



Acceptability of E-Model Scenario-Based PageTeaching Strategy by Technical College Students in Learning Electronics Works Concepts in Gombe State

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ABSTRACT

This research was carried out with the aim of investigating the acceptability of the E-Model Scenario-Based Teaching Strategy by Technical College Students in Learning Electronics Works Concepts. One (1) research question and one (1) hypothesis were formulated to guide the study. The study adopted a Descriptive Survey Research Design. The area of the study was Gombe state. The population of the study consisted of 145 students while the sample of the study consisted of 43 students, from which 27 were males while 16 were females. The instrument for data collection was Acceptability Survey Instrument (ASI). The instrument was validated by two experts from the Department of Electrical Technology Education MAU, Yola and one expert from the Department of Vocational and Technology Education, Abubakar Tafawa Balewa University, Bauchi. A reliability coefficient of 0.8 was obtained using Chronbach's Alpha method which showed that the instrument was valid. Mean and standard deviation was used to analyze the research question while the t-test was used to test the hypothesis at a 0.05 level of significance. A grand mean of 3.50 was obtained, which showed that the e-Model SBT was Very Much Acceptable (VMA) by the students. On the gender side, a mean acceptability score of 3.49 was obtained by males while a mean acceptability score of 3.51 was obtained by females. The findings revealed among others that, students of the Electronics works trade accepted the E-Model SBT in learning Electronics concepts. It was therefore recommended that teachers should be trained and encouraged to use both offline and online e-Model SBT in the process of teaching.

INTRODUCTION

Technical college is an equivalent of conventional secondary school in Nigerian education system with curriculum which contains skilled subjects known as trades. In addition to that, it also contains non-skilled subjects known as general education subjects. Technical colleges provide technical and vocational training needed to prepare students for work in various technical occupations (Ezugu, 2004). National Board for Technical Education (NBTE, 2006) also defined technical colleges as schools that prepare students to acquire practical and applied

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skills as well as basic scientific knowledge." Federal Republic of Nigeria (FRN, 2013) outlined a range of trades in the technical colleges to include but not limited to: Mechanical, Computer craft, Building, Wood work, Cosmetology, Catering, Textile, Printing, Business and Electrical Engineering trades which consist of electrical installation and maintenance work and Radio, Television and Electronic Works trade.

Radio/Television and Electronic Works (RTVe) is a trade which consists of subjects that cover both cognitive and psychomotor aspects of learning. The trade is designed to equip students



with hands-on experience in installing, maintaining and servicing of electronic devices and systems (National Business and Technical Examinations Board, 2006). The trade also enables the trainees acquire the operations of common electronics devices as well as understand the basic concepts of satellite transmission, reception and installation. It also enables the trainees appreciate the operations of electronics devices as well as acquiring practical skills in diagnosing faults and repair television (NABTEB, 2006). RTV trade prepares students to become machine operators, artisans, craftsmen and master craftsmen in Radio, Television, and Electronics works (Zambwa, Makinde & Samaila, 2018). Radio Communication trade is clustered into modules of instruction as follows. Electronics devices and Circuits, Radio and Audio frequency amplifiers, Radio system, Television I, Television II, Colored Television and Radio and Electronics system (NBTE, 2006). The modules are designed to give training and impart necessary skills leading to the production of craftsmen and other skilled personnel who will be enterprising and self-reliant (FRN 2004). Specifically the Radio, Television and Electronic works modules are designed among other things to provide the student with basic competencies that will enable trainees dismantle, assemble, repair, service, maintain and install Radio and Television sets, Amplifiers, Video recorders and other Electronic appliances, system and circuits (NBTE, 2006). The Federal and State governments of Nigeria have recognized the importance of teaching radio; television and electronics works trade in technical colleges. Hence, the programmes are being introduced in many Federal and State Technical Colleges (NABTEB, 2006).

According to Kumar (2006), Electronics students find it difficult to understand the principles, operations, practices and application of most of the Electronic Devices. These limitations encountered by students of Technical Colleges could be among the possible reasons for the difficulties they encounter in learning electrical electronics related disciplines at the tertiary education level. In order to lay a sound foundation for electronics work trade students, teachers need to diversify their instructional

approaches so as to help such students to effectively specialize in any of the chosen electronics career related courses; Tumba and Chinda (2014) observed that Electronics works trade students of Technical colleges find it difficult to understand the principles and practices of Electronics which leads to their poor performance in theoretical and practical courses. Their study revealed that the use of conventional method of teaching could be the major factor that affects their performance in learning electronic skills.

