



ABSTRACT

The study looked at how computer training affected technical teachers' requirements for teaching technical drawing in technical colleges in Nigeria's Plateau State. The study was led by four research questions and objectives. Based on the study questions posed, four additional hypotheses were also presented. All eleven (11) Technical Drawing Teachers from Technical College, Bukuru made up

INFLUENCE OF COMPUTER TRAINING ON TECHNICAL TEACHERS' NEEDS IN TEACHING TECHNICAL DRAWING IN TECHNICAL COLLEGES IN PLATEAU STATE, NIGERIA.

***YAKMUT, PILERA HAMIDU; & **GOTIP, MORGAK**

*College of Health Technology Pankshin, Plateau State, Nigeria. **Department of Science Education, Faculty of Education, University of Jos, Plateau State, Nigeria

INTRODUCTION

In Nigeria, technical colleges are thought of as the main vocational institutions. They provide comprehensive instruction designed to prepare students for admission into a variety of occupations (Okoro, 2006). A technical college, according to Abdulwahab and Usman (2014), is described as an educational setting created to help people develop the knowledge and skills necessary for them to enter the workforce and advance in it in a meaningful and productive way. The author went on to say that a technical college is a crucial component of a larger educational establishment that works to educate decent citizens by fostering their development of physical, social, civic, cultural, and economic skills. Similar to how technical college is used to refer to educational institutions that, in addition to general education institutions, offer the study of technologies and related



the study's population. The sample chosen was made up of the population because it is a manageable population. Purposive sampling was the technique that was employed. To gather data, a 21-item questionnaire with an internal consistency of 0.81 was administered to five Technical Drawing Teachers from the Government Science School, Kuru, Jos South, who were not included in the sample. The study issues were addressed using the mean statistic, and the Pearson's correlation was employed to test the hypothesis at a significance level of 0.05. All four of the null hypotheses were disproved. The results showed that there was a very high positive link between instructors' performance in teaching technical drawing and their usage of application software (CAD), internet facilities, peripheral equipment, and CAD facilities. The study suggests, among other things, that workshops and seminars be held for technical drawing instructors on the use of application software (CAD) for technical illustration instruction.

Keywords: *Computer Training, Influence, Needs, Teaching and, Technical Drawing*

sciences and the acquisition of practical skills, attitudes, understanding, and knowledge relating to occupations in various sectors of economic and social life, the United Nations Educational Scientific and Cultural Organizations (UNESCO) Document (2014) states that technical college is used as a comprehensive term. Technical and vocational colleges provide general education courses called technical education, which can be used to get ready for a career or for continuing education. To help trainees fit into the workforce, it provides training in a variety of trades and occupations.

In particular, skilled trades and semi-professional employment are among the important occupations for which technical institutions prepare young people and adults. Workers in these professions can also renew their knowledge and skills at a technical college. The Federal Republic of Nigeria's National Policy on Education (Federal Republic of Nigeria, 2013) outlines the objectives of Technical and Vocational Education and Training (TVET) as follows: To provide trained manpower in applied sciences, particularly at craft, advanced level; to provide the



technical knowledge and vocational skills necessary for agricultural, commercial, and economic development; to provide training and impart the necessary skills to individuals who shall be self-reliant economically; to provide the technical knowledge and vocational skills necessary for the development of Technical Education

One of the educational institutions that offers secondary school education is Technical College, Bukuru, Jos South, Plateau State. It was established in 1953 to give Nigerians in the area access to technical education (Audu, Must'a'amal, Kamin, Saud, and Hamid, 2014). The goes on to say that over the course of its 55-year history, it has significantly impacted the country's need for industrial personnel. This was accomplished by teaching its pupils about agricultural mechanization, plumbing and pipe fitting, auto mechanics, electrical installation and maintenance, and joinery and carpentry. Among the additional fields are furniture design and building, mechanical engineering, radio, television, and electronics work, refrigeration and air conditioning, fabrication/welding, and block laying, bricklaying, and concrete work (Building). The General Studies Department, which oversees English, Mathematics, Chemistry, Physics, Biology, and Economics, is another option in addition to these disciplines.

