

# E-Learning as an Academic Strong Tool in the Production of Competence Electrical Installation Graduates in Technical Colleges in Ekiti State, Nigeria

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**ABSTRACT:** *The study investigated E-learning as an academic strong tool in the production of competent electrical installation graduates in technical Colleges in Ekiti State, Nigeria. To guide the study three research questions were raised and tested at 0.05 level of significance. A descriptive survey design was adopted for the study. A sample of fifty two (52) technical teachers formed the sample of this study. The instrument used for data collection was a self- structured closed ended questionnaire tagged: E-learning Questionnaire (EQ). Data collected were analyzed using mean and standard deviation. The findings of the study were: there were e-learning technologies available for use in electrical installation technology instruction in technical colleges, there were e-learning technologies being utilized among the electrical installation students in technical colleges and there were constraints to the use of e-learning technologies in electrical installation instruction in technical colleges. The study recommended that teachers and students should be sensitized through seminars and workshops on the need to maximally utilize available e-learning technologies in technical colleges.*

**Key Words:** *E-learning, Academic, strong tool, electrical installation, technical college.*

## Introduction

Education system in Nigeria has passed through different phases and stages. With the myriad of changes in technology, one ponders if changes in educational system, teaching methodology, educational policy were worthwhile. Although a change is expected and inevitable, as a natural phenomena in life. Education system in Nigeria has experienced many challenges and problems in terms of continuity and inconsistency due to restructuring of the system from time to time by different government and their policy. Nwagwu (2010) stressed that Nigeria has experienced growth without development. He opined that the past and contemporary endeavors in education: lack in synergy and interactive harmonious relationship between educational growth and educational development. Again, Moja (2010) noted that for over a decade, the political instability has generated a negative ripple on the Nigeria education system. The political unrest hindered not just the education system in general but the school in particular. He stressed that these difficulties were more pronounced at the foundational levels of education i.e. primary and secondary schools. These problems call for an urgent solution through the use of new technology.

Teaching and learning is an important process for development of man which affects the society when both the teachers and students actively involved in the process. Well planned and properly directed education is a key to success and progress of a nation (Mark, 2013). No nation can boast of being buoyant in knowledge and skill without integrating technology into her educational system. Most of the developing countries or nations of the world like Nigeria are still characterized by the traditional chalk and talk method of instruction which makes learning ineffective and deny learners the opportunity to apply the skills learnt in the actual job situations (Fidelis, 2015). More importantly, practical skills can be learnt through the ICT by using video learning, well described pictorial view of lesson which may not be available in the classroom where teaching and learning process is taking place. The use of ICT links such as classroom to entire world and help them to get more materials (video, pictures, text) for effectively teaching and learning process. Communication skills of the teacher could be highly developed with interaction with internet. Skills in attaining good mastery of subject matter could also be enhanced through the use of ICT facilities.

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 that 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).

Internet has become one of the vital ways of making available resources for research and learning for both teachers and students to share and acquire information (Richard & Haya ,2009). E-learning encompasses the use of the internet and other important technologies to produce materials for learning, teaching learners, and also regulate courses in an organization (Fry, 2001). E-learning according to Dublin (2003) tends to reveal the specialization and interest of the researchers. As a concept, it covers a range of applications, learning methods and processes (Rossi, 2009). E-learning refers to the use of information and communication technologies to enable the access to online learning/teaching resources. In its broadest sense, Abbad (2009) defined E-learning to mean any learning that is enabled electronically or by electronics means. He however narrowed this definition down to mean learning through the uses of digital technologies. Some researchers like LaRose (2014), Keller & Cernerud (2002) described e-learning as any learning that is internet- enabled or web-based. It is defined as the use of information and communication technologies in diverse processes of education to support and enhance learning in institutions of higher learning, and it includes the usage of information and communication technology as a complement to traditional classrooms, online learning or combines the two modes.

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 & 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 distant learning, thus a transmission of lectures to distant locations by way of video presentations. However, Liu & Wang (2009) argues 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 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, Lefebure (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).

The roles and values of E-learning in education are numerous for example, it promotes students' commitment to learning. It introduces the concept of new learning like many on-line learning packages which give students greater control over what they learn and how they learn. It equally facilitates students and teachers togetherness in lessons, tutorials and one to one interactions across different geographical locations. Again, it makes students to understand science and technology by effectively conducting experiments that can be viewed on screen. It also enhances the process of learning through interaction with simulations and fosters students' interest and motivation.

E- Learning as an education concept uses internet technology, it delivers 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 know fact that students loves internet as they love to connect with their friends online, doing a lot of different things like music and gaming. The idea of E-Learning help in turning the environment that students love into an environment for learning. This will go a long way in improving the teaching and learning of Electrical installation. 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.

