International Journal of Educational Research and Technology
P-ISSN 0976-4089; E-ISSN 2277-1557
IJERT: Volume 8 [3] September 2017: 25-33

Website: www.soeagra.com/ijert.html
ICDS : 5.8 [University of Barcelona, Barcelona]
Global Impact Factor: 0.765 Scientific Journal Impact Factor: 3.72
Journal Impact Factor (JIF) : 1.54

ORIGINAL ARTICLE

OPEN ACCESS

Use of Ict Tools For Human Performance Improvement In Technical Drawing Contents Delivery at Secondary School Level

Abraham, Lois N, Otuaga, Akomeno
Department of Curriculum Studies and Educational Technology, Faculty of Education, University of Port Harcourt, Choba, Rivers State. Nigeria.
Email: akostar14@gmail.com

ARTICLE HISTORY
Received:
10.05.2017
Revised
17.06.2017
Accepted
29.07.2017

ABSTRACT
The paper examined use of Information Communication Technology (ICT) tools for human performance improvement in technical drawing contents delivery at the secondary school level. The study adopted a survey and quasi experimental research design and Purposive sampling technique, a sample size of 300 senior secondary I to 3 students and 40 teachers randomly selected from 14 schools out of 19 schools where technical drawing is been offered as a subject in Rivers State. Checklist and questioners was the instrument used for data collection. Having a reliability coefficient of 0.78 was used to elicit response from the respondent. Data obtained were analyzed using the mean, standard deviation and analysis of variance (ANOVA) through the application of SPSS software. Based on the analyzed data the following findings were made. ICT tools (CAD) has not been used in teaching Technical Drawing in secondary school to improve students' performance. ICT tools/equipment availability and functionality in the technical drawing studio were not sufficient for the teaching of technical drawing. Technical drawing teachers have not possessed the ICT skills required for teaching technical drawing in secondary school.
Keywords: *ICT Tools, Human performance improvement, Technical Drawing, content delivery*

CITATION OF THIS ARTICLE
Abraham, Lois N, Otuaga, Akomeno. Use of Ict Tools For Human Performance Improvement In Technical Drawing Contents Delivery at Secondary School Level Inter. J. Edu. Res. Technol. 8[3] 2017; 25-33.
DOI: 10.15515/ijert.0976-4089.8.3.2533

INTRODUCTİON

The Nigerian Educational Research and Development Council (NERDC) has the mandate to develop curriculum for use at all levels of education system in Nigeria. The existing secondary school curriculum serves as a pathway in the accomplishment of the contents as envisaged by the National Economic Empowerment and Development Strategy (NEEDS) and the Millennium Development Goals (MDG). The target of NEEDS can be summarized as; Value reorientation, Poverty eradication, Wealth creation, Job generation and using education to empower people. The objectives of the technical drawing curriculum are to:

- Provide an understanding of the theoretical and applied concepts relating to the use of ICT to facilitate visual communication of ideas in the construction and production industries.
- Provide introduction to modern drawing studio practice.
- Lay the foundation for technological development in building and engineering.
- Stimulate, develop and enhance entrepreneurship skill in the diverse areas of drawing studio practice.

Technical drawing is a universal language used by engineers, draftsmen, technicians, architects e.t.c. to convey instructions in the workshop making use of technical standards that define practical symbols, perspectives, units of measurement, notation systems, visual styles, or layout conventions (Faah,2001). With the commonality in technical language, a drafter is able to communicate more concisely by using a

