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INFLUENCE OF E-LEARNING ON EFFECTIVE MASTERY OF ELECTRICAL INSTALLATION AND MAINTENANCE PRACTICE BY ELECTRICAL STUDENTS IN EKITI STATE TECHNICAL COLLEGES

BY

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Abstract

The study investigated influence of e-learning as an effective tool for mastery of electrical installation and Maintenance Practice in Ekiti state Technical Colleges. To guide the study, two research questions and two hypotheses were formulated and tested at 0.05 level of significance. A descriptive survey design was adopted for the study. Fifty (50) electrical installation and Maintenance Practice teachers formed the sample of this study. The instrument used for data collection was a self-structured questionnaire tagged E-learning for Electrical Installation Questionnaire (EEIQ). Data collected were analyzed using mean. The findings of the study include; the extents e-learning influences mastery of electrical installation technology in technical colleges, e-learning influences students' interest in learning electrical installation and maintenance practice in technical colleges, the extent e-learning is being utilized in training electrical installation and maintenance practice students in technical colleges, and the challenges associated with the utilization of e-learning for training electrical installation and maintenance practice students in technical colleges. From the above, it was recommended that teachers and students should be sensitized through seminars and workshops on the need to maximally utilize e-learning for effective teaching and learning of electrical installation and maintenance practice in technical colleges.

Keywords: E-learning, technical education, learning approach, electrical installation technology.

INTRODUCTION

Today, we are living in a technological world, as a result of technological revolution. Almost everyone in the society associates with technology for example. E-learning which is an aspect of technology deals with the use of all types of technologies, including electronic technologies in learning greater tasks in education. This means using a computer to deliver part or whole of a course whether in the school, or distance learning is tasks. It entails the use of electronic educational technology in learning and teaching, (Maresel, 2013). Electronic educational technologies include: Educational technology, learning technology, multimedia learning, Technology Enhanced Learning,(TEL), Computer Based Instruction (CBI), Computer Managed Instruction (CMI),Computer Based Training (CBT), Computer Assisted Instruction (CAI), Internet Based Training (IBT) Information and Communication Technology (ICT) (Anderus, 2012).

Wentling, (2010) explain the term e-learning to refer to the attainment and use of knowledge that are predominantly facilitated and distributed by electronic means. He emphasize e-learning depends primarily on computers and networks, and it is likely progress into systems comprising of a variety of channels such as wireless and satellite, and technologies such as cellular phones. In a literature review, Liu and Wang (2009) found that the features of e-learning process chiefly centered on the internet; global sharing and learning resources; information broadcasts and knowledge flow by way of network courses. Flexibility of learning as computer-generated environment for learning is created to overcome issues of distance and time. Gotschall (2000) argues that the concept of

e-learning was proposed based on distance learning, thus a transmission of lectures to distant locations by way of video presentations. However, Liu and Wang (2000) argued that the progression of communications technologies, particularly the internet transforms distance learning into e-learning.

E in E-learning as interpreted by Bernerd, (2012) means Exciting, Energetic, Enthusiastic, Emotional, Extended, Excellent and Educational in addition to "electronic" while Eric, as revealed by Hallo, (2012) suggested that it should be referred to Everything, Everyone, Engaging, and Easy" but Moore, (2011) says there is a significant variation in the understanding and usage of the term E-learning. Summarily E-learning is electronic learning which means using a computer to deliver part or whole of a course whether it in a school or anywhere.

E-learning has become an important part of most organizations and businesses these days, (Saderel, 2012). Several researchers such as suggested that E-learning will be an important part of education for the next generation (Mints, 2013). The use of E-learning in teaching and learning is becoming increasingly vital owing to the global network of the twenty first century teaching and learning. In line with this, Lefebvre, (2012) opined that the use of modern technology such as ICT, CAI etc. offers many means of improving teaching and learning at this present age, (Marlet, 2012).