Technical drawing is one of the topics given at Technical College, Bukuru. Technical drawing is essentially the common language that technicians, engineers, craftspeople, and industrialists use to communicate, according to Okorie (2011). The author went on to say that individuals who have received training in creating and understanding technical drawings, including technicians, engineers, designers, artisans, and manufacturers, can accurately understand them. According to Okoro (2013), the utility of Technical Drawing transcends cultures and languages, and for any nation to advance technologically, the nation must develop the training of its population in the technology's native tongue, Technical Drawing. It is a vocational subject that provides the technical foundation for engineering and architecture as a method of entrepreneurship. Technical standards that define practical symbols, viewpoints, and units of measurement, notation systems, visual styles, or layout conventions are used by engineers, draftsmen, technicians, and architects in the workshop to communicate more clearly and concisely (Faah, 2011). These guidelines guarantee that a drawing is clear and manageable to comprehend.



Although the National Board for Technical Education (NBTE) mandated that technical drawing be taught as a trade-related course in technical colleges and should be taken by all students in engineering trade and construction trades, with the exception of craft practice, the Federal Government of Nigeria (FGN) made technical drawing an elective subject offered at secondary school level in its National Policy on Education (FRN, 2013). This is because of the fundamental knowledge and skills it provides. Therefore, all students in the technical connected subjects must take Technical Drawing as a trade related course in technical college for an enhanced academic performance. Therefore, it becomes crucial that only qualified instructors deliver technical drawing instruction. Regardless of their field of specialization, students at Technical College Bukuru offer Technical Drawing as a course.

NERDC (2007) lists the following as the goals of technical drawing: to provide an understanding of the theoretical and applied concepts relating to the use of computers to facilitate visual communication of ideas in the production and construction industries; to introduce students to contemporary drawing studio practice; to lay the groundwork for future technological advancements and studies in engineering and drawing; and to stimulate, develop, and enhance entrepreneurial skills.

Basic design process duties, drafting supplies and equipment, technical publications, preliminary sketch and design, working drawing (to incorporate standard symbols), and an introduction to computer-aided drafting are all covered in the Technical Drawing course outline (CAD).

The purpose of the Introduction to CAD (Computer Aided Design) course outline is to give students a basic understanding of how to use new technology for designing and drafting technical drawings so that they may integrate themselves into the workforce. Utilizing computer-aided design systems has greatly mechanized and expedited the drafting process (CADS). The building drawing technology known as CAD employs computers to reduce tedious drafting tasks and improve versatility (Usman, 2006). Drawing is created and altered on a visual display unit's screen (VDU).

Students must learn how to operate a computer and its accessories, such a keyboard, thumb wheels, light pen, joystick, mouse, trackball, puck, and printers, in order to thrive in technical drawing. The purpose of using a computer to transmit technical drawing content is to facilitate and guarantee accuracy and



consistency in drawings. With the use of computer aided design tools and interface procedures, it also saves time and is simple to use. A simple "undo" command now makes it possible to correct a mistake and continue writing without having to delete the entire page.

The computer has become an essential and crucial instructional tool for technical drawing in today's globalized world. In accordance with Abraham and Otuaga (2017), some advantages of using Information Communication Technology (ICT) tools for technical drawing delivery include: The use of ICT tools in technical drawing delivery facilitates, and ensures precision and standard in drawings; time-saving and simple to use with the help of Computer Aided Design software and interface procedure; erasing or fixing a mistake no longer requires a drafter to scrap the entire page; a drafter can now make changes to drawings without having to redo them; A copy of the original can be changed using the 2D CAD system, saving time; sophisticated drawings can be made using the 2D CAD system, including designs for huge projects like buildings and airplanes. Assembling: 3D CAD enables individual parts to be assembled together to represent the final product; precision drawing: The degree of accuracy in the use of hand instrument drawing is low compared to the use of 2D and CAD; virtual Simulations: With CAD software, the presenter can input commands that allow the CAD programmed to show a virtual simulation of the design. It offers measuring precision of around 100%, which makes the drawing simpler for the user to understand, implement, and; clear Communications (prototype/template). Drawings created using computer-aided design (CAD) convey information more clearly than drawings made by hand.

