

## Technology and Vocational Education and Emerging Technological Skills Needed in Achieving E-Learning in Enugu State.

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### ABSTRACT

*This study assessed technology and vocational education and emerging technological skills needed for achieving e-learning in Enugu state due to the problem of poor and completion of curriculum in technology and vocational education. . The purpose of the study is to identify emerging technological skills needed for achieving e-learning. Two research questions guided the study and two null hypotheses were also tested. The study adopted a survey method. The area of the study is all the technical colleges in Enugu state. The population was 38 graduate teachers and there was no sampling as the population is manageable. The instrument for data collection is a structured questionnaire. Three experts validated the instrument and a reliability coefficient of 0.76 was obtained. Mean and standard deviation were used to analyze the data collected for the study. Findings reveal that the items were agreed by the respondent. This simply means that knowledge of computer hardware and software, knowledge of how to log in and assess information and programming are relevant in emerging technological and vocational education. In conclusion it is relevant from the forgoing that emerging technological skills needs is today a force that has changed aspects of the way we live in the area of e-learning.it was recommended that technology and vocational educators should be motivated and encouraged to develop and use multimedia software and hardware that are relevant.*

**Keywords:** Technology and Vocational Education, Emerging Technological Skills, E-Learning

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### INTRODUCTION

Technology and Vocational education and training is used as a broad term in the area of educational process which involves apart from the general education, it is the study of technologies and related science and acquisition of practical skills, attitude, understanding and knowledge relating to occupation in various areas of economic and social life. Momoh (2012) defines Technology and Vocational Education and training as a form of education whose primary aim is to prepare students for employment in a recognized occupation and skills. In the same vein Yakuku (2006) defines Technology and Vocational Education as:

- An integral part of general education
- A means of life-long learning and a preparation for responsible citizenship
- An instrument for promoting environmentally sound and sustainable development
- A method of facilitating poverty alleviation.

He further defines Technology and Vocational Education and training as a post secondary vocational training programme whose aim is the production of technicians to fill the middle class manpower.

According to Uwaifo (2019), Technology and Vocational Education and training is the



training of technically oriented personnel who are to be the initiators, facilitators and implementers of technical development of a nation. In his own view this training of its citizens on the need to be technically literate would eventually lead to self-reliance and sustainability. He further observed that technical education is more than any other profession that has direct impact on the development of the country. This Technology and Vocational Education and training has contributed immensely ranging from electrical/electronic technology, metal work technology, mechanical/automobile technology, Building technology, Woodwork technology, Agricultural science, Home Economics, computer science etc. it is a practical oriented education which makes it unique in its content and approach thereby demanding special attention in education.

Education is always a powerful instrument for progress and the greatest power known for man's improvement. It is also phenomenon engaged by societies in all their developmental stages. The process of education helps to impart useful and relevant skills to individuals which in turn lead to societal growth. Highly industrialized nation have at one time or the other identified Technology and Vocational Education as a transformational key policy the thrust for technological economic and development growth.

Technological growth commenced in Nigeria's with the change of curriculum from 6 – 5 – 4 – system of education to 6-3-3-4 system of education. The 6-3-3-4 system seeks the vocationalization the school systems and makes secondary education relevant to the industrial manpower needs and self-employment needs of the individuals. It was on the note that the pre-vocational subjects like introductory technology and integrated science and made compulsory at the junior secondary school

level under the 6-3-3-4 arrangement. This is a step in the right directions in providing the skills required for individual to be better, more useful and productive citizens of the society after graduation. (Samuel 2019).

The graduates are equipped with these technology and vocational are relatively the labour force and their professional responsibilities are required to effectively perform in the dynamics and competitive world of work. It is therefore important to note that this system of education needs to be properly managed to achieve the desired goals and objectives through developmental and economic growth.

Developmental growth is seen as a socio-economic term within a socio-cultural system where new ideas are hatched, new changes are introduced leading to the production of higher per capital income and a higher standard of living through the agency of modern science and technology and improve qualitative social organization. Development of technology is associated with the eradication of diseases, poverty, ignorance, illiteracy, unemployment and low life expectancy. It is the capacity of satisfying people's needs for good health, shelter, clothing, education, communication, energy and leisure. If these needs are satisfied to a large extent in the nation's citizenry, then the nation in question is said to be developed technologically.