According to Bakare (2016), Technical Colleges are charged with the production of craftsmen and technicians. Akpan (2013) said that technical Colleges are designed to prepare individuals to acquire practical skills, basic scientific knowledge and attitude required as craftsmen and technicians at sub-professional levels. Okoro (2016) said they are regarded as the principal Vocational Institutions in Nigeria that give full vocational training intended to prepare students for entry into various occupations as operatives or artisans and craftsmen. Graduates who undergo training in Electrical Installation and Maintenance Practice are expected to possess work skills for success in Installation of electrical machines and equipment, maintenance of machines and equipment, winding of Electrical machines, testing and inspection of electrical Installations, repair of electrical machines, etc.

Electrical Installation and maintenance Practice is one of the trades offered in technical Colleges. It is a Vocational trade that exposes students to skills. According to Wikipedia (2012) Electrical Installation and Maintenance Practice is a program me introduced by way of practical exercise, the maintenance of electrical system and circuits, electrical Installation, Inspection and test procedure. National Board for Technical Education (NBTE) (2004) Electrical craftsmen are expected to test, diagnose, service, install and completely repair any fault on electrical machines and equipment using the manufacturer's manual. In the report of NBTE (2004) the aim of Electrical Installation and Maintenance Practice is to give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant. Improvement is the process of making something better than before.

Improvement according to Olaitan, Amusa and Azouzu (2010) is the ability or condition for becoming better than before. Improvement in this study, is a process of helping graduates of technical Colleges to acquire higher proficiency level and work skills in Electrical Installation and maintenance practice for greater efficiency. For work to be done requires energy and skills. Skills according to Michael (2014) is an individual's capability to control elements of behavior, thinking and feeling within specified context and within particular task domains.

E-learning as an education concept uses internet technology, it deliveries the digital content, provides a learner-oriented environment for the teachers and students. It promotes the construction of life-long learning opinions and learning society. It is a well-known fact that Students loves internet as they love to connect with their friends online, doing a lot of different things like music and gaming. In our technical colleges, E-learning as a modern system of learning will invariably improve teaching-learning process in Electrical installation. It is also believed that it will help the students to pay maximum attention and enhance permanent learning especially in practical aspect of electrical and electronic technology.

Statement of the Problem

Electrical Installation and Maintenance Work programme in technical colleges is designed to produce skilled craftsmen who will be able to perform basic functions in electrical installation and maintenance work both in private and public sector (Ali, 2016). This calls for the necessity of acquiring high quality practical skills through the use of appropriate teaching and assessment strategies to be complemented with competent and experienced teachers, well-equipped workshops, adequate supply of teaching materials, adequate supervision of practical lessons and proper linkages between technical colleges, local industries and major industries for competency training in different trades (Richard, 2014).

Unfortunately, practical skills acquisition in Electrical Installation and Maintenance practice in Nigerian technical colleges has long be battling with numerous challenges among which are poor teaching strategies and inadequate facilities. The teaching of technical subjects has been too theoretical that many students prefer subjects or courses in Arts and Social Sciences because there is no longer much emphasis on the learners' practical skills acquisition in technical colleges. Teachers in most cases use lecture method instead of applying a variety of strategies and methods like demonstration and individual or guided discovery and online learning system (Isah, 2014). In addition, many teachers and students do not have the required skills and competency in the utilization of online learning system for impacting electrical installation insinuation to students in technical colleges.

In view of the above therefore, the study intends to examine E-learning as an effective tool for mastery of electrical installation technology in Ekiti State Technical Colleges.

Objective of the study

The purpose of the study is to examine the influence of E-learning on effective mastery of electrical installation and maintenance practice by electrical students in Ekiti state technical colleges. The study specifically intends to;

1. Find out if e-learning has influenced effective mastery of electrical installation practices of electrical students in Ekiti State technical colleges.
2. Find out if e-learning has influenced effective mastery of electrical maintenance practices of electrical students in Ekiti State technical colleges.

Research Questions

The following research questions are raised to guide the study.

1. E-learning has influenced effective mastery of electrical installation practices of electrical students in Ekiti State technical colleges?
2. E-learning has influenced effective mastery of electrical maintenance practices of electrical students in Ekiti State technical colleges?