E- Learning includes all forms of electronically supported learning and teaching (Tavangarian, 2004). The information and communication systems, whether networked or not, serve as specific media to implement the learning process. It often involves both out-of-classroom and in-classroom educational experiences via technology, even as advances continue in regard to devices and curriculum. Abbreviations such CBT (Computer-Based Training), IBT (Internet- Based Training) or WBT (Web-Based Training) are synonymous to E- Learning. E-learning is the computer and network- enabled transfer of skills and knowledge. Its applications and processes include Web-based learning, computer-based learning, virtual education opportunities and digital collaboration. Contents are delivered via the Internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM. It can be self-paced or instructor-led and it includes media in the form of text, image, animation, streaming video and audio.

Electrical installation and maintenance work has the aim of preparing individuals in a way that on competency they should be able to complete the programme to install, operate, maintain and repair electrically energized system at residential, commercial and industrial complexes and also, be able to handle electrical wiring DC Motors, AC Motors, generators, controls and electrical distribution panels.

## **Research Questions**

The following research questions were raised to guide the study:

1. To what extent are E-Learning technologies available for use in electrical installation technology instruction in technical Colleges in Ekiti State, Nigeria?
2. To what extent are E-Learning technologies being utilized among the electrical installation students in technical Colleges in Ekiti State, Nigeria?
3. What are the constraints to the use of E-Learning technologies in electrical installation instruction in technical colleges in Ekiti State, Nigeria?
4. What are the improvement measures to be adopted in the use of e-learning technologies in electrical installation instruction in technical colleges in Ekiti State, Nigeria?

## **Methodology**

The research design adopts for this study is descriptive survey research design. It is preferable because topic of investigation centres on individual opinion or perceptions. It involves gathering of information on E-Learning and teaching, learning process. A self-made structured questionnaire is used to elicit relevant information from the respondents.

The population of this study consists of all electrical installation teachers in technical colleges in Ekiti State, Nigeria.

The samples for this study consists of all the electrical installation teachers in technical Colleges in Ekiti State, Nigeria. The whole population of 52 electrical installation teachers was used because of its small size for the study.

The research instrument used for this study is self-constructed – questionnaire tagged E-learning Questionnaire (EQ). 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 background information of the respondents while section B centered on E-learning facilities using Likert type scale of rating, Strongly Agree (SA), Agree (A), Strongly Disagree (SD), Disagree (D).

To establish the validity of the instrument, the questionnaire was given to the project supervisor for scrutiny and necessary corrections or modifications.

For the reliability of the instrument, a test-retest method of reliability was adopted was used and using Pearson product moment correlation reliability coefficient of 0.78 was obtained which is considered high enough for the study.

The researcher with the help of the vice principal of the technical colleges of the study area will administer the instrument and collect data immediately.

The responses of the respondents on the items of the questionnaire are analysed with aid of computer.

## **Results and Discussion**

### **Research Question 1**

To what extent are E-learning technologies available for use in electrical installation technology instruction in Technical Colleges in Ekiti State, Nigeria?

**Table 1: Responses on the E-learning technologies available for use in electrical installation technology instruction in Technical Colleges in Ekiti State, Nigeria.**

s/n	ITEMS	SA	A	D	SD	Mean	St.D	Remarks
1	E-library	53 (53%)	40 (40%)	3 (3%)	4 (4%)	3.42	0.74	Agreed
2	Over-head Projector	65 (65%)	31 (31%)	4 (4%)	-	3.61	0.56	Agreed
3	LCD Projector	63 (63%)	34 (34%)	3 (3%)	-	3.60	0.55	Agreed
4	Webcam and Digital Camera	56 (56%)	30 (30%)	9 (9%)	5 (5%)	3.37	0.84	Agreed
5	Television and computer printer	85 (85%)	10 (10%)	5 (5%)	-	3.80	0.51	Agreed
Grand Mean						2.80	0.64	Agreed

Mean greater than or equal to 2.50 indicate 'Agreed' otherwise 'Disagreed'

The result presented in Table 1 revealed the responses of the respondents on the e-learning technologies available for use in electrical installation technology instruction in technical colleges. The mean values in the table are greater than 2.50 which indicated that majority of the respondents agreed with statements in item 1-5 that E-library (3.42), over-head projector (3.61) LCD projector (3.60), webcam and digital camera (3.37), television and computer printer (3.80). The grand mean in the table is also greater than 2.50. This further justified the claim that all the e-learning technologies available for use in electrical installation technology instruction in technical colleges.

### Research Question 2

To what extent are E-Learning technologies being utilized among the electrical installation students in Technical Colleges in Ekiti State, Nigeria?