Computer and its peripherals knowledge is necessary for employment, the economy, education, and everyday life. According to Abimade (2018), the introduction of computer studies as a curriculum at all levels of our educational institution is now necessary as a result of the recognition of the computer's noble role in man's pursuit of a pleasant lifestyle. The government must take the appropriate steps to guarantee that instruction is practical, activity-based, experiential, and IT-supported in order to meet one of the specific purposes of education in Nigeria, which is to promote Information Technology capacity at all levels (FRN, 2013).

Statement of the Problem

The National Board for Technical Education (NBTE) basic standard contains CAD in it as acknowledgement of the necessity to enhance secondary school (Technical) curriculum to accommodate new technologies. The current Technical Drawing instructors are graduates of colleges of education, universities' faculties or



institutes of education, The National Teachers' Institute (NTI), and other degree-granting organizations that offer technical education programs. These instructors have not completed any curricula that include CAD content, but they are now expected to instruct students in CAD. For teachers to instruct T.D. They must learn how to operate the computer, as well as programs for teaching computer-aided design and field-specific notation and geometry (CAD). The majority of teachers at technical institutions lack the ability to teach the new curriculum of technical drawing, which includes CAD, despite the efforts of teacher training programs to improve technical education programs. The question is whether technical drawing instructors, who lack any CAD experience or training, will be able to teach CAD.

Another issue that made this study necessary was the lack of sufficient teaching tools, such as labs, workshops, and classrooms. Technical drawing is a hands-on discipline that deals with developing skills. Only if the tools, equipment, and materials utilized in industry are likewise used to instruct pupils in a classroom setting can meaningful training be achieved. Basic tools, equipment, and resources are required to make technical subject instruction engaging and focused.

Another issue that hinders the teaching of technical drawing is the lack of contemporary teaching facilities. The absence of contemporary teaching tools like computers and their peripherals, such as printers, projectors, electronic whiteboards, photocopiers, modems, webcams, pen drives, smartphones, I-pods, and I-pads, microphones, web boards, AutoCAD software, Corel Draw, CAD/Micro stations, Revit, Team boards, cassettes, and internet access, is a major problem. This isn't the case right now, though.

The use of simulations, animations, and the application of softwares such as Auto Card, Revit, Archicad, and others will facilitate effective teaching and learning of Technical Drawing, but teachers of Technical Drawing are still using the old traditional methods. The teaching and learning of Technical Drawing has also changed from the traditional methods of teaching such as lectures, discussions, assignments, and others to the introduction of modern teaching methods. Since technical teachers at Technical College, Bukuru lack the necessary computer abilities to teach technical drawing, this study's primary issue is that issue, which necessitates addressing.



Purpose of the Study

The aim of the study is to determine the influence of Computer training on technical teachers' needs in teaching Technical Drawing in Technical Colleges in Plateau State, Nigeria. Specifically, the study intends to determine:

- i. Technical Drawing teachers training needs in the use of application software (CAD) for teaching Technical Drawing.
- ii. Technical Drawing teachers training needs in the use of internet facilities for teaching Technical Drawing.
- iii. Technical Drawing teachers training needs in the use of peripheral equipment for the teaching of Technical Drawing.
- iv. Technical Drawing teachers training needs in the use of CAD facilities for the teaching of Technical Drawing.
- v. The strategies for improving the computer skills of Technical Drawing teachers for the teaching of Technical Drawing.

Research Questions

The following research questions were formulated to guide the study:

1. What are the Technical Drawing teachers training needs in the use of application software (CAD) for teaching Technical Drawing?
2. What are the Technical Drawing teachers training needs in the use of internet facilities for teaching Technical Drawing?
3. What are the Technical Drawing teachers training needs in the use of peripheral equipment for the teaching of Technical Drawing?
4. What are the Technical Drawing teachers training needs in the use of CAD facilities for the teaching of Technical Drawing?
5. What are the strategies for improving the computer skills of Technical Drawing teachers for the teaching of Technical Drawing?

Hypotheses

The following null hypotheses guided the study.

Ho₁: Teachers' use of application software (CAD) has no relationship with their performance in teaching Technical Drawing.

Ho₂: Teachers' use of internet facilities has no relationship with their performance in teaching Technical Drawing.



Ho₃: Teachers' use of peripheral equipment has no relationship with their performance in teaching Technical Drawing.

Ho₄: Teachers' use of CAD facilities has no relationship with their performance in teaching Technical Drawing.