Hypotheses

The following null hypothesis will be tested at 0.05

1. There is no significant difference in the mean responses of male and female teachers on the extent e-learning has influenced effective mastery of electrical installation practices of electrical students in Ekiti State technical colleges.
2. There is no significant difference in the mean responses of male and female teachers on the extent e-learning has influenced effective mastery of electrical maintenance practices of electrical students in Ekiti State technical colleges.
3. Significant relationship does not exist between e-learning and mastery of electrical installation practices.
4. Significant relationship does not exist between e-learning and mastery of electrical maintenance practices.

METHODOLOGY

The research design adopted was descriptive survey research design. The population for this study consisted of all fifty electrical installation and Maintenance Practice teachers in Ekiti state technical colleges. The whole population will be used because of its small size for the study. The research instrument used for this study was a self-constructed-questionnaire tagged E-learning for Electrical Installation Questionnaire (EEIQ), which was developed by the researchers. The item statements embodied in the questionnaire are related to the purpose and questions raised for the study. It has two sections A and B. Section A contained demographic information of the respondents while section B centered on e-learning for Electrical Installation using likert type scale of Strongly Agree (SA), Agree (A) Strongly Disagree (SD) and Disagree D. To establish the validity of the instrument, the questionnaire was given to three experts in the department of industrial technical education for scrutiny and necessary corrections or modifications. For the reliability of the instrument, Cronbach alpha reliability was used. The instrument had a reliability co-efficient level of 0.86. The data was collected by administering the questionnaire directly to the respondents by the researcher and two research assistants. Data collected were analyses were carried out using SPSS statistical package. Mean and Standard deviation was used to answer the research questions, while a t-test was used to test the hypothesis at a 0.05 level of significance.

Any item with a mean value of 2.50 – 4.00 was considered agreed, while any item with a mean value of 0.00-2.49 was considered as disagree. For the test of significance, the probability (p) value was used in comparison with the alpha value of.05 and at other relevant levels. If any item has a probability value greater than.05 ($P > 0.05$), it will be concluded that there is no significant difference in the mean responses of the respondents.

RESULTS

Research Question One

E-learning has influenced effective mastery of electrical installation practices of electrical students in Ekiti State technical colleges?

Table 1: Mean Ratings on influence of e-learning on mastery of electrical installation technology.

S/N	ITEMS	$\bar{X}$	SD	REMARK
1	The use of e-library as a tool can influence the mastery of electrical installation technology	2.90	0.87	Agreed
2	Through e-learning teachers and learners are open to facts and figures regarding the topic of discussion.	3.04	0.75	Agreed
3	E-learning gives the real perception of learning materials that may not available during traditional learning.	3.04	1.07	Agreed
4	It is easy to master the concept of electrical installation and maintenance practice with e-learning resources like internet and digitals.	3.08	0.81	Agreed

5	Every concept of electrical installation and maintenance practice are available if e-learning facilities are made available.	2.84	0.86	Agreed
	Grand Mean	**2.98**		

Data presented on Table 1 showed that the mean ratings of items 1-5 are 2.90, 3.04, 3.04, 3.08 and 2.84 respectively. All the mean ratings are above the cut-off point of 2.50. This means that the respondents agreed that the use of e-library as a tool can influence the mastery of electrical installation practices and through e-learning teachers and learners are open to facts and figures regarding the topic of discussion. They agreed that E-learning gives the real perception of learning materials that may not available during traditional learning and that every concept of electrical installation practice are available if e-learning facilities are made available. The grand mean of 2.98 is found to be above the cut-off point of 2.50. This implies that e-learning has influenced mastery of electrical installation practices of electrical students in Ekiti State technical colleges

Research Question Two

E-learning has influenced effective mastery of electrical maintenance practices of electrical students in Ekiti State technical colleges?