**Table 2: Responses on the extent by which e-learning technologies are being utilized among the electrical installation students in Technical Colleges in Ekiti State, Nigeria.**

s/n	ITEMS	SA	A	D	SD	Mean	St.D	Remarks
1	Teacher uses e-learning technologies for online learning	73 (73%)	22 (22%)	4 (4%)	1 (1%)	3.67	0.60	Agreed
2	Technical teachers use E-learning facilities for online research	68 (68%)	27 (27%)	5 (5%)	-	3.63	0.58	Agreed
3	Technical teachers use LCD and overhead project in electrical installation classroom interaction	73 (73%)	27 (27%)	-	-	3.73	0.44	Agreed
4	Technical teachers use LCD and overhead project in electrical installation classroom interaction	65 (65%)	29 (29%)	5 (5%)	1 (1%)	3.58	0.63	Agreed
5	Television and computer printer is audio-visual learning in electrical installation	64 (64%)	27 (27%)	8 (8%)	1 (1%)	3.54	0.68	Agreed
Grand Mean						3.63	0.58	Agreed

Mean greater than or equal to 2.50 indicate 'Agreed' otherwise 'Disagreed'

The result presented in Table 2 revealed how e-learning technologies is being utilized among the electrical installation students in technical colleges. The mean values in the table are greater than 2.50 which indicated that majority of the respondents agreed with statements in item 1-5 that teacher uses e-learning technologies for online learning (3.67), technical teachers use e-learning facilities for online research (3.63), technical teachers use e-learning resources in sourcing information for teaching electrical installation (3.73), technical teachers use LCD and overhead project in electrical installation classroom interaction (3.58), and television and computer printer is audio-visual learning in electrical installation (3.54). The grand mean in the table is also greater than 2.50. This further showed that extent how e-learning technologies are being utilized among the electrical installation students in technical colleges.

### Research Question 3

What are the constraints to the use of e-learning technologies in electrical installation instruction in Technical Colleges in Ekiti State, Nigeria?

**Table 3: Constraints and improvement measure to be adopted in the use of e-learning technologies in electrical installation instruction in Ekiti State, Nigeria.**

s/n	ITEMS	SA	A	D	SD	Mean	St.D	Remarks
1	Lack of conducive classroom environment for e-learning of electrical installation	68 (68%)	23 (23%)	7 (7%)	2 (2%)	3.57	0.71	Agreed
2	Poor electricity power supply	66 (66%)	34 (34%)	-	-	3.66	0.47	Agreed
3	Lack of ICT qualified teachers	41 (41%)	18 (18%)	36 (36%)	5 (5%)	2.95	0.98	Agreed
4	Lack of availability of ICT equipment	73 (73%)	18 (18%)	5 (5%)	4 (4%)	3.60	0.76	Agreed
5	Lack of computer infrastructure in schools	54 (54%)	41 (41%)	4 (4%)	1 (1%)	3.48	0.62	Agreed
Grand Mean						3.45	0.71	Agreed

**Mean greater than or equal to 2.50 indicate 'Agreed' otherwise 'Disagreed'**

The result presented in Table 3 revealed the constraints and improvement measure to be adopted in the use of e-learning technologies in electrical installation instruction in technical colleges. The mean values in the table are greater than 2.50 which indicated that majority of the respondents agreed with statements in item 1-5 that lack of conducive classroom environment for e-learning of electrical installation (3.57), poor electricity power supply (3.66), lack of ICT qualified teachers (2.95), lack of availability of ICT equipment (3.60) and lack of computer infrastructure in schools (3.48). The grand mean in the table is also greater than 2.50. This justified the claim that item 1-5 there are constraints to the use of e-learning technologies in electrical installation instruction in Technical Colleges.

#### Research Question 4

What are the improvement measures to be adopted in the use of e-learning technologies in electrical installation instruction in Technical Colleges in Ekiti State, Nigeria?

**Table 4: Responses on the improvement measure to be adopted in the use of e-learning technologies in electrical installation instruction in Technical Colleges in Ekiti State, Nigeria.**

s/n	ITEMS	SA	A	D	SD	Mean	St.D	Remarks
1	Employment of ICT qualified teachers for electrical installation	21 (21%)	58 (58%)	12 (12%)	9 (9%)	2.91	0.82	Agreed
2	Provision of enough funds to finance e-learning facilities in order to enhance electrical installation	53 (53%)	47 (47%)	-	-	3.53	0.50	Agreed
3	Conducive environment should be made available for the teaching and learning of Electrical installation in technical colleges	49 (49%)	45 (45%)	2 (2%)	4 (4%)	3.39	0.72	Agreed
4	Sponsor of teachers/ students for seminar/ workshop where they can learn more on uses of e-learning teaching for effective teaching and learning	29 (29%)	24 (24%)	27 (27%)	20 (20%)	2.62	1.10	Agreed
5	Building a well- equipped e-library and workshop for technical colleges	28 (28%)	65 (65%)	4 (4%)	3 (3%)	3.18	0.64	Agreed
Grand Mean						3.13	0.76	Agreed