Methodology

Descriptive survey research design was used for the study. This design was adopted for the study because according to Gotip, Azi and Kankani, (2017) a descriptive survey research design is one which involves the assessment of public opinion using collection of detailed descriptions of existing phenomena with the intent of using the data to justify current conditions and practices or to make better plans for improving phenomena. Therefore, descriptive survey research design was used to solicit the opinion of technical teachers on the influence of Computer Training on Technical Teachers' Competencies in teaching Technical Drawing at Technical College Bukuru.

The population for the study comprised all the eleven (11) Technical Drawing teachers in Technical College Bukuru, Plateau State, Nigeria. This comprised of 9 male and 2 female. The researchers used total purposive sampling technique where the entire population of teachers (11) were used as sample since the whole population of interest all share a given characteristics and the population size is relatively small and can be managed by the researchers.

The instrument used for data collection was researchers' structured questionnaire with twenty-one item-statements. The questionnaire was structured into two (2) sections. Section "A" contains the background data of the respondents while, section "B" contains the questionnaire items using five-point Likert type scale. The questionnaire was validated by three experts, one from Technical Education, another from Test and Measurement and one from Computer Education, all from University of Jos in Plateau State, Nigeria. The experts looked at the appropriateness, comprehensiveness and clarity of the items in the questionnaire. Their criticisms and opinions were used to straighten the face and content validity of the instrument. The reliability of the instrument was determined using a Cronbach Alpha Coefficient method. The value of the Internal consistency was obtained by administering a single test to five (5) Technical Drawing Teachers from Government College Jos, Plateau State, Nigeria which yielded a reliability coefficient of 0.87.



Mean and Standard deviation were used to answer the research questions while Pearson correlation was used to test the null hypotheses at 0.05 level of significance. The real limit numbers of are as follows: Strongly Agree (SA) 5 points; Agree (A) 4 points; Undecided (UND) 3 points; Disagree (D) 2 point and Strongly Disagree (SD) 1 point guided the decisions taken while answering the research questions. Also, the decision rule for the hypotheses was that any P-value above 0.05 significant level was not rejected while below 0.05 level of significance was rejected.

Results

The results of the study were presented in tables and in line with the research questions and hypotheses that guided the study as below:

Research Question 1: What are the Technical Drawing teachers training needs in the use of application software (CAD) for teaching Technical Drawing?

Table 1: Mean Analysis of Technical Drawing Teachers Training Needs in the Use of Application Software (CAD) for Teaching Technical Drawing

S/no	Statement	SA 5	A 4	UN 3	D 2	SD 1	Mean score	Decision
1	I am proficient in drawing of boundary lines and squaring up	0	1	4	4	2	2.36	Disagreed
2	I am proficient in placing of title block and personal data.	0	1	5	5	0	0.20	Disagreed
3	I am proficient in arranging drawing on the sheet	0	1	4	4	2	0.17	Disagreed
4	I am proficient in indicating major and minor titles	0	1	5	4	1	0.19	Disagreed
5	I am proficient in identifying various lines used in Technical Drawing and their applications	0	1	4	5	1	0.18	Disagreed
	Sectional Mean						1.20	Rejected



From table 1 obtained and presented above, Technical Drawing teachers disagreed with all the items on Technical Drawing teachers training needs in the use of application software (CAD) for teaching Technical Drawing. The sectional mean of 1.20 revealed that Technical Drawing teachers lack proficiency in the use of application software (CAD) for teaching Technical Drawing

Research Question 2: What are the Technical Drawing teachers training needs in the use of internet facilities for teaching Technical Drawing?

Table 2: Mean Analysis of Technical Drawing Teachers Training Needs in the Use of Internet Facilities for Teaching Technical Drawing

S/no	Statement	SA 5	A 4	UN 3	D 2	SD 1	Mean score	Decision
6	I am proficient in using the internet to surf for information.	1	2	4	3	1	0.24	Disagreed
7	I am proficient in sending and receiving mails on the internet	0	1	5	4	1	0.19	Disagreed
8	I am proficient in sharing instructional materials with students and other staff online	1	1	5	4	0	0.24	Disagreed
9	I am proficient in downloading information from the internet	0	3	5	2	1	0.24	Disagreed
	Sectional Mean						0.23	Rejected

From table 2 obtained and presented above, Technical Drawing teachers disagreed with all the items on Technical Drawing teachers training needs in the use of internet facilities for teaching Technical Drawing. The sectional mean of 0.23 revealed that Technical Drawing teachers lack proficiency in the use of internet facilities for teaching Technical Drawing

Research Question 3: What are the Technical Drawing teachers training needs in the use of peripheral equipment for the teaching of Technical Drawing?



