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## GRAPHIC DESIGN SKILLS REQUIRED FOR ENTREPRENEURIAL DEVELOPMENT

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### INTRODUCTION

Graphics are the visual presentations of textual and non-textual information on various planes including a wall, canvas, paper or computer screen. Graphics are used to brand, notify, demonstrate, or even entertain audience at home and schools. Examples of graphics can be photographs, drawings, diagrams, symbols, geometric designs, maps and engineering drawings, among other related images. They frequently merge text, color and illustrations in order to convey information or idea/style. Graphics can be practical or merely artistic. However, people look good in their mode of dressing and fashion. The same people beautify their homes, churches, occasion arena, altar of worship etc, for the sake of achieving their goals. The way people decorate and dress themselves is for the sake of pleasure, happiness and comfort. Certainly, no meaningful dressing/decoration can exist without meaningful design or thought. No meaningful design can exist without a little aspect of art, be it typography (words), photography (images) or other applied form of beauty and no art can exist without a hand behind it. This hand could be supernatural or natural. Graphic design cannot be discussed fully without a mention of art. This is why Art and Design Community Development Service (CDS) group in Makurdi, Benue State (n.d), noted that art is the product of creative human activity in which materials are shaped or selected to convey an idea, emotion, or visual interesting form. Human art involves a design which could be graphic design, or a combination of elements of graphic design.

The elements and principles are the skillful order and unity of organization and management of various segments of design. These elements include such thing as lines, colour, texture, value, shapes, type, space and form while

the principles involve balance, variety, proportion, dominance, and repetition.

Graphic design is a creative visual/innovative process of communication that combines art and technology to communicate ideas to the audience. It requires a calculative, initiative and creative mind which depends more on cognitive and psychomotor domain/ability of individuals. Graphic design is an eye-catching mode of communication for attraction and money making by the designers. According to AGDA (2011), graphic design is defined as an interdisciplinary, problem-solving activity which combines visual sensitivity with skill and knowledge in areas of communications, technology and business. These Graphic design practitioners' specialized in the structuring and organizing of visual information to aid communication and orientation. The graphic design process is a problem solving process, one that requires substantial creativity, innovation and technical expertise (AGDA,2011). The emphasis on the AGDA view of graphic design implies the use of skills, one being creative, having focus to produce new thing in order to solve client's problem at a time in a different way.

The term "skill" according to Nwangwu and Obi (2014) could be referred to as the ability to do a job or work very well. Nwangwu and obi went further to say that a person is said to have acquired a skill when the person can competently/professionally finish a given piece of work at a given time with minimum errors. It was base on the mastery skills and competency that a learner can start developing his / her entrepreneurial skills such as confidence. The confidence skill boosts person's zeal and creates a wide road for other skills to manifest. The

knowledge and level to which the learner absorbs pains can determine his / her entrepreneurial skills.

The entrepreneurial development skill acquired by the learner act as a good foundation for his/her entrepreneurship. Entrepreneurial skills according to Umunadi (2014) are simply business skills which an individual acquires for him to function effectively in the turbulent business as an entrepreneur or a self-reliant. These skills according to Obulom (2003) include:

- Ability to plan, organize and manage small business
- Ability to source for fund for the running of a small –scale business
- Ability to develop skill of keeping the accounting records of small-scale business
- Developing human and public relations skills
- Developing skills for the maintenance of law relating to the registration and running of small-scale business and coordination of both human and material resources
- Developing skills for effective supervision and coordinating of both human and material resources and for effective utilization of the profit for the growth and development of the firm
- Ability to apply integrating business skills
- Ability to develop broad base investment planning and implementation skills.

According to Okenwa (2005), “an entrepreneur is defined as an individual who is willing and able to take business risks with aims and objectives to maximize profit”. Iromaka (2005), also noted that “entrepreneur is that individual or person who undertakes the risk of investing in creation, growth and growth development. He adds value to what otherwise would have remained latent in its original form or idealization state”. Entrepreneurial ability found in an entrepreneur usually has the following characteristics

- The entrepreneur takes the initiative in combining the resources of land, capital and labour in the production of goods or services
- The entrepreneur has the choice of making basic business policy decisions, that is those routine decisions which set the course for a business enterprise
- The entrepreneur is an innovator, the person who attempts to introduce on commercial basis new products, new productive techniques, or even new forms of business organization

- The entrepreneur is obviously a risk bearer. The reward for his or her time, efforts and abilities may be attractive profits or loss and eventually bankruptcy. In short, the entrepreneur risks not only time, effort and business reputation but his invested funds and those of his associates or stockbrokers (Ekwue, 2004).

In view of all these, one can see entrepreneur as a person who runs a enterprise with a great value of commitment, a manager of time, one who makes adequate utilization of plan and fund bearing in mind to make great profits and does not discard plans of fudging ahead when fall into loss but bear risk in a radical manner of bravery. He aims at value creation and his guts is always focused on a good end of achievement and does not believe in how long and often time of failure, but how well it will be at the end. An entrepreneur always has his garment of confidence in his personality and development skills.

The entrepreneurial development cannot go beyond the knowledge level and exposition of the person. This is why Akinpelu (1992) quoted by Nwosu (2005) maintained that people are the subjects and objects of development. In line with entrepreneurial development, technology is the corner stone of the modern world development, where everything is being computerized for greater sense of attraction. Multimedia technologies such as computer, scanner and camera are mostly used for graphic designs. According to Answer Corporation (2012), multimedia technology is the synergistic union of digital video, audio, computers, and information and telecommunication technologies. Answer Corporation went further to state that multimedia technology refers to both the hardware and software used to create and run such systems as mentioned above. Computer is replacing the labour base of manual operation to technology enhanced base of productivity with speed, accuracy, dynamic and efficiency.

Some of the software used in graphic design includes: CorelDraw, macromedia fire force, Microsoft dream weaver, Microsoft paint etc. On the other hand, scanner is electronic machine used to receive and send visual captured images to computer for storage and production in hardcopy/ softcopy for a purposeful work of art. Camera on its own is also electronic capturing device for collection of images direct from the object or source for future view through the use of film reader/paper. It is worthy of note that the mission of computer and technology is to make life better and provide a

better outlook of objects, introduce easy way of doing things and speed up problem-solving, promote businesses and transactions, and have unlimited access to information with speed and accuracy. This mission can be achieved by subjecting training to different groups of people either in schools or in business centres through entrepreneurial training.

Umunadi (2014), opined that entrepreneurial training is a form of training that makes a person to become an organizer and a manager of commercial undertaking or enterprises. Graduates of skill acquisition who want to engage on graphic designs need to know and learn the basic computer skills such as booting system, customizing, saving and opening graphics, importing and exporting images, and as well print a graphics in his/her appreciation package before going deep into graphic design proper. The central point of undergoing entrepreneurial training is to learn technical know-how, be a self-reliant individual who could provide a means of living through establishment of a business or job that will stand against unemployment and idleness. So many areas of training exist in graphic design such as advertising design, animation art and design, digital film, making and video production, digital photography, fine arts in game design, multimedia and visual communication, sequential imaging and illustration, visual effects and motion graphics, web development and design etc. Graphic designers are the experts that should train trainee in their very best, to build graphic design skills expected of them to gain the basic information and knowledge required to achieve their targets without fear and discouragement in order to overcome the challenges of joblessness/unemployment that full the society. The Article of Association of the International Council of Graphic Design (2011) stated that a graphic designer is one who has artistic sensibility, skill and experience and / or training professionally to create designs or images for production by any means of visual communication, and who may be concerned with illustration; typography, calligraphy; surface design for packaging; or the design of patterns, books, advertising and publicity material, or any form of visual communication. Graphic designers are the persons who have the artistic thinking skills and experiences to produce visual images, patterns, or typography based on a given training and can as well train others for their careers. Graphic designers target in training is to produce individuals how could establish an enterprise in order to reduce abject

poverty in the society at large. Graphics designers does not discriminate gender differences in as much as the competency exist.

### **Statement of Problem**

Graduates of skill acquisition centres sometimes have the basic technical skills required to establish an enterprise but lack the entrepreneurial skills such as communication skill, planning skill, interpersonal skill, thinking skill, financing skill among others that will make them capable of establishing an enterprise. An entrepreneur requires interpersonal skills to sustain and explore any business. It is as a result of lack of these entrepreneurial skills that make most of the aspirants' move up and down after graduation in search of white collar job which makes them idle and unemployed graduates and at the end not achieving their dreams.

### **Purpose of Study**

The major purpose of the study is to ascertain the basic graphic design skills required for entrepreneurial development. Specifically, the study identified the:

- Basic computer skills required by an entrepreneur
- Basic graphic design skills required by an entrepreneur
- Entrepreneurial development skills required to establish an enterprise
- Factors that could hinder entrepreneurial development

### **Research Questions**

The study sought answers to the following questions:

- What are the basic computer skills required by an entrepreneur?
- What are the basic graphic design skills required by an entrepreneur?
- What are the entrepreneurial development skills required by an entrepreneur to establish an enterprise?
- What factors could hinder entrepreneurial development among entrepreneurs?

### **Hypotheses**

One hypothesis was formulated and tested at 0.05 level of significance.

H<sub>01</sub>: there is no significant difference in mean ratings of male and female graphic designers on the factors that could hinder entrepreneurial development among entrepreneurs.

### **Materials and Methods**

The study adopted survey research design. This design was chosen for this study because a survey research is a fact-finding in nature and according to Anyakoha (2009), survey design uses questionnaires and interviews, observation etc. in order to determine the opinions, attitudes, preferences and perceptions of persons of interest to the investigation. Thus, survey design is most appropriate for this study because it sought to identify the basic graphic skills required for entrepreneurial development using questionnaires.

#### Area of the Study

The study was conducted in Nsukka Urban of Enugu State, Nigeria. This area is divided into three: Mkpunano, Nru and Ihe-Owerri. This area was chosen based on the fact that it has been observed as the hearth of the town where most people looking for job together with most entrepreneur use as a target area to establish their enterprise.

#### Population

The population for the study consists of 28 printing presses in Nsukka Urban. This statistics was obtained from the Registered Printing Press Union Nsukka Urban Chapter. The entire population was studied because it is a manageable size, no sampling was done.

#### Instrument for Data Collection

A structured questionnaire on graphic design skills required for entrepreneurial development was developed and was used for collecting data from the respondents. The instrument carried four –point rating scale ranging from highly required (4), required (3), slightly required (2), and not required (1).

#### Validation of the Instrument

The instrument was face-validated by three experts; one from the department of Vocational Teacher Education (Computer Education), two from Graphic Designers all in Nsukka. The experts assessed the instrument to ensure clarity of terms and

appropriateness of items used in the questionnaires.

#### Reliability of the Instrument

The face validated instrument was subjected to a reliability test. The internal consistency of the items was determined through the use of Cronbach alpha method with coefficient of 0.81

#### Method of Data Collection

The questionnaire was administered personally by the researcher with the help of four trained research assistants. The choice of research assistants was necessitated in order to ensure timely completion of data collection.

#### Method of Data Analysis

Mean and standard deviation were used to answer the research questions. In taking the decisions on the value of the mean, arithmetic mean of the response option of 4,3,2 and 1 was calculated and the result was 2.50 or above. This was used as cut-off point. Any item with a mean value of 2.50 or above was regarded as required or agreed by the respondents, while any item below 2.50 was regarded as not required or disagreed by the respondents. Standard deviation was used to determine the homogenous responses of the respondents to the mean rating of one another. Any item with a standard deviation less than 1.96 (95% confidence limit) indicated that the respondents were close to the mean. The independent t-test was used to test the null hypothesis at 0.05 level of significance.

## RESULTS

### Research Question 1

What are the basic computer skills required by an entrepreneur?

**Table 1**

**Mean rating and standard deviation scores of basic computer skills required by an entrepreneur.**

S/N	Items on basic computer skills	$\bar{X}$	SD	Decision
1.	Ability to boot Computer	4.00	0.00	R
2.	Ability to save graphics	3.85	0.35	R
3.	Ability to open saved graphic	3.84	0.36	R
4.	Scan graphic into computer	3.68	0.46	R
5.	Import graphics from external sources	3.55	0.49	R
6.	Export graphics to other medium	3.52	0.50	R
7.	Ability to Print graphics	3.61	0.48	R

Note:  $\bar{X}$  = Mean, SD = Standard Deviation, R = Required; NR = Not Required

Table 1 reveals that all the items used had their cut-off point above 2.50 which indicates that the items are required as the basic computer skills an entrepreneur should have in order to be able to use computer as one of the multimedia technology which will help him/her work effectively. The table also showed that the standard deviation of the items ranged from 0.00-0.50 indicating that the

respondents are homogenous in their responses on the basic computer skills required by an entrepreneur.

### Research question 2

What basic graphic design skills are required by an entrepreneur?

**Table 2**

**Mean rating and standard deviation scores of basic graphic design skills required by an entrepreneur.**

S/N	Items on basic graphic design skills	$\bar{X}$	SD	Decision
1.	Ability to install graphic software	3.89	0.31	R
2.	Ability to use tool box and basic tools in drawing	3.85	0.35	R
3.	Ability to use property bar	3.84	0.37	R
4.	Ability to use colour pallets	3.68	0.47	R
5.	Ability to use design view template	3.82	0.38	R
6.	Ability to use wizard in design	3.52	0.50	R
7.	Ability to differentiate objects	3.42	0.49	R
8.	Ability to draw objects	3.93	0.24	R
9.	Ability to give and transfer effect	3.85	0.35	R
10.	Ability to shape objects/ image	3.70	0.46	R
11.	Ability to use html code	3.56	0.61	R
12.	Ability to use symbols and special character	3.73	0.44	R
13.	Ability to use appropriate text	3.67	0.47	R
14.	Ability to use effective line and character spacing	3.72	0.45	R
15.	Ability to change measurement unit	3.68	0.47	R
16.	Ability to use appropriate paper set up	3.44	0.61	R
17.	Ability to use X and Y axis and method placement	3.57	0.50	R

Data presented in Table 2 shows that the items had their cut-off point above 2.50 which indicates required and their mean rating ranges from 3.42-3.93 which also falls within the required and highly required category. Item 7 and 16 are required while item 1,2,3,4,5,6,8,9,10,11,12,13,14,15 and 17 are highly required. The standard deviation ranges from 0.24 – 0.61 which indicate that the respondents

responses are homogenous. This implies that all the items listed are among the basic graphic design skills required by an entrepreneur.

### Research question 3

What are the entrepreneurial development skills required by an entrepreneur to establish an enterprise?

**Table 3**

**Mean rating, standard deviation scores and t-test of entrepreneurial development skills required by an entrepreneur to establish an enterprise.**

S/N	Items on basic graphic design skills	$\bar{X}$	SD	Decision
1.	Ability to exercise self-confidence	3.94	0.22	R
2.	Have a good planning skill	3.61	0.37	R
3.	Have a good communication skill	3.77	0.42	R
4.	Have a good inter-personal skill	3.69	0.28	R
5.	Have marketability skill	3.73	0.44	R
6.	Should be a risk bearer	3.73	0.44	R
7.	Have a managerial skill	3.76	0.42	R
8.	Have accountability skill	3.76	0.42	R
9.	Have flexibility skill	3.77	0.42	R
10.	Have thinking skill	3.69	0.46	R
11.	Have productivity skill	3.68	0.46	R

Data presented in Table 3 shows that all the items had their mean ranging from 3.68 – 3.94 which indicates highly required. The result of the standard deviation for the items ranges from 0.22 – 0.46 which implies that the responses of the respondents

on the entrepreneurial development skills are homogenous.

#### Research question 4

What factors could hinder entrepreneurial development among entrepreneur?

**Table 4**  
**Mean rating, standard deviation and t-test of factors that could hinder entrepreneurial development among entrepreneur**

S/N	Items on factors that could hinder entrepreneurial development	$\bar{X}$	SD	Printing press (male) N <sub>1</sub> = 24		Printing press (female) N <sub>2</sub> = 4		t-cal	df	Sig (2-tailed)	Decision
				$\bar{X}_1$	SD	$\bar{X}_2$	SD				
1.	Funds	3.63	0.48	3.70	0.45	3.00	0.00	4.888	28	0.000	NS
2.	High cost of training in school or business centres	3.25	0.43	3.16	0.37	4.00	0.00	-7.096	28	0.000	NS
3.	Inadequate computers for practice in schools business centres	3.31	0.46	3.34	0.47	3.00	0.00	2.290	28	0.024	NS
4.	Lack of motivation by public and government	3.17	0.91	3.31	0.87	2.00	0.00	4.747	28	0.000	NS
5.	Lack of interest by learners	3.35	0.48	3.27	0.45	4.00	0.00	-5.029	28	0.000	NS
6.	Insufficient exposure of learner to diff graphic design software	3.82	0.38	3.80	0.40	4.00	0.00	-1.553	28	0.124	S
7.	Low turnover/profit by existing enterprises	3.43	0.45	3.60	0.38	4.00	0.00	4.656	28	0.00	NS

Key:  $\bar{X}$  = Mean, SD = Standard deviation, N<sub>1</sub> = Number of male, N<sub>2</sub> = Number of female, S = Significant, NS = Not

Data presented in Table 4 shows that all the items had their mean ranging from 3.17 – 3.63 which falls within the categories of agreed and strongly agreed. Item 2, 3, 4 5 and 7 falls within the agreed category with the mean of 3.25, 3.31, 3.17, 3.35, 3.43 respectively while item 1 falls within strongly agreed with the mean of 3.63. The result of the standard deviation for the items ranges from 0.43 – 0.91 which implies that the responses of the respondents on factors that could hinder entrepreneurial development are homogenous. The result also shows that there was a significant difference in the mean response of the respondents on item 6 since the significance level is 0.124 which is more than the 0.05 level of significance. Therefore, the null hypothesis of no significant different was rejected. The result revealed that there was no significant difference in the mean responses of the graphic designers on the item 1,2,3,4 and 5 since their significance level ranges from 0.00 – 0.02 which is

significant, df = degree of freedom, t-cal = calculated value of t-test using SPSS level of significance.

#### Discussion on the result

less than the 0.05 level of significance. Therefore, the null hypothesis of no significant difference was not rejected.

#### Discussion

The findings of the study revealed that the basic computer skills required for graphic design include booting computer, saving images or design, retrieving /opening saved images or design, scanning images or design, importing and exporting images or design and printing images or design. This agree with the observation of Nwangwu and Obi (2014) which stated that in order to successfully manipulate computer software and hardware systems, computer users should possess the skills for operating the system.

The study also revealed that basic graphic design skills requires ability to install graphic software packages, use tool box and basic tools, use property bar, use color pallets, use design

view/template, use wizard, differentiate objects, draw objects, give and transfer effects, shape objects/images, use Corel script/html code, use symbols and special character, use appropriate text, use effective line and character spacing, change measurement unit, use appropriate paper set up, use x and y axis and method placement among others.

Findings from the study also revealed that the entrepreneurial development skills requires confidence, planning skill, interpersonal skill, marketability, pains taking/risk bearer, managerial skill, communication skill, accountability skill, flexibility skill, thinking and productivity skill. This result is in line with Nwosu (2006) who stated that "the productivity of entrepreneurs can be improved through intellectual enhancement. Intellectual enhancement pertains to acquisition of necessary knowledge and skills that assist one perform effectively and efficiently". Nwosu and Chijoke (2005) also stated that productivity is concerned with ensuring high capacity and quality in goods and services produced for the welfare of the people in the society. This also agrees with the observation of Ozioko (2006) who stated that ways of developing entrepreneurship through creativity include confidence, thinking and flexibility.

The study also revealed that there are some factors that could hinder entrepreneurial development such as funds, high cost of training in school/business centres, inadequate computers for practice, lack of motivation by public and government, lack of interest by learner, insufficient exposure of the learner to different graphic design software, low turnover/profits by existing enterprises. This is in line with Nwangwu (2010) who noted that one of the biggest challenges facing computer education in Nigeria is funding. It also relate to the view of Ozioko (2006) who stated that among the factors that could hinder creativity is resistance to change – change is constant yet in the thinking of many, things are to be done as it has been from the past. They cannot be flexible in their thought and action.

### Conclusion

Graphic design is a good skill for money making for individuals who can develop a creative mind to stand for entrepreneurship. It requires persons who can develop/build their entrepreneurial skills to overcome fear, discouragement and other challenges associated with establishing an enterprise. Graphic design offers good opportunity for job creation that stands against

unemployment/joblessness in the society. It helps to reduce abject poverty in the society. Its elements and principles together with the basic computer skills requires a little training, guide and practice in order to be competent enough to accomplish task without a delay.

### Recommendation

- Government should provide multimedia technologies and equipment that would encourage the use of computer in all schools in adequate measure.
- Government should organize annual competition on graphic design among graphic designers to display the work culture and creative art in Nigeria.
- Government should provide supervision team to ensure that entrepreneurship education is being promoted in all schools of learning.
- Government should provide medium of incentive for individuals who could establish a reasonable business before graduation from schools of learning

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## INTEGRATING COMPUTER SKILLS INTO THE TEACHING AND LEARNING OF IGBO LANGUAGE FOR ENTREPRENEURSHIP DEVELOPMENT

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### ABSTRACT

*The integration of computer skills into the teaching and learning of different subjects has become the major focus of educators in the recent past. The versatility of the computer makes its integration into the teaching and learning of all school subjects feasible. The major significance of this integration is the production of employable school leavers. Those who study Igbo language at various levels of education should not be left out in this all-important global trend. This paper, therefore, seeks to highlight the need to integrate computer skills into the teaching and learning of Igbo language at all levels of education in Nigeria. It also examines the obstacles that could work against this integration and provides possible ways of making the integration achievable in order to have school leavers who are equipped with skills for entrepreneurship development.*

### INTRODUCTION

Language is one of the greatest attributes of man. One wonders how life would have been without Language. There is no activity of man in this world that can be complete without Language. It reveals the thought of man, preserves the culture of a given people and makes man a distinct being. One of the three major Languages approved by the government to be taught in Nigerian schools is Igbo Language. The other two are Hausa and Yoruba. The study and use of these Languages would apart from promoting social integration and national cohesion in a multi-lingual country, would also preserve the culture of Nigerians as stipulated in the National policy on Education (NPE, 2004).

Igbo Language is spoken in Abia, Anambra, Ebonyi, Enugu and Imo states. Some parts of Bayelsa, Delta and Rivers states also speak Igbo Language (Nkamigbo, 2007). The Igbo people who speak this Language are found in the south eastern part of Nigeria. However, among the aforementioned three major Languages in Nigeria, Igbo Language is the most neglected. Ejiofo (2009) captures the enormity of the passive attitude of the speakers of Igbo Language by asking some pertinent questions thus:

In Igbo Land today, who is insisting that the Igbo Language be taught seriously in the nursery, primary and secondary schools, colleges and universities? What certificate

examination does one fail unless one passes Igbo Language? What job does one not get because he failed Igbo? In what Language are our addresses of welcome written? (P. 172).

The above questions still beg for answers. In Nigeria today, many Igbo people do not use their Language in their daily communication. They prefer English Language to their mother tongue (Oyelami, 2008). Besides, it is on record that most Igbo children are not ready to study anything concerning Igbo Language in tertiary institutions. Because of this lack of interest in studying Igbo, many of the Federal Government Colleges, Army and the Police primary and secondary schools where Igbo Language is to be studied, have no Igbo Language teacher (Ezema, 2009).

The above situation is worrisome considering the importance of language especially in preserving the culture of the people. The above problems are further compounded by the fact that most Igbo Language teachers use the conventional lecture method in teaching almost all aspects of the Igbo Language study (Omeje, 2009). This method, has been known to be boring and teacher-centred as it does not allow for active participation of learners in the teaching and learning process. There is therefore, urgent need to devise better methods of teaching Igbo Language in order to arouse the

interest of the learners. One major way of achieving this is by integrating computer skills into the teaching and learning of Igbo Language in primary, secondary and tertiary institutions in Nigeria. Computer is a very important aspect of Information Communication Technology (ICT). The government of Nigeria recognizes the importance of ICT in education. According to the National Policy on Education (NPE, 2004), "Government shall provide necessary infrastructure and training for the integration of ICT in the school system in recognition of the role of ICT in advancing knowledge and skill in the modern world".

The integration of computer skills into the teaching and learning of Igbo Language in Nigerian schools will in no small measure help in the production of school leavers who will serve as job creators instead of job seekers. This paper is therefore aimed at highlighting the need for this integration for entrepreneurial development of the school leavers.

### **Conceptual Framework**

#### **Igbo Language**

One of the major ways of differentiating one group of people from another is by the language spoken by each group. There are many ethnic groups in Nigeria. All these ethnic groups have their different languages. Igbo language is the language spoken by the people from the south eastern states of Nigeria: Abia, Anambra, Ebonyi, Enugu and Imo, and some parts of Bayelsa, Delta and Rivers States (Nkamigbo, 2007). Igbo language has about twenty million speakers (Echeruo, 2001) and is one of the tonal languages that exist in Nigeria because of what tone does in it (Osuala, 2009).

Ironically, the government of Nigeria which recommends Igbo, Hausa and Yoruba Languages to be taught in Nigerian schools, also makes a credit pass in English Language a criterion for Nigerians seeking admission into tertiary institutions. This criterion is not extended to the indigenous languages. Over the years, Nigerian linguists have decried the poor use of indigenous languages in governance, creative writings and other forms of communication. Nkoro and Chukwu (2011) have noted with dismay the fact that the more these linguists highlight the disadvantages of relegating our indigenous languages to the background, the more prominent English Language, the nation's second language becomes in all matters of communication. This problem, according to Elugbe (1990) has not only excluded Nigerians in matters that affect them but has also made

acquisition of knowledge and transfer of technology difficult.

Unfortunately, this poor use of indigenous languages is made worse by the indifferent attitude of most Igbo Language speakers towards their language. According to Aguiyi (2012:7), "Most parents in Nigeria (especially in Igbo Land) react negatively to the idea of teaching their children through the vehicle of the indigenous language. In fact, most of them prefer high fee-paying private schools where the medium of instruction is strictly English Language". In their observation, Okoye and Onwuegbuchunam (2011) have shown that inferiority complex affects Igbo people in the use of their language. In a similar vein, Ani (2012) laments that the greatest problem facing Igbo Language is the Igbo man's attitude to his language. An Igbo man, according to Ani, prefers greeting in English to greeting in Igbo Language. In support of this assertion, Anyaegbuna (2012:30) wrote that "it is glaring that Ndi Igbo equally stand out as one group that rarely communicate freely and proudly in Igbo Language publicly." In fact, literature is replete with a lot of problems confronting the growth of the Igbo Language.

Considering the enormity of these problems, there is the need to evolve better means of teaching the Igbo Language to encourage the native speakers especially the youths to speak their language. The young Igbo Language speakers must be made to acknowledge the importance of their language to avert the extinction of the language at all levels of education in Nigeria. This will be of invaluable help considering the fact that learners of these days have general positive and enthusiastic attitudes to multimedia and are convinced that their learning is more effective (Shawcross, 2004). Besides, this integration will drastically reduce the high rate of unemployment in the country as most students graduate from tertiary institutions without getting good jobs because they lack the needed skills to fit into the labour market.

### **Computer in Education Process**

Computer is a very important aspect of Information and Communication Technology (ICT). Akudolu (1996) defines computers as electronic devices that can store, process, disseminate and retrieve large volume of information with great speed and accuracy and it is the best educational technology medium for individualizing instruction. Asogwa (2009) observes that the learner interacts directly with the computer programmes, and the computer assesses the learner's progress and

suggests ways for improvement. The versatility of the computer makes it to be seen as a useful tool that can relate to many aspects of life through communication as well as a useful tool in teaching and learning (Johnson, 2010). Some of the types of computer technology that can be used in the education process are given below:

**i. Interactive whiteboards**

In the modern classrooms, interactive whiteboards have replaced the chalkboards. By using the whiteboards, teachers easily connect to their computers and share files and presentations with students. Besides, teachers and students can control the board, move objects and write text with their fingertips. This makes learning exciting.

**ii. Electronic Learning (e-learning)**

E-learning, according to Sarojini (2007) has been variously defined but one thing that is common to all the definitions is the term technology. E-learning involves a learner using a variety of computer and networking technologies to access training materials. It is education offered using electronic delivery methods such as CD-ROMS, video conferencing, websites and e-mails to facilitate learning through the use of computer based devices. It is also known as on-line learning (Oyelami, 2008). One major advantage of e-learning is that students can stay at home and receive lectures, do examinations and receive their results on-line without face to face interaction with teachers or examiners. Distance is therefore, not a barrier to both students and researchers in this kind of technology. Highlighting the importance of ICT vis-à-vis electronic learning, Enemuoh and Onwuka (2006) opine that ICT has become a cardinal tool of government and organizations. It is now almost imperative for policy makers to focus on e-health, e-commerce, e-finance, e-government and e-education as catalyst for all development agenda.

**iii. Software**

Software refers to materials on which some information is recorded, stored and preserved. Software holds or carries instructional content. Examples are recorded tapes, compact disk, video compact disk, flash drive, digital video disk, etc (Asogwa, 2009). Computer technology allows students to use different software such as word processing that helps students with typing and publishing papers and spreadsheet for calculation. There is graphic software for drawing and painting and there are education software such as interactive educational software that uses drills and practice, Encarta kids, typing tutor, among others. They all enable students to learn course materials,

do assignments and engage in other educational processes at their own pace.

**iv. The Internet**

Students have benefited a lot since the inception of the internet. The internet provides a great deal of access to information on various areas of human endeavour. It is a computer-based global information system that has tremendously enhanced communication among people from different geographical locations. The internet enables students to download useful academic materials that are up-to-date for their projects and research works. Tinio (2011:8) observes that, "networked computers with internet connectivity can increase learner motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events". The internet is so important and useful. Teachers can use the internet to connect to their students while they are at home. Teachers can create blogs for the purpose of posting assignments for absent students.

**Entrepreneurship Development**

The phrase 'entrepreneurship development' has become popular in developing countries including Nigeria in the recent past. This is because it has to do with skill acquisition and general well-being of an individual in particular and the society as a whole. According to Ugwoke (2012:68), "Entrepreneurship development is a programme of human capital development and a requirement for instilling and preserving entrepreneurial climate in an economy". Osuala (2009) outlines the objectives of entrepreneurship education as follows:

- a) Providing students with meaningful education to make them self-reliant
- b) Providing graduates with the training skills that will make them meet the manpower needs of the society
- c) Providing graduates with enough training in risk management to make uncertainty bearing possible and easy and
- d) Stimulating industrial and economic growth of rural and less developed areas (P.68).

According to Anyadike, Emeh and Ukah (2012), the dexterity with which hunger and poverty have devastated lives and future ambition of youths especially graduates in Nigeria, have led to scholars prescribing entrepreneurship development as the permanent cure for extreme hunger and poverty brought about by unemployment.

From the foregoing, it can be deduced that for one to achieve this entrepreneurship development, one must be educated accordingly.

This has, therefore, made the integration of computer skills into the teaching and learning of Igbo language inevitable. According to Volkmann (2004), one becomes an entrepreneur not by birth but by education as well as by experience. In the words of Andrea (2005), entrepreneurship is not just for business students. Other students can also have a unique set of skills that can make them suitable for entrepreneurial activities which include creating jobs for themselves and for others.

How Computer Skills can be Integrated into the Teaching and Learning of Igbo Language

Computer skills can be integrated into the teaching of almost all the areas of Igbo Language. One major way of achieving this is by making software programmes that support easy use of Igbo language on the computer and internet available. Besides, all the symbols and diacritics used to write Igbo language should be made available by default on the computer keyboard.

In addition, Igbo language learners can benefit from having texts, contents and teacher's instructions presented in an audio file format. Igbo language students can listen to a piece of content in the classroom through an audio file created on a computer or even a compact disc and then discuss what they have learnt with other students. If files are able to be uploaded appropriately, these students could even have access to the clips at home.

Obstacles to Successful Integration of Computer Skills into the teaching and learning of Igbo Language in Schools

In spite of the innumerable benefits of using the computer in education, it has some factors that hamper its successful integration into the teaching and learning of Igbo Language in Nigerian schools.

i. Lack of ICT Compliant Teachers – The fact that most teachers lack the skills and knowledge to teach computers in schools is a global phenomenon. This problem is, however, worse in the developing countries. For instance, in the south eastern part of Nigeria, majority of Igbo language teachers do not know how to operate a computer, let alone teach others using the computer system. This is in line with the observation of Onwuka and Ekwewkwo (2014) that most secondary schools teachers including Igbo language teachers are not computer literate. They further lamented that this is a problem because there is no way a teacher without the knowledge of computer can help the students in that regard. In a case study research on primary school competence and confidence level regarding the use of ICT in teaching practice

conducted in five European countries, Peralta and Costa (2007) found out that technical competence influenced Italian teachers' use of ICT in teaching. In Syria, teachers' lack of technological competence has been cited as the main barrier (Albirini, 2006). In a research carried out in Australia, Newhouse (2002) found out that many teachers lacked the knowledge and skills to use computers and were not enthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching practices.

The situation is even worse in Nigeria going by a research conducted by the Global Information Technology in 2004 using the Networked Readiness Index (NRI) to measure the degree of preparation of a nation to participate in and benefit from ICT development. Nigeria was ranked 88<sup>th</sup> out of 104 countries covered. In 2005, the same research was repeated. This time, out of 115 countries covered, Nigeria ranked 90<sup>th</sup>. United States of America topped the list, followed by Denmark, Iceland, Finland, Canada, Taiwan, Sweden, Switzerland and United Kingdom in that order (Ejionueme, 2012). According to Pelgrum (2001), the success of educational innovations depends largely on the skills and knowledge of teachers. To integrate computer skills into the teaching and learning of Igbo Language in Nigerian schools is a good idea but the major barrier is lack of competent teachers to handle a wide range of varying computer applications for various purposes.

ii. High Cost of ICT Facilities – Prohibitive prices of computer resources have made it impossible for many schools within the Igbo community to have enough for both teachers and students. In the rural areas, most of the schools do not have computer at all. This is a very big obstacle to the integration of computer skills into the teaching and learning of Igbo Language in our various schools. This problem is exacerbated by lack of fund and poverty in the land.

iii. Lack of Appropriate Software – The development of appropriate software for the teaching and learning of Igbo Language is another factor militating against the integration of computer skills. In other words, software that is appropriate for Igbo language curriculum is in short supply. Iloene, Iloene, Mbah and Mbah (2013), have observed that Igbo Language teachers do not sufficiently use computers in teaching because some symbols and diacritics used to write the Igbo language are not available by default on the standard keyboard. Besides, there are no software programmes

(system and application) that support easy use of Igbo on the computer and internet.

- iv. **Inadequate Power Supply** – The functionality of the computer is dependent upon the availability of electricity. Unfortunately, power generation in Nigeria has not been stable and reliable over the years. This is a great obstacle to the realization of the integration programme.
- v. **Poor Policy Implementation** – According to the National Policy on Education (NPE, 2004:15), “Government shall provide necessary infrastructure and training for the integration of ICT in the school system in recognition of the role of ICT in advancing knowledge and skill in the modern world.” This policy statement is indeed a far cry to what obtains in Nigerian schools today. No special training for manpower development in the knowledge of ICT and no enabling environment for integration of computer skills into the educational system in Nigeria. The teaching and learning of Igbo language is not exempted.
- vi. **Lack of Technical Support** – Nigeria lacks skilled man power to handle technical issues when things go wrong while using computers. There is acute shortage of trained personnel that can easily intervene or render support with regard to repair and maintenance of computer equipment. This can be frustrating to the teachers whenever the need for these trained personnel arises.