**Mean greater than or equal to 2.50 indicate 'Agreed' otherwise 'Disagreed'**

The result presented in Table 4 revealed the responses of the respondents on the measures should be taken to discourage, prevent, or otherwise address cheating in public examinations to the schools. The mean values in the table are greater than 2.50 which indicated that majority of the respondents agreed with statements in items 1-5 that employment of ICT qualified teachers for electrical installation (2.91), provision of enough funds to finance e-learning facilities in order to enhance electrical installation (3.53), conducive environment should be made available for the teaching and learning of Electrical installation in technical colleges (2.62), and building a well-equipped e-library and workshop for technical colleges (3.18). The mean responses in the table are greater than 2.50 and the grand mean (3.14) is greater than 2.50. This implies that there are improvement measures adopted in the use of e-learning technologies in electrical installation instruction in technical colleges.

## Discussion

The result of the research question one revealed that there are the extent to which e-learning technologies are available for use in 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.

The research question two also indicated the extent to which e-learning technologies are being utilized among the electrical installation technology teachers in technical colleges. It is confirmed that teacher uses e-learning technologies for online learning. According to Hallo (2015) online research carried out by technical teachers through the use of e-learning facilities. It is obvious from the study that technical teachers use e-learning resources in sourcing information for teaching electrical installation. Mallam (2016) opined that e-learning is use to store, retrieve, manipulate, transmit or receive information electronically in a digital form. It consists of hardware, software networks and media for collection, storage, processing, transmission and presentation of information in a form of voice, data, texts and images (Abdulrahaman & Akinnubi, 2012).

Research question three unraveled the constraints to the use of e-learning technologies in electrical installation instruction in technical colleges. It pointed out the following: lack of conducive classroom environment for E-learning of electrical installation, poor electricity power supply, lack of ICT qualified teachers, lack of availability of ICT equipment, and lack of computer infrastructure in schools as constraints to use of e-learning facilities. This findings is in consonance with the report of Jane (2012), there are factors such as physical infrastructural and educational factors affecting maximum use of e-learning materials.

Research question four showed improvement measures that could be adopted in the use of e-learning technologies in electrical installation in technical colleges. The following strategies were outline from the study: employment of ICT qualified teachers for electrical installation, provision of enough funds to finance e-learning facilities in order to enhance electrical installation, conducive environment should be made available for the teaching and learning of Electrical installation in technical colleges, sponsor of teachers/ students for seminar/ workshop where they can learn more on uses of e-learning teaching for effective teaching and learning and building a well-equipped e-library and workshop for technical colleges. This study also agree with Clayton (2012) which opined that there is need for strategies for helping technical teachers to identify, promote, assess and certify e-learning facilities. Thus there is need to update existing training packages on E-learning facilities.

## 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 sensitize and encourage teachers towards computers literacy because when this is done, the success of integration of computer education into school will be guaranteed.

The evolving and dynamic work environment of the knowledge based economy has serious implications for skills training in technological education to enter and make progress in the world of work and to keep abreast of changes in electrical installation technology, electrical technology students need to develop skills to effectively use e-learning facilities to increase their employability. People with better technical (hard) skills and employability skills stand a better chance of being employed in the new knowledge based economy where adaptability is key.

## Recommendations

1. The Technical Colleges curriculum should reviews to reflect more practical courses in E-Learning facilities for pre-service and in-service teachers.
2. Efforts should be made by the governments at all levels and other stakeholders in education (parents, non-governmental agencies, etc) to make adequate provision for computers and other necessary accessories required for e-learning in technical colleges. This would form the basis for upgraded E-Learning at the tertiary level of education.
3. Teachers and students should be sensitized through seminars and workshops on the need to maximally utilize available E-Learning technologies in technical colleges.
4. 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 20:2020 Document.
5. Female and highly experienced teachers should be encouraged to face the challenge new technologies.
6. New teachers must indeed 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.
7. The curriculum of the identified work skills should be reviewed by the National Board for Technical Education
8. Emphasis should be placed on practical while as a student Electrical workshop and equipment should be functional in order to sustain the interest of the students before graduating
9. Graduates of electrical installation and Maintenance Practice to be on the job-training when employed.

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