commonly-understood convention. Such conventions ensure that a drawing is unambiguous and relatively easy to understand. Technical drawing is a vocational subject which lays technological knowledge foundation in architecture and engineering as a means for entrepreneurship. In order to improve on human performance for private enterprise,Information Communication Technology(ICT) Computer Aided Design (CAD) tools havebeen recommended to train the students (NERDC, 2007). The Computer Aided Design (CAD) tools will facilitate, save time, ensure precision, and details of standard in drawings. In the realization of this plausible ventures, contentious and skills acquiring strategies such as demonstration or 'doing' method should be employed by the teacher in other to inculcate both hands-on and brains-on coordination by which active involvement is expected by the learners. This study hereby states some basic platforms for the integration of Information Communication Technology (ICT) in the teaching of technical drawing. Today, the mechanism of the drafting task has largely been automated and accelerated through the use of computer-aided design systems (CADS). Information Communication Technology (ICT) is a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information such as computer and computer related equipment, the internet and broadcasting technologies (radio, television and telephone). (Sowande 2010).Information Communication Technology (ICT) tools, are tools that have an input, output and we must be able to process with it. Examples include laptop, modem, webcam, pen drive, smartphone, iPods, I pads, microphones, printers, web boards and computer-aided design systems (CAD)/Micro Station, etc.

Application of ICT in Teaching Technical Drawing

Computer Aided Design

There are two types of computer-aided design systems used for the production of technical drawings, two dimensions (2D) and three dimensions (3D). The 2D CAD systems such as AutoCAD or Micro Station reduces the need for pencils, erasers, and other drafting tools in drawing discipline because they are all built into the software. The lines, circles, fillets, arrows, bullets, arcs, curves and conventional symbols are created within the software. It is down to the technical drawing skill of the user to produce the drawing. A 2D CAD system is merely an electronic drawing board.

A 3D computer model can be further processed in CAD/CAM system, it can be modified and archived, technical drawings can then be generated from it, as well.

Benefits of using Information Communication Technology (ICT) Tools for delivering content in Technical Drawing

The following are some of the benefits of using Information Communication Technology (ICT) tools for delivery content in technical drawing:

1. The use of ICT tools in delivering content in technical drawing facilitates, and ensures precision and standard in drawings.
2. Time saving and easy to use with the aid of computer aided design software and interface procedure.
3. Erasing or fixing a mistake no longer requires a drafter to scrap the entire page; a simple "undo" command allows the user to fix the mistake and move forward. The 2D CAD system allows a copy of the original to be modified, saving considerable time.
4. Complex drawing: 2D CAD systems can be used to create plans for large projects such as buildings and aircraft. It provides a way of checking the fitting of various components.
5. Virtual Simulations: With CAD software, the presenter can input commands that allow the CAD programmed to show a virtual simulation of the design.
6. Assembling: 3D CAD allows individual parts to be assembled together to represent the final product.
7. Precession drawing: The degree of accuracy in the use of hand instrument drawing is low compared to the use of 2D and CAD. It provide
8. measuring accuracy of about 100% and this makes the drawing to be easier for the person to read the drawing and implement it.
9. Clear Communications (prototype/template). Because CAD drawings are produced on the computer, the data communicated by the drawing is clearer than drawings produced by hand.

Modern Technical Drawing Studio

A modern technical drawing studio should comprise of the basic constituents of technical drawing tools as listed below: Computer, Printer, Projector, Electronic board, Photocopy machine, Lap top, Modem, Webcam, Pen drive, Smartphone, I-pod, I-pad, Microphone, Web board, AutoCAD software, Corel draw, CAD/Micro station, Internet Service, Revit, and Team board. However, these are essential peripherals that aid effective design and drawing which all students should have. Other constituent in the modern computer studio are classified by Bamiro, (2005) into three categories; namely:

Material: Materials are the things used for drawing. They are consumable items such aspencil, paper, eraser, masking tape etc.

Instrument: Instruments are tools or devices used for precision work in technical drawing, such as measuring devices (Rule, Protractor, Set-Square, T- square, Scale Rule etc.), and marking out devices (pair of compass, Divider, French curve etc.)

Equipment: Equipment are the bulky tools (items) used for drawing. Examples include Drawing Board, Drawing Table, Stool etc.

Human performance improvement (HPI)

Human performance HP "uses a wide range of interventions that are drawn from many other disciplines, including total quality management, process improvement, behavioral psychology, instructional systems design, organizational development, and human resources management" (ISPI, 2007). It stresses a rigorous analysis of requirements at the societal, organizational, process and individual levels as appropriate to identify the causes for performance gaps, provide appropriate interventions to improve and sustain performance, and finally to evaluate the results against the requirements.