### Recommendations

Considering the inexhaustible benefits of using computer technology in the teaching and learning of Igbo Language in schools, the following recommendations are made:

1. Seminars and workshops should be organized regularly for Igbo Language teachers at all levels on how to use computer technology in the classroom.
2. The three tiers of government should encourage the integration of computer skills into the teaching and learning of all subjects as stipulated in the National Policy on Education. They can do this by providing adequate computer technology facilities and constant electricity in all schools at all levels in the South Eastern Nigeria.
3. All the state and local governments that make up the five major Igbo language speaking states should strive to ensure that computer experts are encouraged to develop software programmes (system

and application) that support easy use of Igbo on the computer.

4. Graduates of Computer Engineering should be employed to provide support with regard to repair and maintenance of computer technology facilities in the various schools in the south eastern Nigeria.
5. Government should, in addition to providing adequate security in all the schools to safeguard the computer facilities, set up task force that will monitor the use of the computer facilities to ensure total compliance.

### Conclusion

The benefits of Computer Assisted Language Learning (CALL) cannot be underestimated. Interestingly, the overall benefit has to do with equipping the beneficiaries with the much needed skills for entrepreneurship development. With computer skills, graduates of Igbo Language can hardly be stranded in the labour market. This paper has, in addition to highlighting the benefits of integrating computer skills into the teaching and learning of Igbo language, stated how this integration can be made possible. However, this noble idea will not be realized if nothing is done by the government and all stakeholders to that effect. The onus is on the federal, state and local governments, especially those in the south eastern part of Nigeria to intervene by providing all necessary facilities and the enabling environment in this regard. This will not only allay the fears of imminent death of Igbo Language but will also reduce the high rate of unemployment that rears its ugly head year after year in Nigeria.

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## GENDER DIFFERENCE IN STUDENTS' ACQUISITION OF SCIENCE – ORIENTED ENTREPRENEURIAL SKILLS USING COMPUTER IN SECONDARY SCHOOLS IN NSUKKA EDUCATIONAL ZONE

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### ABSTRACT

*The study determined gender difference in students' acquisition of science oriented entrepreneurial skills using computer in secondary schools in Nsukka Education zone of Enugu state, Nigeria. Two research questions and two hypotheses guided the study. One hundred and forty (140) students comprising 69 females and 71 males, drawn from a population of 6,120 students who offer biology in Senior Secondary one (SS1) constituted the sample. The instrument for data collection was a Test of Science Process Skills Acquisition (TOSPSA). The instrument was validated by experts in Educational Technology and Science Education. A reliability coefficient of 0.63 was established for the instrument using Pearson Product Moment Correlation. The Test of Science Process Skills Acquisition was administered in pre-test and post-test to test for mean achievement. Data collected was analyzed using Analysis of Covariance (ANCOVA). The result of the analysis showed that gender was a significant factor in students' acquisition of science skills and that the combined effect of gender and CAI on students' acquisition of science process skills was significant. . It was then recommended that since the production of CAI is complex and expensive and teachers lack the skills, funds and competencies of producing them, professional organizations like the Nigerian Association for Educational Media and Technology (NAEMT), Science Teachers Association (STAN) and all other stakeholders in Education who are concerned with improving science and technology instruction should undertake the production of CAI for use in schools.*

**Keywords: Science, Skills, Entrepreneurial, Computer, and Gender**

### INTRODUCTION

The clarion call to equip students, especially science – oriented students with science process skills has been paramount in the lips of stakeholders in the education sector. The stakeholders seem to understand the benefits that accrue from the acquisition of these skills to the students and the society at large. Science process skills are abilities used in carrying out mental operations and physical actions, which can be developed by experience (Padilla 1990). These abilities can be transferred from the teacher to the learner in the process of teaching and learning. When a learner has acquired these abilities, he can transfer and translate them into physical actions, which include entrepreneurial actions.

The need to translate science process skills into entrepreneurial actions is underscored by the hydra – headed problem of unemployment experienced by school leavers. The plague of unemployment is currently ravaging virtually every nation of the world and increasing at an alarming rate. There is no parent or guardian of a child who would take delight in his ward being unemployed years after graduation. For the school leaver, unemployment is a dreaded issue that would rather be imagined, than experienced. Unfortunately, this is the situation in Nigeria, and among the teeming youths. Many school leavers are seen roaming the streets, searching for non-existing government jobs.

If these young school leavers and graduates who are science oriented are equipped with scientific abilities while in school and financially empowered on graduation, they can translate these abilities to science-based entrepreneurial actions. These actions may include production of paint, snacks, poultry and fish, in addition to software development and so on. Kerry (2014) described entrepreneurship as the driving wheel of freedom and development.

When school leavers are gainfully self – employed, they can in – turn become employers of labour thus the rate of unemployment kills possessed. The skills in view are in two broad categories – basic and integrated. The basic skills provide a foundation for learning the integrated (more complex) skills. The American Association for the Advancement Science (AAA) identified seven (7) basic skills which are observing, classifying, measuring, inferring, predicting, communicating and using number relationships. The integrated process skills are modelling, operationalizing, collecting and interpreting data, identifying and controlling variables, formulating hypotheses and experimenting to find out facts about an event.

In this study, process skills discussed are Observation, which is a fundamental skill essential for the development of other skills. Observation is carried out using the five senses (eye, ear, nose, etc); or with instruments to aid; Communication that goes hand in hand with observation as it is the ability to share ideas and which becomes effective by use of graphs, charts, maps, diagrams and other visual aids; Classification which sorts objects or phenomena into groups based on what was observed; Measurement which determines the shape, size, length, volume, space, time and others based on standard units; Inference which explains and interprets what was observed ; Predictions which are educated guesses about the outcomes of future events. It is forecasting future observations. The ability to make predictions about future events allows students to successfully interact with the environment around them. Prediction is therefore based on both good observation and inferences made about events; Hypotheses formulation which are wise and tentative guesses subject to scientific testing to explain relationships, planning and conducting investigations; Experimentation: which is concerned with the practical investigation of phenomena that may be through trial and error, though at higher levels, it involves practical investigation of hypotheses formulated on the basis of previous observations. A student that has

acquired process skills displays the ability to carry out investigation by designing, constructing and or selecting and successfully utilizing apparatus to assist in data gathering where appropriate; employing the process of observing, comparing, quantifying, classifying and measuring to gather data; recording and organizing data in a logical form and manipulating and controlling extraneous variables while manipulating the individual variables for the best results.

To acquire these skills, students need to be exposed to scientific activities during teaching. Therefore teaching needs to depart from the conventional lecture approach to a process approach. The process approach implies an active “hands – on” desk for students. The approach sees the learner as active information – processing organism and demands that learners be placed in a problem – solving situation and surrounded with appropriate materials and equipment and in an environment that will enable them process information with a view to solving identified problems. Science activities using process skills allow students to manipulate objects and events to investigate scientific phenomena, analyze data and present findings, through inquiries and discoveries which tend towards scientific development of the nation for wealth creation.

The need for the departure is underscored by the fact that instructional method has been found to engender the acquisition of the skills of science (Mandor, 2002, Ibe, 2004). The use of computer technology in the classroom is an innovative instructional method which has been found to engender the acquisition of the skills of science through the use of computer (Ifeakor, 2005).

Computer according to Ikekunwu (2009) is an automatic machine that follows instructions stored within it to capture, store, process and display information. Computer is said to be multimedia because it can present mixtures of different modes of communication; video, still pictures, graphics, texts and sounds (Nwafor, 2007). Computer can assist a teacher in delivering instruction and in such situation; it is called Computer Assisted Instruction (CAI). Computer Assisted Instruction is an automated instructional technique in which a computer is used to present an instructional programme to learners through an interactive process (Ajelabi, 2002). CAI is learner - centred and activity oriented.

The Cambridge Advanced Learners Dictionary defines gender as the physical or social condition of being male or female Biology as a

science subject is gender sensitive; having higher female enrollment. Unfortunately, there is an acknowledged problem of female underachievement in the subject when compared with their male counterparts apparently under equivalent conditions and this problem of female under achievement appears to be more pronounced in science generally (Nworgu, 2004). Investigations into the many areas of the sciences related to assessing academic attainment have confirmed the aggregate low achievement of females. Some factors have been identified to account for differences in male and female achievement in science subjects. Prominent among the factors identified by Okeke (1990) are sex-role stereotyping, masculine image of science and female socialization process. The increasing unwillingness of students, especially female students to offer science based courses could be checked and, the gender gap in science achievement maybe bridged if science contents are presented using innovative instructional methods like CAI. Based on the foregoing, this study investigated, the gender differences in the acquisition of science process skills in biology using Computer – Assisted instruction. The science process skills in view are also known in this study as science oriented entrepreneurial skills. The study also determined how gender interacted with instructional method (Computer –Assisted Instruction) to influence the acquisition of the skills in biology as a science.

### **Purpose of the Study**

The purpose of the study was therefore to determine gender differences in students' acquisition of science oriented entrepreneurial skills with computer.

Specifically, the study sought to:

1. Ascertain the influence of gender on students' acquisition of science process skills using computer assisted instruction.
2. Determine the interaction effect of Computer-Assisted Instruction and gender on students' acquisition of science process skills.

### **Research Questions**

The following research questions guided the study.

1. What is the influence of gender on the mean achievement scores of students in acquisition of science process skills?

### **Hypotheses**

The following hypotheses were formulated to guide the study and were tested at 0.05 level of significance.

1. There is no significant difference in the mean achievement scores of male and female students in acquisition of science process skills.
2. The interaction effect of Computer Assisted Instruction and gender on students' achievement scores in acquisition of science process skills is not statistically significant.

### **Methodology**

The study adopted the pre-test; post- test non-equivalent control group research design. Two research questions and two hypotheses guided the study. The population comprised 6,120 SS1 biology students in 59 secondary schools in Nsukka Education Zone. One hundred and forty (140) Senior Secondary one (SS1) biology students from two schools (boys and girls) purposively selected from Nsukka urban, constituted the sample for the study. The number of students used in the girls school was 69 and 71 in the boys school. In each school, two intact classes were randomly selected and assigned to experimental and control group. A computer assisted instruction package containing biology instructions on osmosis and diffusion, stored in a Compact Disc Read only Memory (CD-ROM) was used in the instructional process. Instrument for data collection was a 16-item Test of Science Process Skills Acquisition. Test items were paper and pencil type, consisting of practical, alternative to practical and multiple choice questions. The CAI and test were validated by experts to ensure face and content validity. The reliability of the test was ascertained using the test - retest method. A reliability index of 0.63 was obtained using the Pearson Product Moment Correlation. Each of the instructional methods was randomly assigned to each of the two intact classes used. The methods are CAI and Conventional Teaching Process. The CAI group was the experimental group while the CTP was the control group. Students in the CAI group received instructions based on CAI as presented by the computer and responded to the questions and activities accordingly using the keyboard. The regular biology teachers taught the CTP group, without the use of computers, after being trained on how to use the lesson notes for uniformity. The subjects were pre-tested before they

were presented with the instructions, based on the SS1 biology curriculum. After the treatment which is teaching, post- test was administered on the students. The test was collected, marked and scored. Data collected was subjected to both descriptive and inferential statistics. The mean and standard deviation scores were used to answer the research questions, while the analysis of covariance (ANCOVA) was used to test the hypotheses at probability level of 0.05.

**Table1**

Mean and Standard Deviation Scores of Male and Female Students' Exposed to CAI and CTP in a Test of Science Process Skills Acquisition in Biology.

Gender	N	Mean score (pre-test)	Mean score (post-test)	Mean gain score	Difference in gain score	Standard deviation
Male	33	25.22	27.91	2.69	1.29	8.35
Female	36	22.71	24.11	1.40		7.79

Table 1 reveals a higher mean achievement gain score of 27.91 for male students with a standard deviation of 8.35, while the female students had a mean achievement to of 24.11 with standard

## Results

The results of data analysis based the research questions and null hypotheses are presented in Table1 and 2.

### Research Question 1

What is the influence of gender on the mean achievement scores of students in acquisition of science process skills?

deviation of 7.79. Based on the result, it is clear that CAI had a more positive effect on the achievement of male students. The difference in gain score is 1.29, in favour of the males.

**Table 2**

Analysis of Covariance for Students' Overall TOSPSA Achievement Scores by Teaching Methods and Gender

Source of variation	Sum of squares	df	Mean squares	F. Cal	Sig.
Corrected Model	4790.226	4	1197.557	153.522	.000
Intercept	612.319	1	612.319	78.497	.000
Pre-test	4447.490	1	4447.490	570.151	.000
Gender	177.536	1	177.536	22.760	.000
Teaching Method	307.005	1	307.005	39.357	.000
Treatment x Gender	108.627	1	108.627	13.926	.000
Error	1029.672	132	7.801		
Total	73855.000	137			
Corrected Total	5819.898	136			

There is no significant difference in the mean achievement scores of male and female students exposed to Computer - Assisted Instruction.

For hypotheses 1, Table 2 revealed that F - calculated (22.760) is significant at alpha level of .000. Since the value is less than 0.05, the null hypotheses is rejected, indicating that there is a

significant difference in the mean achievement scores of male and female students taught using CAI. The mean score for males is 27.91, while that of females is 24.11. The significant difference is in favour of males.

### Hypothesis 2

There is no significant treatment - gender interaction effect on the mean achievement scores of students as measured by a Test of Science Process Skills Acquisition in Biology.

For hypotheses 2, on the test of interaction between treatment and gender, Table 2 revealed that calculated F value is 13.926 and this is significant at the alpha level of .000. Since the value is more than the 0.05, the null hypothesis is rejected. This means that there is no significant treatment-gender interaction effect on the mean achievement scores of students in Biology as measured by their mean achievement scores in a Test of Science Process Skills Acquisition in Biology.

### Discussion of Findings

The findings of this study indicate that male students achieved significantly higher scores than female students.. The achievement of male students was found significant. The researchers observed that the male students were excited about the innovative wonder machine (computer) and as adolescents, who love adventure, kept on manipulating the machine with keen concentration. This may have enhanced their achievement.

The findings of this study are in disagreement with Chukwu (2005) in which he reported that there is no gender-related difference in science achievement. This finding also contradicts those of Olikeze (1999) and Ifeakor (2003). They reported that there is a significant gender related difference in science achievement in favour of females. Nevertheless, the findings of the study are in agreement with Okoye (2003) and Ifeakor (2005). These researchers observed that gender had significant effect on achievement in favour of males.

The findings of this study have implications for boy- child education in Nigeria generally and Eastern Nigeria in particular. Computer- based science instruction was found to engender the acquisition of science skills by male students. In an age when teenage and young boys are losing interest in education when they see the teeming educated but unemployed youths, there may be hope that when they leave school, they can set up

their own businesses like software development, using skills acquired from school.

The interaction between treatment and gender on students' acquisition of science process skills in Biology was significant. This is in agreement with the findings of Ifeakor (2003) in which it was reported that the combined effect of assessment technique and gender on students' cognitive achievement in Chemistry was significant. However, this disagrees with Nworgu (1990), who found no significant interaction effect between gender and the use of resource materials in teaching Integrated Science. Precisely, male and female students exposed to CAI performed better than their male and female counterparts exposed to the Conventional Teaching Process.

It can be inferred that the use of computer technology in the instructional process can equally equip students with computing skills, in addition to acquisition of knowledge in their science content areas. Youths are adventurous in nature and can explore the 'wonder' machine (computer) beyond the scope imaginable by the teacher. They can therefore acquire skills for repair, maintenance, coupling and even inventing digital devices. The male school leaver can leverage on these skills as he awaits government job, which may never come.

### Recommendations

In view of the findings of this study, the following recommendations are made:

1. There should be continuous computer training through series of symposia, seminars and conferences to instill computer literacy among Nigerian teachers and students. They should be made to learn how to write simple computer programs.
2. Government should improve electricity supply in the country, and especially to schools. This is necessary because the modern world is knowledge based, knowledge is electronics based and electronics is electricity based.
3. Since the production of CAI is complex and expensive, teachers lack the skills, funds and competencies for producing them. Professional organizations like the Nigeria Association for Educational Media and Technology (NAEMT), Science Teachers Association (STAN) and all other stakeholders in Education who are concerned with improving instruction should undertake the production of CAI for use in schools.

4. State and Federal Government should establish, equip and fund Educational Technology Resources Centres in each Education zone. This will ensure that teachers can go to these centres and borrow CAI CD-plates that are educationally relevant.

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## TRAINING NEEDS OF SECONDARY SCHOOL LEAVERS IN THE EFFECTIVE USE OF ONLINE TEST ASSESSMENT FOR JOB APPLICATION OR ENTRY INTO HIGHER INSTITUTION.

BY

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### ABSTRACT

*The study was carried out to identify the training needs of secondary school leavers in the effective use of online test assessment for job application or entry into higher institution using five research questions. The design of the study was survey. The study was carried out in Nsukka local government area of Enugu state. Population for the study was 1032. Sample for the study was 232 made up of 200 secondary school leavers and 32 internet tutors using proportionate random sampling technique. A structured questionnaire was used as an instrument for data collection which was face validated by three experts in Computer Education. Data collected were analyzed using weighted mean to answer the research question, and t- test statistics to test the hypotheses. The reliability of the five clusters had their reliability coefficients ranged from 0.82 to 0.86 respectively. It was found that secondary school leavers needed training on the five clusters in 61 competencies on the use of internet for success in online test assessment. It is recommended that Computer Training centre's and institution with computer training facilities should use the identified competencies by this study for training secondary school leavers for success in online test assessment for job application or entry into higher institution.*

### INTRODUCTION

Assessment is a means of determining the achievement or performance of an individual or worth of a programme. Assessment in the view of Okoro (2000) is a form of evaluation that uses collected data for estimating the worth, quality and effectiveness of a programme. Assessment of student in institution of learning either for promotion to the next level or entry into higher institution was usually carried out manually through written or oral examination. In this study, assessment is the use of internet to determine the performance of secondary school leavers in external examination usually conducted by Joint Admission and Matriculation Board (JAMB) for helping tertiary institution such as universities, polytechnics, and colleges of education determine and select qualified secondary school leavers for admission into their various programmes of learning. This assessment that is of great concern to this study is that one focused on the use of electronic technology such as internet. With development in technology, assessment of learners becomes easier through

electronic means known as internet or online assessment.

Online test assessment is a web based application that establishes a network between the institution, staff and students. Online test assessment according to Robin (2002) is the process used for measuring certain aspect of information which is delivered through a computer connected to the internet. Online test is used primarily to measure cognitive abilities, demonstrating what has been learned after a particular educational event has occurred such as the end of an instructional unit. Institutions log onto their website to set questions of their choice for any student. This score, question, and answers been attempted by the students are then evaluated and scores saved. The scores can be retrieved from the computer by the internet assessor for the determination of the performance of the secondary school leavers to be assessed with regards to qualification and suitability for entry into an institution or job application.

Secondary school leavers in the view of Onwuka (2003) are those individuals who have



completed their senior secondary school certificate programme and some who may continue their studies in higher institution or may decide to enter into occupational field. In this study, secondary school leavers are individuals that has completed a six year study in a secondary school, and passed West African Senior School Certificate Examination(WASSCE) or National Examination Council (NECO) with a minimum of five credit, and qualified to sit for examination for entry into higher institution like University, polytechnics, and college of education or seeking for job application in any organization or federal government parastatal that require such qualification, but they are assumed by this study to have low or negligible experience in the use of internet for answering examination questions for the purpose of entering into higher institution or seeking for job. The reason for this assumption is the scarcity of internet facilities in most of the secondary schools attended by these secondary school leavers. The Joint Admission and Matriculation Board (JAMB), and other recognized internet examination organization or consultant are hired and trusted with the responsibility of carrying out online test assessment to secondary school leavers. Secondary school leavers or Applicants into tertiary institution are made to answer their examination question usually called online test or computer base test examination (CBTE) for ease of marking electronically and control of other factors such as delay in releasing examination result and examination malpractice. Currently, Examination bodies expected the teaching and learning in schools to match with the assessment method which is the use of online test assessment. In the area of this study, the expectations of the examination bodies are far from been real because of certain constraints which include absence of computer base training, use of ICT tools to tackle problems on the internet after graduation. Therefore secondary school leavers who have the intention of seeking admission into tertiary institution or job application through online test assessment, and be successful in acquiring knowledge and skill in all these areas of Computer they need training.

Need according to Procter (1995) is a condition of lacking or wanting something necessary or very useful. In view of Omeh (2010) a need is something that is required to fill an existing essential gap. In this study, need is the ability of secondary school leavers to operate and manage internet test items for success in online test assessment. Secondary school leavers in this study, need to possess:

knowledge and skill in booting on a computer system; operating the input and output devices; software application for browsing and downloading materials from the internet, time and facility management for accessing internet test items and confidence building attitude; For this secondary school leavers to be successful in these areas they need training.

Training as stated by Aliyu (2001) is the organizational effort aimed at helping an employee to acquire basic skills required for the efficient execution of the function for which he was hired. McNamara (2007) state that training involves an expert working with learners to transfer to them certain areas of skill to enable them improve in their current job. Training enhances the acquisition of knowledge, skill, and attitude by an employee that leads to his growth and development within the organizational hierarchy. This type of training is applicable to all areas of technology where the user is ignorant. In the area of this study, secondary school leavers has been used to pen and pencil examination throughout their study in the secondary school which were administered by examination bodies like WASSCE (West African Senior School Certificate Examination) and NECO (National Examination Council). Technology is now exposing and changing the process of examination from pen and pencil to computer and internet based assessment for recruiting school leavers either for job application or entry into tertiary institution. This development has demonstrated significantly the importance of internet assessment, and secondary school leavers departure from pen and pencil examination to internet based facilities by most examination bodies for which many secondary school leavers are ill-prepared or very ignorant. Most of the secondary school leavers are intelligent enough to pass the WASSCE and NECO examination through pen and pencil, but they lack the confidence in attempting and passing online examination for entry into higher institution or seeking for job application after graduation. The issue, here is the inability of this secondary school leavers to interact confidently and intelligently with the technology provided for the online test assessment by the internet assessors. Therefore, secondary school leavers' need effective training to enable them become familiar, confident, and skilled in the application of computer and internet to enable them interact fully with these devices during online examination. To be effective means to be very successful in the direction a teacher will want a

student or learner to succeed. This success can only be achieved through training which is needed by secondary school leavers in online test assessment in the mastery of the competencies on the components of the computer already stated above. Therefore, it is necessary to identify the competencies in areas of computer as stated in this study where secondary school leavers need training for success in online test assessment for job application or entry into higher institution.

The major purpose of the study therefore, is to determine the training needs of secondary school leavers on the effective use of online test assessment for job application or entry into higher institution. Specifically, the study identified the training needs of secondary school leavers in:- Booting on a computer system, Operating of input and output devices, Software application for browsing and downloading material from the internet, Time and facility management for accessing internet test items, and Confidence building attitudes for success in online test assessment.

### Methodology

Five research questions were answered by the study and five hypotheses tested. The design of the study was descriptive survey. The study was carried out in Nsukka local government area of Enugu state. Population for the study was 1032 made up of 1000 secondary school leavers and 32 internet tutors. Sample for the study was 232 made up of 200 secondary school leavers and 32 online instructors using proportionate (20%) random sampling technique to select the sample for the secondary school leavers while the entire population of the internet tutors was involved in the study. A 61 structured questionnaire item derived from literature was used as an instrument for collecting data. Each questionnaire item had four responses options of Highly Needed (HN), Averagely Needed (AV), Slightly Needed (SN), Not Needed (NN) with assigned values of 4,3,2,1, respectively. It was face validated by three experts in Computer Education from the Department of Vocational Teacher Education, University of Nigeria, Nsukka. The reliability of the questionnaire item was achieved through the use of cronbach-Alfa to determine the internal consistency of each item. The Alfa- co-efficient obtained for each area is as follows: Booting on the computer system -0.82, Operating input and output devices -0.85, Software

application for browsing and downloading -0.86, Time and facility management -0.83, and Confidence building attitude -0.84. The questionnaire was used to collect data through the help of two research assistants. The data collected were analyzed using weighted mean to answer the research questions, and t- test statistics to test the hypotheses of no significant difference at 0.05 level of significance and relevant degree of freedom.

The real limit of numbers was used to take a decision on the mean as follows: 4.00 – 3.50 (HN), 3.49 – 2.5 (AN), 2.49 – 1.5 (SN), 1.49 – 1.00 (NN); any item with a mean of 1.50 or above indicated that the item is needed for training school leavers for success in online test assessment. In deciding on hypothesis tested on the mean ratings of the responses of internet tutors and secondary school leavers the P- value was used. Any item whose P- value is greater than or equal to 0.05, indicated that there is no significant difference in the mean ratings of the responses of the two groups of respondents on the training needs of secondary school leavers on the item. Therefore the hypothesis of no significant difference was accepted for that item.

### Results

The result for this study was obtained from the research questions answered and hypotheses tested through the analysis of the data collected.

**Research Question 1:** What is the competency in booting on a computer system on which secondary school leavers needed training for success in online test assessment?

**Hypothesis 1:** There is no significant difference in the mean rating of secondary school leavers and internet tutors on the competencies in booting on a computer system on which secondary school leavers needed training for success in online test assessment.

The data for answering research question and testing hypothesis one were presented in Table 1.

**Table1: Mean ratings and t-test analysis of the responses of secondary school leavers and internet tutors on the competency in booting on a computer system.**

IT: n=32, SSL: n= 194

S/N	ITEM STATEMENT	$\overline{X_g}$	$\overline{X_{sl}}$	$\overline{X_t}$	$S^2_{sl}$	$S^2_t$	p-value	RQ	HO
1.	Turn on the power button on a computer system	3.88	3.87	3.89	0.33	0.31	0.78	HN	NS
2.	Observe if the system is loading and setting the registers to specific values.	3.47	3.50	3.47	0.50	0.50	0.78	AN	NS
3.	Check if the c.p.u jumps to address the BIOS	3.66	3.65	3.67	0.48	0.47	0.87	HN	NS
4.	Observe if the BIOS runs post (power on self test) and other necessary check on the computer system	3.46	3.46	3.45	0.56	0.58	0.92	AN	NS
5.	Observe if the BIOS locates the MBR (master Boot Record)	3.42	3.17	3.62	0.70	0.68	0.01	AN	S
6.	Check if primary bootloader runs from MBR and locates the secondary bootloader.	3.53	3.53	3.54	0.56	0.58	0.92	HN	NS
7.	Observe if the secondary bootloader loads the operating system and the windows logo is displayed on the screen of the monitor of the computer system.	3.49	3.46	3.50	0.67	0.65	0.80	AN	NS
	CLUSTER INFORMATION	3.55	3.52	3.59	0.54	0.53	0.72	HN	NS

Tables 1 revealed that the mean value is 3.55 on the cluster information on the competency in booting on a computer system and is greater than 1.50; this indicated that secondary school leavers needed training on the competency in booting on a computer system.

The data in table 1 revealed that the cluster information on the competency in booting on a computer system had its P- value as 0.72 and is greater than 0.05 indicating that there was no significant difference in the mean rating of the responses of secondary school leavers and internet tutors on the competency in booting on a computer system.

**Keys:**  $\overline{X_g}$  Grand mean,  $\overline{X_t}$  mean of Internet tutors,  $\overline{X_{sl}}$  mean of secondary school leavers,  $S^2_{sl}$  Variance of Secondary school leavers,  $S^2_t$  Variance of Internet tutors, NS Not Significant, HN Highly Needed, AN Averagely Needed, S\* Significant. IT Internet tutors, SSL Secondary School Leavers, RQ Research Question, Ho hypotheses

**Research Question 2:** What are the competencies in operating input and output devices on which secondary school leavers needed training in for success in online test assessment?

**Hypothesis2:** There is no significant difference in the mean rating of secondary school leavers and internet tutors on the competencies in operating input and output devices on which secondary school leavers needed training for success in online test assessment

The data for answering research question and testing hypothesis two were presented in Table 2.

**Table2:**  
**Mean ratings and t-test analysis of the responses of secondary school leavers and internet tutors on the competency in operating input and output devices.**

IT: n =32, SSL: n = 194									
S/N	Item statement	$\overline{X_g}$	$\overline{X_{sl}}$	$\overline{X_t}$	$S^2_{sl}$	$S^2_t$	p-value	RQ	HO
1	Connect the power cable to the source of power	3.80	3.81	3.82	0.39	0.38	0.86	HN	NS
2	Connect the VGA (Video Graphic Adapter) cable from the monitor to system unit.	3.38	3.47	3.30	0.49	0.49	0.87	AN	NS
3	Locate and press the power button to start up the monitor	3.65	3.52	3.80	0.55	0.50	0.03	HN	S
4	Identify if monitor screen display the desktop icons.	3.63	3.62	3.67	0.55	0.51	0.61	HN	NS
5	Locate and press the buttons at the base of the monitor to adjust the volume, contrast, brightness and colour of the monitor	3.48	3.43	3.49	0.66	0.61	0.62	AN	NS
6	Click on left button of the mouse to select an item	3.58	3.59	3.61	0.49	0.48	0.83	HN	NS
7	Click on the left button of the mouse twice to open a selected item.	3.45	3.46	3.50	0.67	0.65	0.80	AN	NS
8	Click on the right button of the mouse to pop up a small dialog box	3.55	3.56	3.58	0.50	0.49	0.70	HN	NS
9	Handle the mouse correctly	3.48	3.46	3.52	0.56	0.58	0.64	AN	NS
10	Press F1 to display the help dialog box	3.28	3.31	3.32	0.78	0.72	0.93	AN	NS
11	Press F10 to activate the menu bar option	3.25	3.05	3.49	0.67	0.65	0.01	AN	S
12	Press ctrl + shift + Esc key to open window task manager.	3.33	3.37	3.36	0.70	0.67	0.94	AN	NS
13	Press Alt + TAB key to switch to another running program	3.43	3.43	3.47	0.71	0.68	0.75	AN	NS
14	Press window logo + E key to display windows explorer	3.30	3.31	3.33	0.59	0.59	0.84	AN	NS
15	Press window logo to display the start menu	3.53	3.43	3.50	0.61	0.62	0.59	HN	NS
16	Press ctrl + C key to copy a document	3.38	3.43	3.50	0.61	0.62	0.59	AN	NS
17	Press ctrl + X key to cut a document	3.38	3.43	3.40	0.61	0.61	0.79	HN	NS
18	Press window logo + P key to start the print manager	3.45	3.33	3.60	0.61	0.62	0.02	AN	S
19	Press window logo + D key to minimize all open window and display the desktop.	3.45	3.43	3.50	0.61	0.62	0.59	AN	NS
20.	Press shift + Delete key to delete an item permanently.	3.45	3.46	3.50	0.67	0.65	0.80	AN	NS
CLUSTER INFORMATION		3.46	3.44	3.51	0.60	0.58	0.58	HN	NS

Keys.  $\overline{X_g}$  grand mean,  $\overline{X_t}$  mean of Internet tutors,  $\overline{X_{sl}}$  mean of secondary school leavers,  $S^2_{sl}$  Variance of Secondary school leavers,  $S^2_t$  Variance of Internet tutors, NS Not Significant, HN Highly Needed, AN Averagely Needed, S\* Significant. IT Internet tutors, SSL Secondary School Leavers, RQ Research Question, Ho hypotheses

Table2 revealed that the mean value is 3.46 on the cluster information on the competency in operating input and output devices and is greater than 1.50; this indicated that secondary school leavers needed training in operating input and output devices.

The data in table 2 revealed that cluster information on the competency in operating input and output devices had its P- value as 0.58 and is greater than 0.05 indicating that there was no significant difference in the mean rating of the

responses of secondary school leavers and internet tutors on the competency in operating input and output devices on a computer system.

**Research Question3:** What are the competencies in software application for browsing and downloading materials from the internet on which secondary school leavers needed training for high performance in online test assessment?

**Hypothesis 3:** There is no significant difference in the mean rating of secondary school leavers and internet instructors on the competencies in software application for browsing and downloading materials from the internet on which secondary school leavers needed training for high performance in online test assessment.

The data for answering research question and testing hypothesis were presented in table 3.

**Table 3 Mean ratings and t-test analysis of the responses of secondary school leavers and internet tutors on the competency in software application for browsing and downloading materials from the internet**

IT: n =32, SSL: n = 194

	Item statement	$\overline{X_g}$	$\overline{X_{sl}}$	$\overline{X_t}$	$S^2_{sl}$	$S^2_t$	p-value	RQ	HO
1.	Get on the web with a computer system	3.88	3.87	3.39	0.33	0.31	0.78	HN	NS
2.	Open internet explorer or Mozilla	3.70	3.71	3.73	0.52	0.48	0.84	HN	NS
3.	Enter a web address	3.33	3.31	3.35	0.53	0.52	0.66	AN	NS
4.	Locate search engine (e.g.) yahoo, goggle.	3.58	3.62	3.61	0.55	0.52	0.90	AN	NS
5.	Navigate through web pages.	3.50	3.53	3.54	0.56	0.58	0.92	HN	NS
6.	Search the internet for information	3.30	3.11	3.55	0.78	0.72	0.01	AN	S
7.	Type needed concept into the search engine.	3.18	3.21	3.21	0.65	0.66	0.95	AN	NS
8.	Download material/document from the internet through appropriate path.	3.50	3.53	3.54	0.56	0.58	0.92	HN	NS
9.	Save web pages as a file.	3.40	3.46	3.42	0.56	0.58	0.71	AN	NS
10.	Store or transfer the downloaded materials into a storage devices e.g. flash	3.38	3.27	3.62	0.70	0.68	0.00	AN	S
11.	Open multiple web pages of a time	3.33	3.37	3.36	0.65	0.63	0.90	AN	NS
12.	Browse for relevant material	3.40	3.40	3.44	0.66	0.65	0.73	AN	NS
13.	Download PDF files successfully	3.33	3.37	3.37	0.70	0.70	0.97	AN	NS
14.	Create and send email messages.	3.25	3.31	3.28	0.69	0.68	0.85	AN	NS
15.	Logout from the internet.	3.48	3.46	3.52	0.56	0.58	0.64	AN	NS
	CLUSTER INFORMATION	3.43	3.43	3.46	0.60	0.59	0.71	AN	NS

Keys.  $\overline{X_g}$  grand mean,  $\overline{X_t}$  mean of Internet tutors,  $\overline{X_{sl}}$  mean of secondary school leavers,  $S^2_{sl}$  Variance of Secondary school leavers,  $S^2_t$  Variance of Internet tutors, NS Not Significant, HN Highly Needed, AN Averagely

Needed, S\* Significant.

IT  
Internet tutors, SSL Secondary School Leavers, RQ  
Research Question, Ho hypotheses

Table3 revealed that the mean value is 3.43 on the cluster information on the competency in software application for browsing and downloading materials and is greater than 1.50; this indicated that secondary school leavers needed training in software application for browsing and downloading.

The data in table 3 revealed that the cluster information on the competency in software application for browsing and downloading materials from the internet had its P- value as 0.71 and is greater than 0.05 indicating that there was no significant difference in the mean rating of the responses of secondary school leavers and internet tutors on the competency in software application for browsing and downloading materials from the internet.

**Research Question4:** What are competencies in time and facility management on which secondary school leavers needed training for effectiveness in online test assessment?

#### Hypothesis 4

There is no significant difference in the mean rating of secondary school leavers and internet instructors on the competencies in time and facility management on which secondary school leavers needed training for effectiveness in online test assessment.

