Impediments in Utilizing Information and Communication Technology in Teaching Mechanical Crafts Practice in Government Technical Colleges in Rivers State.

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ABSTRACT

This study examined the impediments in utilizing information and Communication and Technology for teaching mechanical craft practice in technical colleges in Rivers State. Specifically, this study investigated the government and material related impediments in utilizing information and Communication Technology for teaching mechanical craft practice in technical colleges in Rivers State. Two research questions and hypotheses were tested at 05 level of significance. A descriptive survey design guided the study. The population of the study comprised 19 and 174 mechanical craft practice teachers and National Technical Certificate III students in the four technical colleges in Rivers State. The population was manageable, therefore, the entire population was used for the study, hence no sampling technique was used for the study. Self-made survey questionnaire served as the instrument that was to elicit information from the respondents. The instrument was face validated by two experts in the Department of Vocational and Technology Education in Rivers State University. The reliability of the instrument was established using Cronbach Alpha reliability coefficient which yielded a coefficient of 74. Mean and Standard Deviation were used to answer the research questions while z-test statistical tool was used to test the hypotheses. The study found among others that diversion of funds meant for technical colleges, abandonment of technical colleges, inability of government to allocated enough fund for technical colleges, non-provision of ICT facilities, inability of government to train technical teachers, irregular supervision of technical colleges, erratic power supply, cost of purchasing ICT facilities, cost of maintaining ICT facilities, lack of adequate ICT tools, lack of conducive classroom, poor internet among others are the impediments in utilizing information and communication and technology for teaching mechanical craft practice in technical colleges in Rivers State. It was recommended among others that Government should regularly conduct training for technical college teachers to help them enhance their competence skills in utilizing ICT facilities for teaching mechanical craft practice.

Keyword: Information and Communication Technology, Teaching Mechanical Craft Practice & Technical College

INTRODUCTION

Technical college is one of the institutions introduced to help achieve educational aims and objectives. Technical college is an institution that gives full vocational training intended to prepare students for entry into various occupations (Okoye and Arimuno, 2016). Also, Ochogba and Ordu (2019) described technical

college as an institution that prepares individuals with technical skills relevant for employment, self-reliance or for admission into technical related course in tertiary institutions.

Ajie, Ochogba, and Bassey (2023) asserted that Technical colleges are established with responsibilities of training people to become craftsmen and technicians. The type of training given to students in technical colleges qualifies trainee for jobs in both public and private sectors of the economy. Both sectors according to Ndomi in ogwola and Utanta (2022) require well-trained and competent technicians who can operate and maintain the available technical equipment. In the same vein, Nwachukwu, Bakare and Jika (2016) submitted that technical college provides students through training with relevant and adequate knowledge, skills and attribute for employment under the guidelines of a teacher in related occupations.

However, technical college students are trained in different skills such as motor vehicle mechanics, woodwork, plumbing, computer craft, mechanical trades, radio television (RTV) and electronics works, electrical installation and maintenance (Ede, *et al.* in Onoh, and Onyebuenyi 2017). Similarly, Joseph, *et al* (2018) asserts that technical colleges train craftsmen and master craftsmen in building construction, Radio, Television and Electronic works, Electrical Installation, Auto-mechanics, Plumbing and Pipe fitting, Carpentry and Joinery, Painting and Decorating, Welding and Fabrication, Cabinet Making among others.

Consequently, the training offered in technical colleges is of great importance to human development. For instance, one of the trades offered in technical college that has contributed so much in establishing self-reliant and employable personnel is mechanical craft practices. Mshelizah (2013) described Mechanical craft as one among the trade courses offered at Technical Colleges which allow the individual student to fit into industrial production units for the purposes of machining process. Also, Elom,(2014) described Mechanical craft as an aspect of training, which is designed to enable the learners know how to complete job assignments according to mechanical drawings and work instructions, apply the knowledge and skills they have acquired in workplace situations, and be able to work independently and as a member of an industry, in line with this description, Ugbalu in Nnodim and Quintus (2023) said mechanical craft involves making of individual parts from plate or bar materials by cutting of metal, marking-out, drilling, turning, milling, tapping, grinding, and assembly operations.

