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Strategy for Improving Students' Poor Skills in Building Electronic Systems in the Universities in Rivers State, Nigeria

Reagan NnabioRobinson &Egbuluka Celestine Owuzie
Department of Industrial Technical Education
Ignatius Ajuru University of Education
Rumuolumeni, Port Harcourt.

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Abstract
The study was necessitated by the need to improve students' skills in building electronic systems in the universities in Rivers State. One research question guided the study, and onehypothesis was used to test the study at 0.05 level of significance. The study adopted descriptive survey research design. The population of the study comprised of all the lecturers and final year students of electronic engineering or technology of the 3 Universities located in Rivers State. Sampling size was 32, which comprised of 12 lecturers and 20 final year students, based on returned instrument. A structured questionnaire was used as instrument for the study. 3 experts validated the instrument. Cronbach Alpha reliability method was used to establish the internal consistency of the items which yielded an overall coefficient of 0.89. Data collected were analyzed using mean and standard deviation to answer the research question, while t-test was used for the hypothesis at 0.05 level of significance. Findings revealed that the engagement of more workshop practices than classroom teachings will improve students' skills in building electronic systems in the Universities in Rivers State. Based on the findings, some recommendations were given of which one is that, lecturers in the universities should be encouraged to use more of workshop practices than classroom teachings in building electronic systems.

Keywords: Strategy, Electronic System, University, Poor Skill, Improve, Students, Building, Rivers State.

I. Introduction

Electronic has assumed a center stage in virtually all human endeavours. It has led to the political, socioeconomic, and educational development of all nations of the world. It has also affected, modified and shaped the lives of every society and institutions. Electronic is the branch of science and technology that deals with the study of flow and control of electrons, and their behavior and effect on vacuums, gases and semiconductors(Das, 2021). This control of electrons is accomplished by certain components or devices that resist, carry, select, steer, switch, store, manipulate, and exploit the electrons in a circuit. The identification of electron in 1897 along with the subsequent invention of the vacuum tube which could amplify and rectify small electrical signals brought about the field of electronic. Resourceful practical applications in electronic began at the invention of the diode by Ambrose Fleming and the triode by Lee De Forest in the early 1900s. These made the detection of small electrical voltages such as radio signals from a radio antenna possible with a non-mechanical device. In many higher institutions of learning, the field of electronic is a branch in physics and in electrical engineering, which deals with the emission, behaviour and effect of electrons using certain electroniccomponents or devices. Electronic uses active devices to control the flow of electron by amplification and rectification; which distinguishes it from classical electrical engineering that only uses passive effects such as resistance, capacitance and inductance to control electric current flow. The early growth of electronic was rapid, and by the 1920s, commercial electronic systems were becoming widespread with electronic devices being used in such systems, and diverse applications were continually being explored to create different innovations that met human needs. All these curiosities in the field of electronic and others, brought about the electronic revolution of the first half of the twentieth century, which enabled the construction and building of electronic systems like

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radio, television, radar,washing machine, drier, keypad,telephoneand much more (Bird, 2007).

Gradually as the complexity of electronic systems grew,different problems began surfacing. One of such problems was poor skills of building electronic systems with ease. Skill is the ability to do something well, usually gained through a training or an experience. It is a special ability acquired as a result of training to do something well. A skilled worker is one who is highly proficient or an expert in a trade; or a person who has attained excellence in a particular trade or vocation. Hence, the skill in this context is the ability to build electronic systemswell (Rao, 2010). Electronic system refers to the physical interconnection of components (devices) or blocks (sub-systems), that gathers various amounts of signal together; but have both Inputs and Outputs with the outputs being produced by processing the inputs. Also, the input signal(s) may cause the process to change or may itself cause the operation of the system to change. Therefore, the input(s) to a system is the "cause" of the change, while the resulting action that occurs on the systems output due to this cause being present is called the "effect", with the effect being a consequence of the cause.In other words, an electronic system can be classed as "causal" in nature as there is a direct relationship between its input and its output. Electronic systems analysis and process control theory are generally based upon this Cause and Effect analysis. For instance, in an audio system, a microphone (input device) causes sound waves to be converted into electrical signals for the amplifier to amplify (a process), and a loudspeaker (output device) produces sound waves as an effect of being driven by the amplifiers electrical signals (Bird, 2007).