Table 3: Mean Analysis of Technical Drawing Teachers Training Needs in the Use of Peripheral Equipment for Teaching Technical Drawing

S/no	Statement	SA	A	UN	D	SD	Mean score	Decision
		5	4	3	2	1		
10	I am proficient in drawing of boundary lines and squaring up.	3	6	2	0	0	4.09	Agreed
11	I am proficient in placing of title block and personal data	4	7	0	0	0	4.36	Agreed
12	I am proficient in illustrating forms of lettering	2	6	3	0	0	3.91	Agreed
13	I am conversant different types of symbols and conventions used in drawings	5	4	2	0	0	4.27	Agreed
14	I am efficient in identifying and sketching various geometric shape and figures	4	6	1	0	0	4.27	Agreed
	Sectional Mean						4.18	Accepted

From table 3 obtained and presented above, Technical Drawing teachers agreed with all the items on Technical Drawing teachers training needs in the use of peripheral equipment for the teaching of Technical Drawing. The sectional mean of 4.18 revealed that Technical Drawing teachers were well-trained in the use of peripheral equipment for the teaching of Technical Drawing.

Research Question 4: What are the Technical Drawing teachers training needs in the use of CAD facilities for the teaching of Technical Drawing?

Table 4: Mean Analysis of Technical Drawing Teachers Training Needs in the Use of CAD Facilities for Teaching Technical Drawing

S/no	Statement	SA	A	UN	D	SD	Mean score	Decision
		5	4	3	2	1		
15	I am proficient in using the computer.	0	2	3	2	4	2.27	Disagreed



16	I am proficient in installing the CAD into a computer	0	1	3	2	5	2.00	Disagreed
17	I am proficient in printing using the CAD	0	2	2	1	6	2.00	Disagreed
18	I am proficient in saving and retrieving a document using the CAD	0	1	3	3	4	2.09	Disagreed
Sectional Mean							2.09	Rejected

From table 4 obtained and presented above, Technical Drawing teachers disagreed with all the items on Technical Drawing teachers training needs in the use of CAD facilities for the teaching of Technical Drawing. The sectional mean of 2.09 revealed that Technical Drawing teachers were not proficient in the use of CAD facilities for the teaching of Technical Drawing.

Research Question 5: What are the strategies for improving the computer skills of Technical Drawing teachers for the teaching of Technical Drawing?

Table 5: Mean Analysis of Strategies for Improving the Computer Skills of Technical Drawing Teachers for the Teaching of Technical Drawing

S/no	Statement	SA	A	UN	D	SD	Mean	Decision
		5	4	3	2	1	Score	
19	Seminar on the use of computer is organized for the technical teachers periodically	0	2	2	5	2	2.36	Disagreed
20	The technical teachers are given computers for their practice	0	1	4	3	3	2.27	Disagreed
21	Technical teachers are sponsored to go and improve their skills on the use of computer	0	0	4	5	2	2.18	Disagreed
Sectional Mean							2.27	Rejected

From table 5 obtained and presented above, Technical Drawing teachers disagreed with all the items on the strategies for improving the computer skills of



Technical Drawing teachers for the teaching of Technical Drawing. The sectional mean of 2.27 revealed that Technical Drawing teachers were encouraged to improve their computer skills o for the teaching of Technical Drawing.

Test of Null Hypotheses

The null hypothesis was tested using t-test analysis. All tests were conducted at $P > 0.05$ level of significance.

Ho: Teachers' use of application software (CAD) has no relationship with their performance in teaching Technical Drawing.

Table 6: Pearson Correlation Test on Teachers' Use of Application Software (CAD) and their Performance in Teaching Technical Drawing.