The International Society for Performance Improvement (ISPI) defines HPT as:

A systematic approach to improving productivity and competence, by using a set of methods, procedures, and a strategy for solving problems and for realizing opportunities related to the performance of people. More specific, it is a process of selection, analysis, designs, development, implementation, and evaluation of programs to most cost-effectively influence human behavior and accomplishment. It is alsoa systematic combination of three fundamental processes: performance analysis, cause analysis, and intervention selection, and can be applied to individuals, small groups, and large organizations."(ISPI, 2012)

A simpler definition of HPT is a systematic approach to improving individual and organizational performance (Pershing, 2006).

Characteristics Of Human Performance Technology (HPT)

HPT is based on the assumption that human performance is lawful, drawing principles from numerous fields including psychology, systems theory, engineering and business management (Chyung, 2008).

HPT is empirical, using observations and experiments to inform decision making (Chyung, 2008).

HPT is result oriented, producing measureable and cost effective changes in performance (Chyung, 2008).

Technical drawing is a vocational subject that provides skill for self reliance of the students and a strategy for solving problems for realizing opportunities related to the performance of people (students). Technical drawing develops key workforce competencies in the individual and enables the individual (students) to be flexible and meet the demands of the changing economy. A technical drawing student should be equipped with the competencies required by both the informal and formal sectors of the economy.

Statement of the Problem

Due to advancement in technological achievement in our contemporary era, the mechanics of drafting task has largely automated and accelerated through the use of Computer Aided Design (CAD) system which reduces the need for pencil, eraser and other drafting tools. Technical drawing student's performance and improvement need to be upgraded in order to meet up with the demand of the society. This work investigates the extent to which ICT CAD tools have been used to deliver content in technical drawing to improve the performance of senior secondary school studentsin Rivers State.

Objectives of the Study

The purpose of this study is to find out the extent to which the use of ICT tools in content delivery in technical drawing has contributed to human performance and improvement.

Specifically, the study sought to:

1- Determine if there is any significant influence on the use of ICT tools in content delivery in technical drawing for human performance improvement.
2- Determine the extents to which ICT tools are available for human performance improvement in secondary schools in Rivers State.

Research Questions

In an attempt to analyze the human performance improvement while using ICT tools for technical drawing content delivery in secondary schools, the following research questions have been raised to guide the study:

1. What are the available ICT tools in a standard technical drawing studio in secondary schools in Rivers State?
2. What is the extent of usage of ICT tools for teaching technical drawing in schools where they are available?
3. To what extent can ICT tools be used to improve human performance in technical drawing content delivery in secondary schools in Rivers State?

4. To what extent do male and female technical drawing teachers possess ICT skills needed for human performance improvement.

Research Hypotheses

The following null hypotheses were tested at 0.05 levels of significances:

Ho1. There is no significant differences between the mean rating of teachers and students on the extent of ICT tool usage, where they are available for content delivery in technical drawing to enhance human performance.

Ho2. There is no significant relationships between the use of ICT tools in technical drawing content delivery and human performance improvement in secondary schools in Rivers State.

Ho3. There is no significant difference between the mean scores of male and female technical drawing teachers in the extent to which they possess the skills needed for human performance improvement.

MATERIAL AND METHODS

The study adopted a survey and quasi experimental research design.The population for the study is made up of 255 public secondary schools, 4 demonstration schools and 2 technical colleges in Rivers State.The sample consisted of Three hundred (300) senior secondary I to 3 students and 40 teachersrandomly selected from 14 secondary schoolsout of 19 schools where technical drawing is been offered as a subject in Rivers State. Purposive sampling technique was used to achieve the above sampling size.