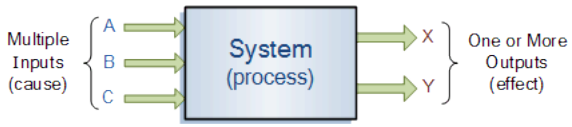

Figure 1: Block diagram representation of a simple electronic system

A system can be represented in many ways such as; mathematically, descriptively, pictorially or schematically. However, electronic systems are generally represented schematically as a series of interconnected blocks and signals with each block having its own set of inputs and outputs. Each block in a system does represents a system or an individual component of a system. But it is good to note that, these blocks (subsystems) can be connected together in series, parallel or combinations of both depending upon the flow of the signals. As a result, even the most complex electronic system can be represented by a combination of simple blocks, with each block representing an individual component or complete sub-system. The representation of an electronic system as a number of interconnected blocks is commonly known as "block-diagram". The electronic system may have multiple inputs and multiple outputs. The system accepts the inputs and it processes the required task to produce the outputs. The state of the system can be changed by processing the inputs. Therefore, the inputs are the "cause" of change in system's equilibrium state (Nahin, 2002). This means the inputs and outputs of a system are in a direct relationship that inputs will show effect on outputs. This analysis of electronic system is known as "Cause and Effect analysis". But electronic systems can also be regarded as a process that transforms one signal into another so as to give the desired system response. Then we can say that a simple electronic system consists of an input, a process, and an output with the input variable to the system and the output variable from the system both being signals.

With serious efforts made by developed nationslike the USA towards the development of electronic systems, the problem of poor skills of building electronic systems was overcomed, but the secret was hidden from developing nations like Nigeria.In most of the developed nations, the skills of building electronic systems was handled by higher learning institutions like the university (Nobel, 2016). University is an educational institution that prepare students for real life situation by equipping them with up-to-date information and skills (Eze&Azu, 2017). Hence, universities offering electronics engineering or technology courses should be able to train students to be armed with better skills of building electronic systems with ease after graduation in Nigeria. Unfortunately, contrary is the case. Most graduates of electronic engineering or technology in the universities in Nigeria are not armed with better skills of building electronic systems with ease (Uhunmwagho&Okedi, 2013). On that note, it is the opinion of the researchers that there is need to improve the skills of students in building electronic systems in the Universities in Nigeria. Hence, employing better teaching strategies to improving students' skills in building electronic systems could be a solution. This is the premise of this study. The study intends to use Rivers State as a case study.Strategy can be referred to as the art of planning the best way to achieve success over a period of time. It is the opinion of the researchers

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that an introduction of more workshop practices than classroom teachings in the curriculum is a strategy that will improve students' skill in building electronic systems.The researchers observed that students are engaged more in the classroom teachings than workshop practices as enshrined in the curriculum. This opinion was supported by Olisa (2009) who stated that involving students in more practical works than classroom teachings will improve student'sknowhow in practical subjects. On the contrary, Jimoh-Kadiri(2012) was of the opinion that effective classroom teaching is a key strategy to acquiring skills. However, considering the different opinions in related literature, it became imperative for the researchers to carry out a study on thestrategy for improving students' poor skills in building electronic systems in the universities in Rivers State.

Statement of the Problem

Electronic deals with the study of electron behavior, flow, and control under different conditions such as vacuums, gases, or semiconducting materials where electrons are observed. Today, electronic has become prominent in every home globally, and their use has become very verse and handy through electronic systems of different types. Electronic systems are at the center of human activities; making life much easier than envisaged from its inception.In the developed nations, electronic systems are still going through different innovative stages, but the contrary is the case in developing nation like Nigeria. University students who are at the center of constructing and building of electronic systems are not creating the required impact due to poor skills (Rao, 2010). It has been observed countlessly that university graduates of electronic technology in Nigeria are not reflecting good skills in building electronic systems. This problem is a key contributor to the poor technological advancement in Nigeria. Its prevalence has called for urgent improvementespecially in developing nations like Nigeria. As a result, the researchers deemed it fit to consider this study on the strategy for improving students' poor skill in building electronic systems in the universities in Rivers State.

Purpose of the Study

The purpose of this study is to determine the strategy for improving students' poor skill in building electronic systems in the Universities in Rivers State. Specifically, the study sought to determine;

1. the extent to which the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State.

Research Questions

The following research questionguided the study:

1. to what extent will the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State.

Hypotheses

The following null hypotheses was tested at 0.05 level of significance:

1. there is no significant difference in the mean responses of lecturers and students on the extent to which the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State.

II. Methodology

A descriptive survey research design was adopted for the study. The population of the study comprised of all the lecturers and final year students ofelectronic engineering or technologyof the 3Universities located in Rivers State. Sampling size was 32, which comprised of 12 lecturers and 20 final year students,based on the collected instrument. The instrument for data collection was a structured questionnaire designed by the researchers. The questionnaire was structured on five-point scale of Very High Extent (VHE), High Extent (HE), Moderate Extent (ME), Low Extent (LE) and Very Low Extent (VLE). Three experts in Niger Delta University Amassoma, Bayelsa State validated the instrument. Cronbach Alpha was used to ascertain the internal consistency of the instrument, and an overall reliability coefficient of 0.89 was attained. The researchers administered several copies of the questionnaire with the help of three research assistants, but only 32 were returned and used for data analysis. Data collected for the study were analyzed using mean to answer the research questions and standard deviation to determine the homogeneity or otherwise of the respondents' views. T-test was used to test the null hypotheses at 0.05 level of significance. Where the p-value is less than or equal to 0.05, the null hypotheses is rejected, but if the p-value is greater than 0.05, the null hypotheses is accepted.