The data for answering research question and testing hypothesis were presented in table 4

**Table 4 Mean ratings and t- test analysis of the responses of secondary school leavers and internet tutors on the competencies in time and facility management.**

IT: n =32, SSL: n = 194

	Item statement	$\overline{X_g}$	$\overline{X_{sl}}$	$\overline{X_t}$	$S^2_{sl}$	$S^2_t$	p-value	RQ	HO
1	Set realistic goal in internet test assessment.	3.85	3.87	3.36	0.33	0.34	0.89	HN	NS
2	Plan for the future when assessing the internet.	3.25	3.28	3.27	0.63	0.56	0.94	AN	NS
3	Monitor activities as you assess the internet.	3.68	3.52	3.82	0.55	0.49	0.02	HN	S
4	Create an environment conducive for effectiveness in the internet environment	3.45	3.43	3.50	0.66	0.65	0.61	AN	NS
5	Set priorities for yourself as you assess the internet items.	3.35	3.34	3.40	0.78	0.73	0.65	AN	NS
6	Carry out activity around those priorities	3.53	3.56	3.56	0.56	0.58	0.96	HN	NS
	CLUSTER INFORMATION	3.51	3.50	3.48	0.58	0.55	0.67	HN	NS

Keys.  $\overline{X_g}$  grand mean,  $\overline{X_t}$  mean of Internet tutors,  $\overline{X_{sl}}$  mean of secondary school leavers,  $S^2_{sl}$  Variance of Secondary school leavers,  $S^2_t$  Variance of Internet tutors, NS Not Significant, HN Highly Needed, AN Averagely Needed, S\* Significant, RQ Research Question, Ho hypotheses

Table 4 revealed that the mean value is 3.51 on the cluster information on the competencies in time and facility management and is greater than 1.50; this indicated that secondary school leavers needed training in time and facility management.

The data in table 4 also revealed that the cluster information on the competency in time and facility management had its P- value as 0.67 and is greater than 0.05 indicating that there was no significant difference in the mean rating of the responses of secondary school leavers and internet tutors on the competency in time and facility management.

**Research question 5:** What are the competencies in confidence building attitude on which secondary school leavers needed training for success in online test assessment?

**Hypothesis5:** There is no significant difference in the mean rating of secondary school leavers and internet instructors on the competency in confidence building attitude on which secondary school leavers needed training for success in online test assessment

The data for answering research question and testing hypothesis five were presented in table 5

**Table 5**

**Mean ratings and t- test analysis of the responses of secondary school leavers and internet tutors on the competencies on confidence building attitude.**

IT: n =32, SSL: n = 194

SN	Item statement	$\overline{X_g}$	$\overline{X_{sl}}$	$\overline{X_t}$	$S^2_{sl}$	$S^2_t$	p-value	RQ	HO
1.	Accept the truth about himself both good and bad, and be ok with it	3.90	3.90	3.91	0.29	0.28	0.91	HN	NS
2.	Surround oneself with likeminded and supportive people	3.33	3.51	3.25	0.53	0.52	0.01	AN	S
3.	Start with achieving small and easy goal and work up to larger goal	3.35	3.37	3.41	0.79	0.77	0.80	AN	NS
4.	Recognize and release destructive habits from the past.	3.45	3.46	3.48	0.56	0.54	0.87	AN	NS
5.	Focus on the positive not the negative.	3.38	3.59	3.62	0.61	0.60	0.76	AN	NS
6.	Provide positive feedback to learners when appropriate	3.70	3.55	3.84	0.48	0.43	0.03	HN	S
7.	Provide suitable environment and facility for learners to learn.	3.23	3.28	3.24	0.58	0.56	0.75	AN	NS
8.	Correct learners gently when they make mistake rather than bullying.	3.33	3.37	3.37	0.70	0.70	0.97	AN	NS
9.	Set realistic goal for each learner	3.50	3.53	3.54	0.56	0.58	0.92	HN	NS
10.	Create an open and positive environment for learning	3.30	3.37	3.34	0.70	0.70	0.79	AN	NS
11.	Be proud of students when they record achievement	3.38	3.41	3.41	0.66	0.64	0.92	AN	NS
12.	Encourage students to try harder when they fail.	3.53	3.56	3.56	0.56	0.58	0.96	HN	NS
13.	Use appropriate teaching strategies that provide an opportunity for equal participation.	3.48	3.50	3.52	0.71	0.68	0.84	AN	NS
	CLUSTER INFORMATION	3.45	3.49	3.49	0.59	0.58	0.73	AN	NS

Keys.  $\overline{X_g}$  grand mean,  $\overline{X_t}$  mean of Internet tutors,  $\overline{X_{sl}}$  mean of secondary school leavers,  $S^2_{sl}$  Variance of Secondary school leavers,  $S^2_t$  Variance of Internet tutors, NS Not Significant, HN Highly Needed, AN Averagely Needed, S\* Significant, RQ Research Question, Ho hypotheses

Table 5 revealed that the mean value is 3.45 on the cluster information on the competencies in confidence building attitude and is greater than 1.50; this indicated that secondary school leavers needed training in the competency in confidence building attitude.

The data in table 5 also revealed that the cluster information on the competency in time and facility management had its P- value as 0.73 and is greater than 0.05 indicating that there was no significant difference in the mean rating of the

responses of secondary school leavers and internet tutors on the competency in confidence building attitude.

### Discussion of Findings

The study found out that secondary school leavers needed training for success in online test assessment in the following competencies: 7 competencies in booting on the computer System, 20 competencies in operating input and output devices, 15 competencies in software application for browsing and downloading material from the internet, 6 competencies in time and facility management and 13 competencies on confidence building attitude. These findings were in agreement with the submission of Omeh (2010) who stated that for individual to perform the operation of booting the computer system effectively they must be competent in 7 competencies such as Turning on the power button



on the computer system among others. Also in Time and Facility Set priorities for yourself as you assess the internet items and 5 others. The findings was supported by the submission of Marle Sloane (2009) that effectiveness in interaction with the computer for success in any examination required confidence building attitude in 13 competencies like; create an open and positive environment for learning and 12 others. The findings of the hypothesis revealed that there is no significant difference in the mean rating of the internet tutors and secondary school leavers on 52 out of 61 competencies for operating computer on which secondary school leavers need training for success in online test assessment. This revealed that the knowledge and the professional competencies of the respondent in operating computer for success in online test assessment did not significantly influence the responses on the 52 items, but probably did significantly on nine items.

### Conclusion

It was generally observed in the area of this study that secondary school leavers who have been used to pen and pencil examination usually encounter difficulties in interacting with the computer in any examination for success in online test assessment, and therefore usually recorded low scores, though they may be competent intellectually. This study was carried out to identify the competencies required for operating the computer on which secondary school leavers needed training for success in online test assessment. The study also found out that secondary school leavers needed training in 61 competencies in 5 areas of computer for success in online test assessment for job application or entry into higher institution. It is therefore recommended that the findings of this study be used by organized computer training centres, higher institution, internet tutors for training secondary school leavers for success in online test assessment.

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## CHALLENGES AND PROSPECTS OF INTEGRATION OF COMPUTER AND ICT SKILLS INTO TEACHING AND LEARNING OF PHYSICS EDUCATION FOR ENTREPRENEURIAL DEVELOPMENT IN TERTIARY INSTITUTION IN NIGERIA.

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### ABSTRACT

*Integration computer and ICT skills into teaching and learning of physics education for entrepreneurial development equip students with current trends in technological advancement. This paper discusses entrepreneurship skills through physics education, the place of physics in entrepreneurial skill acquisitions in Nigeria and how physics could be taught to develop entrepreneurship skill. Also discussed are challenges which faces both the teachers and the students and which act as the barriers for proper integration of computer skills into teaching and learning of physics education for entrepreneurial development. Suggestions were also made on how best to produce job creators instead of job seekers by infusing the spirit of entrepreneurship into the mode of instruction of physics teachers which will facilitate the emergence of entrepreneurial physics students.*

### INTRODUCTION

Computer science education and information and Communication Technology (ICT) are at present becoming the most important elements defining the basic competences of students in science and physics education. Technological advancement requires the use of Information and Communication Technology (ICT) in teaching and learning to equip the students with the required skills for effective operation of the ICT equipment and facilities. This implies that a lot is required of teachers and students to keep pace with current trend in technological advancement. According to Agu, (2013) when computer and communication technologies are combined, the result is information technology. Agu (2013) further stated that Information Technology is a general term that describes any technology that helps to produce, manipulate, store, communicate and disseminate information. It is comprised of computers, networks, satellite communications, cables television, electronic mail, electronic games and automated office equipment.

ICT is defined as the acquisition, processing, storage and dissemination of vocal, textual, pictorial and numerical information by a micro electronics based combination of computer systems and telecommunication equipment in information process (Ayo 2002). Leah (2005),

stated that ICTs need to be seen as “an essential aspect of teaching’s cultural toolkit in the twenty-first century, affording new and transformative models of development that extend the nature and reach of teacher learning wherever it takes place”. ICT is necessary for effective teaching and learning.

Teaching is the process of imparting knowledge, experiences, attitudes, and skills to the learner. Offorma (2006), defined teaching as a systematic activity deliberately engaged in by somebody to facilitate the learning of the intended worthwhile knowledge, skills and values by another person and getting the necessary feedback. Learning is a process of acquiring experiences, knowledge, skills and attitudes. It is a permanent change in behavior which can be as a result of experience. Ngwoke (2004), defined learning as a process which causes a change in behavior of an individual. Learning occurs when students have achieved what they were taught. Achievement in physics Education can be improved with the use of ICT equipment and facilities in teaching and learning. Anene (2005), stated that achievement is qualified by measures of students academic standing in relation to those of other students tested with the same instrument. The need to improve teaching and learning led to the introduction of the use of ICT in teaching and learning.

The use of Information and Communication Technology ICT in teaching and learning is very important. It equips students with current trends in technological advancements. It is an instrument for technological advancement and economic growth in the twenty-first century. Due to the increasing number of industries, the need for technical man power becomes necessary. Since these trained man power are going to work with ICT facilities and equipment in the industries, there is need for them to be trained with those ICT Equipment and facilities. Despite the important nature of the use of in teaching and learning of physics education, its use in teaching and learning is still inadequate. The use of ICT is faced with such challenges as high cost of computer hardware and software, weak infrastructure, lack of human skills and knowledge in ICT and lack of software, appropriate and culturally suitable to Nigeria, Adua-Ogiaegbaen and Iyamu (2005). Epileptic power supply in various communities is a big challenge to effective use of ICT in teaching and learning. Providing solutions to the above named challenges will go a long way in ensuring of physics education graduates who are skilled in the use of ICT for production purposes, drawing, programming and invention of new issues in physics education.

#### **Entrepreneurial skills through Physics Education**

Education is the instrument for empowering young people with knowledge and skills, which provide them access to productive employment (National Planning Commission NPC (2013). In recognition of the need for education, the Nigeria National Policy on Education (2013), noted that education is that process concerned with the transmission of worthwhile values, skills and knowledge suitable for developing learner's potentials for national development. Anaduaka and Okafor (2013), noted that the major goal of education in any nation is to prepare its citizens for responsible and productive adult life, so as to be able to function honestly, efficiently and effectively in the society which they live. For any nation to be able to prepare its citizens for responsible and productive adult life, entrepreneurship must be taken into account.

Entrepreneurship means setting up and running a business in a profitable and sustainable manner. Entrepreneurs innovates, discovers new products, new opportunities and start up new ventures. In the new economy, there is constant demand for innovation and entrepreneurship.

Entrepreneurship is the quality of being an entrepreneur.

An entrepreneur is a person who makes money by starting or running business especially when this involves taking financial risks (wehmier , 2001). An entrepreneur is also a person who perceives a business opportunity and takes advantage of the scarce resources to use them, (Akinola,2006).According to him, an entrepreneur bears the non- insurable risks in his enterprise and it is the entrepreneur who directs the human and material resources in his business objectives. The entrepreneur is an original or of profitable business ideas. The entrepreneur is innovative. Ogunleye (2007) described an entrepreneur as he who creates incremental wealth through the use of resources. An entrepreneur is an original or of profitable business ideas. The entrepreneur innovative. Ogunleye (2007) described an entrepreneur as he who creates incremental wealth through the use of resources. An entrepreneur therefore can be seen as somebody who initiates or finances new commercial enterprises, one who assumes the responsibility and the risk for a business operation. As an innovator, he develops a new product, a new market or a new means of production. For an entrepreneur to be able to do all these there must be need for applied skills like critical thinking, communication, teamwork, leadership, creativity, innovation, diversity and so on. Critical thinking means making judgment that are logical and well thought out. It is a way of thinking in which you don't simply accept all arguments and conclusions you are exposed to but rather than have an attitude involving questioning such argument and conclusions. Communication is the imparting or interchange of thoughts, opinions or information by speech, writing or signs. Teamwork is the process of working collaboratively with a group of people in order to achieve a goal. Leadership is the ability to inspire or influence others towards the leader's goal. Leadership has followers. Creativity is the act of turning new and imaginative ideas into reality. Innovations are the process of translating an idea or invention into a good or service that creates value. To be called an innovation an idea must be replicable at an economical cost and must satisfy a specified need. Diversity is a satisfying mix of idea, cultures, races, genders, economic statue and other characteristics, necessary for promoting growth and learning among a group. Diversity involves having people from a variety of cultural, ethnic and racial

background consortium of different perspective. These skills are needed to become successful. These entrepreneurial skills should be inculcated into students early enough so as to be self reliant after secondary school career.

In the face of the serious growth of unemployment in Nigerians today the need for Nigeria to seek avenues for self-employment and self-fulfillment is now compelling. In other words, Nigeria can no longer rely on the labour market to provide jobs. Invention of alternative source of employment in form of self employment otherwise called entrepreneurship is greatly needed is very important to the future of Nigeria economy. It is a must now, judging by the figure that graduates yearly from the institution of higher learning. In the last few years, more than 70% of senior secondary school leavers find it difficult to gain admission into higher institutions while over 60% of graduates are not able to get employment immediately because they are relatively unskilled (Millennium Development Goal document (2005). This is usually because these graduates go into small scale and sometimes, large business enterprises without been adequately prepared to face the challenges of entrepreneurship. Part of the problem is the nature of the education system, which tends to produce job "seekers" instead of "job creators". To be able to produce job creators there is the need to infuse the spirit of entrepreneurship into the mode of instruction of physics teachers which will facilitate the emergence of entrepreneurial physics students.

#### **The place of physics in entrepreneurship skills acquisition in Nigeria**

The introduction of entrepreneurship education into physics education curriculum could lead to a continuous and sustainable technological growth of the country (Ogunleye 2007). In view of this, development of physics-based entrepreneurship education should receive serious attention among the policy makers and curriculum studies in the curriculum of physics subject of senior secondary school, it is possible for teachers to teach their students effectively in a way that the students will see the usefulness of and how they can utilize the knowledge and skills acquired for gainful employment in the society.

Physics as a physical science is the study of the physical properties of matter in relation to energy. It involves utilization of natural substances and the creation of artificial ones. The study of the physics helps one to get the energy we need and

how to protect our environment, Physical involves process skills used in the discoveries and acquiring of scientific knowledge . Skills is an ability that has been acquired by Training. It is also ability to produce solution in some problem domain. Skill is the ability to do something well. Entrepreneurship skills are occupational survival skills. These skills are equivalent to process skills in physics which are the ways and strategies followed by the physicists in order to arrive at the product of science. These process skills include:

1. Observation
2. Measurement
3. Recording
4. Prediction
5. Research
6. Controlling variables
7. Classification
8. Counting Numbers
9. Hypothesis
10. Experimentation
11. Analysis
12. Interpretation of data
13. Inference
14. Generalization
15. Conclusion (Ugwu 2007)

The use of this process skills over a period of time lead to an accumulation of scientific knowledge in form of scientific laws, principles and theories, all of which put together constitute the product of science. Development of these process skill should lead to the acquisition of the skill that successful entrepreneurs use to start their ventures.

One of the activities in physics is experimentation. This provides a forum for practicing the theoretical knowledge gained in the classroom and for demonstrating the psychomotor skills of a teacher and a learner. It further aids the understanding of difficult concepts in the curriculum; creates opportunity for the testing of facts and theories in physics. It is believed that learners can achieve more if given the opportunity to practice the theoretical knowledge gained in the classroom. Experimentation thus gives room for better attainment of lesson objectives. Experimentation in science is however dependent on the availability of science equipment for proper understanding, development and application. The realization of this goal can be impeded by non availability of science equipment that can ensure effective teaching and learning. Many authors have however reported the issue of inadequacy in science equipment in educational institutions in Nigeria (Ogunleye in Ugwu, (2008), Ogunmade, Bajah, 1982, and

Osonbonye, 2002 Okedeyi & Bajulaye, 2006; Nwagbo, 2008,. It has also been reported that the non-availability of science equipment in educational institutions serves as barrier to effective teaching of science. Adeyemi (1990), confirms the persistent poor performance of students in science, in educational institutions in Nigeria over the years. This poor performance of students has been attributed to some factors such as non-availability of science equipment in educational institutions and inadequate qualified physics teachers. The issue of inadequacy of science in educational institution is a great challenge to the teaching and learning of physics education. Over the years financial allocation to the education sector has been inadequate thus making it impossible to produce adequate equipment for teaching and learning of physics education.

In the words of Asiriwa (2005), science and technology is central to education and necessarily concerned with teaching or training of individual in order to acquire systematic skills, knowledge, attitude, and the application of the skills in the society. In spite of the benefits of physics to man and society, the education system has continually turned out graduates with skills and attitude that are neither needed in the modes of production, nor saleable in the limited industrial commercial establishments. This is because these products did not practice the right skills while in the senior secondary schools. This has continuously led to mass unemployment of school leavers, with the attendant problem of increased economic social and moral vices. The goal of education is entrepreneurship, and the development of entrepreneurial skills can be achieved through active learning of process skills (Iyekekpolor2007). The acquisition of professional qualification in a subject like physics equips an individual with skills to be self-employed, because of having acquired entrepreneurial and/or process skills. Functional physics education emphasizes applicability or transferability of the acquired knowledge to the immediate environment. This is the purpose of physics education as stated in the National Policy on Education (2013) which includes the acquisition of appropriate skills and development of the society. Consequently physics like entrepreneurship, aims at equipping an individual to be self-reliant. Physics is also concerned with the creation of energy and how

to protect the environment from natural disaster. It is an artistic enterprise which offers a lot to occupational opportunities in areas like:

1. Manufacturing of goods such as circuit board which can be used for commercial charging of phones and batteries in the physics laboratories.
2. Researching: through development of process skills in physics which leads to the acquisition of skills that successful entrepreneurs use to start their ventures.
3. Production of solar energy panel which is a source of energy to man can be very useful to the society.

### **Teaching physics to develop entrepreneurship skills**

Developing entrepreneurship skill through physics will best be achieved through an active learning of the process skills. What learners learn is greatly influenced by how they are taught. For learners to develop the process of entrepreneurial skills, the teacher must have a theoretical and practical knowledge and abilities about physics teaching and learning. The decision about content activities that teachers make, the interaction with students, the selection of assessment, the habit that teachers demonstrate and nurture among their students and the attitude conveyed, all affect the knowledge, understanding ability and attitudes that students develop. There is considerable research evidence that if learners are active in the class, they will learn more effectively (National Commission for Colleges of Education 2009). The active participation of the learner in the class depends on the teacher who uses learner centred teaching approach strategy since learning takes place when the learner is actively involved and also interacts with the environment.

Active learning as teaching –learning strategy emphasizes that the planning, teaching and assessment are focused on the needs and abilities of the learners. The learners are actively engaged in doing most of the work by using their hands and brains in the teaching and learning process. In active learning, learners do manipulate report, observe, measure, record, communicate and handle and so on; they are involved in process and entrepreneurial skills. Many advantages include accrue when learners are active participants in the classrooms activities. The advantage includes information retention, learner-teacher interaction, learner-learner interaction, academic achievement, communication skills team

work and positive attitudes towards the subject and the motivation to learn (NCCE, 2009). There are many active learning strategies that can be used in the physics classroom. They include discussion, games, excursion, role playing, drama, project, demonstration, discovery, problem solving method and process-based approach. These methods develop in the student critical thinking skills, creativity, open mindedness, and not only help students on developing the process skills but also their entrepreneurial skills and their socio-economic lives. These activity-based strategies yield better quality and entrepreneurial learning. The realization of these goals can be impeded by teachers and students challenges.

### **Teachers' Challenges**

Teacher quality is the factor that matters most for students learning (Darling & Berry 1998). Lack of teacher professional development for technology age is one of the most serious obstacles to fully integrate teacher into the curriculum (Fatemi, 1999). Furthermore lack of teacher professional development for technology age is one of the most serious obstacles to fully integrate computer skills into teaching and learning for entrepreneurial education. The role of the classroom teacher is the most important factor in the full development and use of technology in the school, Office of technology Assessment (1995). The transformation of classroom technology from hardware, software and connection into tools for teaching and learning depends on knowledgeable and enthusiastic teachers who are motivated and prepared to put technology to work on behalf of their students. Many teachers do not have the technical knowledge or skills to recognize the potential for technology in teaching and learning. Merely knowing how to use computer is not enough. Teachers have to be knowledgeable about technology and have self confidence enough to be able to integrate Technology effectively in the classroom. The use of ICT is being an essential part in education therefore teachers should be empowered by the many opportunities the use of ICT offers. In many schools, technology is not easily accessible by teachers. Computers may be located in laboratories instead of in each teacher's classroom, and internet connections may be limited to certain designed computers. To promote teachers for the use of technology, school administrators should ensure that adequate numbers of computers with internet connections

are available to teachers and the access times are not limited. Teachers need ample opportunities to practice with the technology and gain confidence in its use. Some of the teachers lack competence because they were not taught with the use of ICT equipment, materials and facilities during their school days and as such they do not possess skills in using them. Some teachers are resistant to change because they find it difficult to adapt/adopt the current technology advancement and as such they always reject everything that will make them stress themselves.

However, supporting the teachers in these skills and areas empowers them to seek out and take advantage of other sources of information, and also they will better understand their own capabilities and traits and to enhance their confidence in their own abilities. One of the teachers challenges is that some student are not interested in being enterprising or entrepreneurial.

### **Students' Challenges**

Some school administrators find it difficult to create time for their teachers to be enlightened on the use of ICT in teaching and learning. According to the study conducted by Sicilia (2005), the most common problem reported by teachers was lack of time to plan their technology lessons, explore different internet sites or look at various aspects of educational software. Administrator must have a clear vision of technology to support student learning and understanding of the roles that all school staff must play in achieving that vision. They must be cheerleaders and visionaries who see beyond the daily routine to a vision of what is possible through the use of technology. Students always like to see the result of any task they performed. When the results are delayed, the students will not know whether they did well or not, this may make them approach next task or learning with little or no concentration. Most students of physics education lack skills in the use of ICT equipment and materials in learning and may result to learning with difficulty.

As a result of high cost of ICT equipment and materials for teaching and learning, most students cannot afford them and as such are unable to practice the use of ICT on their own time rather they rely on the knowledge they got from their class work.

### Prospects of Integration of Computer Skills into Teaching and Learning of Physics Education for Entrepreneurial Development.

Using computer and ICT to incorporate entrepreneurship courses develops and enhances skills, aptitude and attitude. It provides students with the opportunity and motivation to:

1. Work creatively and independently.
2. Develop research, analysis and critical thinking skills.
3. Be able to work on unfamiliar environment and respond to the unexpected events.
4. Better understand their own capabilities and traits in the use of ICT and to enhance their confidence in their own abilities.
5. Foster business and financial knowledge and understanding.
6. Empower the students to seek out and take advantage of other sources of information; (Osuala 2004).

Using computer/ICT skills in teaching and learning of physics education for entrepreneurial development can make teaching and learning interesting to students because students like seeing what they are being taught demonstrated. The use of ICT facilitates students paying attention in the class. It also improves education efficiency. Through the use of ICT in teaching and learning of physics education, carefully prepared computer packages can be used to ensure that learners are properly instructed. Software can be developed to teach certain topics.

### Conclusion

Integration of computer and ICT skills into teaching and learning physics education for entrepreneurial development equip students with current trends in technological advancements. Despite the important nature of the use of computer and ICT in teaching and learning of physics education, its use is faced with such challenges such as high cost of computer hardware and software, weak infrastructure, lack of human skills and knowledge in ICT and lack of software appropriate and culturally suitable to Nigeria. For any nation to be able to prepare its citizens for responsible and productive adult life, entrepreneurship must be taken into account. To be able to produce job creators, there is need to infuse the spirit of entrepreneurship into the mode of instruction of physics teachers which will facilitate the emergence of entrepreneurial physics students.

Integration of computer skill into teaching and learning for entrepreneurial development could

led to a continuous and sustainable technological growth in the country. In view of this in the development of physics –based entrepreneurship education, it is possible for teachers to teach their students by integrating computer skill into teaching and learning of physics education for entrepreneurial development and the students will then see the usefulness of and how they can utilize the knowledge/skill acquired for gainful employment in the society. Providing solutions to the challenges of ICT usage will go a long way in encouraging the integration of computer skills into teaching and learning of physics education for entrepreneurial development.

### Suggestions

1. Teachers should be given a follow-up/support to master new contents and strategies of using ICT and to integrate them into their practice of teaching and learning of physics education.
2. Computer and ICT facilities should be provided in the tertiary institution in Nigeria and physics teachers, should be encouraged to use them.
3. Teachers should be given a large block of time to gain initial familiarity with new hardware or software, learning and practicing for sustained periods. This is because time built into teachers schedule can provide teachers with the opportunities to discover what technologies can do, learn how to operate them and experience which ways to apply them.
4. Physics teachers in higher institution of learning should be granted in-service training to acquire more knowledge and entrepreneurship skill to teach the students in higher institution.
5. Government should organize seminars, workshops and conferences for physics teachers so that they can be taught the techniques of integration of computers and ICT skills into teaching and learning for entrepreneurial development.

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## LECTURERS PERCEPTION ON USE OF INFORMATION AND COMMUNICATION TECHNOLOGY FACILITIES IN TEACHING AND LEARNING IN SOUTH EASTERN UNIVERSITIES IN NIGERIA

BY

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### ABSTRACT

### ABSTRACT

*Use of information and communication technology facilities in teaching entails all the technological gadgets with which teacher's support teaching and learning in the classroom. The study seeks to find out the most frequently and effectively used ICT facilities in teaching and learning in Nigerian Universities. The design employed is descriptive survey. Questionnaire was used to collect data from the population sample. Simple random sampling technique was used to get sample from different Universities in South Eastern Nigeria. Data collected were analyzed using mean, standard deviations, frequency count and percentages. The results of the study show that over eighty percent of the teachers agree that the most frequently and effectively used ICT facilities are computer system and projector. The study recommended amongst others that; government should help in making more computers and projectors available in Nigerian Universities for teachers and students to use. Also, Parents who can afford computer system should buy one for their children as the equipment helps to strengthen children's grasp in use of the ICT facilities for better effective learning.*

### INTRODUCTION

The study seeks to ascertain the perceptions and relative standings or opinions of lecturers and students on use of information and communication technology in teaching and learning. Perception can be defined as the process of using senses to acquire information about the surroundings or issues in an environment. Perception differs from individual to another as various individuals encode and decode experiences with their environment in different ways. In the present study, lecturer's opinions on the use of information and communication technology gadgets were analyzed. The implications of the various opinions of teachers on use of ICT gadgets in teaching also form the basis of this study.

Use of information and communication technology in advancement of education has been found to be one of the benefits of the twenty-first century owing to advancements in technology. Madueke (2011) pointed out that advancements in use of ICT gadgets in fostering teaching and learning has been one of the gains of technology in

the get age. This has been in line with concerted efforts towards making the national educational objectives. Education is one of the most important tools used to foster creation of worthwhile skills and attitudes needed for national development thus appropriate use of ICT gadgets to foster learning is key to both national education goals and development.

Advancements in technology will be of immense benefit to education if appropriately harnessed. Owing to this reason, the United Nations Economic and Cultural Organizations in 2011 drafted a blueprint/ benchmark - (UNESCO ICT CFT, 2011), United Nations Economic Social and Cultural Organizations Information and Communication Technology Competency Framework for Teachers - which stipulated the various necessary competencies with which teachers can harness advantages inherent in information and communication technology in enhancing learning and instruction in classrooms. Also, Akudolu, (2004) noted that towards the end of

the 20<sup>th</sup> century, it became apparent that national development depends on educational advancement which in turn depends on technological progress.

One of the major progresses made in technology had been advancements in Information and Communication Technology. It suffices to say that developments in information and communication technology (ICT) has broken all national and international barriers in communication thereby turning the world into a global village; by making information available to most people anywhere, anytime. Since ICT improves the quality of education of a nation, and national development benefits hugely on the extent to which a nation uses ICT facilities in education, then it will be worthwhile to pay more attention to ICT, the various facilities of ICT and how they can be used to foster learning. To do this, teachers especially Economics teachers need basic ICT competencies to effectively use information and communication technology gadgets in fostering learning.

Information and communication technology may be defined as that facet of technology which deals with the handling and processing of information, using all kinds of electronic devices in facilitating communication. Margaret, (2005) defined Information and communication technology as an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. These electronic systems can be used for broadcasting, telecommunications and all forms of computer-mediated communications including teaching in a classroom. Adoni (2010) noted that Information and communication technology centered education covers the use of computers, on-line self-learning packages, interactive CDs, satellites, radio, optical fiber technologies, telepresence systems and all types of information technology (IT) hardware and software in teaching. However, for the purpose of this study, the ICT facilities for whose competencies the researcher will focus on include; the use of computer system to communicate learning, use of internet and computer networking and use of slide shows in teaching. These facilities were selected amongst other facilities because they are the most frequently used ICT facilities for teaching, (UNESCO, 2011). It's quite pertinent to note that the competencies

discussed are practical and functional skills which the lecturer needs to demonstrate if he is to effectively teach using ICT facilities.

### **Problem of the study**

Evidences abound that ICT facilities can be used to effectively facilitate learning. Report on availability of ICT facilities in teaching in Nigerian universities however remains unknown. Noteworthy, the presence of ICT technology and facilities alone will not stimulate significant changes in learners without a teacher. Teachers are important in the implementation of ICT policies in education. Without the teachers, students may not be able to effectively enjoy available potentials inherent in ICT on their own. Lecturers need to actively engage the use of ICT in teaching and for them to effectively do this; they need to have the requisite skill and competencies needed in use of ICT facilities and most importantly, the facilities with which to foster learning have to be available and efficiently used.

Also, there is dearth of evidence on ability of lecturers to teach Using ICT facilities. Gains inherent in using ICT facilities to support learning in the classroom are many. UNESCO, 2011, has identified competencies which will aid teachers in use of ICT facilities in teaching, the study therefore seek to harness the opinion of lecturers on use of information and communication technology in teaching and learning. Therefore, the problem of this study posed as a question is: what are the opinion of lecturers on use of Information and Communication Technology facilities in teaching and learning in classrooms.

### **Purpose of the study**

The general purpose of this study is to find out the perceptions of teachers on use of information and communication technology in teaching and learning in classrooms. Specifically, the study seeks to;

1. Find out the most frequently used information and communication technology facilities in teaching and learning?
2. Ascertain how effective is use of information and communication technology gadgets in teaching and learning?
3. Investigate how available are the information and communication technology gadgets in various secondary schools for teaching and learning?

### **Research questions**

The following research questions were formulated to guide the study;

1. What are the most frequently used information and communication technology facilities in teaching and learning?
2. What is the efficacy of use of information and communication technology gadgets in teaching and learning?
3. How available are the information and communication technology gadgets in various secondary schools for teaching and learning?

### Methodology

The research design employed in the course of the study is descriptive survey. The area of this study is south eastern Nigeria. In the south eastern Nigeria, there are five federal universities in the five south eastern states in Nigeria namely; University of Nigeria Nsukka, (Enugu state), Federal University of Technology Owerri (Imo State), Federal University, Ndufu-Alike, Ebonyi state, Michael Okpara University of Agriculture, Umudike (Abia State), and Nnamdi Azikiwe University Awka (Anambra state). the study was however carried out using three of the five federal universities namely; University of Nigeria Nsukka, Federal university of technology, Owerri, and Nnamdi Azikiwe university Awka.

The population of the study comprises of all the federal universities in south eastern Nigeria. The sample for the study is made up of sixty (60) lecturers and thirty (30) students who were randomly sampled from the three universities identified. Simple random sampling technique was used to draw the three universities while accidental sampling technique was used draw the teachers and students used in the cause of the study.

The instrument used for the purpose of the study is a researcher developed twenty one item

**Table 1: (cluster one) Response to Research Question One**

S/N	ITEMS	Frequencies and Percentages of the Scales							
		SA		A		D		SD	
		N	(%)	N	(%)	N	(%)	N	(%)
1	Commonly used ICT facilities in Nigerian are computer system and projectors	74	82.2	08	8.9	06	6.7	02	2.2
2	There is dearth of enough ICT gadgets like computer systems in universities classrooms in Nigeria	48	53.3	20	22.2	14	15.6	08	8.9
3	lecturers and students prefer to use ICT gadgets to learn than the chalk board	45	50	28	31.1	10	11.1	07	7.8
4	The major facilities used to teach students today in our universities are ICT gadgets	06	6.7	36	40.0	38	42.2	10	11.1
5	Apart from computer system and projector, other ICT gadgets like tape recorders and white boards are used to teach in Nigerian Universities	07	7.8	31	34.4	39	43.3	13	14.4

structured questionnaires which consisted of three clusters. Each cluster is meant to address each research question to ensure unidimensionality of the items selected. The instrument was validated by three research experts from the Department of Science Education, University of Nigeria, Nsukka. This is to ensure that the structure, layout and contents of the instrument are in line with the research objectives. Their comments and professional inputs were effected in the final drafting of the instrument.

To establish the reliability of the instrument, it was administered to twenty lecturers teaching in Federal university of Nigeria, Ndufu Alike, Ebonyi State. SPSS, 16.0 was used to run Cronbach alpha reliability to determine the internal consistency of the instrument and an estimate of 0.767 was obtained which showed that the instrument is reliable.

The validated questionnaire instrument was administered to the ninety sampled respondents from the various schools by the researcher and the results were collected on the spot by the researcher. All ninety copies of the instrument administered were successfully returned which yielded a return rate of one hundred percent.

### Results and Discussions

The results of the research were presented in tables as follows in tandem to the research questions:

#### Research Question One:

Results to research question one is presented in the table below;

**What are the most frequently used information and communication technology facilities in teaching and learning?**

From the results shown in table one above we could see that eighty two percent of the respondents strongly agree that the commonly used ICT facilities in Nigerian universities were computer system and projectors. This result shows that majority of the respondents strongly believe that computers and projectors are the ICT facilities used to teach in Nigerian Universities. This position is supported by Danope, (2013) when he discovered that amongst computer system, video tele-conferencing, audio tele-conferencing, projectors, PowerPoint presentation, use of white board, etc,

only the computer system and projectors were used often in academic presentations and teaching.

Also, fifty percent of the respondents strongly believe that lecturers and students prefer to use ICT facilities during teaching and learning than the black board. This also shows that if ICT gadgets are made available in Nigerian universities, lecturers and teachers will use them to teach various contents of interest.