The purpose of mechanical craft is to make sure that students possess complete basic skills in technology sector manufacturing, machine, equipment and automation installation, and maintenance work (Elom, 2014). In addition to comprehensive basic skills, they are trained to possess particular expertise in a certain area and the ability to acquired new skills in accordance with their job descriptions. Graduates of mechanical craft are expected to know how to use hand tools as well as operate machines used in manufacturing and maintenance. Graduates in this field are expected to know various manufacturing techniques as well as work methods used in the assembling and installation of machines, tools and equipment. It is expected that graduates of mechanical craft at the technical college level would be useful to themselves and the society at large (Elom, 2014). Furthermore, mechanical craft equips students with potentials that cover technical and non-technical competencies for employment (Amaechi and Thomas, 2016). Therefore, teaching and learning process in technical colleges ought to be effective. Consequently, there are several innovations in technical related programmes for teaching especially in developed countries. One of the innovations in technical colleges for teaching is the use of information and Communication Technology (ICT). Rouse (cited in Biswas, 2017) described ICT as a term that encompasses any communication, device or application that involves; radio, television, cellular phones, computer, network hardware and software, satellite system and other services and application associated with them, such as video conferencing and distance learning. Also, Adiela and Ochogba (2020) described ICT as the technological means of transmitting information from one device to another.

ICTs utilized in teaching include radio and television (broadcasting technologies), computer and the internet (digital technologies) and telephony among others. These arrays of technologies are regarded as powerful

tools for educational changes and reform. When appropriately utilized, ICT could help in raising educational quality by helping to make teaching and learning to be an active process connected to real life. Through ICT, teachers could gain access to relevant for instruction delivery in the classroom. Attesting to this, Chan in Ibidapo (2015) opined that ICT's are hardly tools that help classroom teachers in improving pedagogy of teaching. On the part of students, ICT makes learning explicitly and can take place at the learner's convenience. This means that learners could easily print their course materials online whenever they feel is convenient for them. Attesting to this, Moore in Adiela and Ochogba (2020) asserts that ICTs are relevant in terms of student's motivation which ensures better productivity. Another contribution of ICT to education is teleconferencing. Basically, learners are actively involved in the learning processes when ICT is adopted as a teaching instrument and this encourages student to make decisions, plans, and so forth (Lu, Hou, & Huang, 2014).

Unfortunately, several authors found that ICT tools are not frequently utilized by technical educators. This is because several factors contribute to teachers not using ICT tools in teaching. Factors such as lack of in-service training on the use of ICT, inadequate ICT facilities, poor supervision and administration of ICT programmes, high cost of acquisition of ICT facilities, low internet frequency, among others are factors that have stampeded the effective use of ICT in technical institutions in Rivers State (Deebom & Goma, 2018). Also, Chisenga in Adiela and Ochogba (2020) asserted that one major factor against the use of computer in tertiary institutions in erratic power failure. Furthermore, Okwudishu in Rabiu, Bawa, Saminu and Ibrahim (2021) asserted that lack of adequate search skill and inability to access or use internet by instructors and students are responsible for poor usage of computer in research. However, based on the significance of ICT in education, several authors have researched on the factors affecting the use of ICT in teaching but much work has not been done on the impediment to utilizing ICT in teaching mechanical craft practice. Therefore, this study will examine the impediment in utilizing ICT for teaching mechanical craft practice in Technical Colleges in Rivers State.

Purpose of the Study

The study examined the impediments in utilizing ICT for teaching mechanical craft practice in Technical Colleges in Rivers State. Specifically, the study sought to:

1. Examine government related impediments in utilizing ICT for teaching mechanical craft practice in Technical Colleges in Rivers State.
2. Ascertain material related impediments in utilizing ICT for teaching mechanical craft practice in Technical Colleges in Rivers State.

Research Questions

1. What are the government related impediments in utilizing ICT for teaching mechanical craft practice in Technical Colleges in Rivers State?
2. What are the material related impediments in utilizing ICT for teaching mechanical craft practice in Technical Colleges in Rivers State.?

Hypotheses

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

1. There is no significant difference between the mean responses of teachers and students on the government related impediments in utilizing ICT for teaching mechanical craft practice in Technical College in Rivers State.
2. There is no significant difference between the mean responses of teachers and students on the material related impediments in utilizing ICT for teaching mechanical craft practice in Technical Colleges in

Rivers State.