Conventional teaching method has been defined by Sawant and Rizvi (2015) as the teacher-centered approach where teacher is active and students are passive in teaching and learning process. It has also been defined by Kivunja (2013) as the method of teaching using chalk and board for teachers; pen and paper for students. Unfortunately, conventional teaching methods such as lecture method and demonstration method are more widespread in Nigeria (Gombe state inclusive) than modern methods of teaching and there is a need to investigate empirically on student-centered methods of teaching that will help students to improve on their performance in electronics (Errigton, 2010). Recent studies conducted by Ogbu (2018), Chinda (2016) and Petal (2014), have also shown that, conventional method of teaching focuses on inculcating knowledge to learners with little application or practice thus, making the conventional method of teaching ineffective. On the other hand, modern methods of teaching expose learners to active participation in classroom lessons and its assessment is seen as activity integrated with teaching and learning which occur through observation. Modern methods of teaching involve use of modern ways to improve teaching and learning in classroom. For example, Teleconference method of teaching which involves use of computer with Wi-fi connection in the classroom where teacher demonstrates the subject on his computer and students receive lectures in their various homes. Another modern method of teaching is Scenario-Based teaching, which is the modern method for this study. Scenario Based Teaching (SBT) is a teaching method or strategy that encourages students to



fully participate in classroom lessons using real-life stories, and sometimes incorporated with photos and video clips of local community activities that students are conversant with for the purpose of explaining professional concepts so that students could get real knowledge of the subject matter (Patel, 2014).

For this study, e-Model Scenario-based Teaching (SBT) is a software application that follows the model of Scenario-Based teaching strategy so that learners are actively involved in an online programmed instruction and work at their own pace, it can be on individual basis or in small groups as the instruction provides immediate feedback. Students do not move to the higher level until he masters the concept. On the other hand, the teacher becomes mediator or collaborator instead of being the key source of information and transmitter of knowledge and skills. This is in line with the study conducted by Samai'ila, Makinde and Zambuwa (2016) where they stated that, a teacher is a mediator that helps his students to have concrete knowledge and skills in teaching electrical course with Computer Assisted Instruction (CAI). Hence, it can be observed that, there is a compelling challenge to also expose electronic students in technical colleges because the world community of knowledge now depends on digital systems. This calls for Co-opting e-learning into the classroom by electronic teachers in order to meet the world standard.

Acceptability is an important variable in teaching and learning; it has been defined by Avramidis and Kalyva (2007) as opinion, attitude, and value of student or teacher relative to the treatment or experience they had when receiving in educational system. Acceptability is a subjective feeling of being interested in a particular type of activity. Allen and Robbins (2010) defined acceptability as motivational construct that influences students' engagement and performance in learning. Acceptability plays a key role in influencing students' learning behavior and attention to participate in the future. This means that, a student who accepted a particular teaching method of a teacher is also interested in teacher's way of teaching, this makes him motivated in studying his course and that would help him to improve his performance.

The aim of using e-model Scenario-Based Teaching is to arouse the interest of both male and female students to learn Electronic works concepts effectively, hence the need for this study.

Statement of the Problem

Several factors have been lamented in the literature that could have caused poor performance of students in Electronics works trade, these include: school management factor, student's factor and teacher factor. The study will put emphasis on teacher factor as Lucas, Baba, Godwin and Fai (2022) identified lack of good methodology as the major reason for low performance and drop-outs in the technical colleges in Nigeria. Also Ogbu (2018) observed that students' poor performance in Electronics works trade at national examinations has persisted over the last ten years and consequently has resulted in unemployment, poverty among craftsmen plus scarcity of skilled men and women needed for the growth of the nation's economy. Abdullatif and Rufa'i (2014) stated that the quality of technical college graduates has been a major concern for most employers of labor in Nigeria. Chief Examiner's Report (2014-2018) reveals that out of 9,225 students that sat for electronic works examination only 38.6% passed at credit level; this statistics showed that about 60 percent of technical college students lack knowledge and skill required in electronic works trade. Studies have shown that this poor performance is attributed to poor delivery of instruction in the classroom. Few to mention are studies conducted by Lancaster and Lau (2020) where they found that adoption of teacher-centered methods of teaching by the teachers results into ineffective use of varieties of instructional methods and instructional techniques and inability of teachers to effectively implement the curriculum to naturally increase students' interest, participation and commitment in learning. Ogbuanya and Owodunni (2015) stated that, the shortcomings of teacher-centered method of teaching could be responsible for poor academic performance of Electronics works trade students in public examination. In order to address and improve on the issue of teaching and learning techniques in Electronics works