**Item by item Percentage mean and standard deviation of respondents who agree and those who disagree on items to research question one.**

**Table 2: Item by item mean and standard deviations for research question one**

ITEMS	AGREE				DISAGREE			
	% Strongly Agree	% Agree	Mean (X)	STD	% Disagree	% Strongly Disagree	Mean (X)	STD
1	82.2	8.9	45.55	51.830	6.7	2.2	2.3	0.9899
2	53.3	22.2	37.75	21.991	15.6	8.9	5.8	5.939697
3	50	31.1	40.55	13.364	31.1	7.8	15	14.14214
4	6.7	40.0	23.35	23.5467	40.0	11.1	14.98	4.695189
5	7.8	34.4	21.1	18.809	43.3	14.4	28.85	20.435

From the statistic on the mean score of those that agree on the items contained in research question one; it could be observed that the mean score of the respondents that agree on the item are consistently higher than the mean score of the respondents that disagree for items that are positively skewed. This means that the respondents generally responded positively on all the items that asked whether lecturers would like to use ICT gadgets to teach in Nigerian Universities. This is in line with the findings of Jensen (2012), who opined that use of ICT gadgets in teaching and learning elicits curiosity and sustains attention of the learners more than the use of blackboard and traditional method of teaching.

Also, the mean score of respondents who disagree those other ICT gadgets apart from projectors and computer system were used in teaching was higher than the mean percentage of respondents who agree to the item. This also shows that no other ICT facilities like white board were being used in teaching in south eastern universities.

**Research Question Two:**

**What is the efficacy of use of information and communication technology gadgets in teaching and learning?**

Results to research question two is presented in the table below;

**Table 3: (cluster two) Responses to Research Question Two**

S/N	ITEMS	Frequencies and Percentages of the Scales							
		SA		A		D		SD	
		N	(%)	N	(%)	N	(%)	N	(%)
1	Use of ICT facilities makes teaching better	43	47.8	22	24.4	14	15.6	11	12.2
2	Students taught using ICT facilities learn better than students taught using the blackboard	35	38.9	30	33.3	16	17.8	9	10.0
3	Use of ICT facilities makes learning more enjoyable	54	60.0	20	22.2	10	11.1	6	6.7
4	Use of ICT facilities to teach makes lecture boring	5	5.6	7	7.8	35	38.9	43	47.8

From the table above on the response of respondents towards question items, we can see that over seventy percent of the respondents believe that use of ICT facilities to teach in classrooms makes teaching better. Also, over

eighty percent of the students believe that use of ICT facilities to in teaching and learning makes learning more enjoyable. This is in tandem with the position of UNECO (2011), report that use of ICT facilities in classroom situation yields more gain on

students achievement and makes more information available for the students.

This result is also comparable to the respondents' response to question item four of the second cluster addressing research question two. We can see that the respondents skewed negatively when asked if use of ICT facilities to

teach makes teaching to be boring. To better illustrate, the results to research question two were presented in an item by item mean and standard deviation for the respondents.

**Item by item Percentage mean and standard deviation of respondents who agree and those who disagree on items to research question two**

**Table 4: Item by item mean and standard deviations for research question two**

ITEMS	AGREE				DISAGREE			
	% Strongly Agree	% Agree	Mean (X)	STD	% Disagree	% Strongly Disagree	Mean (X)	STD
1	47.8	24.4	36.1	15.6	15.6	12.2	13.9	2.4
2	38.9	33.3	36.1	17.8	17.8	10.0	13.9	5.5
3	60.0	22.2	41.1	11.1	11.1	6.7	8.9	3.1
4	5.6	7.8	5.6	0	38.9	47.8	43.35	6.3

From the statistics presented in the table above on research question two, we can see that the mean score for those who agree are consistently higher than the respondents who disagree on research question item one to three except on research question four which is negatively skewed. This shows that the respondents believe that use of ICT facilities in

teaching and learning in the classrooms makes learning more effective than the chalk board.

**Research Question Three:**

**How available are the information and communication technology gadgets in various secondary schools for teaching and learning?**

**Table 5: (cluster three) Responses to Research Question Three**

S/N	ITEMS	Frequencies and Percentages of the Scales							
		SA		A		D		SD	
		N	(%)	N	(%)	N	(%)	N	(%)
1	There are enough computer system in my school laboratory for teaching	14	15.6	20	22.2	37	41.1	19	21.1
2	The ICT facilities in my school are readily available for students use	15	16.7	20	22.2	26	28.9	29	32.2
3	Use of ICT facilities in my school by students is prohibited except on special request from the department.	56	62.2	23	25.6	6	6.7	5	5.6
4	Our university classrooms were well equipped with ICT facilities like the computer system.	14	15.6	12	13.3	35	38.9	29	32.2

From the analysis, in answer to research question three presented above, we can observe that a greater percentage of the respondents do not believe that there is enough ICT facilities made available for teaching and learning purposes in their classrooms. This can be confirmed from the table by the fact that the percentage score of the students who skewed towards the respondents that disagree that there is enough facilities available for study.

Also, interesting is the response to question item three which seek to know if students were freely allowed to use ICT facilities in their institutions at will. Over Sixty two percent of the respondents strongly agree that the facilities were prohibited from students use except when permission is granted for a limited time or on occasions of seminar presentation.

**Item by item Percentage mean and standard deviation of respondents who agree and those who disagree on items to research question three**

Table 6: Item by item mean and standard deviations for research question three

ITEMS	AGREE				DISAGREE			
	% Strongly Agree	% Agree	Mean (X)	STD	% Disagree	% Strongly Disagree	Mean (X)	STD
1	15	22.2	18.9	4.7	41.1	21.1	31.1	14.1
2	16.7	22.2	19.45	3.9	28.9	32.2	30.6	2.3
3	62.2	25.6	43.9	25.9	6.7	5.6	6.2	0.8
4	15.6	13.3	14.45	1.6	38.9	32.2	35.6	4.7

Also from the table above, we could observe that the mean score of respondents who disagree that there are enough ICT facilities in south eastern universities. This is in exception of item three in which they agree that use of ICT facilities are usually used on special request from relevant departments.

### Conclusions

Based on the findings from the results to research question one to three, the researcher therefore concludes that;

- The most frequently used ICT facilities for teaching and learning purposes in south eastern Nigerian universities were computer system and projectors.
- Use of information and communication technology facilities in teaching in South Eastern Nigerian Universities is more effective than use of the blackboard.
- ICT facilities are not readily available for teaching and learning purposes in Nigerian universities.

### Recommendations

Based on these conclusions, the following recommendations were proffered;

- Use of Other ICT facilities like white boards and video tapes should be exploited by teachers to enhance more use of other ICT facilities in teaching and learning.
- Efforts should be intensified by both school authorities and government agencies in organizing conferences and workshops to emphasize more gains inherent in use of ICT facilities in teaching and learning so that most teachers will come to appreciate it and make concerted effort in using ICT gadgets to teach their students.
- Government agencies should intensify funding on provision of and installation of

ICT facilities for students and teachers use in our Universities.

- Parents who can afford computer system should buy one for their children as the equipment helps to strengthen children's grasp in use of the ICT facilities for effective learning.

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## ANDROID PHONE MAINTENANCE COMPETENCIES REQUIRED FOR TRAINING OF YOUTHS IN LAGOS STATE

BY

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### ABSTRACT

*The study made appropriate contents in android phone maintenance for training of youths at skill acquisition centres in Lagos State. Three research questions guided the study and three null hypotheses formulated were tested at 0.05 level of significance. A survey research design was adopted for the study. The population for the study was 122 which comprised of all the 35 lecturers of electrical/electronic engineering technology in Polytechnics, 22 lecturers of electrical/electronic technology in Colleges of Education and 67 road side cell phone technicians in Lagos State. Since the population was manageable, the entire 122 respondents were used in the study, therefore, there was no sampling. A structured questionnaire was used for data collection. The instrument was validated by three experts. Cronbach alpha reliability method was adopted to determine the internal consistency of the questionnaire item and 0.84 was obtained. One hundred and twenty two copies of the questionnaire were administered. One hundred and twenty copies of the questionnaire were collected back and analyzed using factor analysis while analysis of variance was used to test the hypotheses of no significant difference at 0.05 level of significance. The study found out that the competencies identified in android phone maintenance are appropriate for the training of youths at skill acquisition centres in Lagos State. It was recommended that all the competencies identified should be used to organize training for youths at skill acquisition centres in Lagos State.*

**Keywords:** Appropriate content, android phones, Maintenance, Training, Youths, competence

### INTRODUCTION

Android phone is a powerful, high-tech handset that runs on Google's android operating system. Android phones come in different shapes, colours and sizes. Some have super fast processors, powerful cameras and a few have hardware QWERTY keyboards. All current android phones feature a touch screen, the size of which varies, but in most cases it measures at least 3-inches diagonally, although some devices use much larger displays. Reardon (2010) described android phones as modern mobile phones which typically support additional services such as e-mail and internet access; short-range wireless communications, as well as business and gaming applications, and photography. Bakare (2014) explained that android phones are capable of sending and receiving emails, editing documents and storing files. Every handset maker makes

android phones. Samsung, Sony, Acer, Alcatel, Asus, Huawei, LG, Motorola and ZTE have all made android phones. They have a number of features in common, but manufacturers also try to differentiate their own products by implementing additional functions to make them more attractive to consumers. Android phones are sophisticated and complex in nature but found very useful in all aspect of human life. Bakare (2014) stated that there is no aspect of human life where cell phones have not made impacts. Android phones are found useful in education, security, health, transportation business among others. Android phones are prone to faults such as open and short circuit faults, broken screen, casing, ports and motherboard most especially when handled carelessly or misused. In order to bring faulty android phones back to normal

operable stage, maintenance activities must be carried out.

Maintenance is the activities carried out to restore back a malfunctioning or faulty device. Maintenance according to Olaitan in Ihediwah (2007), is a set of measure or steps taken to ensure that a given piece of equipment or infrastructure is kept in good operational order until it attain its maximum possible life span. In the Report of Microsoft Corporation (2009) maintenance is described as the work done regularly to keep a machine, building, or piece of equipment in good condition and working order. Two major types of maintenance can be carried out on android phones include preventive and corrective maintenance. Preventive maintenance is systematic inspection, detection, correction and prevention of developing failures, before they become actual or major failures. Bakare (2014) described corrective maintenance as the activity undertaken to detect, isolate and rectify a fault so that the failed equipment, machine or system can be restored to its normal operable state. Maintenance of faulty devices like android phones requires or demands appropriate content development that will guide our youth in their skill training.

Content is the totality of the subject matter delivered to the students through appropriate process in order to achieve a clearly stated objective. Content according to Urevbu (1994), refers to what is taught in school, it is the subject matter or topics consisting facts, concepts, ideas, skills, knowledge within a particular subject and how they will bring about change in the individual and to the society. Content is a list of subjects, topics, skills, competencies, themes, concepts or works to be covered by teacher and his students. Gay (1999) explained that appropriate contents should therefore meet the needs of society in which it is being implemented. Bakare (2014) stated that a content is appropriate when meets the need of the immediate society, hence, adequate skill training will be impossible to achieve without appropriate contents.

Appropriate training contents for android phone maintenance, therefore, should include a list of skills and competencies in troubleshooting, phone repairs, flashing, configuring, maintaining and upgrading of malfunctional phones. James (2011) explained that android phones help in selling and buying of goods and services with ease but has

created some management problems to the users in the areas of maintenance where youth can gainfully be employed. Youths are young energetic people whose ages range from 16 to 35 years. Youths according to United Nation General Assembly report (1995) are young people of 15-24 years bracket. Abu (2014) stated that this age range may go up to 30 years in developing countries like Nigeria. The youth population according to the 2006 census is almost a hundred million. This means that they constitute more than two thirds of the country's population of 140 million. They are the backbone of the development of the country. Indeed if Nigeria is to be sustained as a viable entity, there must be a very good plan to tap the energy and resourcefulness of the youth population to fast track economic development and this can be achieved through skill training in android phones.

Training is the learning activities carried out to modify the behavior of someone or group of learners. Training according to Gordon (1992) is a planned and systematic modification of behavior through learning event, activities and programme which results in the participant achieving the level of knowledge, skills and abilities to carry out their work effectively. Onuka (2008) viewed training as a skill acquisition process through which youths are taught new knowledge and skills and how to apply them. The author stated further that the objectives of training youths in occupations is to assist them in acquiring relevant competencies in all aspect of any production activities so as to increase their production capacity. Training therefore is the acquisition of relevant knowledge and skills require for maintaining of android phones by the youths through practical teaching to enhance their entry into android phone maintenance

Making of appropriate contents in android phone maintenance for training of youths will not only help providing information on the knowledge, skills and attitude required for effective cell phone maintenance but it will enhance technological development and provide employment to the youths (Ogbuanya and Bakare, 2014). Unemployed and underemployed youths are more exposed to conflicts and illegal activities, many of them fall prey to armed and rebel conflicts. To address these issues of youth unemployment, this study is set to determine the skill content areas appropriate for

training of youths for maintenance of android phones in Lagos State.

### Statement of the Problem

Most of the users cannot easily locate efficient technicians who can repair and service faulty android phones thereby making users whose phones are faulty abandon them for new ones. Providing competent personnel to maintain faulty android phones will reduce continuous spending of money and electronic wastage which can cause health problems such as cancer to people especially where they are exposed carelessly. Moreover, the report of the study of Bakare (2014) showed that the people maintaining android phones in Lagos State are not formally trained and therefore use trial by error approach during maintenance and cause more problems to cell phones contracted to them. Making use of appropriate contents in android phones maintenance for training youths at skills acquisition centres will also reduce unemployment in the society.

### Purposes of the Study

The major purpose of this study was to identify android phone maintenance competencies required for training of youths in Lagos State. Specifically, the study sought to identify:

1. Competencies required for servicing and repairing of faulty android phones
2. Competencies required for configuring and flashing of malfunctioning android phones
3. Competencies required for upgrading of android phones

### Research Questions

1. What are the competencies required for servicing and repairing of faulty android phones by youths in Lagos State?
2. What are the competencies required for configuring and flashing malfunctioning android phones by youths in Lagos State?
3. What are the competencies required for upgrading android phones by youths in Lagos State?

### Hypotheses

The following null hypotheses were tested at .05 level of significance:

- H<sub>01</sub>:** There is no significant difference in the mean responses of lecturers of electrical/electronic engineering technology in Polytechnics, Colleges of

Education and Cell phone technicians on the competencies required for servicing and repairing of faulty android phones.

- H<sub>02</sub>:** There is no significant difference in the mean responses of lecturers of electrical/electronic engineering technology in Polytechnics, Colleges of Education and Cell phone technicians on the competencies required for configuring and flashing of malfunctioning android phones

- H<sub>03</sub>:** There is no significant difference in the mean responses of lecturers of electrical/electronic engineering technology in Polytechnics, Colleges of Education and Cell phone technicians on the competencies required for upgrading android phones

### Method

The study adopted survey research design. Survey research design in the opinion of Osuala (2005) is a design that studies characteristics and focuses on people, the vital facts of people and their beliefs, opinions, attitude, motivation and behaviors. The survey research design is appropriate for this study because it aimed at identifying appropriate contents in android phones maintenance for training of youths. The study was conducted in Lagos State of Nigeria. The population for the study was 122 which comprised of all the 35 lecturers of electrical/electronic engineering technology from Department of Electrical/Electronics Technology, Yaba College of Technology, Lagos State Polytechnic Ikorodu and Lagos City Polytechnic Ikeja and 20 Lecturers of Electrical/Electronic Technology from Federal College of Education (Technical) Akoka and Adeniran Ogunsanya College of Education Otto Ijanikin and 67 Cell phone technicians in Lagos State. Since the population was manageable, the entire 122 respondents were used in the study, therefore, there was no sampling.

A structured questionnaire was used as instrument for data collection based on 5-point Likert scale. The structured questionnaire had 56 competency items developed for collecting data in accordance with the research questions. The instrument was in four sections A-C. A centered on competencies required for servicing and repairing of faulty android phones, B was on competencies required for configuring and flashing of malfunctioning android phones, C dealt with the competencies required for upgrading android

phones. The instrument was face validated by three experts drawn from Department of Vocational Teacher Education, University of Nigeria, Nsukka. The internal consistency reliability coefficient of 0.84 was obtained for questionnaire items using Cronbach alpha technique. Out of one hundred and twenty two copies of the questionnaire administered to the respondents with the help of three research assistants, only 120 copies were duly retrieved which represent 98.36 percent return rate.

The data collected from the study were analyzed using factor analysis for answering the research questions. For selecting the appropriate competencies in android phones maintenance for youth empowerment, 0.50 as factor loading was utilized. Any competency with factor loading of 0.50 and above was required and any competency with factor loading less than 0.50 was not required. Analysis of Variance (ANOVA) was employed for testing the three null hypotheses at 0.05 and relevant degrees of freedom. The null hypothesis of no significant difference was accepted for any item whose P- value was greater than 0.05, but it was rejected for any item whose P-value was less than 0.05.

## Results

The results for the study were obtained from the research questions answered through data collected and analyzed.

### Research Question 1

What are the competencies required for servicing and repairing of faulty android phones by youths in Lagos State?

#### Hypotheses 1

$H_{01}$ : There is no significant difference in the mean responses of lecturers of electrical/electronic engineering technology in the Polytechnics, Colleges of Education and Cell phone technicians on the competencies required for servicing and repairing of faulty android phones.

The data answering research question and testing hypothesis one are presented in Tables 1a, b & c.

**Table 1(a): Summary of the outcome of Factor Analysis for answering Research Question One and Analysis of Variance for Testing Hypothesis One**

SN	A. Competencies in Troubleshooting android phones	Factor Loading at 0.50	P-values	Sig.	Remark	Ho
1	Write down the history of the faults from the cell phone user	0.78	0.61	0.05	Required	NS
2	Identify the facilities for cell phone trouble shooting	0.61	0.38	0.05	Required	NS
3	Test the faulty cell phone in the presence of the owner	0.57	0.57	0.05	Required	NS
4	Identify the symptoms of all the possible faults	0.68	0.49	0.05	Required	NS
5	List all the possible causes of the problems	0.55	0.45	0.05	Required	NS
6	Check the list of possible causes against the list of the symptoms	0.70	0.54	0.05	Required	NS
7	Rank the remaining causes in order of likelihood	0.71	0.51	0.05	Required	NS
8	Tackle the likeliest causes in the order of the complexity, cost and /or time required to check them	0.77	0.38	0.05	Required	NS
9	Use tested or certified unit to replace bad units of the same capacity if fault is obvious	0.58	0.49	0.05	Required	NS
10	Record down the outcome of the troubleshooting	0.66	0.61	0.05	Required	NS
11	Reveal the result of the trouble shooting to the owner of the cell phone	0.67	0.67	0.05	Required	NS

**Table 1(b): Summary of the outcome of Factor Analysis for answering Research Question One and Analysis of Variance for Testing Hypothesis One**

SN	B. Competencies in servicing malfunctioning android phones	Factor Loading at 0.50	P-values	Sig.	Remark, Ho
12	Dismantle cell phone before embarking on maintenance actions	0.52	0.45	0.05	Required NS
13	Check the battery contacts for proper connection	0.66	0.51	0.05	Required NS
14	Clean the battery by removing carbon from the contacts	0.67	0.21	0.05	Required NS
15	Clean the motherboard of a phone using soft wool	0.78	0.32	0.05	Required NS
16	Adjust the settings of the phone for functionality	0.58	0.33	0.05	Required NS
17	Heat each ICs inside the phone for functionality	0.65	0.54	0.05	Required NS
18	Dry clean the phone if drop inside the water	0.59	0.48	0.05	Required NS
19	Check for proper contact of SIM card	0.71	0.55	0.05	Required NS
20	Clean the whole of cell phone with appropriate agents	0.56	0.31	0.05	Required NS
21	Check the speaker or mouth piece for proper operation	0.72	0.34	0.05	Required NS
22	Check the charging point of a phone for functionality	0.66	0.45	0.05	Required NS
23	Clean the screen of a cell phone	0.61	0.23	0.05	Required NS
24	Check the flash light of a cell phone for proper operation	0.73	0.46	0.05	Required NS
25	Check the flip flop IC for proper operation in case of sliding phone	0.67	0.42	0.05	Required NS
26	Check the power ICs of a cell phone for functionality	0.67	0.43	0.05	Required NS
27	Check all electrical installation operations as designed in schematic manual	0.51	0.30	0.05	Required NS
28	Check for contact of keyboard for proper operation	0.67	0.34	0.05	Required NS
29	Test the keyboard IC for effective operation	0.77	0.05	0.05	Required NS
30	Check the active components in the charger for functionality	0.65	0.51	0.05	Required NS
31	Check the passive components in the charger for functionality	0.76	0.38	0.05	Required NS
32	Clean the screen of a cell phone with a very soft damped cotton cloth	0.55	0.52	0.05	Required NS
33	Scratch the battery and SIM contacts with fine sharp paper or object	0.58	0.27	0.05	Required NS

**Table 1(c): Summary of the outcome of Factor Analysis for answering Research Question One and Analysis of Variance for Testing Hypothesis One**

SN	C. Competencies in repairing faulty cell phones	Factor Loading at 0.50	P-values	Sig.	Remark, Ho
34	Dismantle the cell phones	0.69	0.59	0.05	Required NS
35	Split out the casing of the cell phone	0.60	0.51	0.05	Required NS
36	Separate the key pad from the mechanism	0.56	0.62	0.05	Required NS
37	Move the slider down	0.58	0.71	0.05	Required NS
38	Lift the connector up to unplug the screen that is attached to the circuit ribbon	0.59	0.54	0.05	Required NS
39	Move the slider up in case of slide phone	0.71	0.71	0.05	Required NS
40	Run fingernail along the edge of the front cover to unclip it	0.65	0.43	0.05	Required NS
41	Remove the front cover of the cell phone	0.58	0.21	0.05	Required NS
42	Identify faulty area or components in a cell phone	0.67	0.43	0.05	Required NS
43	Test the components with appropriate testing instruments	0.56	0.51	0.05	Required NS
44	Remove the component(s) from the mother board using appropriate tools	0.78	0.34	0.05	Required NS
45	Select components of correct specification	0.62	0.08	0.05	Required NS

46	Verify the condition of the components before fixing it back to the mother board	0.59	0.54	0.05	Required	NS
47	Repair or change the faulty components if totally bad	0.72	0.21	0.05	Required	NS
48	Fixes back the components into mother board correctly	0.64	0.43	0.05	Required	NS
49	Applies soldering iron for only 3 seconds if needed	0.52	0.22	0.05	Required	NS
50	Applies sufficient flux to point(s) being soldered	0.63	0.43	0.05	Required	NS
51	Couple back the phone	0.57	0.19	0.05	Required	NS
52	Configure the phone	0.56	0.22	0.05	Required	NS

Data in presented in Tables 1a, b and c showed that all the competencies in troubleshooting, servicing and repairing faulty android phones had their factor loadings ranged from 0.51 to 0.78 which were either equal to or greater than 0.50 loading factor. This indicated that all the competencies in troubleshooting, maintaining and repairing faulty android phones are appropriate for training of youths in Lagos State. The Table also indicated that all the items had their P-values greater than 0.05. This indicated that there was no significant difference in the mean responses of lecturers in Polytechnics, Colleges of Education and Cell phone technicians on the competencies in troubleshooting, maintaining and repairing faulty android phones. Therefore, the null hypothesis of no significant difference was upheld for all the 52 competencies.

**Table 2: Summary of the Outcome of Factor Analysis used for answering Research Question two and Analysis of Variance for Testing Hypothesis two**

SN	Competency items	Factor Loading at 0.50	P-values	Sig.	Remark	Ho
<b>D</b>	<b>Competencies in configuring malfunctional android phones</b>					
1	Select or click on menu	0.66	0.53	0.05	Appropriate	NS
2	Select settings	0.51	0.34	0.05	Appropriate	NS
3	Select configure setting correctly	0.52	0.09	0.05	Appropriate	NS
4	Identify or generate personal configuration	0.49	0.54	0.05	Appropriate	NS
5	Select add new in web	0.71	0.67	0.05	Appropriate	NS
6	Create wap.mtnonlineplay.com	0.65	0.43	0.05	Appropriate	NS
7	Select home page	0.58	0.21	0.05	Appropriate	NS
8	Click on bearing setting to have proxy server	0.67	0.43	0.05	Appropriate	NS
9	Generate 8080 on port	0.56	0.81	0.05	Appropriate	NS
10	Rewrite username and password two times	0.78	0.27	0.05	Appropriate	NS
11	Click backup and choose options	0.62	0.58	0.05	Appropriate	NS
12	Activate as web	0.59	0.54	0.05	Appropriate	NS
13	Click web for browsing to show bookmark	0.72	0.09	0.05	Appropriate	NS
14	Complete the configuration correctly	0.64	0.08	0.05	Appropriate	NS
<b>E</b>	<b>Competencies in flashing malfunctional android phones</b>					
15	Select appropriate facilities for flashing	0.66	0.56	0.05	Appropriate	NS
16	Connect the laptop to the internet	0.53	0.88	0.05	Appropriate	NS
17	Key in the website of the service provider	0.58	0.44	0.05	Appropriate	NS
18	Unzip the downloaded flashing software	0.64	0.65	0.05	Appropriate	NS
19	Download correct software from the website of the service provider	0.65	0.08	0.05	Appropriate	NS
20	Register with the CDMA or GSM carrier in the cell phone	0.67	0.54	0.05	Appropriate	NS

## Research Questions 2

What are the competencies required for configuring and flashing of malfunctioning android phones by youths in Lagos State?

## Hypothesis 2

**H<sub>02</sub>:** There is no significant difference in the mean responses of lecturers of electrical/electronic engineering technology in Polytechnics, Colleges of Education and Cell phone technicians on the competencies required for configuring and flashing of malfunctioning android phones

The data answering research question and testing hypothesis two are presented in Table 2

21	Connect the cell phone to the computer with the help of appropriate USB cable	0.63	0.69	0.05	Appropriate	NS
22	Install the downloaded software onto the phone	0.51	0.21	0.05	Appropriate	NS
23	Complete the installation within 15-20 minutes	0.56	0.17	0.05	Appropriate	NS
24	Disconnect the phone from laptop	0.55	0.23	0.05	Appropriate	NS
25	Test the cell phone for functionality	0.70	0.23	0.05	Appropriate	NS

Data presented in Table 2 showed that all the competencies in configuring and flashing malfunctioned android phones had their factor loadings ranged from 0.51 to 0.78 which were either equal to or greater than 0.50 loading factor. This indicated that all the competencies in configuring and flashing malfunctioned android phones are appropriate for training of youths in Lagos State. The Table also indicated that items had their P-values greater than 0.05. This indicated that there was no significant difference in the mean responses of lecturers in Polytechnics, Colleges of Education and Cell phone technicians on the competencies in configuring and flashing malfunctioned android phones. Therefore, the null hypothesis of no significant difference was upheld for all the 25

competencies in configuring and flashing malfunctioned android phones.

### Research Question 3

What are the competencies required for upgrading of android phones by youths in Lagos State?

### Hypothesis 3

**H<sub>03</sub>:** There is no significant difference in the mean responses of lecturers of electrical/electronic engineering technology in Polytechnics, Colleges of Education and Cell phone technicians on the competencies required for upgrading android phones

The data answering research question and testing hypothesis three are presented in Table three

**Table 3: Summary of the Outcome of Factor Analysis for answering Research Question two and Analysis of Variance for Testing Hypothesis two**

SN	Competency items	Factor Loading at 0.50	P-values	Sig.	Remark	Ho
<b>F</b>	<b>Competencies in Upgrading android phones</b>					
1	Select the appropriate material for upgrading	0.63	0.06	0.05	Appropriate	NS
2	Remove obsolete parts of the android phone	0.56	0.28	0.05	Appropriate	NS
3	Unscrew the parts or unit to be upgraded	0.68	0.44	0.05	Appropriate	NS
4	Replace the obsolete parts or unit of the android phone	0.53	0.65	0.05	Appropriate	NS
5	Connect android phones to the computer using USB cord	0.65	0.08	0.05	Appropriate	NS
6	Open the iTunes software	0.54	0.54	0.05	Appropriate	NS
7	Select the android phone name to the iTunes source list on the left	0.62	0.59	0.05	Appropriate	NS
8	Select the summary tab	0.59	0.21	0.05	Appropriate	NS
9	Check for update button	0.68	0.11	0.05	Appropriate	NS
10	Select install newest button	0.55	0.53	0.05	Appropriate	NS
11	Close the window	0.68	0.45	0.05	Appropriate	NS
12	Disconnect the android phone from the computer	0.56	0.51	0.05	Appropriate	NS

The data presented in Table 3 revealed that factor loading of the competencies in upgrading malfunctioned android phones ranged from 0.53 to 0.68. This means that all the 12 competencies in upgrading malfunctioned android phones are appropriate for the training of youths at skills acquisition centres in Lagos State. The Table also

indicated that each item had its P-value greater than 0.05. This showed that there was no significant difference in the mean response of lecturers in Polytechnics, Colleges of Education and Cell phone technicians on the competencies in upgrading android phones. Therefore, the hypothesis of no significant difference was upheld for the 12 competencies.

## Discussion of findings

The findings of this study revealed 52 appropriate competencies for trouble shooting, servicing, and repairing of faulty android phones, 25 competencies in configuring malfunctioned android phones, and 12 competencies in upgrading malfunctioned android phones. The findings of this study agreed with the findings of Ogbuanya and Bakare (2014) who conducted a study on mechatronics skills required for integration into electrical/electronic engineering technology programme in polytechnics for sustainable employment of graduates in contemporary Nigeria. The findings revealed that 16 mechatronics contents and 40 mechatronics skills were required for integration into electrical/electronic engineering technology programme in polytechnics for sustainable employment of graduates

This finding was in agreement with the findings of Nwachukwu, Bakare and Jika (2010) who carried out a study to identify effective laboratory safety practice skills required by electrical and electronics students for effective functioning in the laboratory of technical colleges in Ekiti State. The authors found that 10 safety practice skills were required to use electrical hand tools, 25 safety practice skills in operating electrical and electronic power tools and machines and 10 safety practice skills for working in electrical/electronic workshop.

This finding is also in agreement with the study of Akinduro (2006) who carried out a study on electrical installation and maintenance work skills needed by technical college's graduates to enhance their employability in Ondo State. The author found out that the graduates of technical colleges need domestic installation skills, industrial installation skills, cable jointing skills, battery charging skills and winding skills in electrical machine for employment in Ondo state. The findings of the above researchers in their various research activities helped to support the justification of the results of this study on the development of appropriate competencies in smart phone maintenance for empowerment youths at skills acquisition centres.

## Conclusion

Android phones are recent mobile technology used by the people to make and receive calls. Android phones are cell phones that typically support services such as e-mail and internet access; short-range wireless communications, as

well as business and gaming applications, and photography. These phones are useful by many people in Lagos state but most of the users could not easily locate competent technicians who can repair or service faulty android phones thereby making users whose phones are faulty abandon them for new ones. It is in this direction that this study was carried out to identify appropriate android phone maintenance competencies required for training of youths in Lagos State. Based on the data collected and analysed, the study identified 52 competencies in servicing and repairing of faulty android phones, 25 competencies in configuring and flashing of malfunctioning android phones and 12 competencies in upgrading android phones that are required by youths in Lagos State.

## Recommendations

1. It is recommended that all the identified competencies in android phone maintenance should be used for training of youths at various skills acquisition centres in Lagos State.
2. The competencies identified in this study should be permanently integrated into the programmes of electronics technology in skills acquisition centres.
3. Relevant facilities and materials should be made available by government and enabling individuals for training of youths in android phone maintenance in skills acquisition centres.

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## EFFECTS OF FOUR MODES OF DIGITAL VIDEO DISC PRESENTATIONS ON STUDENTS' ACHIEVEMENT AND RETENTION IN SALAH IN NIGER STATE, NIGERIA

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### ABSTRACT

*The study was carried out to investigate the effects of four modes of digital video disc presentations on students performance in Salah. This study is a true experimental research design that employed a randomized of four groups. Two hundred and two students (one hundred and sixty male students and forty two female students) were used for the study. One of the co-educational senior secondary schools (GDSS) in Minna, Niger State was purposively selected for the study. Three tests on achievement, performance and retention measured based on individual, dual/congregational and amendments in Salah were used for data collection. Fifty objective questions on achievement test in Salah were the instruments used for collection of data. Two research questions were answered anti two hypotheses tested. The independent variables were four modes of Digital Video Disc consisting; picture before text, text before picture, picture text synchronized and text-only: the mediating variable was gender anti dependent variables were achievement and retention. The data were analysed using mean, standard deviation and analysis of variance. There were significance differences ( $P < .05$ ) in the mean scores of the different four modes in achievement. There was no significant difference of gender on students' achievement score using retention in Salah, ( $P < .228$ ). Based on the findings and implications, it was recommended that the Ministries of Education should liaise with the National Education Technology Center, Kaduna and other such centers to produce digital video discs as instructional materials for use in schools to facilitate students' performance in learning. The use of these modes: Picture before Text and Text before Picture should be employed by Islamic studies teachers and teachers from other disciplines.*

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### INTRODUCTION

Islamic Studies is one of the subjects in the School curriculum. The word "Islam" is an Arabic word meaning peace (Salam). The literal meaning of Islam is to yield or submission to God (Ahmed, 1990). Islam means total submission to the command and will of God (Habiba. 2013). Islam is a monotheistic religion articulated by the text considered by its adherent to be the verbatim word of God (Qur'an), and by the teachings and normative examples called the Sunnah and composed of Hadith of Muhammad who is the last Prophet of God (Esposito. 2010). Muhammad (2008) further explained that what is required of a Muslim is to live in perfect peace with others and try during his or her entire life to establish good relation between man and man as well as man and God. The religion's concepts and practices according to

Farah (2011) include the five pillars of Islam which consist of sincerely reciting the Muslim profession of faith (Shahadah), performing ritual in the proper way five times each day (Salah), paying alms or charity or tax to benefit the poor and the needy (Zakat), fasting during the month of Ramadan (Sawm) and performing pilgrimage to Mecca (Hajj). They are the five obligations that every Muslim must satisfy in order to live a good and responsible life according to Islam.

Salah is described by Kaura, Amoo, Muhammed and Flassan (1999) as the means through which Muslims thank Almighty Allah for the favour done to the worshippers and also seek the provision of many other things that are essential to them. Salah is positioned second among the five pillars and must be obligatorily performed five times in a day

but in accordance with the conditions (Ahmad. 1990). Habiba (2013) qualified Salah as the first, highest and most solemn phenomenon manifestation of the Islamic religion and it is an absolutely necessary activity of the Islamic religious life. Ahmad further noted that Salah is the heart and centre of Islamic practices. The worshipper, who performed the Salah at the right time in congregation, enjoys and expresses satisfaction for doing it (Mahmud. 2006). The obligatory requirements to make up the unit (Raka'ah) Mahmud (2006) are as follow: (Takbir ihram) the first pronouncement of Allah is the greatest: Ruku'u or bowing of the worshipper's back and kept in flatten manner; rising from the Ruku'u; Sujud or prostration while the palms and fore-head are on the ground and rising from the Sujud. If any of these six arts in Salah is omitted or added mistakenly and later realized by the devotee, he must amend it by performing Qabli or Ba'di postures. The five obligatory daily Salahs could he performed in the mosque, home or neat open places (Ademiran. 2000). According to Kaura et al (1 999) Salah is mainly divided into two: the obligatory and the non obligatory.

The teaching of Prophet Muhammad (Hadith) explained that Salah performed in congregation is more rewarding than individual Salah. Congregational Salah is superior or always rewarded twenty seven times than Salah performed individually (Hedayatullah. 2006). Therefore. devotee should pray in congregation and be mindful of God during the performance of the arts. Muslim should be able to amend the Salah when any mistake is made during its performance. Correct and timed performance in Salah expresses the Islamic religious obligation in which Muslim puts oneself in relation with Allah in the simplest and most direct way.