The instrument used for the study wasa modified four point likert-scale questionnaire containing a total ofthirty (30) item statements which was administered to students who offer technical drawing and their teachers. The response options used are: very high extent (4), high extent (3), low extent (2) and very low extent(1) with a criterion mean reference of 2.50. Observation checklist was also used to ascertain the availability of ICT tools in secondary schools to answer research question one.

The research instrument was validated through consultation with experts in technical drawing, educational technology and also measurement and evaluation in the University of Port Harcourt for both face and content validation. The corrections/suggestions of the experts led to a modification of some items in the questionnaire.

The instrument was further subjected to pilot study using the test retest method of an interval of two weeks. The pilot study established a reliability coefficient of 0.78 using the Pearson product moment correlation (PPMC) formula. The instrument was administered by the researchers and 85.7% was retrieved

Out of the Three Hundred and Fifty (350) questionnaires given out, Three hundred were returned, making a total of 85.7% return rate.

Research questions were answered using the Arithmetic mean (x). The decision point was put at 2.5 This, therefore implies that a mean rating of less that 2.5 is "Low extent" while a mean rating more than 2.5 is "High extent" the parametric of z-test was used at 5% level of significance to analyze the null hypothesis.

RESULTS AND DISCUSSION

The results of the data analyses are presented below in accordance with the research questions.

Research Question 1

What are the available ICT tools in a standard technical drawing studio in secondary schools in Rivers State?

Table 1: Showing students response on the available ICT tools/equipment.

	ICT tools/ equipment	Sampled schools	Available and Functional (%)	Available Not Functional	Not Available	Mean	S D	Decision
1	Computer	19	8 (42.1)	4 (21.1)	7 (36.8)	1.95	0.90	NA
2	Printer	19	5 (26.3)	2 (10.5)	12 (63.2)	1.65	0.86	NA
3	Projector	19	4 (21.1)	-	15 (78.9)	1.40	0.81	NA
4	Electronics Board	19	-	-	19 (100)	1.03	0.58	NA
5	Photocopy machine	19	11 (57.9)	3 (15.8)	5 (26.3)	2.25	0.90	AV

6	Laptop	19	7 (36.8)	-	12 (63.2)	1.60	0.93	NA
7	Modem	19	5 (26.3)	-	14 (73.7)	1.53	0.88	NA
8	Webcam	19	7 (36.8)	-	12 (63.2)	1.70	0.97	NA
9	Pen drive	19	2 (10.5)	-	17 (89.5)	1.20	0.61	NA
10	Smartphone	19	10 (52.6)	-	9 (47.4)	1.20	0.61	NA
11	IPods	19	2 (10.5)	-	17 (89.5)	1.25	0.67	NA
12	I pads	19	4 (21.1)	-	15 (78.9)	1.40	0.81	NA
13	Microphones	19	10 (52.6)	6 (31.6)	3 (15.8)	2.03	0.95	NA
14	web boards	19	-	-	19 (100)	1.00	0.00	NA
15	AutoCAD software	19	9 (47.4)	-	10 (52.6)	1.85	1.00	NA
16	Corel Draw software	19	12 (63.2)	-	5 (26.3)	1.85	1.00	NA
17	CAD/Micro Station	19	-	-	19 (100)	1.00	0.00	NA
18	3D/2D Achi CAD	19	4 (21.1)	-	15 (78.9)	1.45	0.85	NA
19	Internet service	19	5 (26.3)	-	14 (73.7)	1.50	0.88	NA
20	Revit	19	-	-	19 (100)	1.15	0.53	NA
21	Team Board	19	1(5.3)	-	18 (94.7)	1.10	0.44	NA
Overall mean						**1.48**		
MIDPOINT						**2.5**		

Available and functional (AV)= 3 Available /Not functional = 2 Not Available (

The result shown in table 1 revealed students' response on the availability of ICT tools/equipment in a standard technical drawing studio. A midpoint of 2.50 was established. It was indicated that all the item statements were not available revealing a total mean of 1.48. Photocopying machine and microphone has a mean greater than 2.50 which indicate that they are available in technical drawing studio. Computer, printer, laptop, modem, webcam, AutoCAD software, Corel draw software and internet services means ranged between 1.95, 1.65, 1.60, 1.53, 1.7, 1.85, 1.85, and 1.50. This indicates that the rate of their availability and functionality in the secondary technical drawing studio is not up to average.Other ICT tools such as projector, electronic board, pen drive, smart phone, IPods, I pad, web board, CAD Micro station, Revit, Team board and 3D/2D Archi. CAD with mean range of 1.40, 1.03, 1.20, 1.20, 1.25, 1.00, 1.00, 1.15, 1.10, and 1.45 were not available.

