by the regulatory bodies of engineering (NUC, NBTE, CORENN etc)
- The management of each tertiary institution should create facilities and consumables stock taking unit

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