Table 2: Mean Ratings on influence of e-learning on mastery of electrical maintenance

S/N	ITEMS	$\bar{X}$	SD	REMARK
6	E-learning assist students in understanding details of electrical maintenance practice.	2.92	0.71	Agreed
7	E-learning reduces difficulty of learning electrical maintenance practice.	2.84	0.54	Agreed
8	E-learning arouses students' interest and memory retention in electrical maintenance practice.	2.96	0.98	Agreed
9	Students enjoys using e-learning in electrical maintenance practice because of its practical applications.	3.28	0.79	Agreed
10	E-learning allows students to learn practical-based aspect of electrical maintenance practice conveniently.	2.98	0.61	Agreed
	Grand Mean	**3.00**		

Data presented on Table 2, showed that the mean ratings of items 6-10 are 2.92, 2.84, 2.96, 3.28, and 2.98. All the mean ratings are above the cut-off point of 2.50. This means that the respondents agreed that E-learning assist students in understanding details of electrical maintenance practice. E-learning reduces difficulty of learning electrical maintenance practice. E-learning arouses students' interest and memory retention in electrical maintenance practice. Students enjoys using e-learning in electrical maintenance practice because of its practical applications. E-learning allows students to learn practical-based aspect of electrical maintenance practice conveniently. The cluster mean of 3.00 was also found to be above the cut-off point of 2.50. Therefore, e-learning has influenced effective mastery of electrical maintenance practices of electrical students in Ekiti State technical colleges.

Hypothesis 1

Table 3: The t-test Analysis of the Mean Responses of the Male and Female Respondents on the extent e-learning has influenced effective mastery of electrical installation practices.

S/N	ITEMS	X_1 (male)	X_2 (female)	Sig.	Remarks
1	The use of e-library as a tool can influence the mastery of electrical installation technology	3.541	3.375	0.234	NS
2	Through e-learning teachers and learners are open to facts and figures regarding the topic of discussion.	3.000	2.964	0.738	NS
3	E-learning gives the real perception of learning materials that may not available during traditional learning.	3.270	3.410	0.472	NS
4	It is easy to master the concept of electrical installation and maintenance practice with e-learning resources like internet and digitals.	3.625	3.571	0.734	NS

5	Every concept of electrical installation and maintenance practice are available if e-learning facilities are made available.	3.729	3.714	0.903	NS

Table 3 shows that all the five items had their significant value to be greater than .05 (P>0.05). This indicated that, there was no significant difference between the mean responses of male and female teachers on the on the extent e-learning has influenced effective mastery of electrical installation practices, therefore the hypothesis which stated that there is no significant difference in the mean responses of male and female teachers on the extent e-learning has influenced effective mastery of electrical installation practices of electrical students in Ekiti State technical colleges was accepted.

Hypothesis 2

Table 4: The t-test Analysis of the Mean Responses of the Male and Female Respondents on the extent e-learning has influenced effective mastery of electrical maintenance practices.

S/N	ITEMS	X_1 (male)	X_2 (female)	Sig.	Remarks
6	E-learning assist students in understanding details of electrical maintenance practice.	3.729	3.714	0.903	NS
7	E-learning reduces difficulty of learning electrical maintenance practice.	2.229	2.178	0.698	NS
8	E-learning arouses students' interest and memory retention in electrical maintenance practice.	1.625	1.660	0.822	NS
9	Students enjoys using e-learning in electrical maintenance practice because of its practical applications.	3.416	3.357	0.728	NS
10	E-learning allows students to learn practical-based aspect of electrical maintenance practice conveniently.	3.229	3.339	0.531	NS

Table 4 shows that all the five items had their significant value to be greater than .05 (P>0.05). This indicated that, there was no significant difference between the mean responses of male and female teachers on the on the extent e-learning has influenced effective mastery of electrical maintenance practices, therefore the hypothesis which stated that there is no significant difference in the mean responses of male and female teachers on the extent e-learning has influenced effective mastery of electrical maintenance practices of electrical students in Ekiti State technical colleges was accepted.

Hypotheses 3

Table 5: Model Summary of Regression Analysis between e-learning and mastery of electrical installation

Unstandardized Coefficients		Standardized Coefficients				
B	Std. Error	Beta	t	Sig.	R	R^2
25.789	2.880		8.955	.000	.480	.230
.182	.040	.480	4.510	.000		

Table 5 highlights the model summary of Regression analysis between e-learning and mastery of electrical installation. The value of R^2 is .230 which means that 23% variation in the mastery of electrical installation practices is explained by the e-learning they experience. The Table also provides details of models parameters (Beta values) and significance of these values. The unstandardized Beta coefficient gives measures of the contribution of each variable to the model. It is clear from the table that the value of unstandardized Beta is .182 which represents the gradient of regression line. Therefore, if the value of predictor variable is increased by one unit, there is .182 unit increase in the outcome variable. This impact is statistically significant because sig. value $p < .000$ which is less than .05 (95% confidence interval). Therefore, the null hypothesis is rejected. It may be concluded that significant relationship exist between e-learning and mastery of electrical installation practices.