The above result indicates that ICT tools/equipment availability and functionality in the technical drawing studio is not sufficient for the teaching of technical drawing in secondary schools to improve human performance in Rivers State.

Research Question 2

What is the extent of usage of ICT Tools for teaching and learning of technical drawing in schools where they are available?

Table:2. Extent of usage of ICT tools for teaching and learning of Technical Drawing.

		Teachers (N=40)			Students (N=300)		
N	**Item statement**	**Mean**	**Std**	**D**	**Mean**	**Std**	**D**
1	To what extent do AutoCAD modified tool is used in technical drawing instruction	1.88	0.94	LE	1.20	0.60	LE
2	To what extent do you use "Anotate and parametric" AutoCAD tool for teaching/learning	1.70	0.85	LE	1.55	0.75	LE
3	To what extent the teacher deliver technical drawing content with microphone.	3.73	0.51	HE	2.20	0.65	LE

4	To what extent do you use clipboard AutoCAD tools for teaching and learning technicaldrawing.	1.78	0.89	LE	1.02	0.70	LE
5	To what extent do you use modify tools for teaching/learning technical drawing.	1.83	0.87	LE	1.80	0.77	LE
6	To what extent do you use Microsoft word for instructional delivery/learning in technical drawing	2.05	0.88	LE	1.45	0.58	LE
7	To what extent can you use pen drive to deliver content in technical drawing.	2.03	1.07	LE	1.60	0.56	LE
8	To what extent do Add manager in Corel draw is used to deliver content in technical drawing	2.05	0.88	LE	1,35	0.60	LE
9	To what extent do you use object model in automation in delivery content in technical drawing.	2.00	0.85	LE	1.40	0.78	LE
10	To what extent does macros manager ducker is used technical drawing content delivery.	1.68	0.80	LE	1.00	0.88	LE
	Average mean value/Std	**2.07**	**0.85**	LE	**1.47**	**0.69**	LE

Source: Researcher's field work, 2015

Table 2 above shows responses on the extent of usage of ICT tools for teaching and learning of technical drawing in schools where they are available. It was indicated that all the item statements were of low extent revealing a total average mean of 2.07 for teachers and 1.47 for students. The above implication is a revelation that available ICT tools (CAD) has not been used in teaching Technical Drawing in secondary school to improve students' performance.

Research Question 3

To what extent can ICT tools (CAD) beused to improve human performance in technical drawing content delivery in secondary schools in Rivers State

Table3: ***shows responses of the extent of ICT tools (CAD) used in teaching technical drawing in secondary school in Rivers State.***

s/no	Item statement	Teachers (N=40)			Students (N=300)		
		Mean	Std	D	mean	Std	D
.1	To what extent does availability of modern drawing studio has affected the implementation of technical drawing curriculum and the performance of the students.	3.50	1.81	HE	4.00	1.78	HE
2	To what extent the use of ICT tools in implementing technical drawing content has affected student's improvement and performance.	3.42	1.04	HE	3.80	1.94	HE
3	To what extent will the use of computer aided design will improve human performance in technical drawing	3.16	0.95	HE	4.20	1.21	HE
4	To what extent does the use of electronics board in delivery content in technical drawing will improve human performance.	2.85	1.37	HE	2.50	0.84	HE
5	To what extent will the use of AUTOCAD in technical drawing will improve human performance.	4.05	1.13	HE	4.05	1.27	HE
6	The use of Microsoft word for instructional delivery in technical drawing will improve human performance.	2.55	0.98	HE	3.80	1.00	HE
7	To what extent will the use of power point for teaching technical drawing will improve human performance	3.12	1.41	HE	3.25	1.05	HE
8	To what extent will the use of internet facility will improve students performance	3.02	1.19	HE	4.00	1.17	HE
9	To what extent will the use of interactive board will improve human performance.	3.50	1.22	HE	3.00	0.87	HE
10	To what extent will the use of Archi CAD in delivery content in technical drawing will improve human performance.	2.32	0.83	HE	4.45	1.30	HE
	Average mean value/Std			**HE**			**HE**