		Teachers' Use of Application Software (CAD)	Teachers' Performance in Teaching Technical Drawing.
Teachers' Use of Application Software (CAD)	Pearson Correlation	1	.916**
	Sig. (2-tailed)		.000
	N	11	11
Teachers' Performance in Teaching Technical Drawing.	Pearson Correlation	.916**	1
	Sig. (2-tailed)	.000	
	N	11	11

The result of the Pearson correlation shows that teachers' use of application software (CAD) has a significant relationship with their performance in teaching Technical Drawing since $P > 0.05$, $n = 11$. Therefore, the null hypothesis was rejected in favour of the alternative hypothesis. Therefore, teachers' use of application software (CAD) has a significant relationship with their performance in teaching Technical Drawing. The relationship can account for 91.6% of the variance.



The result of the Pearson correlation coefficient test one shows there was a very strong positive correlation between teachers' use of application software (CAD) and their performance in teaching Technical Drawing.

Ho₂: Teachers' use of internet facilities has no relationship with their performance in teaching Technical Drawing.

Table 7: Pearson Correlation Test on Teachers' Use of Internet Facilities and their Performance in Teaching Technical Drawing.

		Teachers' Use of Internet Facilities	Teachers' Performance in Teaching Technical Drawing.
Teachers' Use of Internet Facilities	Pearson Correlation	1	.647**
	Sig. (2-tailed)		.000
	N	11	11
Teachers' Performance in Teaching Technical Drawing.	Pearson Correlation	.647**	1
	Sig. (2-tailed)	.000	
	N	11	11

The result of the Pearson correlation shows that teachers' use of internet facilities has a significant relationship with their performance in teaching Technical Drawing since $P > 0.05$, $n = 11$. Therefore, the null hypothesis was rejected in favour of the alternative hypothesis. Therefore, teachers' use of internet facilities has a significant relationship with their performance in teaching Technical Drawing. The relationship can account for 64.7% of the variance. The result of the Pearson correlation coefficient test one shows there was a very strong positive correlation between teachers' use of internet facilities and their performance in teaching Technical Drawing.

Ho₃: Teachers' use of peripheral equipment has no relationship with their performance in teaching Technical Drawing.



Table 8: Pearson Correlation Test on Teachers' Use of Peripheral Equipment and their Performance in Teaching Technical Drawing.

		Teachers' Use of Peripheral Equipment	Teachers' Performance in Teaching Technical Drawing.
Teachers' Use of Peripheral Equipment	Pearson Correlation	1	.904**
	Sig. (2-tailed)		.000
	N	11	11
Teachers' Performance in Teaching Technical Drawing.	Pearson Correlation	.904**	1
	Sig. (2-tailed)	.000	
	N	11	11

The result of the Pearson correlation shows that teachers' use of peripheral equipment (CAD) has a significant relationship with their performance in teaching Technical Drawing since $P > 0.05$, $n = 11$. Therefore, the null hypothesis was rejected in favour of the alternative hypothesis. Therefore, teachers' use of peripheral equipment has a significant relationship with their performance in teaching Technical Drawing. The relationship can account for 90.4% of the variance. The result of the Pearson correlation coefficient test one shows there was a very strong positive correlation between teachers' use of peripheral equipment and their performance in teaching Technical Drawing.

Ho₄: Teachers' use of CAD facilities has no relationship with their performance in teaching Technical Drawing.

Table 9: Pearson Correlation Test on Teachers' Use of CAD facilities and their Performance in Teaching Technical Drawing.

		Teachers' Use of CAD facilities	Teachers' Performance in Teaching Technical Drawing.
Teachers' Use of CAD facilities	Pearson Correlation	1	.911**
	Sig. (2-tailed)		.000
	N	11	11



Teachers' Performance in Teaching Technical Drawing.	Pearson Correlation	.911**	1
	Sig. (2-tailed)	.000	
	N	11	11

The result of the Pearson correlation shows that teachers' use of CAD facilities has a significant relationship with their performance in teaching Technical Drawing since $P > 0.05$, $n = 11$. Therefore, the null hypothesis was rejected in favour of the alternative hypothesis. Therefore, teachers' use of CAD facilities has a significant relationship with their performance in teaching Technical Drawing. The relationship can account for 91.1% of the variance. The result of the Pearson correlation coefficient test one shows there was a very strong positive correlation between teachers' use of CAD facilities and their performance in teaching Technical Drawing.