Digital video disc or digital versatile disc (**DVD**) is an **optical disc storage media** (Philips. Sony, Toshiba & Warner, 1995). For digital video disc to be used in teaching and learning it must fulfil these functions: represents and presents both real and virtual words, facilitates teaching and enhances learning condition (Curtis, 2004). DVD is a multimedia. It has the capacity to incorporate variety in instructional design. DVD has numerous important roles which include proper presentation, explanation and understanding of processes, actions or behaviour in which temporal direction is a fundamental element and the moving image is indispensable (Guitierrez. 1997). Video also takes

off the work-load from the teacher and it is a medium that opens the window to the outside world (Akpabio & Dubriel, 2004). That means, video has made teaching easier for teachers who handle the classes that are more than one hundred students in times of control, audibility and visual. Furthermore, Kumar, Sharm and Vyas (2003) outlined the following attributes of video: it enhances group discussion, it is not costly and many students can be favorably exposed to it; it is ranked third behind telephone and computer and returns attractive investment. According to Malik (2010), video breaks through the villages of the world, for example in distance learning programmes, learners acquire knowledge through medium with the use of Instructional guides. DVD is preferred to video cassette in this study because it is a more recent educational technological media. The application of educational technology or media in instruction according to Okwo (1999) can bring immense benefits to the learners. As conventional methods of ilk and chalk could not improve the poor performance of students in Salah, this study used four modes of DVD. These include text-only, picture text synchronized, text before picture, and picture before text, all were in silent mode in this study hut sound could be added to all of these in another study. This video presentation appeals to women in leading Salah especially during the month of Ramadan when men who are versed in Quran are not in the residence.

The challenges are designing, structuring and encoding of information on DVD in instruction. Therefore, DVD has the potentials for enhancing the acquisition of the skills in Salah. In the same vein, Mayer (2001) explained that the more variety we incorporate in methodology and media, the better our chances of developing specific abilities of each student.

Gender is a range of characteristics that distinguishes male and female or masculine and feminine attributes assigned to them (Richard, 1994). In relation to the above definition, Abideen et al, (1995) noted that women are not sanctioned from leading obligatory Salah in congregation of male and female in the mosque or other places by Islamic law but she must be more versed in Quran than the male under her residence which Umm Waraqa bint Abdullah was an example. This video presentation appeals to women in leading Salah at co-educational schools, girls schools and also during the month of Ramadan when men who are versed in Quran are not in the residence.

The degree of success of the four modes of DVD could be achieved through the use of instruments like, achievement test and others. According to Gabriel, (2009) achievement test is a term used to indicate the degree of success attained in some general or specific area. Achievement test affirms students learning progress and teachers teaching ability. As such, if student finds certain area difficult to understand, the teacher will provide additional support and use of different methods of instructions (Mahmud, 2006). Achievement test in this work refers to 50 objective questions administered to the students after the third lesson.

Retention in this study also refers to the level to which the learners can reproduce what they were taught after some times (McCullough, 1992). Walsh, (1990) defined visual retention test to be an individually administered test for students that are of the same age especially, eight to adulthood. Visual retention test measures visual concept and visual memory. It could be timed and the results are professionally scored through rating on arrangement of papers.

Therefore, the re-testing on achievement test done after four weeks shows the students understood what was taught and their levels of memorization was also identified effective (retention test). In relation to this study, these researchers examined the retention level of students using slide and video: Yusuf (1997) on the use of slide and Achebe (2006) on the use of video instruction but no researcher did on the use of mode of digital video disc instruction presentations on students level of comprehension. This prompted the researcher to examine students using retention test as well. However, National Examination Council (NECO) Chief Examiners' Reports (2009-2011) identified that one of the areas of the students' poor performance in Islamic studies includes Salah and suggested improvement on the method of instruction. This calls for the determination of the researcher to find out the effects of four different modes on achievement, performance and retention. Picture may come before text, text may come before picture or picture and text synchronized or verbal message completely absent in DVD presentations. These packages explain the four modes of DVD presentations used in this study.

#### **Statement of the Problem**

Salah is a very important topic in the area of Islamic studies and most of the students offer it. It has been noted that students do not perform well in Salah. This has been buttressed by the Chief Examiners'

Reports for NECO (2009-2011). Therefore, students inability to perform Salah properly, poses a lot of problems in this area of study. Islamic studies being very important subjects that deals with moral training of the students is also important in their academic life and the society at large. If this important aspect of Islamic studies is not well tackled and taught to the students will mere the objectives this important subject.

That is, the inability of the students to perform Salah well may be attributed to the ways the content is usually presented to the students. Conventionally, students were presented the content through verbal while this requires a new method of presentations to the students. Therefore, this study will investigate the effects of four modes of DVD presentations on the senior secondary school students ways of performing Salah.

#### **Purpose of the Study**

The purpose of the study was to find out the effects of four modes of digital video disc presentations (picture before text, text before picture, picture and text synchronized and text only): gender and achievement and retention test (4x2x3) in Salah. Specifically, the study:

1. Determine the effects of four modes of video presentations on students retention achievement scores in Salah..
2. Find out the retention achievement score of students using four modes of video presentations in Salah. based on gender.

#### **Research Questions**

These research questions guided the study:

1. What are the effects of four modes of presentations in mean score of students retention achievement test in Salah?
2. What is the effect of gender in mean score of students retention achievement test of video presentations in Salah?

#### **Hypotheses**

Based on the research questions outlined above, the following hypotheses were tested at 0.05 level of significance.

**Ho<sub>1</sub>:** There is no significant difference in the mean score of students retention achievement test of four modes of video presentations in Salah.

**Ho<sub>2</sub>:** Gender is not a significant source of difference in the mean score of students retention achievement test of four modes of presentations in Salah.

### Methods of Data Analysis

Mean and standard deviation were used to answer the research questions, Analysis of variance (ANOVA) was used to test the hypotheses. The direction of differences was established using a Scheffe analysis for pairwise comparison.

### Methodology

The research design adopted for this study was a true experimental design. The population was made up of two hundred and two senior secondary school one (SSSI) students from Day Secondary School, Minna in Niger State. The sample constituted 160 boys and 42 girls randomly selected for the study. From the sample, four groups were formulated. These groups are model- 51 students, mode 2-51 students, mode 3-40 students and mode 4-50 students respectively. All the four groups are experimental. The research instrument was made

up of 50 objective questions in Salah. The topic was Salah drawn from second terms scheme of work FCT, (2004) and developed by the researcher. Post-test took place immediately after the third day lesson. The retention test took place after four weeks conduction of the post-test. The two tests were marked and the level of the students retention ability were also measured. Three lecturers validated the instruments. Mean and standard deviation were used to answer the research questions and analysis of variance (ANOVA) was used to test the hypothesis. Sheffe analysis for pairwise comparison showed the direction of the differences.

**Table 1: Mean and standard deviation on retention achievement scores of students according to mode**

Mode	Presentations	N	Mean	Std. Deviation
1	Picture Before Text	51	26.27	6.94
2	Text Before Picture	51	30.73	7.99
3	Picture Text Synchronised	50	24.42	7.43
4	Text-only	50	28.74	6.59
	Total	202	27.55	7.59

The data on retention achievement scores of students on Table I revealed that students in mode 2 retained most with mean score of 30.73 and standard deviation of 7.99, this was followed by the students in mode 4 with mean score of 28.74 and standard deviation of 6.59. Next to students in

mode 4 were students in mode 1 with the mean score of 26.27 and standard deviation of 6.94.

### Research Question 2

What is the effect of gender in the mean retention achievement scores of students in Salah?

**Table 2: Scheffe Post Hoc Test for significant differences in means among students retention achievement scores in Salah**

Mode	N	Subset		
		1	2	3
Mode 1	50	24.42		
Mode 2	51	26.27	26.27	
Mode 3	50		28.74	28.74
Mode 4	51			30.73
Sign.		.648	.406	.595

The results in table 2 revealed that there were differences in mean scores of students in mode 3 (picture text synchronised), mode 4 (text-only) and mode 2 (text before picture). The significant differences were in favour of mode 2 and

4. There were significant differences in students achievement in retention test in modes 1 and 2 in favour of mode 2. There were no significant differences between mode 3 and 1, 1 and 4, and 4 and 2.

**Table 3: Mean and Standard Deviation retention achievement scores of students four modes of presentation by gender**

Gender	N	Mean	Std. Deviation
Male	160	27.21	7.72
Female	42	28.83	7.04
Total	202	27.55	7.59

The data on gender in Table 3 revealed that female students with mean of 28.83 and standard deviation of 7.04 performed better than the male students

whose mean was 27.21 and standard deviation of 7.72. The results showed that female students performed slightly better than male students.

### Hypothesis 1

There is no significant difference in the mean retention achievement scores of students exposed to the four modes of presentations in Salah.

**Table 4: Summary of ANOVA for differences in the mean among students achievement scores using retention in Salah due to mode and gender**

Source	Type III sum of squares	Df	Mean square	F	Sig.
Corrected Model	1410.391a	7	201.484	3.840	.001
Intercept	103940321	1	103940.321	1980.863	.000
Mode	630.614	3	210.205	4.006	.009
Gender	76.883	1	76.883	1.465	.228
Mode x Gender	169.933	3	56.644	1.080	.359
Error	10179.614	194	52.472		
Total Corrected	164903.000	202			
Total	11590.005	201			

Table 4 revealed the difference in mean retention achievement scores of students exposed to the four modes of digital video disc presentation in Salah. The F calculated for mode was 4.006 and it was significant at  $P < .009$ . Therefore, it was significant at  $P < .05$ . This was because .009 was less than 0.05. There was significant difference in the mean retention achievement scores of students in Salah. The null hypothesis was rejected.

### Hypothesis 2

There is no significant difference in the mean retention achievement score of male and female students in Salah using the four modes of presentation.

Table 4 revealed that F calculated for the gender was 1.465 and it was significant at  $P < .228$ . Therefore, there was no significant difference in the mean retention achievement score of students using four modes of presentation by gender. Hence the null hypothesis was not rejected.

### Conclusion

Based on the fore mentioned findings of this study, one can conclude that the acquisition of knowledge by hypothesis and experimentations, utilizing four modes of digital video disc as instruction can significantly increase students participation in the classroom.

1. The result of achievement using retention test showed significance in the four modes.
2. The result of achievement using retention test showed no significance in gender.

Therefore, the Islamic studies teachers could consider the four modes (picture before text, text before picture, picture text synchronised and text

only) of instruction to enhance the acquisition of Saiah in Islamic studies.

### Recommendations

After the findings of the study and the educational implications, these recommendations were made:

1. The use of picture before text, text before picture and picture text synchronized as modes of presentation through digital video disc should be employed by the Islamic studies teachers and teachers of other disciplines to impart the skills and make the knowledge permanent in the students.
2. The Federal and States Ministries of Education, National Education Technology Center, Kaduna and various Institutions of learning such as Universities, Polytechnics, Colleges of Education, Government Research/Resource Centres and alike, should organize Workshops, In-service and Refresher courses, Conferences, Teaching Materials and Equipment for exhibition in order to equip the teachers with the necessary skills needed for producing and use of teaching DVD in Islamic studies.
3. The Federal, States, Local governments, Organizations and Private Individuals should to provide schools with enough equipment and software for the use of DVD in the school.

### Suggestions for Further Study

The following suggestions were advanced for further study:

1. The increasing number of schools which include heterogeneous sample calls for the use digital video disc in instruction. These include

schools in both rural and urban areas (private and government owned schools) across the state. The study could be replicated in rural and in urban schools.

2. Other practicable topics within Islamic studies could be treated using the same approach of digital video disc as instruction. Furthermore, similar topics from different subject areas could be treated in the same way.
3. 202 co-educational senior secondary school (SS1) students were used as sample in this study. Other senior secondary school students (SS2 and 3); junior secondary school students (JSS 1, 2 and 3); primary; nursery and tertiary institutions could also be used as research samples on similar topics.

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## TECHNOLOGY COMPETENCIES REQUIRED BY FURNITURE-MAKING INSTRUCTORS IN TECHNICAL COLLEGES FOR STUDENTS ENTREPRENEURSHIP DEVELOPMENT IN LAGOS STATE

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### ABSTRACT

*The study identified technology competencies required by Furniture-making instructors in technical colleges for students' entrepreneurship development in Lagos State. Survey research design was adopted for the study. The population for the study consisted of technical college Instructors and Furniture-making students in Lagos State. Three research questions guided the study. Questionnaire was used for data collection. Data were analyzed using Mean. A reliability coefficient of 0.82 was obtained using Cronbach Alpha method. The findings of the study revealed 21 technology competencies items required by Furniture-making instructors in technical colleges for effective entrepreneurship. It was recommended that Furniture-making instructors in technical colleges should avail themselves of the opportunities of staff development programmes to enable them acquire the basic technology competencies required in technical colleges for students' entrepreneurship development in Lagos State.*

**Keywords:** Technology, Competencies, Furniture-making, Instructors, Technical Colleges, Entrepreneurship Development

### INTRODUCTION

Technology allows for integration of multiple media. The levels of technology possessed by educators seem to be the basis for determining significant effects on individuals' innovativeness, social and economic development (Pickett, 2009). The author further stated that the notion of adding multimedia opportunities in the daily classroom activities of students cannot be applauded enough. According to Arul and Veena (2014), the literature is increasingly expected to use computer technology to access and manipulate information. Knowing how to manage electronic information from an ever-widening array of resources and in proliferating formats is essential.

Siddiqui (2010) reported that teachers lack the necessary competencies to be comfortable in playing a leadership role in the integration of technology into classrooms. To be fully prepared to function productively in a technology-oriented society, the author explained that teachers must develop not only fundamental technology competencies, but also proficiency in using a variety of technology tools to solve problems, make informed decisions and generate new knowledge. The development of these competencies, as in other basic areas of knowledge in the view of Siddiqui, is the responsibility of the schools and

their instructional staff. This suggests that instructors' should be redefined to enable them integrate technology in the classrooms to impact new knowledge, skills and attitude to students. The new knowledge through technology can be acquired in technical colleges.

Technical colleges are post-primary institutions that run vocational education and offer various vocational subjects or trades in order to equip individuals with appropriate knowledge and skills required for either paid jobs or self-employment (Okoro, 2006). The goals of vocational education in technical colleges in the view of Federal Government of Nigeria (2004) are geared towards the acquisition of appropriate skills, ability and competencies that will enable graduating students to live in and contribute to the development of the Nigerian society. Trades offered in technical colleges in Nigeria for students' self-reliance in the opinion of National Board for Technical Education (NBTE, 2003) include: blocklaying; brick-laying and concrete work; computer studies; entrepreneurship; and Furniture-making.

Furniture-making is the practice of using various woodworking competencies to design, prepare, construct, showcase, and market varieties

of Furniture-making products. According to Nigerian Educational Research and Development Council (NERDC, 2009), Furniture-making is aimed at preparing students for self-employment that will reduce youth restiveness, robbery and achieving millennium development goals. However, knowledge and competencies acquired in technical colleges for self-employment in Furniture-making are taught by technical instructors.

An instructor in the opinion of Keith (2014) is a person who uses their knowledge and expertise in a specific area to teach others the same set of skills. The author asserted that the use of information technology, which involves computer networking and communications systems, is also a key component of a technical instructor's job. In view of this study, a **Furniture-making instructor is an individual that has been trained** in the act of teaching students to acquire appropriate technology.

Technology is the making, usage and knowledge of tools, techniques, crafts, systems or methods of organization in order to solve a problem or serve some useful task. Technology has become a powerful catalyst in promoting learning, communications and life skills for economic survival in today's world (Morris, 2011). The author emphasized that the importance of technology in our everyday and academic lives is increasing. In today's society, schools need to expose students to technology and use it as a classroom resource. According to Christensen (2002), computers have played a critical role in educational settings for several decades. The author reported that teachers with computer training have a positive effect on their students' attitude toward technology. Knezek (2010) opined that technology helps teachers to expand beyond linear, text-based learning and to engage students who learn best in other ways. Using technology in the classroom Christensen opined that it helps the students in developing an understanding of the various computer tools and software technological investment according to Orill (2001) improves the effectiveness of the instructional practices of teachers and, in turn, improves student performance. This in consonance with the view of Resta and Burson (1998) who argued that to function productively in a technology-oriented society teachers must develop not only fundamental technology competencies, but also proficiency in using a variety of technology tools to solve problems, make informed decisions, and generate new knowledge. However, to function productively and create value through recognition of business opportunities in a technology-oriented environment,

demands entrepreneurship development orientation to succeed.

Entrepreneurship development according to Bryce (2013) is a process of encouraging people to go for self-employment, start and pursue their own ventures-in products and services, than looking for employment opportunities elsewhere. It revolves around the idea of creativity and innovation that are the causes of rapid technological opportunities. This explains that entrepreneurship development is aimed at creating conducive environment for young entrepreneurs to access relevant entrepreneurship skills, knowledge, values and attitudes for their businesses. With reference to this study, entrepreneurship development is a process of Furniture-making instructors in technical colleges encouraging students to go for self-employment of their own enterprise than looking for employment opportunities elsewhere. The acquisition of technological opportunities for self-employment can be connected with the development of a broader array of competencies.

In the opinion of Gupta (1999) competencies are the knowledge, skills, attitudes, values, motivations and beliefs people need in order to be successful in a job. Olaitan (2003) emphasized that to be competent implies that an individual has acquired the knowledge, skills, attitudes and judgements which he requires in order to perform successfully at a specified proficiency level in a given work. This explains that competencies represent the knowledge and skills required for performing and supporting the computer-related business processes. In this study, competencies are the measurable knowledge, skills, attitudes, and motivations required by Furniture-making instructors in technical colleges in order to be successful in instructions for effective entrepreneurship. The knowledge and ability to use computers and related technology efficiently in the classroom require relevant technology competencies.

Technology competency according to Ikolo and Okiy (2012) is the knowledge and ability to use computers and related technology efficiently, with a range of skills covering levels from elementary use to programming and advanced problem solving. Technology competencies are a set of technology standards that define proficiency in using computer related technology efficiently in the classroom. Gupta argued that technology competencies are based on using tools and technical equipment for the teaching and transferring of knowledge. They

include any technology that helps to produce, manipulation, store, communication, and/or disseminate information. In the same vein, the basic technology competencies which teachers must demonstrate through computer applications in the classroom in the opinion of North Carolina Department of Public Instruction (1999) include: computer operation; word processing/introductory desktop publishing; spreadsheet/graphing; social networking; internet; and multimedia integration.

With reference to this study, technology competencies are the abilities of Furniture-making instructors in technical colleges to use computers and related technology efficiently for entrepreneurship development. However, basic technology competencies required by Furniture-making instructors in technical college for entrepreneurship development in view of this study include: word processing competencies and social networking competencies. To effectively utilize technology to create, edit and print documents in the classroom require basic word processing competencies.

*Word processing* according to O'Leary, and O'Leary, (2006) referred to the creation, editing, formatting, storage, and output of both printed and online or electronic documents. The authors asserted that word processing is the most used business application for personal computers, perhaps alongside [World Wide Web](#) browsers and electronic-mail (e-mail) applications. In the view of Resta and Burson (1998), word processing competencies are the abilities to create, edit, save and print documents using computer technology. The authors explained that teachers use word processors for personal productivity such as: creating their lesson plans, memos to other members, and letters to parents. Word processing competencies therefore, are the abilities of Furniture-making instructors in technical colleges to utilize computers to compose text; create their lesson plans; design images; save and print document or memos to teach students for entrepreneurship development. To effectively teach the students, develop and expand their professional contacts demand social networking competencies for success.

Social networking in the view of Nicole (2007) is an on-line service, platform, or site that focuses on building and reflecting of social relation among people. The ability to network is one of the most crucial competencies any individual or entrepreneur can have. According to Exforsys

(2010), social networking is geared towards individuals who wanted to connect for personal reasons. It has revolutionized the way everyone connects on-line and a tool for professionals for career enhancement. The author asserted that today social networking is now used by professionals to be recognized in the industry or to simply connect to persons that could help them boost chances for a better career. Social networking has become a tool for professionals for career enhancement. More so, the two forms of social networking in the opinion of Exforsys include: personal and professional social networking. Personal social networking is the type of social networking to connect and gain friends. Professional social networking on the other hand, is geared towards career or business enhancement. The author asserted that businesses could also use social networking, by developing a product and use it to sell their products or offer their services.

Teachers require on-line teaching competencies, which involves transferring of knowledge through internet. These according to Obi and Akarahu (2010) include: holding of discussion class, sending of e-mails, giving and assessing of students performance. Social networking competencies in the opinion of Ibezim (2011) establishes that interconnected internet communities, sometimes known as personal networks help people make contact that would be good for them to know, and would unlikely have met. In view of this study, social networking competencies are the abilities of Furniture-making instructors in technical colleges to expand their personal, professional knowledge of contacts through holding of discussion class, sending of e-mails, giving and assessing of students performance for entrepreneurship development.

Technology competencies therefore, are veritable tools to Furniture-making instructors in technical colleges, which serve as important function beyond satisfying intellectual curiosity for students' entrepreneurship development in an innovative and technological-oriented society. It is believed that acquisition of basic technology competencies by Furniture-making instructors in technical colleges will enable them empower students with innovative knowledge, skills and attitudes required for entrepreneurship development.

### **Statement of the Problem**

It is generally accepted that the instructors who learn how to integrate technology into their classrooms teach

differently than instructors who received no such training. Observation revealed that teachers with computer training have a positive effect on their students' attitude toward technology. In today's society, schools need to expose students to computer technology and use it as a classroom resource. This technological investment also perceived to improve the effectiveness of the instructional practices of instructors and, in turn, improves student performance. Today's instructors seem not prepared to effectively use existing technology in the classroom. Interestingly, unemployment is an unfortunate reality, whose overcoming often depends on social networking support, among other competencies. Technology therefore, is paramount for entrepreneurship development of the students and as a result, instructors in technical colleges require basic technology competencies such as: word processing and social networking. If instructors in technical colleges do not acquire these competencies, they may not be able to empower the students with the new technology-based knowledge, skills and attitude required for self-employment, poverty reduction and wealth creation. Acquisition of technology competencies by instructors in technical colleges will enable them teach students to be self-employment and face the global trend of the innovative and technological-oriented century era. This study therefore, identified technology competencies required by Furniture-making instructors in technical colleges that considered imperative for students' entrepreneurship development.

### **Purpose of the Study**

The major purpose of this study was to identify technology competencies required by Furniture-making instructors in technical colleges for students' entrepreneurship development in Lagos State. Specifically, the study identified:

1. Word processing competencies required by Furniture-making instructors in technical colleges for students' entrepreneurship development.
2. Social networking competencies required by Furniture-making instructors in technical colleges for students' entrepreneurship development.

### **Research Questions**

The following research questions guided the study:

1. What are the words processing competencies required by Furniture-making instructors in teaching in technical colleges for students' entrepreneurship development?

2. What are the social networking competencies required by Furniture-making instructors in teaching in technical colleges for students' entrepreneurship development?

### **Methodology**

Survey research design was used for this study. The study was carried out in Lagos metropolitan area of the South-Western zone of Nigeria. The population for the study consisted of 12 Furniture-making Instructors in the six government technical colleges in Lagos State. There was no sampling because the population is of manageable size. The instrument for data collection was a Technology Competencies Structured Questionnaire (TCSQ) that addressed the research questions with a five point Likert response scales of Strongly Required (SR); Required (R); Undecided (U); Not-Required (NR); and Strongly Not-Required (SNR); with assigned weighted values of 5, 4, 3, 2, and 1 respectively. The questionnaire was validated by three experts. A reliability co-efficient of 0.84 was obtained using Cronbach Alpha analysis to determine the internal constituency of the questionnaire items. 12 copies of the 21-items TCSQ were administered to the respondents in Lagos State by the researcher with the help of three research assistants. All the 12 copies of the 21-items TCSQ administered were retrieved and analyzed. The data collected from the study were analyzed using *Mean* for answering the research questions, an item with the *Mean* of 3.50 or above were Regarded as required; while any item with *Mean* below 3.50 was considered as Not-Required by Furniture-making instructors in teaching in technical colleges for students entrepreneurship development in Lagos State.

### **Results**

#### **Research Question 1**

What are the words processing competencies required by Furniture-making instructors in teaching in technical colleges for students' entrepreneurship development?

Relevant data are presented in Table 1.

#### **Tables 1**

***Mean Responses of the Respondents on the Word Processing Competencies Required By Furniture-Making Instructors in Teaching in Technical Colleges for Students' Entrepreneurship Development.***

***N=21***

S/N	Word Processing Competencies	$\bar{X}$	Remarks
1.	Connect keyboard, monitor and scanner to the UPS in teaching.	3.91	Required
2.	Locate, open and protect document with password in teaching for students' entrepreneurship development.	3.78	Required
3.	Save typed work from computer into flash drive, CD and from CD into computer in teaching.	4.02	Required
4.	Create, copy, save, and print documents in teaching.	4.08	Required
5.	Format text, paragraphs and a research paper in text citations in teaching.	3.96	Required
6.	Employ Laptop graphics power point to deliver instructions in teaching.	3.83	Required
7.	Use computer soft-wares such word perfect in processing information in teaching.	4.10	Required
8.	Insert graphics into a document in teaching.	4.01	Required
9.	Create a hyperlink in teaching	4.07	Required
10.	Adopt projector in teaching	4.02	Required

Table 1 revealed that all the 10 word processing competencies items had their *Mean* value ranged from 3.78 to 4.10. This indicated that all the 10 items were required by Furniture-making instructors in teaching in technical colleges for students' entrepreneurship development.

#### Research Question 2

What are the social networking competencies required by Furniture-making

instructors in teaching in technical colleges for students' entrepreneurship development?

Relevant data are presented in Table 2.

**Table 2**  
**Mean Responses of the Respondents on the Social Networking Competencies Required by Furniture-making Instructors in Teaching in Technical Colleges for Students' Entrepreneurship Development.**

*N* = 21

S/N	Social Networking Competencies	$\bar{X}$	Remarks
1	Connect to internet services such as e-mail in teaching.	4.01	Required
2.	Use internet services during teaching students.	3.91	Required
3.	Apply appropriate evaluation technique to assess on-line during teaching students.	4.06	Required
4.	Use group addresses for e-learning in teaching students.	3.70	Required
5.	Make contacts face to face and on-line during teaching students.	3.65	Required
6.	Utilize World Wide Web (www) to publish information on website during teaching students.	3.63	Required
7.	Source information using search engine in teaching students.	4.01	Required
8.	Operate cashless transaction during teaching students.	2.68	Not-Required
9.	Use telecommunication facilities during teaching students	3.79	Required

10. Adopt electronic presentation software in teaching technical college students.	4.02	Required
11. Employ e-mail to give information and receive feedback in teaching technical college students.	3.59	Required

The data presented in Table 2 revealed that 10 out of 11 social networking competencies items had their *Mean* value ranged from 3.65 to 4.06. While item number eight had its value score of 2.68, which is below the cut-off point of 3.50, as such, the majority of the respondents indicated that 10 social networking competencies were required by Furniture-making instructors in teaching in technical colleges for students' entrepreneurship development.

### Discussions

The findings of this study in Table 1 revealed that 10 word processing competencies required by Furniture-making instructors in teaching in technical colleges for students' entrepreneurship development in Lagos State. These word processing competencies include ability to: connect keyboard, monitor and scanner to the UPS; create, copy, save, and print documents; locate, open and protect document with password; save typed work from computer into flash drive, CD and from CD into computer; format text, paragraphs and a research paper in text citations; employ Laptop graphics power point to deliver instructions; use computer soft-wares such as word perfect in processing information; insert graphics into a document; create a hyperlink in teaching students; and adopt projector in teaching for students entrepreneurship development. The findings were in line with the view of O'Leary, et al. (2006) who refers to word *processing* as the creation, editing, formatting, storage, and output of both printed and online or electronic documents. The findings were also in consonance with the work of Resta and Burson (1998) who described word *processing* competencies as the abilities to create, edit, save and print documents using computer technology. The findings and the views of authors above helped to justify the findings of this study on word processing competencies required by Furniture-making instructors in teaching in technical colleges for students' entrepreneurship development in Lagos State.

The findings in Table 2 indicated that Furniture-making instructors in technical colleges required 10 social networking competencies for students' entrepreneurship development in Lagos

state. These social networking competencies include ability to: connect to internet services such as e-mail in teaching; use internet services during teaching; apply appropriate evaluation technique to assess students on-line during teaching; use group addresses for e-learning in teaching; make contacts face to face and on-line during teaching; utilize World Wide Web (www) to publish information on website during teaching; source information using search engine in teaching; use telecommunication facilities during teaching; adopt electronic presentation software in teaching; and employ e-mail to give information and receive feedback from students for entrepreneurship development. The findings supported the opinions of Obi and Akarahu (2010) who emphasized that teachers require on-line teaching skills, which involves transferring of knowledge through internet, such as holding of discussion class, sending of e-mails, giving and assessing of students performance. These findings also agreed with the views of Ibezim (2011) who argued that social networking competencies establishes interconnected internet communities, sometimes known as personal networks that help people make contact acts that would be good for them to know, and would unlikely have met. The findings of the authors on social networking competencies gave credence to the findings of this study on social networking competencies required by Furniture-making instructors in teaching in technical colleges for students' entrepreneurship development in Lagos State.

### Conclusions

Based on the findings of this study, the study concluded that Furniture-making instructors should be trained to acquire word processing competencies to enable them create, copy, save, and print documents in teaching students and social networking competencies to enable them hold discussion in the classrooms, send e-mails, give and assess students performance, among others in technical colleges for students' entrepreneurship development in Lagos State.

### Recommendations

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

1. Furniture-making instructors in technical colleges should endeavor to avail themselves of the opportunity of staff development programmes such as: in-service training, workshops, seminars to enable them acquire the necessary technology competencies required during teaching for students' entrepreneurship development.
2. For effective students' entrepreneurship development, the Government and technical college administrators should provide adequate technology facilities/resources in the classroom during teaching to Furniture-making department.

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## INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SKILLS FOR INTEGRATION INTO TECHNICAL VOCATIONAL EDUCATION AND TRAINING (TVET) FOR SUSTAINABLE SELF-EMPLOYMENT AMONG NIGERIAN YOUTHS.

BY

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### INTRODUCTION

Vocational and technical education is the acquisition of skills and techniques in chosen occupation or profession to enable an individual earn a living. It refers to those aspects of the educational process involving in addition to general education, the study of technologies and related sciences and the acquisition of skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life (Federal Government of Nigeria, 2004). Technical and vocational education according to Momoh-Olle (2005) is a programme of education organized to prepare the learner for entrance into a particular chosen vocation or to upgrade workers.

Technical Vocational Education is a type of education or training designed for preparing the individual learner to earn a living and be self reliant. It increases one's earnings in an occupation where technical information and understanding of the laws of science and technology as applicable to modern design, production, distribution and services are essential for success. Vocational and technical education is predicated upon the teaching of skills and also demand the professional or expert use of hands. Substantiating this view, Federal Government of Nigeria (1998) affirmed that vocational and technical education is geared towards the production of the educated man who can effectively work with his head, heart and hands. Technical and vocational education has the benefit of equipping individuals in order to enable them develop the creative and manipulative potentials for the use of man. The development of the economy and the crave for self-reliance and self-sustainability is the driving force for acquiring technical and vocational Education.

The teaching of skills at formal sectors existed in two types of institution initially established in Nigeria, these are technical colleges and trade centers. According to Roland (1995), Vocational and technical education is result oriented because it brings about technological advancement and aims to fit new manpower for employment and provide continuing training for those already qualified, so that they can keep up with modern working methods. The purpose of Vocational and Technical education is to prepare individuals for employment in an occupation or group of occupations. The report of NBTE (2001) asserted that throughout the country, there is a growing awareness about the need for vocational and technical education in woodwork, metalwork, building technology, auto mechanic, electrical/electronics, technical drawing for employability skill acquisition of Nigerian youths. Youth according to United Nation General Assembly report (1995) are young people of 15-24 years bracket. This age range may go up to 30 years in developing countries like Nigeria. For instance, in Nigerian context, youths are people within the age of 18-35 years. The population of youths in Nigeria according to the 2006 census is almost a hundred million (National Population Commission, 2006). This means that youth constitute more than two thirds of the country's population of about 140 million people. They are the backbone of the development of the country. Indeed if Nigeria is to be sustained as a viable entity, there must be a very good plan to tap the energy and resourcefulness of the youth population to fast track economic development and improvement of Nigerian society.

The improvement in societal awareness for economic development has culminated in demands

for changes in content, organization and delivery of vocational and technical curricular to reflect a new emphasis on technology. As a matter of fact, vocational and technical education has as part of the major objectives to develop not only practical skills but also attitudes and habits that make the recipient a creative, innovative and resourceful person in the society. In the achievement of these objectives in Nigerian vocational and technical education system, the acquisition of relevant information and communication technology (ICT) skills by the teachers and learners is imperative.

Information and Communication Technology (ICT) involves the use of computers and other electronic devices to process information. The use of information and communication technologies (ICTs) is fast gaining prominence and becoming one of the most important elements defining the basic competencies in education system. Howell and Lundall (2000) described ICTs as all forms of technology used to create, store, process and use information in its various forms (data, voice, image and multi-media presentations) to facilitate and support communication. In the view of Chinien (2001) ICT deals with digital data and ways of storing, retrieving, transmitting and receiving information. According to World Bank (2006), ICT consists of the hardware, software, networks, and media for the collection, storage, processing, transmission, and presentation of information.

The use of ICT falls into four major categories which include: (i) constructing knowledge and problem solving (through the Internet, email, CD-ROMs, databases, video conferencing); (ii) using process skills; (iii) aiding explanation of concepts; and (iv) communicating ideas (powerpoint, desktop publishing) (Aladejana, 2007). ICT facilitates communication, increase access to learning for students, stimulate a wide range of scientific phenomenon and generally motivate both teachers and students, develop problem solving capabilities and aid deeper understanding (Selinger, 2002). Effective application of ICT skills in Vocational and technical education was delimited to cover major aspects of basic ICT which include: word processing, spreadsheet, graphic and internet skills. Word processing and spreadsheet are programmes found in Microsoft office. Word processing is the writing, editing and production of documents such as letters, reports and books through the use of a computer programmed or a complete computer system designed to facilitate rapid and efficient manipulation of text (Onyewuenyi, 1994). On the

other hand, spreadsheet is a computer programme that displays numerical data in cells in a simulated accountant's worksheet of rows and columns in which hidden formulas can perform calculations on the visible data (Microsoft Encarta, 2010). Other aspects of ICT skills that are considered relevant in the vocational technical education include the use of computer graphics and internet. Computer graphics generally pertains to any computer device or programme that makes a computer capable of displaying and manipulating pictures. Ezeasomba (2004) defined internet as a global connection of millions of computers in a single network. It is a worldwide network of computers. This connection allows people to share information like data, programmes, pictures and music through acquisition and the application of relevant ICT skills. The term skill as described by Okorie (2001) is the expertness, practical ability, dexterity and tact possessed by an individual. An individual is said to have acquired a skill when he can finish a given piece of work at a given time with minimum errors (Obi, 2005). Sharing this view, Osinem (2008) stated that skill constituted an individual's capacity to control elements of behaviour, thinking and feeling within specified contexts and within particular task domains. The present low level of ICT skills of Nigerian graduates of vocational and technical education is worrisome. The employability of the graduates is generally low due to inadequate acquisition of relevant ICT skills while in school. The present situation of low employability skills of technical education graduates in south-south Nigeria is heart-breaking. This situation has given rise to anti-social behaviours among the youths in the area at the detriment of national security and peace. This is even made worse by weak ICT oriented programmes of the present vocational and technical education programme (Federal Republic of Nigeria, 1998). Therefore, the integration of relevant ICT skills into technical and vocational education will not only facilitate the teaching of the trades but will also ensure employability of the technical and vocational education graduates in the contemporary Nigerian labour markets gearing towards increased job creation and overall economic development of the nation. It is based on this background that this study was conceived to identify information and communication technology (ICT) skills for integration into technical vocational education and training (TVET) for sustainable self-employment among Nigerian youths. The specific purposes of the study were to identify:

- i. Word processing and spreadsheet skills for integration into technical vocational education and training (TVET) for sustainable self-employment among Nigerian youths,
- ii. Computer graphics and internet skills for integration into technical vocational education and training (TVET) for sustainable self-employment among Nigerian youths.