Source: Researcher's field work, 2015

Table 3 shows responses of the extent of ICT tools (CAD) used to improve human performance in technical drawing in secondary school. It was indicated that all the item statements were of low extent, revealing a total average mean of 1.60. The above implication is a revelation that ICT tools (CAD) has not been used in teaching Technical Drawing in secondary school to improve students' performance.

Research Question 4

To what extent do male and female technical drawing teachers possess ICT skills needed for human performance.

Table 4: shows the extent male and female technical drawing teachers possess ICT skills required for human performance.

		Male (32)		Female (8)	
SN	ICT Skills for technical drawing	Mean	SD	Mean	SD
1	Uses free hand drawing tools –pencil, straight and curved lines.	2.45	1.01	1.92	0.93
2	Uses shape tools/object	2.55	0.95	2.57	0.84
3	Uses of text tools	2.32	1.03	1.55	0.87
4	Uses line properties –thickness	2.67	1.25	2.50	1.11
5	Copies /duplicate graphic elements	2.00	0.93	1.80	0.87
6	Flip rotate object	1.85	0.86	1.45	0.96
7	Move clip art/graphics within a document.	1.60	0.78	1.30	0.81
8	Changes the size of displayed clip art/graphics	2.00	0.82	1.88	0.74
9	Uses of a digital camera to create a graphic plan.	1.65	0.87	1.60	0.91
10	Layers object-moves to front/back	2.30	1.17	2.15	0.96
	Average mean value/Std	**2.14**	**0.97**	**1.87**	**0.90**

Table:4 above shows responses of male and female technical drawing teachers on ICT skills possess for human performance in technical drawing. The average mean for male teachers is 2.14 and for female teachers is 1.87. This implies that the male technical drawing teachers possess ICT skill more than the females.

Ho1. There is no significant difference between the mean rating of teachers and students on the extent of ICT tool usage were they are available for content delivery in technical drawing to enhance human performance.

Table:5

Group	N	$\bar{X}$	SD	Df	z-cal	z-table	Sign.
Teachers	40	18.8	3.22	338	0.0087	1.960	Accepted
Students	300	17.2	4.10				

In table 5 above, the calculated (z) - value (0.0087) is less than critical (z) value (1.960) at 0.05level of significance and 338 degree of freedom. Therefore, the null hypothesis is accepted. That is,there is no significant difference between the mean rating of teachers and students on the extent of ICT Tool usage where they are available for content delivery in technical drawing to enhance human performance.

Ho2. There is no significant relationship between the use of ICT tools in technical drawing content delivery and human performance improvement in secondary schools in Rivers State.

Table 6

	ICT	HP
Pearson correlation	1	.028
ICT Sig (2tail)		.633
N	300	300
Pearson correlation	0.28	1
HP Sig (2tail)	633	
N	300	300

Table 6 above shows how a Pearson Product Moment correlation was run to determine the relationship between ICT usage and Human performance (HP) in technical drawing in senior secondary schools. The findings of the study show a strong positive correlation between ICT usage and human performance which was statistically significant.r =0.633 n=300 $P < 0.005$

Ho3. There is no significant difference between the mean scores of male and female technical drawing teachers in the extent to which they possess the skills needed for human performance.

Table 7 z-test Analysis on male and female technical drawing teachers on skill needed for human performance.