trade, there is a need to use a valid and reliable model of teaching in form of software application so that students will find it easy to understand the abstract and difficult concepts of Electronics and later investigate the level of students' acceptability of such method in learning Electronics.

Research Question

The following research question was set to guide the study:

1. What is the level of acceptability of the E-Model SBT among students who were taught electronic concepts?

Research Hypothesis

One hypothesis was raised and tested in this study as follows;

H0₁: There is no significant difference between male and female students' mean rating on the level of acceptability of E-Model SBT in learning Electronics concepts.

METHODOLOGY

The design of the study was Descriptive survey research design. Descriptive survey research design is a research design that involves gathering information from a sample of individuals which include opinions, perceptions or feelings in order to estimate a total or overall situation (Ogwo, 2006). The survey research design is therefore considered suitable for this study because the study seeks the acceptability of technical college students on the teaching methods through the use of acceptability rating scale. The population of the study consisted of 145 students of Electronics works trade from four

(4) technical colleges while the sample of the study was 58 students from two intact classes of the two technical colleges; 15 students from GSTC Gombe and 43 students from GSTC Barunde. Simple random sampling technique was to select the two colleges to seek the opinion of the tested students of Electronics works trade. The instrument for data collection was Acceptability Survey Instrument (ASI). Acceptability Survey Instrument (ASI) was a 25-item scale with positive and negative acceptability statements being measured on a 5-point scale that was used to evaluate and determine the level of students' acceptability of the treatment. ASI had two sections; Section A sought responses on students' personal data such as name, sex, class and school name. Section B consisted of a 5-point scale responses which allowed the students to indicate their level of acceptability of E-Model SBT using: Highly Acceptable – HA, Very Much Acceptable – VMA, Moderately Acceptable – MA, Fairly Acceptable – FA and Poorly Acceptable – PA. ASI was validated by three experts from the Department of Electrical Technology Education MAU, Yola and a reliability coefficient of 0.8 was found, which showed that the instrument was valid. The data was analyzed using mean, standard deviation and t-test. Mean and standard deviation was used to analyze research questions while t-test was used to test the hypotheses at 0.05-level of significance.

RESULT AND DISCUSSION

The results of the study are presented in Tables 1 to 6 below. Table 1 showed the socio-demographic variables

Table 1: Mean Response of Students' Acceptability of the e-Model SBT in Learning Electronics Concepts

S/N	Acceptability Statements	N=43	Mean	Remark
1	E-Model SBT is the best way of learning Electronic Works.		4.58	Highly Acceptable
2	E-Model SBT makes Electronics Works lessons very lively.		4.14	Very Much Acceptable
3	More courses should be taught by means of E-Model SBT.		3.93	Very Much Acceptable
4	E-Model SBT only dwells in the psychomotor aspects of Electronics		2.51	Moderately Acceptable
5	E-Model SBT only dwells in the cognitive aspects of Electronics		3.00	Moderately Acceptable
6	E-Model SBT provides better access to scientific method.		4.02	Very Much Acceptable
7	E-Model SBT provides and creates more student-teacher interaction.		4.07	Very Much Acceptable