Economic growth is a purely economic term and it means more output of goods and services in a given nations. An economy that grows in not necessarily developed. In other words, any economy that develops must necessarily grow. A growing economy must have increase in various dimensions of goods and services provided by the people. The developmental and economic growth can be achieved through emerging technology.

The emergence of information and communication technology (ICT) has brought with it changes in the process of imparting and acquiring knowledge. E-learning which is one of the by-products of ICT has changed many aspects of life and opened a wide vista of opportunities for people. One challenge that faces the profession and practice of technology and vocational education and training (TVET) and needed the whole of mankind is the progress and innovation offered by technological development since 1990's (Enang & Okut, 2019). Globally, there is a paradigm shift from the traditional approach of teacher-centered learning to modern methods where ICT play a vital role and TVET cannot be exempted.

ICT has a great speed of providing flexibility, improvement in quality and quantity of learning instead of total dependence of textbooks and materials in prints as teaching and learning in the technical education has done in the past. The advantages of using the e-learning technology as an educational tool range from capacity of students to personally learn needed a skills and information almost in any field imaginable.

### **The concept of E-learning**

There are many terms used to describe learning that is delivered online, via the internet, ranging from distance education, to computerized electronic learning, online learning, internet learning and many others. E-learning means electronic learning. It is learning utilizing electronic technologies to access educational curriculum outside of the traditional classroom. It is not confined to online learning but it includes computer based learning, web-based learning, virtual classroom and digital collaboration. In most cases, it refers to a course, programme or degree delivered completely online.

Okoye, Otuka and Iheonunekwu (2010) see e-learning as all forms of electronically supported teaching and learning which are procedure in character and aimed at affect the construction of knowledge with reference to individual experience, practice and knowledge to the learner. E-learning which has to do with ICT tools and internet facilities can make teaching, especially in TVET more efficient and productive by engendering a variety of tools to enhance and facilitate teachers professional activities through the effective use of internet, intranet, video tape, power point, overhead projections, interactive boards and a host of others. Chinwendu (2015) states that e-learning is all about learning that occur at the computer. According to him, the convergence of the internet and learning or internet-enabled learning is called e-learning. The uses of network technologies to create, foster, deliver and facilitate learning, anytime and anywhere. It is also the delivery of individualized, comprehensive, dynamic learning content in real time, aiding the development of communities of learning, linking learners and practitioners with experts.

Oluwalola and Awodiji (2019) define e-learning as an interactive learning approach for delivery electronically mediated, well designed, learner centered and interactive learning environment to anyone, anyplace anytime by utilizing the internet and designed technologies in the instructional design principles. It is connected with through any electronic medium that may or may not be connected to the internet. E-learning facilities provide the learners with exciting opportunities to search for more educational facilities. The implementation of e-learning in TVET will help to change the old pedagogical approach of the learning and changes the teachers from a knowledge transmitter to a knowledge facilitator.

Unfortunately, despite all the glaring contributions of technology and vocational education and training (TVET) in our nation, Nigeria's is yet to score a high level of this type of education the attention it deserves. This is one of the major reasons for rising unemployment, poverty and unabated crimes in the society today. This paper is an attempt to explore some of the emerging technologies in achieving e-learning in Enugu State and a way forward for technology and vocational education in Nigeria.

### **Statement of the Problem**

It is of the opinion of the curriculum planners that technology and vocational education should prepare citizens with different skills for job or self employment. That the skills acquired should be relevant to labour demand and manpower needs of the society, technological and sustainable development, productivity, self-reliance, national cohesion and global competitiveness. The planning and provision of technology and vocational education in Nigeria is indeed suitable and relevant towards the realization of these goals.

But it seems that these programmes can effectively achieve these goals if it is well managed. In Enugu State, technology and vocational education seems to be facing some emerging technological skills in achieving e-learning in order to achieve the objective of national cohesion and global competitiveness. Hence the emerging technological skills needed in achieving E-learning in technology and vocational education.

### **Purpose of the Study**

The main purpose of this study was to determine the emerging technological skills in achieving e-learning in Enugu State.

Specifically the study sought to:

1. Identify emerging technological skills needed by technology and vocational education graduates in achieving e-learning in Enugu State
2. Determine suitable skills in emerging technology in achieving e-learning by graduates in Enugu State.

### **Research Questions**

The following research questions guided the study:

1. What are the emerging technological skills needed by technology and vocational education graduates in achieving e-learning in Enugu State?
2. What are the suitable skills in emerging technology in achieving e-learning by graduates of technology and vocational education in Enugu State?