Gender	N	$\bar{X}$	SD	Df	z-cal	z-table	Sign.
Male	32	18.7	3.a136	38	0.577	2.021	Accepted
Female	8	18.1	2.23				

In table 6, the calculated z- value (0.577) is less than critical z value (2.021) at 0.05level of significance at df=38. Therefore, the null hypothesis is accepted. That is,there is no significant difference between the mean scores of male and female technical drawing teachers in the extent to which they possess the skills needed for human performance.

DISCUSSION OF FINDINGS

This finding on table 1 reveals grave consequences on the resourcefulness of the teachers. Even if these teachers are willing to learn and use ICT on their own, the non-availability of the facilities will hinder them. This finding is in line with the view of Uwakwe (2012), who explained that the administrators and indeed the entire administration of secondary schools in Nigeria today have been faced with the issue of inadequate funding. From lack of school equipment to the non availability of necessary machineries needed to develop the schools and the necessary required ICT for teaching and learning. Theresult also in line with the words ofEvey (2010) as quoted by Arinze (2012),who noted that there is lack or inadequate ICT infrastructure in many secondary schools. It is very important to note that ICT infrastructural availability in school is *sine-qua-non* especially in this era of globalization and breakthrough in knowledge for maximum academic benefit. However, the finding also corroborates the findings of Pelgrum (2001) in Idoko & Aremu, (2010); Eriba & Adejo, (2004); Ezeoba, (2007) and Fakeye, (2010); who also found that ICT resources were not available in secondary schools. The lack of ICT tools and equipment has negative impact on those that want to learn, and those that have learnt and want to apply it in teaching and learning. This is not applicable to only technical drawing but it also cuts across other subjects. Idoko and Ademu (2010) in an investigation of the challenges of ICT for teaching/learning as perceivedby agricultural science teachers in 210 secondary schools from the three educational zones in Kogi State also found that ICT facilities were not available in secondary schools.Similarly, Fakeye (2010) investigated English language teachers' knowledge and use of ICT inIbadan Southwest LGA of Oyo State and found that availability of computers and their connectivity to theinternet was non-existent in virtually all the schools studied, and utilization which is dependent on availability, and because availability is poor, thus, usability was also found to be poor.

Information Communication Technology tools/equipment availability and functionality in the technical drawing studio were not sufficient for the teaching of Technical Drawing in secondary schools in Rivers State. This confirms the finding of Amuche 2015, that poor extent of utilization of ICT resources in teaching in secondary schools in the area is due to the fact that utilization is directly linked with acquired skills hence the resources can only be utilized in teaching and learning if the teacher acquired the required skills.

The findings also reveal that ICT tools (CAD) have not been used in teaching Technical Drawing in secondary school to improve students' performance. However, ICT tools/equipment available and functional in the technical drawing studios were not sufficient for the teaching of technical drawing in secondary schools in Rivers State.

The finding of the study is in agreement with Cuban (1986); Tyack and Cuban (1995) where it was stated that application of ICT in many schools failed because the teachers were inadequately prepared to use ICT and lacked necessary and adequate support. This revelation should be of interest to educational planner and policy makers as it gives a clue as to why ICT facilities are currently rarely in use as recommended by the Technical Drawing curriculum in teaching certain technical drawing concepts in Nigerian secondary schools.

CONCLUSION AND RECOMMENDATIONS

Pencil on paper final work for technical drawing (building plan, mechanical drawing etc.) are no longer recognized in the society because we are in the era of ICT. However, secondary schools are still operating the obsolete pencil on paper pattern. One of the targets of National Economic Empowerment and Development Strategy (NEEDS) 2007 for Technical Drawing students in senior secondary schools in Nigeria is to acquire the skill of Information and Communication Technology, development of creative abilities thinking and employment. Therefore, to improve the performance of the students, integration of ICT in the teaching of technical drawing is very important. Being aware of the significant role of ICT in Design and Development (Programming), Information Processes Technology and Industrial Technology (Multimedia), especially in the educational activities, education authorities should be encouraged in implementing the strategies to empower ICT in supporting the teaching and learning process in the classroom.