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III. Results

The findings of the study were obtained based on the results of the data analyzed below.

Research Questions 1: To what extent will the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State.

Table 1: Lecturers and students' responses on the extent of more workshop practices than classroom teachingsto improve students' skill in building electronic systems.

S/N	Items	Lecturers N = 12			Students N = 20		
		Mean	SD	DEC	Mean	SD	DEC
1	Soldering skill can improve when taught more in workshop practice than in classroom teaching.	4.30	0.46	HE	4.50	0.56	VHE
2	Components mounting on circuit board skill can improve when taught more in workshop practice than in classroom teaching.	4.49	0.51	HE	4.51	0.50	VHE
3	Block interconnection and troubleshooting skill can improve when taught more in workshop practice than in classroom teaching.	4.27	0.45	HE	4.59	0.49	VHE
4	Devices functions manipulation skill can improve when taught more in workshop practice than in classroom teaching.	4.07	0.54	HE	4.51	0.54	VHE
5	Systems coupling skill can improve when taught more in workshop practice than in classroom teaching.	4.23	0.61	HE	4.61	0.41	VHE
Average Mean and Standard Deviation respectively		**4.27**	**0.51**	**HE**	**4.54**	**0.50**	**VHE**

Source: Researcher

In table 1, all the items in the lecturers'responses are indicated a High Extent (HE). This reveals their opinion thatthe extent to which the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State is high.Similarly, all the items in the students' responses indicate a Very High Extent (VHE); revealing that the extent to which the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State is high.

The average mean response of Lecturers and Students for the statement items were found to be respectively 4.27 and 4.54. These indicate again a High Extent (HE), revealing that both Lecturers and Students are of the opinion that the extent to which the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State is high.The standard deviation of 0.51 and 0.50 for lecturers and students respectively show that the respondents are homogenous in their responses.

Hypotheses 1: there is no significant difference in the mean responses of lecturers and students on the extent to which the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State.

Table 2: T-test on the extent of more workshop practices than classroom teachingsto improve students' skill in building electronic systems.

Lecturers	N	$\overline{X}$	SD	α	df	t-cal.	p-value	Decision
Lecturers	12	4.27	0.51					
				0.05	30	0.39	0 .071	Not
Students	20	4.54	0.50					Significant

Table 2 shows that lecturers do not significantly differ to that of students in their mean ratings onthe extent to which the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State. Theindication a t-value of 0.39, at degree of freedom of 30 and a p-value of 0.071; testing at alpha level of 0.05. The p-value is not significant since the p-value is greater than the alpha value (0.05). Therefore, the null hypothesis is not rejected,hence lecturers do not significantly differ in their mean ratingson the extent to which the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State**.**

IV. Discussion

From the research question, the finding of the study revealed thatthe extent to which the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State is high.This implies that the engagement of more workshop practices than classroom teachings is not just a strategy only, but canbe used to improve students' skills in building electronic systems in the universities in Rivers State.

Similarly, the finding from hypotheses 1 revealed that there is no significant difference in the mean responses of lecturers and students on the extent to which the strategy of more workshop practices than classroom teachings improve students' skill in building electronic systems in the Universities in Rivers State. It implies that both teachers and students were of the opinion that the engagement of more workshop practices than classroom teachings will improve students' skills in building electronic systems in the Universities in Rivers State. The finding of this study is in support with Olisa, (2009), who stated that involving students in more practical works than classroom teachings will improve student's knowhow in practical subjects. However, the study is in disagreement with Jimoh-Kadiri, (2012), who was of the opinion that effective classroom teaching is a key strategy to acquiring skills.

V. Conclusion

The study was considered on the strategy for improving students' poor skill in building electronic systems in the Universities in Rivers State. It was clear from the findings that, the engagement of more workshop practices than classroom teachings are a strategy that will improve students' skills in building electronic systems in the Universities in Rivers State. Since the concepts of electronics are mostly abstract, and the building of electronic systems is highly surrounded by abstract concepts that needed to be converted into realities through consistent practical means. This finding was apt; it brings to limelight that there is need for change of strategies in building electronic systems. And one of such is the engagement of more workshop practices than classroom teachings.

VI. Recommendations

Based on the findings of the study, the following recommendations were made:

1 Lecturers in the universities should be make extra efforts to engage students with relevant and result oriented strategies in building electronic systems.

2 Lecturers in the universities should be encouraged to use more of workshop practices than classroom teachings in building electronic systems.

3 Students in the universities should be re-oriented to be ready and face the constraints associated with more workshop practices, especially in building electronic systems.

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