### Research Questions

Based on the specific purposes of the study, the study answered the following research questions:

1. What are the word processing and spreadsheet skills for integration into technical vocational education and training (TVET)?
2. What are the computer graphics and internet skills for integration into technical vocational education and training (TVET)?

### Hypotheses

**H01:** There is no significant difference in the mean ratings of the responses of technical education lecturers from Colleges of Education and Universities on word processing and spreadsheet skills for integration into technical vocational education and training (TVET)?

**H02:** There is no significant difference in the mean ratings of the responses of technical education lecturers from Colleges of Education and Universities on computer graphics and internet skills for integration into technical vocational education and training (TVET)?

### METHODOLOGY

The study was conducted in Rivers and Cross River States, South-south Nigeria. Two research questions and two null hypotheses were developed to guide the study. Descriptive survey research design was adopted for the study. Descriptive survey research design in the opinion of Owens (2002) is that in which the same information is gathered from an unbiased representative group of interest using questionnaires, interview and observation. Anyakoha (2009) also shared that descriptive design uses questionnaires, interview and observation in order to determine the opinions, attitudes, preferences and perceptions of group of interest to the investigator. Therefore, descriptive survey design was found suitable for this study

because questionnaire was used to collect data from the representative group of respondents. The population for the study was the 56 lecturers of technical and vocational education from selected Colleges of Education and Universities in Rivers and Cross River States, South-south Nigeria. Due to the manageable size of the population, the entire 56 lecturers of technical and vocational education from Colleges of education and Universities in the two states were used, therefore, there was no sampling. The instrument for data collection for the study was a structured 48-item questionnaire titled: "Information and Communication Technology Skills for Integration Questionnaire (ICTSIQ)". The questionnaire was structured into 4-point rating scale of: Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD) with corresponding values of 4, 3, 2, and 1 respectively. The instrument was validated by three experts; two from the Department of Vocational Teacher Education, University of Nigeria, Nsukka and one from Department of Vocational/Industrial Education, Niger Delta University Wilberforce Island, Bayelsa State.

For the purpose of obtaining the internal consistency of the instrument, Cronbach Alpha reliability method was used in which a Cronbach alpha coefficient of 0.81 was obtained indicating high reliability of the instrument. The data collection for the study was carried out with the help of one research assistant who was hired to cover Cross River State while the researchers covered Rivers State. All the 56 copies of the questionnaire administered were retrieved indicating 100% rate of return. Data collected were analysed using mean for answering the research questions while t-test statistics were for testing the null hypotheses at 0.05 level of significance. In taking decision on the research questions, 2.50 on 4-point rating scale was used as cut-off point. Therefore, items with mean value of 2.50 and above were regarded as "Agreed" while any item with mean value of less than 2.50 was regarded as "Disagreed". The null hypothesis of no significant difference was accepted for items whose p-values were greater than 0.05 level of significance while hypothesis of no significant difference was rejected for items whose p-value were less than 0.05 level of significance.

### RESULTS

The results for this study were obtained based on the research questions answered and null hypotheses tested. Both the research questions

and the hypotheses are presented in tables 1 and 2 as follows:

### Research Question One

What are the word processing and spreadsheet skills for integration into technical vocational education and training (TVET)?

**H01:** There is no significant difference in the mean ratings of the responses of technical

education lecturers from Colleges of Education and Universities on word processing and spreadsheet skills for integration into technical vocational education and training (TVET)?

The data for answering research question one and testing hypothesis one are presented in Table 1 below.

**Table 1: Mean Ratings and t-test Statistics of the Responses of Lecturers of Technical Education from Colleges of Education and Universities on word processing and spreadsheet skills for integration into technical vocational education and training (TVET)?** (N = 56)

SN	Word Processing Skills	$\bar{X}_{CE}$	$\bar{X}_{UN}$	$\bar{X}_G$	SD	p-value	RQ	Remarks
1	Document creating skills	3.57	3.51	<b>3.54</b>	0.78	0.33	A	NS
2	Document previewing skills	3.42	3.49	<b>3.46</b>	0.71	0.14	A	NS
3	Creating/inserting of tables, symbols and pictures on documents	3.37	3.37	<b>3.37</b>	0.87	1.00	A	NS
4	Designing and separation of colours	3.47	3.47	<b>3.47</b>	0.83	1.00	A	NS
5	Ability to use scanners to capture pictures and images	3.30	3.40	<b>3.55</b>	0.77	0.15	A	NS
6	Skills in creating http/html document	3.26	3.23	<b>3.24</b>	0.60	0.72	A	NS
7	Backing up your documents and publications on CDs, DVDs or other data storage devices	2.95	3.23	<b>3.17</b>	0.63	0.04	A	S*
8	Mail merging skills	3.23	3.30	<b>3.27</b>	0.85	0.22	A	NS
9	Applying macros skills	3.35	3.33	<b>3.34</b>	0.66	0.70	A	NS
10	Spell checking, Thesaurus, proof reading skills	3.50	3.78	<b>3.64</b>	0.79	0.04	A	S*
11	Creating an equity fax using templates	3.49	3.71	<b>3.60</b>	0.74	0.02	A	S*
12	Use of drawing tools	3.43	3.47	<b>3.45</b>	0.69	0.37	A	NS
13	Saving/opening of documents	3.47	3.52	<b>3.49</b>	0.54	0.48	A	NS
<b>Spreadsheet Skills</b>								
14	Understands the structure of a spreadsheet	2.62	2.93	<b>2.77</b>	0.78	0.03	A	S*
15	Enters data (labels, values) in a cell	2.63	2.45	<b>2.64</b>	0.64	0.09	A	NS
16	Formats data in a cell eg. bold, alignment	3.57	3.51	<b>3.54</b>	0.78	0.33	A	NS
17	Generates appropriate graphs eg. bar, column, line	3.42	3.49	<b>3.46</b>	0.71	0.14	A	NS
18	Uses sum formula and undertakes basic calculations	3.37	3.37	<b>3.37</b>	0.83	1.00	A	NS
19	Sorts data	3.47	3.47	<b>3.47</b>	0.80	1.00	A	NS
20	Opens and uses a commercial database eg. electronic encyclopaedias	3.42	3.44	<b>3.43</b>	0.66	0.15	A	NS
21	Locates specific record(s) using find function	3.36	3.33	<b>3.35</b>	0.72	0.72	A	NS
22	Uses relevant fields	3.46	3.65	<b>3.59</b>	0.83	0.04	A	S*
23	Chooses appropriate data types for fields	3.33	3.35	<b>3.34</b>	0.85	0.22	A	NS
24	Adds/deletes records	3.36	3.40	<b>3.38</b>	0.61	0.70	A	NS
25	Edits data in an existing record	3.57	3.71	<b>3.65</b>	0.79	0.03	A	S*

**Key:**  $\bar{X}_{CE}$  = Mean of Lecturers from Colleges of Education,  
 $\bar{X}_{UN}$  = Mean of Lecturers from Universities,  
 $\bar{X}_G$  = Overall Grand Mean; A = Agreed; S\* = Significant; NS = Not Significant.

From the data presented in Table 1 above, it was revealed that the grand mean ratings of the responses of the respondents on the 25 items in the table ranged between 2.64 to 3.65 on 4-point rating scale. This indicated that the respondents (technical and vocational education lecturers) agreed that all the 25 identified items in the table are word processing and spreadsheet skills for integration

into technical vocational education and training (TVET) for sustainable self-employment among Nigerian youths. The standard deviation values of the 25 items ranged from 0.54 to 0.85 which indicated that the responses of the respondents are close to one another and the mean.

The data presented in Table 1 on hypothesis one showed that p-values of 19 out of the 25 items in the table ranged between 0.09 to 1.00 which are greater than 0.05 level of significance. This implied that there are no significant differences in the mean ratings of the responses of technical and vocational education lecturers from Colleges of Education and Universities on the 19 items. The p-values on the remaining six items in the table were between 0.02

and 0.04 which are in each case less than 0.05 level of significant. This indicated that there are significant differences in the mean ratings of the responses of technical and vocational education lecturers from Colleges of Education and Universities on the six items.

### Research Question Two

What are the computer graphics and internet skills for integration into technical vocational education and training (TVET)?

**Table 2: Mean Ratings and t-test Statistics of the Responses of Lecturers of Technical Education from Colleges of Education and Universities on Computer Graphics and Internet skills for integration into technical vocational education and training (TVET)? (N = 56)**

SN	Computer Graphics Skills	$\bar{X}_{CE}$	$\bar{X}_{UN}$	$\bar{X}_G$	SD	p-value	Remarks RQ	H0
1	Using freehand drawing tools-pencil, straight and curved lines	3.67	3.68	<b>3.67</b>	0.74	0.29	A	NS
2	Using shape tools/objects and text tool like: shape tool, polygon, spiral and graph paper tool etc	3.50	3.73	<b>3.61</b>	0.88	0.03	A	S*
3	Using paintbrush, paint box /fill with colour, spray can/air brush, eraser	3.53	3.56	<b>3.54</b>	0.77	0.37	A	NS
4	Selecting objects with selection object tool	3.49	3.52	<b>3.50</b>	0.82	0.48	A	NS
5	Inserting graphics from various sources e.g. clip art, digital image	3.54	3.55	<b>3.54</b>	0.81	0.73	A	NS
6	Moving and changing of the size of displayed clip art/graphics	3.42	3.63	<b>3.52</b>	0.76	0.04	A	S*
7	Using a digital camera to create a graphic file	3.43	3.48	<b>3.45</b>	0.81	0.20	A	NS
8	Using scanner to convert a picture into a graphic file	3.53	3.55	<b>3.54</b>	0.61	0.33	A	NS
9	Working with the menus eg file , view, edit, etc	3.40	3.49	<b>3.44</b>	0.88	0.14	A	NS
10	Using fill pattern/ colours/ shading and flipping and rotating of objects	3.35	3.40	<b>3.37</b>	0.85	0.56	A	NS
<b>Internet Skills</b>								
11	Creating a web page skill	3.34	3.40	<b>3.37</b>	0.92	0.15	A	NS
12	Accessing information from internet to a different application skill	3.56	3.55	<b>3.55</b>	0.79	0.72	A	NS
13	Downloading/uploading information from/on the web skill	3.46	3.51	<b>3.48</b>	0.71	0.46	A	NS
14	Teleconferencing skill	3.43	3.50	<b>3.46</b>	0.81	0.22	A	NS
15	Composing and sending of email skill	3.35	3.55	<b>3.45</b>	0.75	0.08	A	NS
16	Understands and uses key words in a simple search	3.55	3.74	<b>3.64</b>	0.74	0.04	A	S*
17	Uses and understands hyperlinks / navigation buttons	3.44	3.71	<b>3.57</b>	0.84	0.01	A	S*
18	Chooses appropriate sites from a search	3.48	3.70	<b>3.59</b>	0.77	0.03	A	S*
19	Contributes to the creation of a basic web-page - text, graphics, hyperlinks	3.50	3.49	<b>3.49</b>	0.82	0.90	A	NS
20	Interprets features of a new message	3.43	3.50	<b>3.46</b>	0.91	0.70	A	NS
21	Interprets features of a retrieved message eg. From, Date sent, Reply, Forward	3.54	3.61	<b>3.57</b>	0.86	0.03	A	NS
22	Retrieves and replies to an email	3.46	3.51	<b>3.48</b>	0.77	0.11	A	NS
23	Sends an attachment with an email	3.33	3.36	<b>3.34</b>	0.65	0.73	A	NS

**Key:**  $\bar{X}_{CE}$  = Mean of Lecturers from Colleges of Education,  
 $\bar{X}_{UN}$  = Mean of Lecturers from Universities,  
 $\bar{X}_G$  = Overall Grand Mean; A = Agreed; S\* = Significant; NS = Not Significant.

**H02:** There is no significant difference in the mean ratings of the responses of technical education lecturers from Colleges of Education and Universities on computer graphics and internet skills for integration into technical vocational education and training (TVET)?

The data for answering research question two and testing hypothesis two are presented in Table 2 below.

The data presented in Table 2 above showed that the grand mean ratings of the responses of the respondents on the 23 items in the table ranged between 3.34 to 3.67 on 4-point rating scale. This indicated that the respondents (technical and vocational education lecturers) agreed that all the 23 identified items in the table are computer graphic and internet skills for integration into technical

vocational education and training (TVET) for sustainable self-employment among Nigerian youths. The standard deviation values of the 23 items ranged from 0.61 to 0.92 which indicated that the responses of the respondents are close to one another and the mean.

The data presented in Table 2 on hypothesis two showed that p-values of 18 out of the 23 items in the table ranged between 0.08 to 0.90 which are greater than 0.05 level of significance. This indicated that there are no significant differences in the mean ratings of the responses of technical and vocational education lecturers from Colleges of Education and Universities on the 18 items. The p-values on the remaining five items in the table were between 0.01 and 0.04 which are in each case less than 0.05 level of significant. This indicated that there are significant differences in the mean ratings of the responses of technical and vocational education lecturers from Colleges of Education and Universities on the five items.

### Discussion of Findings

The findings of this study in respect to research question one showed that technical and vocational education lecturers in colleges of education and Universities in south-south Nigeria agreed that word processing and spreadsheet skills for integration into technical vocational education and training (TVET) for sustainable self-employment among Nigerian youths include: creating of document and publication skills, previewing documents and publication skills, creating/inserting of tables, symbols and pictures on documents, designing and separation of colours, ability to use scanners to capture pictures and images, skills in creating http/html document, backing up your documents and publications on CDs, DVDs or other data storage devices, understanding the structure of a spreadsheet, formats data in a cell eg. bold, alignment, use of sum formula and undertaking basic calculations, opening and using a commercial database eg. electronic encyclopaedias, locating specific record(s) using find function, using relevant fields, choosing of appropriate data types for fields and editing data in an existing record among others. The findings of this study agreed with that of Nwosu (2002) who conducted a research to determine word processing and electronic office operations' competencies currently needed by secretaries in selected offices in Abia and Imo States. The author identified word processing skills needed to include: creating word document, previewing documents and publication, creating/inserting of tables,

symbols and pictures on documents, ability to use scanners to capture pictures and images, and ability to create http/html document among others. The findings of this study on the spreadsheet skills corroborated the finding of Ishiyaku (2012) who found that vocational education graduates needed spreadsheet skills such as: understanding the purpose/structure of a spreadsheet, interpreting data from an existing spreadsheet, understanding terminology - column, row, cell, cell range, understanding cell addressing, understanding active cell, entering data (labels, values) in a cell, formatting data in a cell eg. bold, alignment, generating appropriate graphs eg. bar, column, line, changing column width and row height, adding/deleting row/columns, using sum formula and undertaking basic calculations, formatting data to currency, time, number, percentage, sorting data and understanding strengths and weaknesses of a spreadsheet.

On research question two, the study found that technical and vocational education lecturers in colleges of education and Universities in south-south Nigeria agreed that computer graphic and internet skills for integration into technical vocational education and training (TVET) for sustainable self-employment among Nigerian youths include: using freehand drawing tools-pencil, straight and curved lines, selecting objects with selection object tool, inserting graphics from various sources e.g. clip art, digital image, using a digital camera to create a graphic file, using scanner to convert a picture into a graphic file, working with the menus eg file, view, edit, etc, creating a web page skills, teleconferencing skills, accessing, copying and pasting information from internet to a different application skill, composing and sending of email skill, understanding and using key words in a simple search, using and understanding hyperlinks/navigation buttons, choosing appropriate sites from a search, interpreting features of a new message, retrieving and replying to an email and sending an attachment with an email among others. The findings of this study on computer graphic skills supported that of Ahmed (2006) who found that using analog-to-digital conversion techniques, variety of devices-such as curve tracers, digitizers, and light pens-connected to graphic computer terminals, using computer-aided design programs, selecting objects with selection object tool, using scanner to convert a picture into a graphic file and using freehand drawing tools-pencil are some of the major computer graphic skills needed by technical

and vocational education graduates for work on graduation. Also, the findings of this study supported that of Bello (2004) who carried out a study to assess effective utilization of information and communications technology for boosting research in Nigeria. In the study, the researcher found out that internet skills such as good understanding of web browser and application of the right web-based command are required for effective use of ICT in Nigeria.

Generally, the findings of the study on the hypotheses tested showed that there was no significant difference in the mean ratings of the responses of technical and vocational education lecturers from Colleges of Education and Universities on information and communication technology (ICT) skills for integration into technical vocational education and training (TVET) for sustainable self-employment among Nigerian youths. This indicated that, the levels of institutional affiliation of the lecturers did not have any significant influence in their responses.

### Conclusions

It has been the wish of the researcher to identify the ICT skills for integration into vocational and technical education for sustainable self-employment among Nigerian youths in south-south geopolitical zone. This was considered necessary because of the continuous trends in the unemployment situation of graduates couple with the economic and social effects of such situation on the society in the study area. The unemployed youths, majority of which are graduates of vocational and technical education in the area get involved in anti-social activities for survival due to lack of job. This condition further worsened the present security situation in the study area. It is a common say that an idle mind is a devils workshop. Recognizing the economic significance of ICT skills for work in the contemporary society, the identification of the required ICT skills for integration into vocational and technical education in order to bridge the knowledge gap of the graduates for self-employment on graduation in the area is timely and necessary.

Therefore, this study was carried out to identify the possible ICT skills that can be integrated into technical vocational education and training (TVET) for sustainable self-employment among Nigerian youths. The study thereby concluded that ICT skills

in word processing, spreadsheet, graphic and internet were required by the graduates of vocational and technical education for self or paid-employment on graduation. This finding when properly utilized by the major stakeholders in Education sector in the zone and the nation in general will possibly help to address the current trend of employment situation among youths and school graduates in the study area.

### Recommendations

Based on the findings and conclusions drawn from the study, the following recommendations were made for implementation by the government:

1. That the identified ICT skills in word processing, spreadsheet, graphic and internet should be used by curriculum planners at state and federal levels to further improve the existing curriculums of vocational and technical education in the states and the nation in general.
2. That the States governments through its ministry of education should help package the identified ICT skills items in word processing, spreadsheet, graphic and internet into programmes for retraining the idle graduates for self or paid-employment in computer work in the States.

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## COMPETENCY IMPROVEMENT NEEDS OF TEACHERS OF MOTOR VEHICLE MECHANICS' WORK IN THE USE OF ON-BOARD DIAGNOSTIC SENSORS FOR EFFECTIVE TEACHING OF PETROL ENGINE MAINTENANCE IN TECHNICAL COLLEGES IN NIGERIA

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### ABSTRACT

*The study was aimed at determining the competency improvement needs of teachers of Motor Vehicle Mechanics' Work (MVMW) in the use of on-board diagnostic sensors for effective teaching of Petrol Engine Maintenance (PEM) in technical colleges in Nigeria. Two research questions and a hypothesis guided the study. All 58 subjects made up of teachers of Motor Vehicle Mechanics' Work responded to 17 item questionnaire to answer the research questions. The study was carried out in south eastern states of Nigeria. The design for the study was the descriptive survey, using Borich's needs assessment model. Three experts face validated the contents of the instrument. Cronbach Alpha method was used to determine the reliability of the instrument which yielded a reliability of 0.93. Mean and improvement need index (INI) were utilized to answer the research questions while the hypothesis was tested using Analysis of Variance (ANOVA). It was found that teachers of Motor Vehicle Mechanics' Work need improvement in on-board diagnostic system. Based on the findings, it was recommended that vehicles that use on-board diagnostic system should be used in teaching the students.*

### INTRODUCTION

On-board diagnostics, or OBD, is an automotive term referring to a vehicle's self-diagnostic and reporting capability. OBD systems give the vehicle owner or repair technician access to the status of the various vehicle sub-systems. It is a computer-based system built into all model year (MY) 1996 and newer light-duty cars and trucks. OBD monitors the performance of some of the engines' major components, including individual emission controls. The system provides owners with an early warning of malfunctions by way of a dashboard "Check Engine" light (also known as a Malfunction Indicator Light (MIL)). By giving vehicle owners this early warning, OBD protects not only the environment but also consumers; identifying minor problems before they become major repair bills (Henry, 2009). OBDS make use of sensors which make such sensors an input device of the OBDS.

Sensors are the components of the system that provide the inputs that enable the Engine Control Unit (ECU) to carry out the operations that make the system function correctly. The following types of sensors are found in on-board diagnostic system;

- Electromagnetic sensor (The Variable Reluctance type, the Hall type and Crankshaft Position sensors),

- Combustion Knock Sensors,
- Temperature Sensors,
- Manifold Absolute Pressure (MAP) sensor (The Variable-Voltage MAP, Variable-Capacitance type and Variable –Inductance type sensors,
- Air Flow Sensor (Hot Wire Mass Air Flow sensor), and
- Exhaust Gas Oxygen (EGO) sensors (The Voltaic-type EGO and the Resistive-Type EGO sensors). OBDS operates in an automobile using some form of automobile technology.

Automobile technology involves the application of scientific knowledge in the design, selection of materials, construction, operation, maintenance and improvement of the automobile (Forster 1992). Automobile craft is one of the trades offered in technical colleges. Olufemi and Anthony (2010) stated that in Nigeria, technical colleges produce craftsmen for various sectors of the economy including craftsmen in automobile and are regarded as the principal vocational institutions for such purposes. It offers various mechanical trades among which is Motor Vehicle Mechanics' Work (MVMW). The programme of MVMW trade in Nigeria technical colleges is designed to produce

competent auto-mechanics craftsmen for Nigeria technological and industrial development. According to National Board for Technical Education (NBTE, 2007), auto-mechanics craftsmen are expected to test, diagnose, service and completely repair any fault on the motor vehicle to the manufacturer's specification. For this to be achieved, a National curriculum is adopted in all technical colleges accredited by the NBTE.

The curriculum for MVMW in the technical colleges is developed to offer a complete secondary school education in general education in addition to occupational areas while the central purpose of MVMW trade is to provide its recipient with the skill required for work in the automobile industry. Petrol Engine Maintenance (PEM) is one of the modules of MVMW. The goal of PEM is to produce a petrol engine maintenance craftsman who should understand the basic principles of operation and carry out general maintenance and reconditioning work on petrol engine. Some of the general objectives include that the trainee (student) should be able to: understand the basic working principles of petrol engine and restore it to peak performance, and understand the working principles of the fuel system of the motor vehicle. In order to achieve these objectives, the students need to be taught using an innovative mechanism that can identify impending faults in the system for repair.

The teachers of Motor Vehicle Mechanics' Work should ensure that they continue to abreast themselves in the innovations of their field in order to remain relevant and effective. One of the ways they can ensure this is by updating their competencies through training and retraining while still teaching. This means that when a teacher is found deficient in either technical or professional skill or both, he/she needs enhancement to make up for identified inadequacies. The teachers of Motor Vehicle Mechanics' Work in Nigerian technical colleges should be competent in teaching Petrol Engine Maintenance to their students. Unfortunately, the situation is not the case. One of the innovations of automobile technology is the use of on-board diagnostic system which has different components. The improvement of OBDS is not affected by the experiences of the teachers. Motor Vehicle Mechanics' Work teacher, who is government employed, is employed by Ministry of Education. As a civil servant he/she has 35 years of service to put in his/her knowledge, skill and energy in teaching, provided he/she has not attained the age of 60 before the 35 years (Daily Trust, 2009). In the

study, sixteen teachers of 0-5 years experience, eight teachers of 6-10 years experience, nine teachers of 11-15 years of experience, and six teachers of 16-20 years experience responded to the instrument. Others are seven teachers of 21-25 years experience, nine teachers of 26-30 years of experience and three teachers of 31-35 years experience. When the teacher, irrespective of his/her experience, improves on the OBDS he/she becomes a competent teacher.

In the course specification, a teacher is expected to teach the components such as the sensors, actuators, computerized ignition system and diagnose faults using electronics equipment. Presently, the teachers teach these components distinctively. The teacher should be aware of the interrelatedness of these components. The interrelation of these components and few innovations in the component, in the emission system is what is presently referred to as on-board diagnostic system (OBDS). The teachers do not teach OBDS in the Technical Colleges in Nigeria and as such, most of them do not have the competence to teach the OBDS (Odigiri, 2004). The question here is what should be done by the teachers of Motor Vehicle Mechanics' Work in order to teach the Petrol Engine Maintenance so that when their students graduate they would be able to maintain these present manufactured vehicles which use on-board diagnostic system? It is therefore necessary to identify competency needs of the teachers of Motor Vehicle Mechanics' Work on the use of on-board diagnostic sensors for the teaching of Petrol Engine Maintenance in technical colleges.

### **Purpose of the Study**

The purpose of this study is to determine competency improvement needs of teachers of Motor Vehicle Mechanics' Work in the use of on-board diagnostic sensor for Effective Teaching of Petrol Engine Maintenance in Technical Colleges in Nigeria.

Specifically, the study would seek to:

- Identify competencies required by the teachers in the use of sensors of on-board diagnostic system for effective teaching of petrol engine maintenance; and
- Determine competency improvement needs of the teachers in the use of sensors of on-board diagnostic system for

effective teaching of petrol engine maintenance.

### Research Questions

The following research questions were posed to guide the study:

- What are the competencies required by the teachers in the use of sensors of on-board diagnostic system for effective teaching of petrol engine maintenance?
- What are the improvement needs of the teachers in the use of sensors of on-board diagnostic system for effective teaching of petrol engine maintenance?

### Hypothesis

The following null hypothesis was formulated to guide the study and was tested at the .05 level of significance.

- $H_{01}$ : There is no significance difference in the mean ratings of the responses of the teachers of various years of teaching experiences in competences needed in on-board diagnostic sensors for effective teaching of Petrol Engine Maintenance in technical colleges in Nigeria.

### Design of the Study

The study adopted survey research and Borich needs assessment model. The Borich (1980) needs assessment model requires that a mean weighted discrepancy score be calculated for each item, competency or activity included in the needs assessment. A discrepancy can be calculated by comparing the participants' behaviors, skills, and competencies, with the goals of the program: "a discrepancy analysis that identifies the two polar positions of what is and what should be". Further, a comparison could be made to determine a group of individuals' perceived level of competence to complete a task, with their desired level of competence to complete a task.

### Method of Data Analysis

In answering the research question, weighted mean and Improvement Needed Index (INI) was used, while analysis of variance (ANOVA) statistic was used to test the null hypothesis at 0.05 level of significance and appropriate degree of freedom. The mean was utilized in answering research question 1, while INI was utilised to analyse data on improvement needs of teachers of Motor Vehicle Mechanics' Work, which is research question 2. Any item with a mean rating of 3.50

and above is considered needed, while any item with a mean rating below 3.50 is regarded as not needed. This is because 3.50 is the lower real limit of 4.00 which represent averagely needed. The weighted mean of each item under the needed category was calculated ( $x_n$ ). The weighted mean of each item under the performance category was calculated ( $x_p$ ). The difference between the two means was calculated ( $x_n - x_p$ ). This gave the value that indicated whether improvement is needed or not, and stated as follows:

- (1) Where the difference is zero ( $x_n - x_p = 0$ ) that is neutral, it indicates that there is no need for improvement on the item. However, for INI to be equal to zero, any of these conditions must occur:
- (2) Very highly needed = very high performance
- (3) highly needed = high performance
- (4) averagely needed = average performance
- (5) Slightly needed = low performance and
- (6) Not needed = very low performance
- (7) where the difference is positive ( $x_n - x_p = +$ ), it indicates that there is need for improvement of teachers on the item
- (8) Where the difference is negative ( $x_n - x_p = -$ ), it indicates that there is no need for improvement on the item because the mean performance ( $x_p$ ) of the teachers for the scale is greater than the level at which that scale is needed ( $x_n$ ). That is, the teachers can perform the skill to the level at which it is needed and even above. (That is,  $INI = x_n - x_p$ . Where  $x_n$  means needed and  $x_p$  means performance) (Source: Olaitan and Ndomi, 2000).

### Population for the Study

The population for this study consisted of all 58 subjects made up of teachers of Motor Vehicle Mechanics' Work in 40 NBTE-accredited technical colleges in South Eastern States of Nigeria. The states include Abia, Anambra, Ebonyi, Enugu, and Imo states. The states house several vehicle servicing workshops. In addition to that, Enugu state houses a functional automobile maintenance and assembly plant. These areas offer a desirable number of subjects who responded to the instrument of the data collection of this study. The names of the accredited technical colleges were got from the various states' Ministries of Education.

### Instrument for Data Collection

The instrument for data collection for this study was structured questionnaire; consisting of 17 items which sought information on the sensors of OBDS improvement competencies needed by the

teachers. The questionnaire has two columns of needed category and performance category as follows: Very Highly Needed (VHN) 5, Highly Needed (HN) 4, Averagely Needed (AN) 3, Slightly Needed (SN) 2, and Not Needed (NN) 1. The performance category also has a five point scale of: Very High Performance (VHP) 5, High Performance (HP) 4, Average Performance (AP) 3, Low Performance (LP) 2, and Very Low Performance

(VLP) 1. The questionnaire was face validated by three experts. Cronbach Alpha method was used to determine the internal consistency of the instrument, which give a coefficient index of 0.93.

### Results

The results are presented according to the research questions and hypothesis that guided the study.

### Research Questions 1 and 2

**Table 1: Mean Responses of Teachers of Motor Vehicle Mechanics' Work on Competences in Sensors of On-Board Diagnostic System**

S/N	Item Statement	$\bar{x}_N$	$\bar{x}_P$	$\bar{x}_N - \bar{x}_P$	Remark
1	Identify variable reluctance type sensor	3.90	2.68	1.22	RIN
2	Identify hall effect sensors	3.86	2.68	1.18	RIN
3	Differentiate between variable reluctance type and hall effect type sensors	3.76	2.68	1.08	RIN
4	Identify manifold absolute pressure sensor	3.26	2.66	0.60	NR
5	Identify air flow sensor	3.80	2.20	1.60	RIN
6	Differentiate between manifold absolute pressure sensor and air flow sensor	3.42	2.30	1.12	NR
7	Identify variable voltage sensor	4.28	3.06	1.22	RIN
8	Identify variable capacitance type sensor	4.26	2.90	1.36	RIN
9	Identify variable inductance type sensor	4.26	2.88	1.38	RIN
10	Differentiate between variable voltage sensor and variable capacitance type	4.32	2.76	1.56	RIN
11	Differentiate between variable capacitance and variable inductance type	4.28	2.86	1.42	RIN
12	Differentiate between voltaic and resistive type of exhaust gas sensors	4.18	2.98	1.20	RIN
13	Identify crankshaft position sensor	4.30	4.04	0.26	RIN
14	Identify combustion knock sensor	3.92	3.64	0.28	RIN
15	Identify coolant temperature sensor	4.46	3.82	0.64	RIN
16	Identify sensor thermostat	4.42	3.04	1.38	RIN
17	Test a petrol engine for sensors that are in good condition	4.98	1.34	3.64	RIN

RIN= Required and Improvement Needed; NR= Not Required

Table 1 show that 15 items are required and improvement is needed on them by the teachers, while two (2) items are not required in teaching and learning of the petrol engine maintenance.

Competencies are required in the use of sensors of on-board diagnostic system for effective teaching of Petrol Engine Maintenance in the following;

1. Identification of variable reluctance type sensor
2. Identification of hall effect sensors

3. Differentiating between variable reluctance type and hall effect type sensors
4. Identification of air flow sensor
5. Identification of variable voltage sensor
6. Identification of variable capacitance type sensor
7. Identification of variable inductance type sensor
8. Differentiating between variable voltage sensor and variable capacitance type
9. Differentiating between variable capacitance sensor and variable inductance type
10. Differentiating between voltaic and resistive type of exhaust gas sensor

11. Identification of crankshaft position sensor
12. Identification of combustion knock sensor
13. Identification of coolant temperature sensor
14. Identification of sensor thermostat
15. Testing a petrol engine for sensors that are in good condition

### Hypothesis

Ho<sub>1</sub>: There is no significant difference in the mean ratings of the responses of the teachers, based on their experiences, on the competencies needed in the use of sensors of on-board diagnostic system for

Source of Variance	Sum of Squares	Df	Mean Square	f-Cal	f-Tab
Between Groups	0.9135	6	0.152	0.035	2.32
Within Groups	185.334	43	4.310		
Total	186.2475	49			

n= number of responded

The result in the table 2 indicated that calculated value is equal to 0.035 which was less than the table value of 2.32 at 0.05 levels of significance and degree of freedom of 6 and 43. This revealed that there was no significance (NS) difference in the mean ratings of responses of the teachers, based on their experiences, on the competencies needed in the use of sensors of on-board diagnostic system for effective teaching of petrol engine maintenance. The null hypothesis (Ho<sub>1</sub>) is therefore not rejected.

### Discussion of Results

The findings as presented in table 1 showed that 15 items are required and improvement is needed in all the 15 items. This signifies that teachers should be train/retrain in sensors associated with the emission control system. Sensors send the information in the engine to the Engine Control Unit which in turn instructs the actuators to carry out the preset instructions of the engine. The sensors help the driver to know what is happening in the engine before any drivability problem occurs. According to Don (2008), the driver who tends to travel does not need to panic whether the vehicle would take him to the destination. This is because when the vehicle sensor sends the information to the driver showing no problem in the engine; the driver can be rest assured that he can make the journey without breakdown.

The teacher, when trained in the use of on-board diagnostic system, would impart the right information to the student who in turn would use it

effective teaching of petrol engine maintenance.

**Table 2: ANOVA of the responses of the Teachers, based on their Experiences, on the Competencies Needed in the use of Input Devices of On-Board Diagnostic System for Effective Teaching of Petrol Engine Maintenance**

n- 16(0-5 years); 8(6-10 years); 9(11-15 years); 6(16-20 years); 7(21-25 years); 9(26-30 years); and 3 (31-35)

to maintain vehicles that use on-board diagnostic system. One of the vocational principle states that what is used to train should be a replica of what should be used in the industry. Therefore when there is innovation in the industry (automobile), the innovation should get to the trainers (teachers) who in turn should transfer the information to the trainee (students) who would complete the cycle by working in the innovated industry.

### Implications of the Study's Findings

The educational implications of this study are:

- The teachers when improved in the use of on-board diagnostic system would teach Petrol Engine Maintenance effectively.
- When the teachers are improved, their students will be equipped with the skills that are required to maintain the vehicles that use on-board diagnostic system.
- When the students graduate, they would become economically self-reliant craftsmen.
- There is no significance difference in the mean ratings of the responses of the teachers of various years of teaching experiences in competences needed in on-board diagnostic sensors for effective teaching of Petrol Engine Maintenance in technical colleges in Nigeria.

### Conclusion and Recommendations

Based on the findings of this study, it is concluded that teachers of Motor Vehicle Mechanics' Work in Nigeria need improvement in the use of on-board diagnostic system for effective teaching of Petrol Engine Maintenance. There is therefore an urgent need to improve these teachers. This is necessary in order to teach the students who will service the recent petrol engine vehicles that use on-board diagnostic system effectively.