Discussion of Findings

The research work was specifically designed to find out the Influence of Computer Training on Technical Teachers' needs in teaching Technical Drawing in Technical Colleges In Plateau State, Nigeria.

According to research question one, and hypothesis one the finding shows that Technical Drawing teachers lack proficiency in the use of application software (CAD) for teaching Technical Drawing. This finding corroborates that of Malachi (2016) that teachers of Technical Drawing needed capacity building on Basic Design Process; Drafting Materials and Equipment; Sketching and Designing; and on Computer Aided Drafting (CAD). Furthermore, teachers' use of application software (CAD) has a significant relationship with their performance in teaching Technical Drawing because there was a very strong positive correlation between teachers' use of application software (CAD) and their performance in teaching Technical Drawing. This finding is in agreement with that of Oluwadare, Adebayo and Olowe (2015) that there are positive impacts created by AutoCAD package on teachers towards the teaching and learning of AutoCAD package to teach Technical Drawing

Research question two and hypothesis two, the finding shows that Technical Drawing teachers lack proficiency in the use of internet facilities for teaching Technical Drawing. This finding is in agreement with that of Wanjala (2016) that



there is limited use of ICTs in instruction which is attributed to low self-confidence and incompetence in use of internet and inaccessibility to appropriate software materials and technical support. This finding is also supported by the study of Olaitan, Alaribe and Nwobu (2009) that the teachers require capacity building. Teachers' use of internet facilities has a significant relationship with their performance in teaching Technical Drawing, there was a very strong positive correlation between teachers' use of internet facilities and their performance in teaching Technical Drawing. Again, the finding is in line with that of Ghavifekr and WanRosdy (2013) that ICT integration has a great effectiveness for both teachers and the students. Findings indicate that teachers' well-equipped preparation with ICT tools and facilities is one the main factors in success of technology-based teaching and learning. It was also found that professional development training programs for teachers also played a key role in enhancing students' quality learning.

Technical Drawing teachers were well-trained in the use of peripheral equipment for the teaching of Technical Drawing.

Technical Drawing teachers were not proficient in the use of CAD facilities for the teaching of Technical Drawing. This finding is in line with that of Dimelu, (2010) that teachers were deficient in the use of CAD facilities for teaching. The finding is in line that of Mogire (2013) that there was minimal use of CAD facilities in teaching and learning due to lack of software, fewer facilities, lack of computer skills by teachers, power blackouts and inadequate computer laboratory space to accommodate students.

Technical Drawing teachers were encouraged to improve their computer skills for the teaching of Technical Drawing. This finding was supported by the study of Ifeakor (2014) that teachers are ready to adopt computers in the classroom. The finding of this study is also in agreement with that of Audu, Musta'amal, Kamin, Saud and Hamid (2014) that technical colleges teachers need retraining in terms of pedagogical skills as well as practical skills. The competencies and skills that the teachers are supposed to acquire through retraining are expected to produce a positive impact on teaching/learning in the classroom and the schools' workshops; leading to the production of graduates who can be productive and become gainfully employed or become self-reliant; thereby contributing to the development of the society and the nation at large. This is in agreement with Obanya (2004) who stated that the teacher needs to be equipped with an



acceptable standard of general studies of which ICT is paramount. Improving teacher education programmes then is a worldwide concern; with special focus on developing countries, since no education (country) can rise above the quality of its teachers (National Policy on Education, 2013).

Conclusion

Based on the results obtained from the analyses of the data gathered in this research, the following conclusions were drawn:

- i. Technical Drawing teachers need training in the use of application software (CAD) for teaching Technical Drawing.
- ii. Technical Drawing teachers need training in the use of internet facilities for teaching Technical Drawing.
- iii. The Technical Drawing teachers do not need training in the use of peripheral equipment for the teaching of Technical Drawing. However, 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, technical colleges are still operating the obsolete pencil on paper pattern.
- iv. Technical Drawing teachers need training in the use of CAD facilities for the teaching of Technical Drawing.
- v. More strategies need to be put in place for improving the computer skills of Technical Drawing teachers for the teaching of Technical Drawing.