Hypotheses 4

Table 6: Model Summary of Regression Analysis between e-learning and mastery of electrical maintenance

Unstandardized Coefficients		Standardized Coefficients				
B	Std. Error	Beta	t	Sig.	R	R^2
15.698	5.790		2.711	.008	.429	.184
.142	.036	.429	3.945	.000		

Table 6 highlights the model summary of Regression analysis between e-learning and mastery of electrical maintenance. The value of R^2 is .184 which means that 18.4% variation in the mastery of electrical maintenance practices is explained by the e-learning they

experience. The Table also provides details of models parameters (Beta values) and significance of these values. The unstandardized Beta coefficient gives measures of the contribution of each variable to the model. It is clear from the table that the value of unstandardized Beta is .142 which represents the gradient of regression line. Therefore, if the value of predictor variable is increased by one unit, there is .142 unit increase in the outcome variable. This impact is statistically significant because sig. value $p < .000$ which is less than .05 (95% confidence interval). Therefore, the null hypothesis is rejected. It may be concluded that significant relationship exist between e-learning and mastery of electrical maintenance practices.

Discussion

The result of the research question one revealed that there are the extent to which e-learning influences mastery of electrical installation technology in technical colleges. The use of computers can assist to accomplish the objectives of electrical installation technology programme apart from the attainment of the needs of the curriculum. Thus, a computer should not be seen as sophisticated equipment but as a teaching-learning tool that characterize the modern age. Fabunmi (2014) recognized the impact of e-learning technologies since the world has become a global village. E-learning and internet interaction network could be applied to learning for the development of education generally.

Research question two focused on extents are e-learning has influenced electrical maintenance practice in technical colleges. It was revealed that e-learning has improve students' interest in learning electrical maintenance practice in following ways: E-learning assist students in understanding details of electrical maintenance practice. E-learning reduces difficulty of learning electrical maintenance practice. E-learning arouses students' interest and memory retention in electrical maintenance practice. Students enjoys using e-learning in electrical maintenance practice because of its practical applications. E-learning allows students to learn practical-based aspect of electrical maintenance practice conveniently. This study also agree with Clayton, (2012) which opined that there is need for e-learning increase students' interest by exposing them to any students in the world to get information and providing effective materials for their findings.

Conclusion

It is a truism to assert that availability, accessibility and utilization of e-learning technologies in technical colleges will enhance sustainable technical education in Nigeria. One of the factors that determine educational development and innovation, in general, is teachers as they are the ones to use the ICT investments for educational development. Technology does not have an educational value in itself. It becomes necessary when technical teachers use it in the learning-teaching process. Although there are some, who claim that the presence of technology in the classroom creates a pressure and requires an effective use.

Despite the prevalent nature of e-learning in virtually every aspect of human endeavors, they have not been widely integrated into the teaching and learning process in technical schools. The use of e-learning facilities will revolutionize teaching in technical colleges especially in electrical installation technology. It will engender the development of students' innate scientific inquiry mind and their critical thinking abilities. There is need to sensitise and encourage teachers towards computers literacy because when this is done, the success of integration of computer education into school will be guaranteed.

Recommendations

The recommendations are as follows: teachers and students should be sensitized through seminars and workshops on the need to maximally utilize available e-learning technologies in technical colleges; stakeholders in education, such as Ministry of Education and non-governmental agencies should formulate, legalize and implement specific ICT policies on e-learning technologies for the Nigerian educational system to fast-track socio-economic transformation of Nigeria as encapsulated in the Vision 2020 Document. Female and highly experienced teachers should be encouraged to face the challenge new technologies. New teachers must indeed to develop the needed skills in the use of ICTs and to develop positive attitudes towards their use for teaching and research while old teachers should be encouraged to have basic knowledge of computer appreciation.

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