The West African Examination Council and National Examination Council should mandate the use of computers for Senior School Certificate examinations. This will act as a catalyst to secondary schools to

face the challenges and make adequate provision for the place of ICT in Technical Drawing. The influence of ICT (open source tool) cannot be ignored in our students lives. So, the learning activities should be reoriented and reformulated in order to improve the performance of the students, from the manual source centered to the open source ones.

REFERENCES

1. Amuche (2015) Journal of Poverty, Investment and Development www.iiste.org ISSN 2422-846X An International Peer-reviewed Journal Vol.8, 2015 94
2. Availability and Utilization
3. Bamiro, O.A. (2005).*Introductory technology for junior secondary school.* Evans Brothers, Nigeria.
4. Chyung, S. Y. (2008). *Foundations of instructional and performance technology.*
5. Amherst, MA: HRD Press.
6. David, J.& Alan, M. (2005).*Architectural Drafting and Design* (5th ed.). Clifton, Park, NY Delmar Cengage Learning, ISBN 1-4018-6715-4
7. Ekpo, M.C. & Ifreke. (2001).Relationship between students' attitude and performance on physics using computer assisted instruction. *Journal of National Association of Woman Academic* (JOWACs) Vol. 2, (1) 77-87.
8. Evey, C.K. Emmanuel, O.O. Joseph, A. Denis, U. & Asinde, F.A.(2010). The need for ICT in secondary schools curriculum in Nigeria. *Nigerian Journal of Teacher Education and Teaching*. Vol 8, (2) Pp183- 192
9. Fakeye, D. O. (2010). Assessment of English Language Teachers' Knowledge and Use of Information andCommunication Technology (ICT) in Ibadan SouthwestLocal Government of Oyo State. *American-Eurasian Journal of Scientific Research.* 5 (4).56-59.
10. Faah C.K. (2001). Freshman geometrical and engineering drawing*. Ebenezer printing and publishing house, Rivers State Nigeria*.
11. Federal Republic of Nigeria (2007). National policy on education. (4th ed.) *LagosNigerian Educational Research and Development Council*.
12. Green J.N. (2004).*Technical Drawing for school certificate and GCE.* Specrum books limited, Ibadan, Nigeria.
13. Geary A. Rummler, Joseph P. Yaney and Albert W. Schrader (Eds) Ann Arbor: (2010) Bureau of Industrial Relations, University of Michigan. Retrieved November 23, 2007 from http://www.nickols.us/Brethower.pdf
14. Nzewi, U. (2009). Information and Communication Technology(ICT) in Teaching and Learning. *Curriculum and Practice.*Curriculum Organization of Nigeria.
15. Nwosu, A.A. (2003). Integrating Information and Communication Technology(ICT) in STM Classroom. Status and Implication in Akale, N.A.G (Edu). *Proceeding of the 44 Annual conference.* Pp58-60 Ibadan, STAN.
16. NERDC (2007): Technical drawing curriculum for senior secondary schools. Ralph W. Liebing (1999): *Architectural working drawings*. John Wiley andSons, 1999. ISBN0-471-34876-7.
17. Resta, P. (2002): *Information and Communication Technologies in Teacher Education:* A Planning Guide. UNESCO, Paris.
18. Sowande S.H. (2010): *Basic Technology for Schools.* HEBNPublishers Plc www.industriegrafik.com The Role of the Technical Illustratorin Industry web article, Last modified: February 2009retrieved on January,2014.
19. www.Wikipedia The benefits of ICT integration in teaching technical drawing in secondary schools. Retrieve onJanuary 2014.
20. Yuming, L.U (2010): A comparative study on teaching method of engineering. *www.Seiofbluemountain.com, retrieved on January,2014.*
21. Yusuf, M.O. (2005). Information and communication education: Analyzing the Nigerian national policy for information technology. *International Education Journal*. 6 (3), 316-321.