### **Hypotheses**

The following hypotheses guided the study;

**H0<sub>1</sub>**. There is no significant different in mean rating of male and female in emerging technological skills needed by technology and vocation education graduates in achieving e-learning in Enugu state.

**H0<sub>2</sub>**. There is no significant different in the mean score of male and female in the suitable skills in emerging technology in achieving e-learning by graduates of technology and vocational education in Enugu state

### **Method**

The researcher adopted survey research design. The researcher adopted survey method for this study because it will enable the researcher to have accurate assessment of some characteristics of the population or universe from the sample selected and makes inferences from the characteristics of the defined population of the study (Adaranjo, 2011). The area of the study is all technical colleges in Enugu state. The population for this study was 38 teachers of graduates from technology and vocational

education department who have graduated and are teaching in the various secondary schools in Enugu State. There was no sampling because of the manageable size of the teachers. The instrument used in this study was a structured questionnaire. The instrument was face validated by three experts. One from the department of science education of Nnamdi Azikiwe University Awka and the remaining two are from the department of technology and vocational education of Enugu state university of science and technology and their comments guided the modification of the final instrument. The reliability of the instrument was obtained by testing the instrument at Anambra state schools services management board. Using Cronbach Alpha a reliability coefficient index of 0.76 was obtained. This showed that the instrument was reliable and hence used for data collection. The instrument was administered and collected

by the researcher with the help of two trained research assistants.

The entire questionnaire distributed were properly filled and collected. Mean with standard deviations were used to answers the research questions for the study. Any item with a mean of 2.50 and above was regarded as agreed while items with means rating 2.50 were regarded as disagreed.

### Results

The result of the study is presented based on the research question. Details of the result were contained in the tables below.

#### Research Question 1

What are the emerging technological skills needed by technology and vocational education graduates in achieving e-learning in Enugu State.

**Table 1: Mean rating and standard deviation of the responses on the emerging technological skills needed by technology and vocational education graduates in achieving e-learning in Enugu State.**

S/N	Items	$\bar{x}$	SD	Decision
1	Knowledge of computer hardware	3.51	0.69	Agree
2	Knowledge of computer software	3.45	0.77	Agree
3	Knowledge of logging information in the computer	3.34	0.62	Agree
4	Programming computer	3.47	0.63	Agree
5	Retrieval of information	3.28	0.89	Agree
6	Identify computer signals	3.70	0.53	Agree
7	Internet computer signals	3.00	0.73	Agree
Grand mean/Standard Deviation		3.39	0.69	Agree

**Note:  $\bar{x}$  = mean, SD = standard deviation**

Table 1 show that all the items were agreed by the respondents. This simply means that knowledge of computer hardware and software, knowledge of low to log relevant in emerging technological in achieving e-learning by graduates of technology and vocational education in Enugu State. The data also showed that responses on the emerging technological skills needed by

graduates of technology and vocational education in achieving e-learning with overall grand mean score of 3.39 and standard deviations of 0.69. The relative low standard deviation indicates that the respondents did not differ remarkably in their opinion.

**Table 2: t-test of mean rating of male and female graduates teachers in technology and vocational education in emerging technological skills in achieving e-learning in Enugu State.**

Gender	x	SD	N	Df	t-cal	t-tab	P	Decision
Male	3.40	0.68	12	36	0.155	1.98	0.05	N.S
Female	3.42	0.68	24					

Note: x = mean, SD = standard deviation, N = Number, df = degree of freedom, t-cal = t – calculated, t-tab = t – table, NS = Not significant

The analysis in table 2 shows that the value at 0.05 level of significant and 36 degree of freedom for 07 items had their t-calculated value of 0.155, while the critical t-value is 1 – 98. Since the critical t-value is more than the t-calculated, the null hypotheses is therefore not rejected for these items. This invariably means that no significant differences exist between the mean rating of male and female graduates teachers of

technology and vocational education in emerging technological skills needed in achieving e-learning in Enugu State.

### Research Question 2

What are the suitable in emerging technology in achieving e-learning by graduates of technology and vocational education in Enugu State.