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S/N	Acceptability Statements	N=43	Mean	Remark
8	Students lose interest in learning using E-Model SBT		1.84	Fairly Acceptable
9	E-Model SBT creates more interaction among students of Electronics Trade.		3.95	Very Much Acceptable
10	E-Model SBT increases motivation and proper understanding of Electronic Works concepts		4.51	Highly Acceptable
11	E-Model SBT makes Electronics Works lessons more interesting		4.00	Very Much Acceptable
12	E-Model SBT encourages sense of responsibility and self-discipline		3.84	Very Much Acceptable
13	E-Model SBT helps students to learn more in Electronic Works than other methods		4.05	Very Much Acceptable
14	E-Model SBT does not provide room for students to ask question		1.60	Fairly Acceptable
15	E-Model SBT helps to provide better learning experience		3.95	Very Much Acceptable
16	E-Model SBT makes high demand of teacher by students		3.95	Very Much Acceptable
17	Learning through E-Model SBT makes class to be always noisy		1.65	Fairly Acceptable
18	E-Model SBT encourages me to have practical-based learning		4.19	Very Much Acceptable
19	Learning with E-Model SBT is time consuming		3.88	Very Much Acceptable
20	E-Model SBT encourages me to put my community activities into my profession.		4.28	Very Much Acceptable
21	E-Model SBT exposes me to practice professional teamwork.		4.12	Very Much Acceptable
22	Learning with E-Model SBT is boring		1.58	Fairly Acceptable
23	E-Model SBT encourages me to convey reality in to professional workplace.		3.86	Very Much Acceptable
24	E-Model SBT encourages me to have active learning.		4.09	Very Much Acceptable
25	Teachers sometimes find it difficult to control the class while using E-Model SBT		1.84	Fairly Acceptable
Grand Mean			3.50	Very Much Acceptable

Source: Field Survey, 2021

The result from Table 1 showed the level of students' acceptability of E-Model SBT, where the grand mean acceptability score of 3.50 was obtained, this showed that the e-Model SBT

was Very Much Acceptable (VMA) by the students of Electronic works trade.

Table 2: t-test Mean Difference of Male and Female Students' Level of Acceptability of E-Model SBT in Learning Electronics Concepts

Variable	Gender	N	Mean	S. D	df	T	Sig.	Dec.
Acceptability	Male	27	3.49	0.98	41	0.585	0.245	Uphold Ho8
	Female	16	3.51	0.92				

Source: Field Survey, 2021



Table 2 showed the mean acceptability scores of male and female students; where male students obtained a mean acceptability score of 3.49 with a standard deviation of 0.9, while female students in the same group obtained a mean acceptability score of 3.51 with a standard deviation of 0.92. The mean difference was 0.02. The table also revealed the p value of 0.585 is greater than the 0.05 significance level used for the investigation. The null hypothesis which

FINDINGS OF THE STUDY

The results of the study revealed the following findings:

1. E-Model SBT was Very Much Acceptable (VMA) by the students of Electronic works trade.
2. There is no significant difference between male and female students' mean rating on the level of acceptability of E-Model SBT.

DISCUSSION OF FINDINGS

The findings of the study were arranged and discussed in order of the research questions and hypotheses. The findings of the acceptability of E-Model SBT revealed that, e-Model SBT was Very Much Acceptable (VMA) by the students of Electronic works trade. Students who were taught using e-Model SBT had a mean acceptability score (Mean = 3.50) which indicates that the electronic students in experimental class highly accepted the new teaching strategy. Findings of the acceptability of e-Model SBT by the gender revealed that, there is no significant difference between male and female students' mean rating on the level of acceptability of E-Model SBT. Since the calculated t value ($t_{cal}=0.585$) was less than the critical value ($t_{crit} = 2.021$), the null hypothesis was rejected.

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CONCLUSION

The findings of the study serve as the basis for drawing the following conclusions. The acceptability of e-Model by students of Electronics works showed that the model arouse the interest of students in learning Electronics which also helped them to understand Electronic concepts using the community activities they are familiar with. Based on the findings of the study, it can be concluded that, E-Model SBT had a higher acceptability by students of Electronic works trade.

RECOMMENDATIONS

The following recommendations were proffered based on the findings of the study:

1. Electronic teachers in technical colleges should explore the use of e-Model SBT for other topics in Electronic works trade in order to improve students' performance.
2. Electronic works teachers in technical colleges should learn how to develop lesson using e-Model SBT in order to improve students' performance.
3. Management of Technical colleges should encourage Electronic Works teachers to implement e-Model SBT in teaching both theory and practical classes.
4. Ministry of education should recommend the use of e-Model SBT in Nigerian Technical colleges.



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