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

- (1) There should be in-service training in the use of on-board diagnostic system for the teachers of Motor Vehicle Mechanics' Work. The administrators should organise workshops where these teachers could be retrained by experts of on-board diagnostic system. They could better still be given opportunity to further their education in their related areas; through, study leave with pay.
  - (2) New technological developments having implications for automobile such as the use of on-board diagnostic system, should be integrated into the skills contents and learning contents of the curriculum of technical education programme. Production of craftsmen on motor vehicle mechanics by technical colleges should be based on the need of automobile industries. Consequently, the curriculum contents should be directly related to what industries and business need to make graduates easily work in the industries. These call for curriculum contents review that is directly related to the new technological development to be integrated into technical colleges' curriculum.
- However, the integration of automobile technological developments into Nigeria technical college Motor Vehicle Mechanics' Work curriculum will involve combining the theoretical and practical contents of automobile technological development into the existing technical colleges Motor Vehicle Mechanics' Work curriculum.
- (3) There should be an advocacy on the importance of in-service training and that of including on-board diagnostic system to

the curriculum of Motor Vehicle Mechanics' Work. The curriculum planners and education policy makers should be made to understand the innovations of automobile which include on-board diagnostic system. Various sensitization programmes should be organised through the various media, and academic discourse such as conferences.

- (4) Vehicles that use on-board diagnostic system should be used in teaching the students. Various technical colleges should be advised to buy vehicles which they could afford, (either new ones or fairly used ones), but the ones which have on-board diagnostic system. Government and other relevant bodies such as the Parent Teacher Association could still be invited to donate such vehicles, maybe after the advocacy.

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## LANGUAGE EDUCATION LECTURERS' PERCEPTION OF COMPUTER ASSISTED LANGUAGE LEARNING (CALL) IN THE INSTRUCTIONAL DELIVERY OF ENGLISH LANGUAGE

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### Abstract

*The study was carried out to ascertain the language education lecturers' perception of Computer Assisted Language Learning (CALL) in English language instructional delivery. The population of the study was all the language education lecturers involved in training students in English language education in South-East Nigerian universities. Four research questions were developed to guide the study. Descriptive survey design was used for the study and 132 lecturers selected from four universities using random sampling technique constituted the sample. A 29-item questionnaire, validated by three experts in English language education and whose reliability index yielded 0.71 was the instrument used for data collection. Data analysis was done using mean ( $\bar{X}$ ) and standard deviation (SD). Results showed that although CALL is a welcome development in English language instructional delivery, the utilization of its attached language programmes is not void of all the problems identified by the study. However, English language education lecturers have high perception of CALL as an indispensable computer technology for promoting the teaching and learning of English. The study, therefore, recommended that English language education lecturers in Nigerian universities should explore the use of computer and its attached language teaching and learning programmes in order to remain globally competitive and relevant as far as English language instructional delivery is concerned.*

**Keywords:** Computer, Technology, Computer assisted language learning (CALL), English language education.

### INTRODUCTION

Technology and its attendant impacts has influenced the entire universe in diverse ways. The development from manual typewriters, analogue computers to various makes and sizes of digital computers and mobile phones; handwritten letters to SMS, E-mail and internet is traceable to technological advancements. Technology has helped to add more functional values to different sectors of economy including the education sector. Salaway and Caruso (2008) describe technology as the making, modification, usage and knowledge of tools, machines, techniques, crafts, systems and methods of organization in order to solve a problem, improve on a pre-existing solution to problem, achieve a goal or perform a specific function. This is the case with Information Communication Technology (ICT) which is the most influential technology of this dispensation.

ICT refers to a variety of technologies, tools, equipment and applications for processing, accessing and retrieval of information. The Federal Republic of Nigeria (FRN, 2001) views ICT as any equipment or interconnected system or sub-system of equipment used in the automatic acquisition,

storage, control, manipulation, management, government, display, switching, interchange, transmission or receptions of data and information. From Olorundare's (2006) standpoint, ICT incorporates technological electronic devices and varieties of software and materials that facilitate the generation, processing, storage, retrieval, impartations of knowledge, transmission and communication of information. Such devices include televisions, radios, tape recorders and players, phones, VCDs and DVDs, e-mail, internet and computers. All these ICT tools are designed perhaps to make education easier as well as to make teaching and learning more interesting and motivating. However, the central accessible point to most technological devices is the computer.

Computer is a media technology with the ability of accepting, storing, processing, using and displaying information. Computers also transmit data or communicate to other media devices such as television, projector, phone, internet and other computers. Performance of these actions by the computer is dependent on the purpose and the instruction issued to it by its operator. Onasanya



(2002) observes that computers, as an automatic electronic machine, is capable of accepting and performing operation according to the instruction (programme) and providing result of the operation with great speed and accuracy. Computer technology has almost permeated all sectors of the world including the education sector where it has emerged as an indispensable educational tool especially in instructional delivery. The reasons for the high status occupied by the computer are not far-fetched.

The world is becoming more globalized and as such more independent. There is, therefore, need for a labour force capable of manipulating (computer) technology as an instrument for increased and enriched productivity and creativity (Alibi, 2004). Part of this labour force is the English language education lecturers of Nigerian Universities. Again, technology is increasingly advancing. Due to this technological advancements, language teachers have started to consider the use of computers as an essential part of daily language teaching and learning (Groot, 2000). As observed by Tabar & Khodareza (2012), the past few decades have witnessed a huge rise in the number of language teachers using computers and the internet in their classrooms. This is a pointer that computer technology has the potential to play a major role in foreign language teaching and learning.

The role of computer technology in assisting foreign language teaching and learning is referred to as Computer Assisted Language Learning (CALL). It is a language teaching and learning approach in which the computer is used as an interactional element and also used as a tool for presentation, assisting students and evaluating learning material (Tabar & Khodareza, op.cit). In a more extensive description, Calico cited in Ates, Altunay & Altun (2006) explains that CALL adapts the research findings of second language acquisition, sociology, psychology, cognitive sciences, culture examinations and natural language processing to second language pedagogy and relates them to investigation into information processing, artificial intelligence and telecommunication thereby achieving the progress of language teaching and learning processes. Warschauer and Healey in Ates, Altunay & Altun (2012) emphasize that the effectiveness of various CALL materials depends on pedagogical designs and the way teachers use these materials. Thus three language pedagogical designs with the use of CALL were identified by Warschauer and Healey.

First is the CALL design used for drill and practice in language instructions with advances such as integration of speech recognition programmes. This design enriches learners' language learning experiences and encourages individualized learning. Second is the CALL design used for teaching grammar and language forms. Essentially, this design aims at subjecting learners to generate original utterances instead of manipulating prefabricated computer language. The third CALL design is integrative in nature. It integrates the teaching of listening, speaking, reading and writing skills using a combination of various language approaches such as task-based, project-based and content-based approach. These different designs seem to provide a more effective technique to the teaching and learning of English and also present a new language outlook, environment and experiences for teachers and learners. This is because traditional chalk and board method, although, fruitful in some cases, is no longer considered as the sole means of teaching and it is no longer welcomed by language learners as a productive method (Nichd, 2000). Whether Nichd's opinion implies that optimal learning of English as a foreign language may not occur if teachers depend only on the conventional face-to-face classroom instruction, it is left for the consideration and consumption of English language teachers.

With the current status of English as an official language in many nations and also as language of science, technology and international relations, many countries around the world consider the teaching of English as a major educational priority (Mckay, 2000). It is, therefore, behoves the Nigerian universities and lecturers of English education in these universities to provide functional English language instruction that will match its global status thereby preparing students for global competitiveness. This is because with the speed which technology is developing, the globalization and interaction between language instruction and learning may know no bounds. Apart from its position, Akabogu (2006) explains that there is an increasing demand for the learning of English all over the world because of the opportunity it offers speakers to communicate globally and to access international media. The opportunity referred here can be adequately utilized if English language teachers embark on CALL exploration. CALL provides a challenging opportunity for the teacher to be creative, innovative, dynamic and resourceful though it is a departure from the traditional method,

technique and approach of language teaching and learning. It also adds to the teacher's content mastery thereby strengthening the confidence reposed on him by learners.

On the part of learners, CALL stimulates their enthusiasm and appetite for technological know-how. It widens their horizons for communication of information and creative expression. It serves as a powerful tool for the acquisition of those skills required in learning English as a foreign or second language. The interactive nature of CALL encourages interactive and active learner participation in the teaching and learning process especially as learners respond to the prefabricated computer language instructions and suggestions. CALL also provides learners with feedback and freedom to make their own instructional decision. According to Ikwuka (2010) and Cellat (2008), the individualized English language instructions enable learners to study language individually in a motivated atmosphere; at their own pace and with a high level of interactivity. This is, however, dependent on learners' choice and intellectual capabilities.

English language teaching can be exciting and fulfilling if the teacher develops effective teaching strategies that cannot only awake creative potentials and endowments in learners but also provide enriching opportunities that arouse learners' interest and aspirations. Boers, Eyckmaus & Stengers (2004) note that teaching is a complex and unique profession hence it requires a lot of strategizing. When it comes to teaching and learning therefore, having a plan or a strategy definitely becomes necessary. Having a strategy goes with being creative, innovative and resourceful thus English language education lecturers need not circumscribe themselves to the traditional teacher-led classroom method of instructional delivery. Again traditional classroom language learning involves a lot of repetition and practice beyond the classroom instruction to reach mastery of the language. However, with today's technology at one's disposal, the ways in which instruction is delivered can dramatically change (Lee in Cellat, 2008). Lee seems to imply that the teaching and learning of English in the near future may become educationally insalubrious in Nigeria if it is not assisted with computer technology. Here lies the indispensability of CALL as an authentic educational resource that facilitates effective English language teaching and learning.

It may be in the light of the above prediction that Blakes in Akabogu (2006)

emphasizes the need for English language professionals to capitalize on the advantages and strengths of computer technology wherever consistent with best practices. According to Blakes, language teachers who wish to remain competitive in the profession should observe and contemplate instances where technology can assist good teaching practices. One of such technologies is CALL technology. The contemporary language professionals, therefore, must educate themselves to adopt CALL technology to the needs of their own respective learners and environment.

As promising and advantageous as CALL seems to be presented, it is not void of some limitations. For instance, practical knowledge of basic computer operation and application is needed by both teachers and learners before the utilization of CALL programmes and softwares. Unfortunately, most English language teachers today do not have sufficient technological training to guide their students who are exploring computer and its assisted language learning programmes (Lai & Kritsonis, 2006). Apart from causing students to lose interest in classroom instruction and attendance, CALL technology is associated with high cost thus causing education imbalance between students from rich homes and those from low income homes who may find it difficult to purchase computers.

In addition, CALL cannot attend to learners' language learning problems nor provide immediate answers as teachers do in the traditional classroom setting. Lai & Kristonis (op. cit) contend that computer technology mainly deals with listening, reading and writing skills. Moreover, Lai & Kristonis observe that the recently developed speaking skills programmes of CALL are still restricted in their function. This constitutes a problem in using CALL technology. Warschauer (2004) explains that a speaking skill programme should ideally be able to understand a user's spoken input and evaluate it not just for correction but also for appropriateness. It should also be able to diagnose a student's problems with pronunciation, syntax or usage and then intelligently decide among a range of options. This aspect according to Warschauer is yet to be realized with the recently developed CALL programmes.

Considering the inroads computer technology has made in foreign language teaching and learning, there is need to encourage the utilization of CALL in order to facilitate effective English language education instructional delivery especially in Nigerian universities. The thrust of this

study, therefore, is to find out language education lecturers' perception of Computer Assisted Language Learning (CALL) in the instructional delivery of English language in South-East Nigerian universities. To guide the study, the following research questions were developed:

#### Research Questions

1. What is the English language education lecturers' perception of CALL in English language instructional delivery?
2. What is the extent to which CALL promote the instructional delivery and learning of English language?
3. What are the problems associated with the use of CALL in English language instructional delivery as perceived by English language education lecturers?
4. In what ways can English language education instructional delivery and learning be facilitated using CALL?

#### Method

Description survey design was adopted for this study. It is considered appropriate for the study because it concentrates on finding out facts about people's lives, opinion, attitudes, motivation as well as their behaviours (Osuala, 2001). The study aimed at identifying the opinion of English language education lecturers on CALL in instructional delivery. Four research questions were developed to guide the study. The study was conducted in the South-East geopolitical zone of Nigeria. A total of 227 lecturers in English language education and service departments constituted the population for the study. These are lecturers involved in the interpretation of English language education curriculum, the instructional delivery as well as training students in English language education.

Using the random sampling technique, 132 lecturers were drawn as sample.

Data was collected using a 29-item questionnaire structured on a four point rating scale of Strongly Agree; Agree; Disagree and Strongly Disagree with weightings of 4, 3, 2 and 1 point respectively. The instrument was divided in four parts. Parts A and B sought to find out English language education lecturers' perception of the use of CALL and the extent to which it promotes English language instructional delivery. Parts C and D centred on the problems associated with the use of CALL and ways of facilitating English language education instructional delivery and learning using CALL. The instrument was subjected to the criticism of three experts knowledgeable in English language education. Their suggestions were accommodated in producing the final modification of the instrument. Cronbach Alpha was used to determine the internal consistency of the questionnaire items which yielded a co-efficient of 0.71. Responses were analyzed using mean scores and standard deviation. The criterion mean for accepting or rejecting any item was 2.50. Items that had mean scores of 2.50 and above were accepted while those items that had mean scores below 2.50 were rejected.

#### Results

Based on the research questions, the results are presented in Tables 1, 2, 3, and 4 below.

##### Research Question 1

What is the English language education lecturers' perception of CALL in English language instructional delivery?

**Table 1: Mean ratings of English language education lecturers' perception of CALL in English language instructional delivery**

S/No	Item	$\bar{X}$	SD	Remark
1	CALL is an indispensable component of contemporary foreign language learning pedagogy.	3.12	0.71	Accept
2	CALL is a design for combating global technology revolution in foreign language teaching and learning.	2.50	0.93	Accept
3	CALL is a modification of language teaching and learning to meet learners' ability, needs and interest.	3.36	0.59	Accept
4	CALL is a design to make instruction and learning easier, less time consuming and interesting.	3.23	0.67	Accept
5	CALL is a powerful tool for acquisition of foreign language linguistic skills	3.25	0.62	Accept
6	Though CALL is a departure from the traditional face to face language teaching and learning process, it is a positive innovation aimed at promoting language learning.	3.08	0.78	Accept
7	CALL encourages high level of interactivity between teachers and students and between students and peers.	2.66	0.82	Accept

8	Without adopting CALL programmes, English language teaching and learning becomes unwholesome.	3.08	0.78	Accept
9	Language teachers desiring to be globally competitive and relevant must embrace computer technology.	3.50	0.48	Accept
10	Optimal learning may not occur if teachers depend on face-to-face classroom instruction.	2.40	1.04	Reject

Table 1 indicates that apart from item 10, all other items have mean ratings above 2.50 which is the bench mark for the acceptance of any item. This means that language education lecturers perceive CALL as an indispensable technological development which needs to be made a component of contemporary foreign language pedagogy. CALL, therefore, needs to be embraced by English language education lecturers if they intend to make the teaching and learning of English a wholesome process. However, the rejection of item 10 is an indication that from the language education lecturers' perspective, optimal learning may occur if

language teachers are committed to the traditional face-to-face classroom instructional delivery.

### Research Question 2

What is the extent to which CALL promote the instructional delivery and learning of English language?

**Table 2: Mean ratings of English language education lecturers' perception of the extent to which CALL promotes English language learning**

S/No	Item	$\bar{X}$	SD	Remark
11	Provision of a new and motivating outlook for language teaching and learning experience	3.35	0.62	Accept
12	Provision of interactive learning opportunities that promote and strengthen learners' linguistic skills	3.18	0.88	Accept
13	Provision of easy access to learning environments irrespective of time and place	2.52	0.97	Accept
14	Learner autonomy and individualized technology learning at learners' pace	3.46	0.58	Accept
15	Stimulation of learners' enthusiasm and appetite for technological know-how	3.08	0.89	Accept

Data from Table 2 reveal that all the items have means scores above the criterion mean of 2.50. This shows that the English language education lecturers perceive that CALL has the potential of promoting effective language learning.

### Research Question 3

What are the problems associated with the use of CALL in English language instructional delivery as perceived by English language education lecturers?

**Table 3: Mean ratings of the problems associated with the use of CALL in English language instructional delivery as perceived by English language education lecturers**

S/No	Item	$\bar{X}$	SD	Remark
16	Teachers and students must possess basic computer technology knowledge before the application of CALL programme.	3.46	0.67	Accept
17	CALL programmes cannot handle unexpected learning problems in the classroom	3.57	0.54	Accept
18	CALL programmes cannot immediately respond to learners question as teachers do in the class	3.38	0.73	Accept
19	Utilization of CALL in English language instructional delivery is very exorbitant	3.18	0.88	Accept
20	CALL may cause educational imbalance since learners from poor homes may not afford computers	3.28	0.82	Accept
21	Learners may lose interest in classroom attendance and instructional delivery	2.31	1.42	Reject

The data presented in Table 3 show that the English language education lecturers perceived all the items as constituents of the problems associated with the use of CALL in English language instructional delivery. They did not agree that learners' interest in traditional classroom instructional delivery nor their attendance to classes may be lost if the use of CALL programmes is incorporated into English language teaching and

learning. This implies that a combination of methods, approaches and techniques is required for effective English language teaching and learning.

#### Research Question 4

In what ways can English language education instructional delivery and learning be facilitated using CALL?

**Table 4: Mean ratings of the ways of facilitating English language education instructional delivery and learning using CALL.**

S/No	Item	$\bar{X}$	SD	Remark
22	Integrating computer technology into the English language education curriculum	3.29	0.69	Accept
23	Use of interactive English language training softwares in English language teaching and learning	3.36	0.61	Accept
24	Use of multimedia, computer projectors for English language instructional delivery	3.23	0.84	Accept
25	Computer training and re-training of English language education lecturers	3.49	0.57	Accept
26	Availability and regular servicing of ICT facilities	3.25	0.79	Accept
27	Well-equipped language laboratory with computers and ICT facilities including the internet	3.28	0.71	Accept
28	Online lecture delivery, giving of assignments and quizzes	3.36	0.61	Accept
29	Constant power supply and standby generator(s) against power outage	3.20	0.87	Accept

The results presented in Table 4 show that all the items are accepted; indicating that all the items have mean scores above 2.50. This means that the English language education lecturers perceive all the items as being the ways for facilitating English language education using CALL.

#### Discussion

The study found out that CALL has become an indispensable component of foreign language learning. Language education lecturers, whose desire it is to make teaching exciting and fulfilling must embrace computer technology especially if they want to remain competitive and relevant in this era of computer technology. The findings are in tandem with Blakes cited in Akabogu (2006) who avers that language teachers who wish to remain competitive in the profession should observe and contemplate instances where technology can assist good teaching practices. Lee, (2000) further remarks that such practices are capable of enlarging global understanding as well as provide motivation and experiential learning for students.

The results of the findings also show that CALL is a powerful educational tool which promotes foreign language learning. CALL also offers a new outlook for language teaching and learning and it is convenient for creating independent and

collaborative learning environment. However, language teachers and learners should neither restrict themselves to computer and its attached language teaching and learning programmes nor totally depend on the conventional classroom. The traditional classroom instructional delivery cannot be totally discarded because it is fruitful in some cases. However, it is no longer considered as the sole means of teaching since language learners no longer welcome it as a productive method (NICHED, 2004).

The study further found out that despite the role which CALL plays in foreign language teaching and learning, its limitations abound. For instance apart from initiating education imbalance and the high cost of purchasing computer and CALL softwares, utilization of CALL requires basic knowledge and competencies in computer technology. This corroborates the perception of Lia and Kristsonis(2006) that computer and its attached language learning programmes increases educational costs and initiates harm to educational equity.

Finally, the study reveals that integrating computer technology into the English language education curriculum, computer training and retraining of language education lecturers, availability and regular servicing of ICT facilities, online lecture delivery and online administration of assignments and quizzes are some of the ways of

facilitating English language education instruction and learning. This is in line with Brinkley, Dessants, Flamm, Flaming, Forcey and Rothschild (1999) whose opinion it is that lecture delivery, administration of assignments, quizzes, examinations, discussions and paper presentations can be facilitated using e-resources which include CALL programmes and softwares.

### Conclusion and Recommendations

Computer technology is currently permeating every sphere of education and English language education is not left out in this scramble for technology. One of the technologies making waves in foreign language teaching and learning is the Computer Assisted Language Learning (CALL). This study investigated the English language education lecturers' perception of CALL and the extent to which CALL programmes promote English language teaching and learning. Some of the problems involved in the use of CALL programmes and softwares were identified. These include high cost, inability to handle unexpected learners problem or respond to learners' questions as teachers do and lack of basic computer knowledge and competencies on the part of teachers and learners. Among the ways through which English language education can be facilitated using CALL are integration of computer technology into the English language education curriculum; use of interactive English language training softwares; use of multimedia computer projectors for English language instructional delivery; constant power supply and provision and servicing of available ICT facilities.

It was, therefore, recommended that the utilization of Computer Assisted Language Learning (CALL) should be encouraged so as to facilitate quality English language education in Nigeria universities. Also English language education lecturers in Nigerian universities should explore the use of computer and its attached language teaching and learning programmes in order to remain globally competitive and relevant and also to make English language instruction delivery and learning a wholesome process.

### Recommendation

- Government should provide multimedia technologies and equipment that would encourage the use of computer in all schools in adequate measure.

- Government should organize annual competition on graphic design among graphic designers to display the work culture and creative art in Nigeria.
- Government should provide supervision team to ensure that entrepreneurship education is being promoted in all schools of learning.
- Government should provide medium of incentive for individuals who could establish a reasonable business before graduation from schools of learning

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## USING ON-BOARD DIAGNOSTIC TOOL FOR EFFECTIVE TEACHING OF PETROL ENGINE MAINTENANCE IN TECHNICAL COLLEGES IN NIGERIA

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### ABSTRACT

*The study was on the use of on-board diagnostic tool for effective teaching of Petrol Engine Maintenance (PEM) in technical colleges in Nigeria. Two research questions and a hypothesis guided the study. All 58 subjects made up of teachers of Motor Vehicle Mechanics' Work (MVMW) responded to 14 item questionnaire to answer the research questions. The study was carried out in south eastern states of Nigeria. The design for the study was the descriptive survey, using Borich's needs assessment model. Three experts face validated the contents of the instrument. Cronbach Alpha method was used to determine the reliability of the instrument which yielded a reliability of 0.93. Mean and improvement need index (INI) were utilized to answer the research questions while the hypothesis was tested using Analysis of Variance (ANOVA). It was found that teachers of Motor Vehicle Mechanics' Work need improvement in on-board diagnostic system. Based on the findings, it was recommended that there should be in-service training in on-board diagnostic system for the teachers of Motor Vehicle Mechanics' Work.*

### INTRODUCTION

On-board diagnostic system (OBDS) is an emission control system. Recent petrol vehicles use on-board diagnostic system. This came as a result of global concern to reduce emission of carbon monoxide, nitrogen oxides and hydrocarbons. In the view of Bell (2005) spark-ignition engines are particularly responsible for carbon monoxide emissions; an air/fuel mixture, which is rich in fuel, produces an excessive concentration of carbon dioxide (CO<sub>2</sub>). It is important that vehicles with petrol engines are correctly tuned and maintained to provide the optimum air/fuel mixture and to ensure that carbon dioxide emissions are minimized. York (2007) added that precise fuel delivery and spark timing are needed to reduce vehicle emissions. Mechanical engine controls in use at the time (such as ignition points, mechanical spark advance and the carburetor) responded too slowly to driving conditions to properly control fuel delivery and spark timing. Bell (2005) stated that OBDS can identify problem(s) with the emission control system before the vehicle becomes an excessive polluter, allowing time to repair the vehicle before emissions increase.

Sensors and actuators sense the operation of specific components (e.g., the oxygen sensor) and actuate others (e.g., the fuel injectors) to maintain optimal engine control. An on-board computer, known sometimes as an "engine control unit" (ECU) or an "engine control module" (ECM),

controls all of these systems. The on-board computer is capable of monitoring all of the sensors and actuators to determine whether they are working as intended. It can detect a malfunction or deterioration of the various sensors and actuators, usually well before the driver becomes aware of the problem through a loss in vehicle performance or drivability. The sensors and actuators, along with the diagnostic software in the on-board computer, make up what is called "the OBD system." Allan (2001) included diagnostic tool in the system because the information in the software needs to be read by the tool to appreciate the utility of the system. The sensors are the input devices, the actuators are the output devices, the codes programmed in the computer forms the diagnostics software; and the scan tools are referred to as the diagnostic tool. OBDS operates in an automobile.

Automobile technology involves the application of scientific knowledge in the design, selection of materials, construction, operation, maintenance and improvement of the automobile (Forster 1992). Olufemi and Anthony (2010) stated that in Nigeria, technical colleges produce craftsmen for various sectors of the economy and are regarded as the principal vocational institutions. It offers various mechanical trades among which is Motor Vehicle Mechanics' Work (MVMW). The programme of MVMW trade in Nigeria technical colleges is designed to produce competent auto-mechanics



craftsmen for Nigeria technological and industrial development. According to National Board for Technical Education (NBTE, 2007), auto-mechanics craftsmen are expected to test, diagnose, service and completely repair any fault on the motor vehicle to the manufacturer's specification. For this to be achieved, a national curriculum is adopted in all technical colleges accredited by the NBTE.

The curriculum for MVMW in the technical colleges is developed to offer a complete secondary school education in general education in addition to occupational area while the central purpose of MVMW trade is to provide its recipient with the skill required for work in the automobile industry. Petrol Engine Maintenance (PEM) is one of the modules of MVMW. The goal of PEM is to produce a petrol engine maintenance craftsman who should understand the basic principles of operation and carry out general maintenance and reconditioning work on petrol engine. Some of the general objectives include that the trainee (student) should be able to: understand the basic working principles of petrol engine and restore it to peak performance, and understand the working principles of the fuel system of the motor vehicle. In order to achieve these objectives, the students need to be taught.

The teachers of MVMW are trained as vocational educators. Vocational education is that aspect of the general school curriculum concerned with the acquisition of knowledge, attitudes and skills necessary for securing and advancing in a given occupation (Ogwo and Oranu 2006). Nwachukwu (2006) simply put it as education for work. Vocational teachers, just as other teachers, ensure that they continue to abreast themselves in the innovations of their field in order to remain effective. One of the ways they ensure that is by updating their competencies through training while still teaching. This is referred to as in-service training. Aba (2007) stated that in-service training should be developed as an integral part of making up for teacher's inadequacies. This means that when a teacher is found deficient in either technical or professional skill or both, he/she needs enhancement to make up for identified inadequacies. The teachers of Motor Vehicle Mechanics' Work in Nigerian technical colleges should be competent in teaching Petrol Engine Maintenance to their students. One of the innovations of automobile technology is the use of on-board diagnostic system. Therefore, they should be trained in the areas they are deficient in order to be competent.

### Statement of the Problem

The teacher of Motor Vehicle Mechanics' Work teaches Petrol Engine Maintenance. (NBTE, 2007) enumerated six (6) general objectives of Petrol Engine Maintenance. Some of them include that on completion of the module, the trainee should be able to:

- Understand the basic working principles of petrol engine and restore it to peak performance.
- Understand the working principles of the fuel system of the motor vehicle.

In the course specification, a teacher is expected to teach sensors, actuators, computerized ignition system and diagnose faults using electronics equipment. Presently, the teachers teach these components distinctively. The teacher should be aware of the interrelatedness of these components. The interrelation of these components and few innovations in the component, in the emission system is what is presently referred to as on-board diagnostic system (OBDS). The teachers do not teach OBDS in the Technical Colleges in Nigeria and as such, most of them do not have the competence to teach the OBDS (Odigiri, 2004). The question here is what should be done by the teachers of Motor Vehicle Mechanics' Work in order to teach the Petrol Engine Maintenance so that when their students graduate they would be able to maintain these present manufactured vehicles which use on-board diagnostic system?

### Purpose of the Study

Specifically, an attempt was made in this study to;

- Identify competencies required by the teachers in the use of diagnostic tool of on-board diagnostic system for effective teaching of petrol engine maintenance; and
- Determine competency improvement needs of the teachers in the use of diagnostic tool of on-board diagnostic system for effective teaching of petrol engine maintenance.

### Research Questions

The following research questions were formulated to guide the study:

- What are the competencies required by the teachers in the use of diagnostic tool of on-board diagnostic system for effective teaching of petrol engine maintenance?

- What are the improvement needs of the teachers in the use of diagnostic tool of on-board diagnostic system for effective teaching of petrol engine maintenance?

### Hypothesis

The following null hypothesis was formulated to guide the study and was tested at the .05 level of significance.

- $H_{01}$ : There is no significance difference in the mean ratings of the responses of the teachers of various years of teaching experiences in competences needed in on-board diagnostic tools for effective teaching of Petrol Engine Maintenance in technical colleges in Nigeria.

### Design of the Study

The study adopted survey research and Borich needs assessment model. The Borich (1980) needs assessment model requires that a mean weighted discrepancy score be calculated for each item, competency or activity included in the needs assessment. A discrepancy can be calculated by comparing the participants' behaviors, skills, and competencies, with the goals of the program: "a discrepancy analysis that identifies the two polar positions of what is and what should be". Further, a comparison could be made to determine a group of individuals' perceived level of competence to complete a task, with their desired level of competence to complete a task.

### Method of Data Analysis

In answering the research question, weighted mean and Improvement Needed Index (INI) was used, while analysis of variance (ANOVA) statistic was used to test the null hypothesis at 0.05 level of significance and appropriate degree of freedom. The mean was utilized in answering research question 1, while INI was utilised to analyse data on improvement needs of teachers of Motor Vehicle Mechanics' Work, which is research question 2. Any item with a mean rating of 3.50 and above is considered needed, while any item with a mean rating below 3.50 is regarded as not needed. This is because 3.50 is the lower real limit of 4.00 which represent averagely needed. The weighted mean of each item under the needed category was calculated ( $x_n$ ). The weighted mean of each item under the performance category was calculated ( $x_p$ ). The difference between the two means was calculated ( $x_n - x_p$ ). This gave the value that

indicated whether improvement is needed or not, and stated as follows:

- (9) Where the difference is zero ( $x_n - x_p = 0$ ) that is neutral, it indicates that there is no need for improvement on the item. However, for INI to be equal to zero, any of these conditions must occur:
- (a) Very highly needed = very high performance
  - (b) highly needed = high performance
  - (c) averagely needed = average performance
  - (d) Slightly needed = low performance and
  - (e) Not needed = very low performance
- (10) where the difference is positive ( $x_n - x_p = +$ ), it indicates that there is need for improvement of teachers on the item
- (11) Where the difference is negative ( $x_n - x_p = -$ ), it indicates that there is no need for improvement on the item because the mean performance ( $x_p$ ) of the teachers for the scale is greater than the level at which that scale is needed ( $x_n$ ). That is, the teachers can perform the skill to the level at which it is needed and even above. (That is,  $INI = x_n - x_p$ . Where  $x_n$  means needed and  $x_p$  means performance) (Source: Olaitan and Ndomi, 2000).

### Population for the Study

The population for this study consisted of all 58 subjects made up of teachers of Motor Vehicle Mechanics' Work in the NBTE-accredited technical colleges in South Eastern States of Nigeria. The states include Abia, Anambra, Ebonyi, Enugu, and Imo states. The names of the accredited technical colleges were got from the various states' Ministries of Education.

### Instrument for Data Collection

The instrument for data collection for this study was structured questionnaire; consisting of 14 items which sought information on the diagnostic tools OBDS improvement competencies needed by the teachers. The questionnaire has two columns of needed category and performance category as follows: Very Highly Needed (VHN) 5, Highly Needed (HN) 4, Averagely Needed (AN) 3, Slightly Needed (SN) 2, and Not Needed (NN) 1. The performance category also has a five point scale of: Very High Performance (VHP) 5, High Performance (HP) 4, Average Performance (AP) 3, Low

Performance (LP) 2, and Very Low Performance (VLP) 1. The questionnaire was face validated by three experts. Cronbach Alpha method was used to determine the internal consistency of the instrument, which give a coefficient index of 0.93.

#### Research Questions 1 and 2

**Table 1: Mean Responses of Teachers of Motor Vehicle Mechanics' Work on Competences in Diagnostic Tools of On-Board Diagnostic System**

S/N	Item statement	$\bar{x}_N$	$\bar{x}_P$	$\bar{x}_N - \bar{x}_P$	Remark
1.	Read diagnostics codes using a code scanner	5.00	1.08	3.92	RIN*
2.	Connect the vehicle on-board computer to laptop using an interface	4.98	4.98	0.00	RNIN**
3.	Send data from on-board computer to laptop through serial port	5.00	1.06	3.94	RIN
4.	Operate Windmill computer software	4.86	1.04	3.82	RIN
5.	Calculate information in on-board computer using spreadsheet	4.86	1.04	3.82	RIN
6.	Record vehicle fuel consumption using digital multimeter	4.92	1.12	3.80	RIN
7.	Record engine revolution per minute (rpm) using digital multimeter	4.84	1.06	3.78	RIN
8.	Record vehicle speed using digital multimeter	4.80	1.20	3.60	RIN
9.	Record emitted oxygen using digital multimeter	4.98	1.06	3.92	RIN
10.	Record intake air temperature using digital multimeter	3.80	1.00	2.80	RIN
11.	Record ignition timing using digital multimeter	4.96	1.06	3.90	RIN
12.	Identify diagnostic port in the vehicle	4.98	4.98	0.00	RNIN
13.	Enumerate functions of generic scan tool	4.94	3.86	1.08	RIN
14.	Switch off the interface correctly	4.84	1.12	3.72	RIN

\*Required and Improvement Needed \*\* Required but No Improvement is Needed

Data shown on table 1 indicates that 12 items are rated as required and improvement needed on them. Items number 2 and 12 are rated as required and also the competence performance on them are rated on the same level thereby improvement is not needed on them.

#### Hypothesis

Ho<sub>1</sub>: There is no significant difference in the mean ratings of the responses of the teachers, on the competencies needed in the use of diagnostic tool of on-board diagnostic system for effective teaching of petrol engine maintenance.

#### Results

The results are presented according to the research questions and hypothesis that guided the study.

**Table 2: ANOVA of the Responses of the Teachers, based on their Experiences, on the Competencies needed in the use of Diagnostic Tools of On-Board Diagnostic System for Effective Teaching of Petrol Engine Maintenance**  
n- 16(0-5 years); 8(6-10 years); 9(11-15 years); 6(16-20 years); 7(21-25 years); 9(26-30 years); and 3 (31-35)

Source of Variance	Sum of Squares	Df	Mean Square	f-Cal	f-Tab
Between Groups	1.0675	6	0.178	0.674	2.32
Within Groups	11.352	43	0.264		
Total	12.4195	49			

n= number of responded

The result in the table 2 indicated that calculated value is equal to 0.674 which was less than the table value of 2.32 at 0.05 levels of significance and degree of freedom of 6 and 43. This revealed that there was no significance (NS) difference in the mean ratings of responses of the teachers, based on their experiences, on the competencies needed in the use of diagnostic tools of on-board diagnostic system for effective teaching of petrol engine maintenance. The null hypothesis ( $H_{01}$ ) is therefore not rejected.

### Discussion of Results

The findings on table 1 showed that 14 items are required and improvement is needed in 12 items. The two items where improvement is not needed is due to the fact that even though they are required, the teachers can perform them. Therefore, there was no need to retrain the teachers on those items which include; connecting the vehicle on-board computer to laptop using an interface and Identifying diagnostic port in the vehicle. The remaining twelve (12) items, which teachers need improvement, signifies that teachers should be trained and retrained in competencies involved in diagnostic tools of on-board diagnostic system. Policy makers, curriculum developers and government ministries should organize seminars where the experts of on-board diagnostic system should be invited to train and retrain the teachers on them.