Recommendations

In view of the results emanating from this study and conclusion reached, the following recommendations are made:

- i. Workshops and seminars should be organized for teachers of Technical Drawing on the use of application software (CAD) for teaching Technical Drawing.
- ii. Technical schools should be well equipped with internet facilities and other necessary ICT infrastructure.
- iii. Government should provide professional development of Technical Drawing teachers in ICT.

References

Abdulwahab, S. and Usman, A. (2014). Competencies Required by Technical Drawing Teachers in Technical Colleges. *IOSR Journal of Research & Method in Education (IOSR-JRME)* 4(2).



- Abimbade A. (2008). Teaching Computing. *Nigerian Journal of Computer Literacy*, 2(3), 74-83 Nyk Pub. Eleyele Ibadan
- Abraham, L.N and Otuaga, A. (2017). Use of ICT Tools for Human Performance Improvement in Technical Drawing Contents Delivery at Secondary School Level. *International Journal of Educational Research and Technology*. P-ISSN 0976-4089; E-ISSN 2277-1557. 8 (3)
- Audu, R., Musta'amal, A.H., Kamin, Y.B., Saud, M.S. and Hamid, M. (2014). Retraining Needs of Motor Vehicle Mechanics Teachers at Technical College Level. *Journal of Technical Education and Training (JTET)*, 6(1).
- Dimelu, I. N. (2010). Competency-Improvement Needs Teachers of Home Economics in the use of ICT for effective Teaching in Colleges of Education in South Eastern, Nigeria. *Journal of Nigerian Vocational Association* 14 (2) 17-25.
- Faah C.K. (2011). Freshman geometrical and engineering drawing. Ebenezer printing and publishing house, Rivers State Nigeria.
- Federal Republic of Nigeria (2013). *National Policy on Education*. 4th ed. Lagos: Nigerian Educational Research and Development Council.
- Ghavifekr, S.; Rosdy, W.A.W (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Engineering and Science (IJRES)*, 1, 175–191
- Gotip, N. W., Azi, A. S. & Kankani, J. P. (2018). Economics teachers' attitude and challenges to improvisation and utilization of improvised teaching materials in secondary schools. *Africa Education Evaluation*. 2(1), 1-11. <https://doi.org/10.26762/ae.201800006>
- Ifeakor, A.C. (2014). Teachers' Perception on the Adoption of Micro-Computer for Teaching and Learning of Sciences: It's Implication for National Development. *Journal Article in Science Education*
- Malachi C. N. (2016). *Computer Literacy for Schools*. Published by Mc Computer, Owerri Road Nnewi Nigeria.
- NERDC (2007): Technical drawing curriculum for senior secondary schools. Ralph W. Liebing (1999): Architectural working drawings. John Wiley and Sons, 1999. ISBN0-471-34876- 7.
- Obanya, T.C. (2004). Methods on Computation Accuracy and Attitudes. *Journal of Educational Research*, 82(1), 27 - 33.
- Okorie, J. U. (2011). *Introduction to Vocational Education*. Unpublished Manuscripts. Department of Vocational Teacher Education. University of Nigeria.
- Okoro, O. M. (2006) Comparative Analysis of two Methods of Teaching Technical Drawing in Nigeria Secondary Schools. *Nigeria Vocational Journal (NVA)*, 2(1), 34-43.
- Okoro, O. M. (2013). *Principles and Methods in Vocational and Technical Education*. Nsukka University Trust Publishers.
- Olaitan, Alaribe and Nwobu (2009). The Amazingly Patient tutor. Students' Interactions with an Online Facilities in Course. *British Journal of Educational Technology*. 33 (3), 215-236.
- Oluwadare, J.O., Adebayo, V.B. and Olowe, K.O. (2015). Assessment of the Use of Autocad Package for Teaching and Learning Engineering Drawing in Afe Babalola University Ado-Ekiti. *International Journal of Scientific & Technology Research*. 4(9)
- UNESCO, (1974): *ICT pedagogy*. UNESCO office.



TIMBOU-AFRICA ACADEMIC PUBLICATIONS
AUGUST, 2022 EDITIONS, INTERNATIONAL JOURNAL OF:
SCIENCE RESEARCH AND TECHNOLOGY VOL. 10

Usman, A. (2006). *Capturing AutoCAD*. A paper presentation at MDG's capacity building workshop in Federal College of Education (Technical) Gombe.