**Table 3: Mean rating and standard deviation of in achieving e-learning by graduates of technology and vocational education in Enugu State**

S/N	Items	$\bar{x}$	SD	Decision
8	Competency in computer programming	3.22	0.84	Agree
9	Ability to understand different kinds of memory	3.42	0.79	Agree
10	Ability to debug mut-tasking code	3.54	0.68	Agree
11	A good understanding of direct memory access	3.08	0.79	Agree
12	Skills in understanding microprocessor internals ()register	3.48	0.50	Agree
13	Skills in effective use of oscilloscope	3.44	0.66	Agree
14	Skill in multi-tasking	3.48	0.75	Agree
15	Skills in accessing different kinds of memories (RAM, Rom, Flash)	3.28	0.86	
16	Skills in debounding of switches, resistive, ladder, rotary encoders	3.40	0.70	Agree
17	Ability to understand memory regions	3.18	0.77	Agree
	Ability to read and understand schematics	3.14	0.63	Agree
<b>Grand mean/Standard Deviation</b>		<b>3.33</b>	<b>0.65</b>	<b>Agree</b>

Note:  $\bar{x}$  = mean, SD = standard deviation

Table 3 shows that all the items were agreed by the respondents. This simply means that competency in computer programming

language, skills in effective use of an oscilloscope, skills in multi-tasking are relevant in the suitable skills in emerging

technology and vocational education in Enugu State. The data also shows that responses with overall, grand mean score of 3.33 and standard deviation of 0.65. The

relative low standard deviation equally shows that the respondents did not differ remarkably in their opinions.

**Table 4: t-test of mean rating of male and female graduates teachers in suitable skills in emerging technology in achieving e-learning in Enugu State.**

Gender	x	SD	N	Df	t-cal	t-tab	P	Decision
Male	3.31	0.74	12	36	0.76	1.984	0.05	N.S
Female	3.18	0.84	24					

Note: x = mean, SD = standard deviation, N = Number, df = degree of freedom, t-cal = t – calculated, t-tab = t – table, NS = Not significant

The analysis in table 4 shows that the value at 0.05 level of significant and 36 degree of freedom for 11 items had their t-calculated of 0.76, while the critical t-value is 1.984. Since the critical t-value is more than the t-calculated, the null hypotheses are therefore not rejected for these items. This invariably means that no significant differences exist between the mean rating of male and female graduates' teachers of technology and vocational education in emerging technological skills needed in achieving e-learning in Enugu State.

### Discussion

The findings of the study according to research questions revealed that all the items on the emerging technology skills needed by technology and vocational education graduates in achieving e-learning in Enugu State were accepted. This shows that emerging technological skills plays very significant role. This is in agreement with most experts express in their views. According to Nice (2002) emerging technological skills needs brings technology closers. The findings also showed no significant differences between the mean responses of male and female on the mean rating of graduates teachers in technology and vocational education on emerging

technological skills needed in achieving e-learning.

Table 3 shows that all the items were agreed by the responses. This means that competency in computer programming language, a good understanding of direct memory access and skills in understanding microprocessor internal (register) etc are suitable skills in emerging technology in achieving e-learning.

### Recommendation

Despite the fact that e-learning into TVET through the use of ICT is facing a lot of challenges in Nigeria and Enugu state at large, there is a room for improvement because TVET is the surest way to economic and developmental growth of any nation. The production of employable and skilled human recourses for the world of work is essential to sound economic development and growth through the emerging technological skills needed for e-learning. The following suggestions if implemented will foster the future of technology and vocational education through achieving e-learning.

- Funding: funding is the fundamental if the use of ICT in emerging technological skills needed in all ramification and in the real sense and

allow it to succeed. Therefore there should be adequate funding of TVET programme in a holistic manner.

- Policies: the three tiers of government should adopt policies that would avail technology and vocational education teachers and students easy access to the emerging technological tools, machines and equipment.
- Infrastructure and facilities: emerging technological tools, facilities, packages and equipment should be provided in sufficient quantity.
- Technology and vocational educators should be motivated and encouraged to develop and use multimedia software and hardware that relevant.
- The government should provide E-library in every technology and vocational education department. They should make sure that the library has a server for storage, retrieval, uploading and downloading of information.

Training: the use of ICT as an emerging technology can only be possible if there are available and sufficient human resources in the right number.

### Conclusion

Based on the findings of this study, it is evident from the foregoing that emerging technological skills needs is today a force that has changed aspects of the way we live in the area of e-learning. Their capacities need to be built for effective use of e-learning facilities.

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