The problem encountered in the emission control system should be interpreted to appreciate the utility value of the system. Without diagnostic tools, the on-board system usefulness will only be to control the actuators; it would not go beyond that to effect services on them. Allan (2001) stated that maintenance of vehicle that uses on-board diagnostic system is made possible as a result of scan tools and other diagnostic tools use to diagnose the problem of the engine as indicated by the trouble codes. The teacher, when he is trained in on-board diagnostic system, would impart the right information to the student who in turn would use it to maintain vehicles that use on-board diagnostic system. One of the vocational principle states that what is use to train should be a replica of what should be used in the industry. Therefore when there is innovation in the industry (automobile), the innovation should get to the trainers (teachers) who in turn should transfer the information to the trainee (students) that would

complete the cycle by working in the innovated industry.

### Conclusion and Recommendations

Based on the findings of this study, it is concluded that teachers of Motor Vehicle Mechanics' Work in Nigeria need improvement in on-board diagnostic system for effective teaching of Petrol Engine Maintenance. There is therefore an urgent need to improve these teachers. This is necessary in order to teach the students who will service the recent petrol engine vehicles that use on-board diagnostic system effectively.

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

- (1) There should be in-service training in on-board diagnostic system for the teachers of Motor Vehicle Mechanics' Work. The administrators should organise workshops where these teachers could be trained by experts of on-board diagnostic system. They could better still be given scholarship to further their education in their related area; that is, study leave with pay.
- (2) New technological developments having implications for automobile such as in on-board diagnostic system, should be integrated into the skills contents and learning contents of the curriculum of technical education programme. Production of craftsmen on motor vehicle mechanics by technical colleges should be based on the need of automobile industries; consequently, the curriculum contents should be directly related to what industries and business need to make graduates easily work in the industries. These called for curriculum contents that are directly related to the new technological development to be integrated into technical colleges' curriculum. However, the integration of automobile technological developments into Nigeria technical college Motor Vehicle Mechanics' Work curriculum will involve combining the theoretical and practical contents of automobile technological development into the existing technical colleges Motor Vehicle Mechanics' Work curriculum.
- (3) Vehicles that use on-board diagnostic system should be used in teaching the students. Various technical colleges should be advised to buy vehicles which they could afford, (either new ones or fairly

used ones), but the ones which have on-board diagnostic system. Government and other relevant bodies such as the Parent Teacher Association could still be invited to donate such vehicles.

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## SKILL NEEDS OF COMPUTER EDUCATION STUDENTS IN TERTIARY INSTITUTIONS FOR ENTREPRENEURIAL EMPOWERMENT IN SOFTWARE DEVELOPMENT IN ENUGU STATE.

BY

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### Abstract

The study was carried out in tertiary institutions in Enugu State that offer Computer Education to determine the skill needs of the students of computer education in software Development in Universities for entrepreneurial empowerment in Enugu State. The research questions guiding the study are three in number. The research design adopted for the study was survey design. The area of the study is the tertiary institutions in Enugu state with sample size of 110 Computer Education students comprising 25 students from each of the institutions namely UNN, ESUT, ESCET. The data was collected using structured questionnaire which was face and content validated by three experts from the department of VTE, UNN. Data collected was analysed using mean, percentages and standard deviation. Data analysed showed that all the students agreed that all the items are accepted between the percentage of 61% to 95% taking below 20% as not accepted. It was recommended that, adequate application of such items as: logical thinking skills, Abstract reasoning, Mathematical skills, Knowledge of programming language skill, Specialization in software development training technique, Conducive environment and Internet connection among others will enable the students of Computer Education in tertiary institutions in Enugu State to develop both their already acquired skills and the skills needed in software development for entrepreneurship.

### INTRODUCTION

The need for development stems from the desire of surviving to the desire of being satisfied. To attain these range of desires, one needs to be an entrepreneur. Rose(2014) opined that entrepreneurship is the ability to create and build a vision from practically nothing... it is the reason for sensing an opportunity where others experience problems, contradiction and confusion. The author further stated that entrepreneurship is gotten from french word, "entreprendre" which means, to undertake. Taking critical analysis of Rose's concept of entrepreneurship, one will be left with no doubt that entrepreneurship requires skills in being creative, being visionary and sensing opportunity.

The skills needed to sense the opportunity of being entrepreneurial according to Olufisayo (2014) maybe technical or managerial in nature and they relate to the ability to perform task or

functions tactfully in specific areas of entrepreneurial endeavours. Ochiagha (1995) in Onoh, Onu and Oluka (2012) opined that skill acquisition is the surest way through which young people can find their way into the labour market either in public or private sector. Moreover, Okozor in Onoh et al (2012) posited that self-employment through skill development is one of the solutions to unemployment and poverty reduction. Skill can be equated with employment and lack of such leads to unemployment. Of course, unemployment which ideally stems from lack of skills, has been one of the problem in Nigeria development and poverty reduction. These have been the yoke on the successive democratic governments in Nigeria. Thus, they have habitually tried to create a panacea for creating employment and poverty reduction.

Skills are well established habits/methods of doing things [positively](Onoh et al, 2012). The authors further stated that skills are usually associated with particular occupational areas. One of these occupational areas where skill is associated for entrepreneurship is software development. Cahoon and David (2006) asserted that developing software is definitely not just for professionals only but also individuals with desperate skills. Software development involves different business models, product strategy, management and plan compared to the traditional manufacturing and service industries (wikipedia, 2015). Software developers also known as programmers design and build computer programs that helps organizations and equipment work effectively. Ochiagha (1995) in Onoh et al (2012) maintained that skills acquisition in software development is the surest way through which young people can find their way into the labour market either in public or private (sectors of the economy).

Young people are youths that are between the age of 18 – 45 years. United Nation for Education and Scientific Organization (UNESCO: 2015) said that age is the easiest way to define youth particularly in relation to education and employment. Therefore, youth is often indicated as persons between the age where one may leave compulsory education and the age at which one finds first employment. Clearly, this is the age bracket of students in tertiary institutions. In tertiary institutions, higher knowledge and skills are acquired for self and national developments. Students of Computer Education in higher institutions are naturally energetic in carrying out assignments given to them especially as it relate to programming for positive development. To develop software, the programmer writes series of programs that function as a system. Due to necessary tenable skills and competencies needed in software development, one need to attend higher institution or specialized institutions for software development. In an online website it was stated that, one normally needs a degree foundation, (degree or Bachelor of Technology (BTEC), National Diploma (ND) /Higher National Diploma (HND) ) to become a software developer. This knowledge is imparted to students of computer education.

Computer Education is education given to students in tertiary level of institutions for acquisition of computing skills. Olufisayo (2014) said that most technical skills in computing are acquired through

study and after years of experience and practice. The computing skills expected of students in computer education are to make them understand the mechanism of computer, connect different parts of the computer system together, boot the computer system and shut down, install new software and uninstall unwanted ones, use some of the pertinent professional/enterprising software and write programs or design new software in addition to impart acquired skills to students in secondary schools. Software development itself has so many inherent tenants that the developer needs to know and understand. Some of these tenants are; the rigorous, logical, time consuming and the complex nature involved in programming. These inherent tenants in software development require corresponding skills by the programmer. These skills are: attention to details, specialized and technical knowledge, good memory, ability to think in an abstract way ([www.challenge24.org](http://www.challenge24.org)). In addition to these skills are programming skills and entrepreneurial skills. Olufisayo (2014) added credence to that skills may be of technical or managerial nature and they relate to the ability to perform tasks or function tactfully in specific areas of entrepreneurial endeavours. The author further explained that technical skills are practical abilities one needs in order to produce output or provide the required services. Managerial skills according to the author are required to manage business effectively.

The question glaring at all now is having known all the ideal skills it take students of Computer Education in developed countries to develop entrepreneurial softwares like Facebook, Twitter, etc. One is bound to wonder the skill needs of the students of computer education in software Development in tertiary institutions for entrepreneurial empowerment in Enugu State in this period that Nigerian government has declared economic progression and paradoxically has massive unemployed youth.

In Enugu state, computer education is one of the courses in most tertiary institutions. Recently, entrepreneurship course has been introduced as an integral part of today's tertiary education as the result of the government hype for citizens self-employment to ensure poverty reduction. Nwachukwu (2010) said that the success of any economy is largely dependent on the quality of the workforce produced by the institutions for the industry. It has been acknowledged by the government that she cannot employ all her citizens but simply provide the needed atmosphere for the citizens to thrive, yet; the citizens are still not being

entreprising as expected. School being an institution for training and skill acquisition, expects her students to be gainfully employed on graduation. Gainful employment is one of the criteria used in evaluating higher institutions. Anele (2014) said that one of the causes of this unemployment for graduates is that schools turn out more of the graduates than the industries can absorb. Nigeria like any other developing country is a consuming nation instead of a producing nation and consequently has become a dumping ground for the Western and Asian countries.

The consequences of high rate of youth unemployment is seen in the youth restiveness or insurgence in the Northeast. In the southern part of Nigeria, it manifests its ugly head in form of tuggery and kidnaping. Owing to these, there is need for radical change for youths especially graduates to be gainfully employed by themselves. Therefore, to address graduate unemployment in Nigeria, entrepreneurial education becomes a panacea for students self employment and empowerment. Thus the need to acquire software development skills for self employment opportunities of graduates. This work argues that software skill development will not be effective for the students of Computer Education in Enugu State if efforts are not made to ensure that Computer Education programme is purely practical oriented in nature. In view of all the adverse effects of graduate unemployment, it is apt for paradigm shift toward software development as a panacea to being entrepreneurs. Therefore, the major purpose of this study was to determine the skill needs of students of computer education in software development in tertiary for entrepreneurial empowerment in Enugu State. Specifically the study sought to:

1. identify the software development skills required by students of computer education in Enugu State.

**Table 1**

N/S	Skills needed by computer education students for software development	$\bar{X}$	%	STDEV	Remark
1	Proper mouse handling skills	2.64	66	0.67	Required
2	Good typing skill	3.18	80	0.60	Required
3	Logical thinking skills	3.82	95	0.40	Required
4	Abstract reasoning skills	3.27	82	0.65	Required
5	Programming syntax skills	3.64	91	0.50	Required
6	mathematical skills	3.18	80	0.75	Required
7	Programming syntactic	3.18	80	0.53	Required
8	Compilation skill	3.36	84	0.92	Required
9	Error detection ability	2.64	66	0.74	Required

2. determine how to develop the needed software development skills.
3. identify the pre-requisites skills in software development

### Research questions

1. what are the software development skills required by the computer education students in Enugu state?
2. what are the skill needs of students in software development process?
3. what are the pre-requisites in software development

### Methodology

This study adopted survey research design. This involves selecting groups of computer teachers from four institutions offering computer education as a course in Enugu state upon which the instruments were administered, without any random pre-selection process. The population of the study was 350 computer education teachers from four tertiary institutions in Enugu state excluding part-time and sandwich students in these institutions, 25 research instruments were administered in each department of section that offer computer education in the institutions selected. One out of every three accessible computer education student was randomly selected and assigned instrument. The sample size for the four institutions was 100 regular computer education students. The instrument for data collection were structured based on modified four responsive options of VHR (4), HR (3), R(2) and NR(1). The instrument was face and content validated by three experts in the field of computer education. Each respondent was given instrument to fill. Data collected were analysed using means, percentages and standard deviation. The mean with above 2.50 was accepted as agreed in the remark for all the 3 research questions.

### Results

#### Research Question 1:

What are the software development skills acquired by the computer education students in Enugu state?



The result of the study base on the research questions answered was presented in tables 1 – 3.

**Research question 2:** What are the means skills acquired by the students for the development of software packages.

skills, good typing skill, logical thinking skills, abstract reasoning skills, programming syntax skills, mathematical skill, programming syntactic skills, compilation skills, error detection ability were agreed on with mean range of 2.64- 3.82. These

S/N	Means software skills needed by the students in software development	$\bar{X}$	%	STDEV	Remark
10	Through formal training	3.36	84	0.67	Agreed
11	Reading programming materials	3.36	84	0.67	Agreed
12	Constant practice	3.45	86	0.69	Agreed
13	Knowledge of software concepts	3.45	86	0.52	Agreed
14	Specialization in software training	3.36	84	0.67	Agreed
15	Interest in developing software	3.18	80	0.53	Agreed

### Research question 2:

What are the software development skills required by the computer education students in Enugu state? Data for answering research question one were presented in table one. Mean ratings of 2.64 and 3.82 and standard deviation of 0.53 – 0.75 were gotten. Therefore, from the table above, it has been observed that all the items listed in answering questions on the software development skills acquired by the computer education students in Enugu state? are required

skills should be provided by establishing workshop for Computer Education Students. This is in consonance with the finding of (Alio; 2010) affirming that, organizing workshops on entrepreneurship education for craftsmen (software developers) by the National Directorate of Employment. In terms of thinking skill, Rose(2010) stated that, the issue now is how to assist citizens to insert themselves successfully in a globalized world and with the requisite critical thinking as to the true state of affairs in the world.

### Research Question 3

What are the pre-requisites in software development?

Also, the research question 2 presented in table 2 show that all the items in the how the Computer Education Students develop the needed software

S/N	what are the pre-requisite in software development	$\bar{X}$	%
16	use mathematical applications	3.45	86
17	Chronological placements of software items	3.64	91
18	write correct statements for the software	3.27	82
19	compile programs	3.18	80
20	write structured programs	3.27	82
21	debug compiled programs	3.09	77
22	use online software tutors	3.55	89

### Research Question 3

What are the pre-requisites in software development? Data for answering research question three were presented in table three. Mean ratings of 3.09 and 3.65 and standard deviation of 0.52 – 0.71 were gotten. Therefore, from the table above, it has been observed that all the items listed in answering research question two are all required.

skills: through formal training, reading programming materials, constant practice, knowledge of software concepts, specialization in software training, interest in developing software agreed with a mean range of 3.18 – 3.45. The finding of this study was in consonance with that of Nwachukwu (2010) who stated that technology skills for the millennium workplace include... ability to demonstrate basic computer operating skills such as keyboarding and typing skills. Further more, COA (2006) in Nwachukwu (2010) stated that employees are required to have the physical capacity/coordination and dexterity in applying the new technologies that is, physical fitness and manual dexterity.

### Discussion of the findings

The research question one presented in table 1 shows that all the items on the skills needed by computer education students for software development such as: proper mouse handling

Research question 3: presented in table 3 shows that all the items in how the computer education students develop the needed software skills such as: ability to use mathematical applications, chronological placements of software items, ability to write correct statement items, ability to compile programs, ability to write structured programs, ability to debug compile programs and ability to use online software tutors. The respondents agreed with a mean range of 3.09 – 3.55.

### Conclusion

The following conclusions are drawn based on the findings of this study on skills need for entrepreneurial empowerment in software development for computer education students in tertiary institutions in Enugu state. It was found that:

1. Computer Education Students in Tertiary Institutions in Enugu need skills in Software developments.

2. Computer Education Students should develop the needed software developmental skills through formal training, reading of programming materials, constant practicing of programming, acquire software developmental skills, specialised in software and develop and sustain interest in software development.

3. For effective Software development by Students of Computer Education; they need: textbooks/software development materials, computer systems, conducive environment, finance, internet connection, human tutors as well as software or online or computer aided instructional tutor. In support in this finding, Ezegbe (2010) stated that, computer should be made available in schools through the collaboration of communities (PTA) and government.

### Recommendations:

1. The research recommends among other things that computer workshops and laboratories in tertiary institutions in Enugu State be upgraded to acceptable standards with necessary functional facilities put in place because of the massive acceptance of the respondents that entrepreneurial skills in software development are needed by computer education students in tertiary institutions.

2. There should be provision of software related books and materials especially those written by professionals locally for computer education students in the state in view of acquiring needed skills for software .

3. There should be acquisition of ICT skills by lecturers in software development for positive impartation of the skill to the computer education students

4. Again, computer education departments in the higher institutions should stress entrepreneurship in their curriculum owing to the acceptance by the government that she alone can not employ all her teeming graduates .

5. Students intending to be software entrepreneurs should be prepared for risks.

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## EFFECT OF LEARNERS -PRODUCED MULTIMEDIA PACKAGE ON STUDENTS ACHIEVEMENT IN ISLAMIC STUDIES IN SECONDARY SCHOOLS IN NIGERIA

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### Abstract

*The study centered on the effect of produce multimedia instructional package on secondary school students' achievement in practical marriage preparation in northern States of Nigeria. It examined the students' achievement in the Qur'an recitation. True experimental design, specifically pre-test post-test control group design was adopted. The sample size was 80 SS11 students comprising of 52 males and 28 females from intact classes. The two classes were randomly assigned the experimental and control groups. The experimental group was taught with Students produce multimedia instructional while the control group was taught with conventional instructional method. The treatment lasted for four weeks. To guide the study, two research questions and two hypotheses were formulated. Islamic studies Achievement Test (ISAT) comprising thirty practical activities were developed. The instruments were face validated by three experts and the reliability index was .84 and .91 respectively. Analysis of covariance (ANCOVA) used to analyze the data collected for the study. The results showed that Students produce multimedia instructional package had significant effect both on students' achievement in practical marriage preparation; gender had no significant influence on students' achievement in practical Qur'anic recitation preparation; interaction effect of Students produce multimedia and gender on students' achievement in practical marriage preparation was not significant. Therefore, the major contribution of this study is in the area of enhancing the students' achievement in practical marriage preparation. The study has shown that teaching practical Qur'an recitation preparation using Students produce multimedia instructional package enhance these achievement. Finally, the researcher recommended among others that Islamic studies teachers should adopt the use Students produce multimedia instructional package to facilitate teaching and learning.*

### INTRODUCTION

Islam as a religion is founded in Mecca, Saudi Arabia by Prophet of Islam Muhammad (SAW) in the first half of the 7th century A.D later in the century, Islam came to West Africa through traders. The traders made it possible for the religion to spread along trade routes to Kanem - Bomu, Hausa land and the central Sudan. Islam began to penetrate Hausa land on a large scale in 11<sup>th</sup>- 15<sup>th</sup> century (STUP, 2007). However, Islam is centrally established on five pillars and six article of faith. Which emphasis a belief in one God (*Tauhid*), observing five daily obligatory prayers, fasting, alms giving and pilgrims to Mecca at least once in life time. Lemu (1009) outline the six articles of faith to include;; believe in existence of one God, the

angels, revealed books, destiny, Day of Judgment and prophet. These believe determine the life activities of the believers, consequently affecting their culture in marriage.

Muslim marriage and Islamic wedding customs are traditions and practices that relate to wedding ceremonies and marriage rituals prevailing within the Muslim world. Although Islamic marriage customs and relations vary depending on country of origin, both Muslim men and women from around the world are guided by Islamic laws and practices specified in the Quran. According to Zumbroich, (2015) Marriages within the Muslim community are incredibly important. The purpose of marriage in Islamic culture is to preserve the religion through

the creation of a family. Philips, (2005) observed that traditional Muslim societies are generally religiously heterogeneous; which requires an individuals to find socially acceptable partners through traditional methods. From communities, families, friends, when a partner is identified and successfully selected, wedding follows. Muth (1011) stated that there is no single way to Muslim weddings as the culture of the partner's interferes with the Muslim traditions. That is, the culture of the partners determines the kind of rituals that will take place during the Muslim wedding. This therefore, means that there is no uniform rituals in Muslim during marriage/wedding ceremony, the moderation of wedding rituals resulted to the introduction of multimedia instruction in Qur'anic schools

Multimedia instruction moderates and defines practices that are acceptable during Muslim weddings. These practices include light refreshment, soft music and interlude and recitation. The recitation is usually cited by a Muslim cleric, an Imam (Aziz, 2009: Ponzetti, 2003: Leeman, 2009). The ultimate aim of the instruction is to train expert readers with knowledge of the precious recitations. Recitation Islamic studies aims at teaching students how to read correctly, recite and memorizing the Qur'anic Texts. Cultivates of skills of memorization and recitation deepens their knowledge of the Qur'an, with concentration on meanings of readings according to the rules. Attention is also paid to linguistic construction and rhetorical features. Reading Qur'an properly is therefore very important to all the believers and especially for those leading the prayers and lecturing on the recitation of the Qur'an daily service. Recitation is expected to be carried out according to rules of pronunciation, intonation, and caesuras established by the Islamic prophet Muhammad. Similarly, each melodic passage centers on a single tone level, but the melodic contour and melodic passages are largely shaped by the reading rules, creating passages of different lengths whose temporal expansion is defined through caesuras. The Qur'an is marked with twenty-six symbols, circles, rectangles, dashes and letters, with varying colors. These are written above, below, or beside the letters of the alphabet. They indicate the pronunciation of consonants, whether the blending of neighboring or adjacent consonants where recitation pauses and caesuras are forbidden is one subjects been taught in all levels Islamic studies

Islamic studies is one of the school subjects taught in all levels of education from junior and senior secondary schools to university.

Teaching of Islamic studies in schools is aimed at regulating moral behavior and enabling the students to practice effectively religious obligations. However, FGN (2004) spel out that the subject is elective at the junior secondary school level and a core subject at the senior secondary school level. With this development more attention is expected to be paid in implementation of the curriculum.

Islamic studies curriculum is designed based on; guidance (Qur'an, Hadith); Islamic laws (faith, worship), and historical development of Islam. The primary objective is to inculcate senses of gratitude to Almighty God (Allah), awakening facility of intellect and attainment of balance development of individuals without harming the entire community. In the light of the above, the important aspect of Islamic studies is worship as well as pray and observe other social sides as marriage, inheritance and recitation of Qur'an at moderate speed in Arabic language. (Ashkr, 2008) Dauda (1994) asserted that Arabic language is the language of Islamic religions. Therefore, learning to read, write and speak, in Arabic language becomes compulsory to Muslims. Arabic language face the challenge of deriving new methods of teaching basic Arabic to all categories of Muslims to alleviate the problem. More so, it is an undisputable fact that learning a language in a foreign environment is a very difficult task but both the teacher and students are bound to face such difficulties.(ESSPIN, 2013).

The teaching of Islamic studies is of no exception to be a difficult matter because Islamic studies are taught in a conflict of languages; Arabic national language - English and the native language of both the teacher and student. As a result, teachers find it absolutely difficult to identify suitable words to interpret a situation. Lemu & Barau (2007). There are insufficient techniques and teaching materials for teaching Islamic studies. Haynes (2009), opines that, the majority of teachers prefers to teach using only two techniques which are lecture and discussion method. Instead of the interactive teaching strategies like hands on activity, cooperative learning and task - based instruction (TBI). The teacher does more of the talking while students listen, thus making them passive listeners.

In view of above there is need to developed alternative techniques that will speak for itself and cut across all these conflicts and deficiencies, in addition to accommodate all the short coming and deficiencies involved in the teaching of Islamic studies in secondary schools. The needs to change or shift from teacher-teaching

to teacher guiding the student produced a package based on the curriculum. Therefore, there is the need for students to take charge of their learning through developing abilities for self-learning, self-thinking, collaborating, communicating, information, processing, problem solving and the like, leading to cognition and met cognitive domain. (Hung and Khine, 2006). This means that teachers are expected to adopt appropriate teaching method in guiding students to acquired appropriate knowledge, through rehearsal, encoding decoding and processing information in group or individually through students produced multi- media package.

Students produced multimedia package is all about involving and directing students to appropriate learning activities, which include monitoring students' performance, synchronizing, information and providing feedback as to appropriateness of students produced learning activities through multimedia. Students learn more when they are involved and given specific task to play their minds are focused on the task, rather than on the language they are using (Parker, 2010).

Performance of students in Islamic studies has been quite unsatisfactory over the year. Examination bodies such as the West African Examination Council (WAEC) and the National Examination Council (NECO) Chief Examiners Reports (2009-2014) repeatedly indicated the poor performance of students in Islamic studies. The students' poor performances is a projection from the teachers poor method and orientation because of the complexity of Islamic studies that marries English, Arabic and local languages. The performance of the students in Islamic studies at both levels Junior and Senior is discouraging. Therefore, one wonders how students can pass Examination improve quality of behavior and practice religious obligations effectively. Thus there is need for practical performance to enhance student's activities in Islamic studies

Practical performance of the students could help to achieve three bloom's objectives in learning. Psychomotor, cognitive and affective domain. Cognitive retention, test the level to which the learners can reproduce what they were taught over a period of time (Zubairu, 2006). Curtis (2004) stated that, the inseparable principles to teaching and learning are the content, teacher, and students. One active thing in the instructional delivery system is the need for an alternative delivery system in form of multimedia, system as tools for effective teaching and learning. It is increasingly providing richer environments for learning in a wide variety of

formats. Multimedia instruction, according to Mayer and Moreno (2003), Multimedia is being used in educational delivery in form of computer-based narrated animation that explain how a causal system works and one rationale is that multimedia has properties that support the learning of abstract subject matter.

Multimedia are used for designing education delivery in form of images, verbal, spatial presented simultaneously. According to Shelly, Cash man, Gunter and Gunter (2006). Multimedia can incorporate a slide show for visuals, a tape recorder for audio, and an overhead projector for text. According to Guitierrez (1997), multimedia include dealing presentations, explanations, understanding and application of processes, actions or behavior in which temporal direction in a fundamental element, moving images are indispensable. Multimedia according to Nwoji (2000), is that they can be used to arouse interest, modify attitude, clarify concepts, demonstrate and concretize knowledge that could otherwise only be talked about in abstract terms. Tallbott and Oxford (2001) stated that the benefits of students' produced multimedia are that it offers students the chance to acquire highly integrated skills. Damadharan and Rengarajan (2007) stated that multimedia projects in the classroom setting, help students learn to work cooperatively and collaboratively using their group skills and a variety of activities to accomplish the project's overall objectives. Computer as multimedia present mixture of different modes of communication; video, still picture, graphics text and sound (Nwafor, 2007). Computers influence performance and achievement in gender

Gender is a factor influencing Students' performance and achievement. Anakwe (2006) found some factors which account for gender. These include; unfair behaviors of teacher which retard female students' achievement, retention and participation, unequal access for male/female students to participate in classroom discussion, higher achievement level set for boys than girl's female students being assisted often in practical, project and other assignments by teachers. These affect students' achievements. Some studies revealed that girls scored significantly higher than boys (Ezeliora, 2007 and Gimba, 2003) Ifamuyiwa, (2004) and Iwende, (2007) in their studies revealed that male students are academically superior to their female counterparts. The contradictory evidences in academic achievement due to gender had resulted in the need to verify how SPMMP can influence Students' achievement and retention by

gender in Islamic Studies. However, evidences from the studies indicated that no research has been carried out on the effect of SPMMP on achievement and retention. Base on this, the research is aimed at determining the effect of Students Produced Multimedia Package on achievement and retention in selected contents of Islamic Studies in Senior Secondary School Students in Northern Nigeria

Determine performance scores on selected Islamic practices.

To compare performance of those taught with the SPMMP and those taught without.

1. Is there any difference in writing out the Surah in consideration by the three groups?
2. Is there any difference in the reading speed level of those taught with and without SPMMP?

## METHODOLOGY

The study centered on the effect of produce multimedia instructional package on secondary school students' achievement in practical marriage preparation in northern States of Nigeria. It examined the students' achievement in the Qur'an recitation. True experimental design, specifically pre-test post-test control group design was adopted. The sample size was 80 SS11 students comprising of 52 males and 28 females from intact classes. The two classes were randomly assigned the experimental and control groups. The experimental

group was taught with Students produce multimedia instructional while the control group was taught with conventional instructional method. The treatment lasted for four weeks. To guide the study, two research questions and two hypotheses were formulated. Islamic studies Achievement Test (ISAT) comprising thirty practical activities were developed. The instruments were face validated by three experts and the reliability index was .84 and .91 respectively. Analysis of covariance (ANCOVA) used to analyze the data collected for the study. The results showed that Students produce multimedia instructional package had significant effect both on students' achievement in practical marriage preparation; gender had no significant influence on students' achievement in practical Qur'anic recitation preparation; interaction effect of Students produce multimedia and gender on students' achievement in practical marriage preparation was not significant

## RESULTS

**Research Question 1:** What are the mean achievement scores of students taught Islamic studies using Students Produced Multimedia Package and those taught with conventional instruction?

**Table 1:** Mean  $\bar{X}$  and Standard Deviation (SD) of students' achievements scores in practical marriage preparation

Instruction	S/N	Pre-test		Post-test		Gain Score
		$\bar{X}_1$	SD <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>	$\bar{X}$
Treatment	43	8.21	2.42	19.88	3.58	11.69
Control	40	10.55	4.95	17.73	7.32	7.18

Table 1 revealed that the gain score for students taught practical marriage preparation with Produced Multimedia Package was 11.67 while that of students taught with conventional instruction was 7.18. Students taught practical marriage preparation with Produced Multimedia

Package therefore, performed better than students taught with conventional instruction.

**Table 2:** Analysis of covariance of students' practical recitation achievement scores by instruction and gender

Sources of Variation	Sum of squares	DF	Mean Square	F	SIG
Corrected model	1790.976 <sup>a</sup>	4	447.744	41.977	.000
Intercept	701.271	1	701.271	6.5745	.000
Pretest	1480.580	1	1480.580	138.806	.000
Instruction	301.099	1	301.99	28.228	.000
Gender	6.223	1	6.223	.583	.447
Instruction x Gender	42.203	1	42.203	3.957	.050
Error	831.988	78			
Total	32094.000	83			
Corrected Total	2622.964	82			

**H<sub>01</sub>:** There is no significant difference in the mean achievement scores of students taught

using Students Produced Multimedia Package and those taught using conventional instruction. Data in Table 2 showed a statistical main effect for group F (1, 82) = 28.228, P=.000 or P<0.05.

The null hypothesis therefore, was rejected, indicating that there was significant difference in the mean scores of students taught using Produced Multimedia Package and those taught using conventional instruction. The gain score for Students Produced Multimedia Package was 11.67 while that for conventional instruction was 7.18. The difference was in favour of Students Produced Multimedia Package. Therefore, was superior to conventional instruction in practical recitation preparation.

**HO<sub>2</sub>:** There is no significant interaction effect of instruction and gender on student's interest scores in practical recitation preparation.

Table 2 revealed non - significant interaction effect of instruction and gender  $F(1,82) = .208$ ,  $P < .650$ . The null hypothesis was not rejected. The interaction effect of instruction and gender was therefore, not statistically significant.

### Summary of Results

- Students taught practical marriage preparation with Produced Multimedia Package performed better than students taught with conventional instruction.
- Female students performed slightly better than their male counterparts in practical marriage preparation.
- There was no interaction effect of instruction and gender on students' achievement in practical recitation preparation.
- There was interaction effect of instruction and gender on students' interest in practical marriage preparation.

### Discussions

Discussion of the findings is presented under the following sub-headings:

- Effect of Produced Multimedia Package on students' achievement in practical marriage preparation;
- Effect of Produced Multimedia Package on students' Interest in practical marriage preparation
- Influence of gender on students' interest and achievement in practical marriage preparation;
- Interaction effect of Produced Multimedia Package and gender on students' achievement in practical recitation preparation;

- Interaction effect of Produced Multimedia Package and Gender of students' interest in practical marriage preparation.

### Effect of Produced Multimedia Package on students' Achievement in practical marriage preparation

The use of Students Produced Multimedia Package is more superior to the use of conventional instruction in facilitating the achievement of the learners in practical marriage preparation. The difference in the performance might have been as a result of the type of the method of presenting instructions to the learners. Students Produced Multimedia Packages entails that the method is students' centered with learners actively involved in the learning process. This is against the use of conventional instructions that is to say that the method is teacher-centered. In Students Produced Multimedia Packages, students are highly involved in the learning process. The teachers' activity is to coordinate and facilitate while students do the work themselves through operation the medium, posting comments where necessary, commenting on other viewers' comments among others. Through this practice, students retain what they have learnt. However, in conventional instructions, teacher operates the video for the students to watch the activities. Learners' works together own their own to solve problem with the assistance of the teacher. This enables them to understand any concept or issues appropriately because it gives them room for exchange of ideas. In contrast with video instructions which is teacher-centered; the students are just viewing and to the medium.

It should be noted that in Produced Multimedia Package students are self-initiated and self-directed type of learning. Learners determinations of how they learn are expected to be critical to the achievement of the lesson more than the conventional instruction by which the medium dishes out the instructions not minding whether the students learnt or not, not minding whether the students may some clarifications or not. Students therefore, benefited more from package of instruction than conventional instruction in learning practical land preparation.

On the other hand, the conventional instruction used for the control group in this study did not produce a high mean score. Therefore, the method has proved to be ineffective. It is possible that the passive manner of teaching practical land preparation using conventional instruction does not stimulate the students.



The conventional instructional method of teaching practical land preparation at senior secondary classes did not enhance students' achievement. This finding is contrary to that of Israel (2007). In his study on the effects of customized video-taped instruction on secondary school students' achievement in history, it was observed that students taught with customized video-taped instruction performed better. However, in this study, the students' taught with Produced Multimedia Package achieved significantly higher than those taught with the conventional instructional package. The latter did not appear to stimulate or awaken the students' active participation in the topics they were taught. Packages on the other hand provided a basis for the improvement of learner's achievement in practical marriage preparation.

#### **Interaction Effect of Produced Multimedia Package and Gender on Students' Achievement in Practical recitation Preparation**

The result of this findings revealed that male students had mean achievement gain scores higher than the female student in same the experimental group so also in the control group. The differences in the mean achievement gain scores of male and female students in each group were negligible. The negligibility of the difference in the achievement might have been attributed to the uniform exposure to the same treatment at the same time of both male and female. Therefore, Produced Multimedia Package favoured both male and female students in this study. Produced Multimedia Package did not discriminate between boys and girls even though male students' had higher mean achievement scores than their female counterparts. This study is in line with Adeyemi (2012) who investigated the effects of Computer Assisted Instruction (CAI) on Students' Achievement in Social Studies. The findings revealed that there is no significant interaction effect of treatment on students' academic ability in their achievement.

#### **Conclusion**

Based on the aforementioned findings of this study, it can be concluded that Students Produced Multimedia Package has facilitative effect on students' interest and achievement in practical marriage preparation by significantly increasing learners' participations in the classroom. Students taught practical marriage preparation using Produced Multimedia Package achieved significantly higher than those taught with conventional instruction. This means that Produced Multimedia Package video proved superior to the

conventional instruction in promoting students' interest and achievement in practical marriage preparation. Gender had no significant influence on students' achievement in practical recitation preparation. The male and female students' maintained the same level of interest in practical recitation preparation.

Finally, the interaction effect of Produced Multimedia Package and gender were not significant for both interest and achievement of students' in practical marriage preparation. This result indicated that Produced Multimedia Package which was more significant than conventional instruction did not favoured either males or females interest or achievement in practical recitation preparation. Produced Multimedia Package does not discriminate between boys and girls settings in interest and achievement.

#### **Recommendations**

- (1) The use of Produced Multimedia Package that synchronizes text and motion pictures and equally create a forum for students' interactions through posting comments/observations where necessary should be employed by the agricultural teachers in secondary schools.
- (2) Federal government, state governments, national education center and various institutions of learning such as universities, polytechnics, colleges of education, government resource centers, research centers and alike should organize workshops, in-service training programme and refresher courses, conferences, teaching materials and equipment for exhibition in respect of Students Produced Multimedia Package so that teachers should be equip with the necessary skills needed for the utilization of Produced Multimedia Package in teaching practical preparation.

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