METHODOLOGY

The study was carried out in Rivers State. The study adopted descriptive survey design was used for the study. The population of the study comprised all the mechanical craft practice teachers and National Technical Certificate (NTC) III students in technical colleges in Rivers State. NTC III students were selected because they have spent more time in the school than other set of students. As at the time of the study, there was population of 19 and 174 mechanical craft practice teachers and NTC III students respectively. The population was manageable; therefore, the entire population was used for the study. Self-made survey questionnaire titled "Impediments in Utilizing ICT for Teaching Mechanical Craft Practice" (IUICTTMCP) served as the instrument of data collection. The instrument was partitioned into two sections that were structured in the pattern of Likert 5 point rating scale of Strongly Agree (SA-5), Agree (A-4), Undecided (U-3), Disagree (D-2) and Strongly Disagree (SD-1). The instrument was face validated by two experts in the Department of Vocational Technology Education in Rivers State University. Also, the instrument was tested to ascertain its reliability using Cronbach Alpha Reliability Coefficient tool. This was achieved through purposive sampling of 4 Mechanical Craft Practice teachers and 8 NTC III students in technical college in Bayelsa. The reliability coefficient achieved was 0.74 which confirmed the reliability of the instrument. Copies of the instruments were administered and retrieved by the researcher on the spot of administration. Mean and standard deviation were used to answer the research questions and to ascertain the homogeneity of responses. Also, z-test statistical tool was used to test the hypotheses. Mean score less than were rejected while Mean scores equal 3.00 were accepted. Also, z-calculated values less than z-critical values were accepted while z-calculated values greater than z-critical values were rejected which shows that there was a significant difference between the mean responses of the groups.

RESULTS AND DISCUSSION OF FINDINGS

Research Question 1

What are the government related impediments in utilizing ICT for teaching mechanical craft practice in Technical Colleges in Rivers State?

Table 1: Mean Responses on the Government Related Impediments in Utilizing ICTs for Teaching Mechanical Craft Practice

S/N	Government Related Impediments –	Teacher ($n_1 = 20$)			NTC III Students ($n_{2=}184$)		
		SD_1 Decision –			SD Decision		
		x_1			x_2		
1	Diversion of funds meant for technical colleges	3.68	1.5	Agree	3.94	1.46	Agree
2	Abandonment of technical college projects	4.05	1.18	Agree	3.98	1.45	Agree
3	Inadequate funds allotted for technical colleges	4.16	1.34	Agree	3.31	1.66	Agree
4	Non provision of ICT facilities in technical colleges	4.21	0.92	Agree	3.94	1.45	Agree
5	Inability of government to train technical teachers	4.32	0.82	Agree	3.97	1.45	Agree

6	Irregular supervision of technical colleges	4.21	1.08	Agree	3.95	1.46	Agree
7	Poor remuneration of technical college teachers	4.05	1.27	Agree	3.92	1.51	Agree
8	Government insincerity in achieving the aims of technical colleges	3.89	1.45	Agree	3.93	1.51	Agree
9	Overcrowded classrooms	3.63	1.46	Agree	3.95	1.48	Agree
Total		**4.02**	**1.22**		**3.88**	**1.49**	

Source: Field Survey, 2022

Result in Table 1 shows that both teachers and NTC III students in technical colleges in

Rivers State agreed that all the variables highlighted are government related impediments in unitizing ICT for teaching mechanical craft practice in Technical Colleges in Rivers State.

This is evident in the Grand Mean scores 4.02 for teachers and 3.88 for NTC III students, which are both greater than 3.00 which is the acceptable mean value. Also, the closeness in the standard Deviation for both groups which is 1.22 and 1.49 shows homogeneity in the responses of both groups. This is in conformity with Deebom and Goma (2018) that found that factors such as lack of in-service training on the use of ICT, inadequate ICT facilities, poor supervision and administration of ICT programmes, high cost of acquisition of ICT facilities, low internet frequency, among others are factors that have stampeded the affective use of ICT in TVET institutions in Rivers State.

Research Question 2

What are the material related impediments in utilizing ICT for teaching mechanical craft

Practice in technical Colleges in Rivers State?

Table 2: Mean Responses on the Material Related Impediments in Utilizing ICTs for Teaching Mechanical Craft Practice

S/N	Material Related Impediments-	Teacher (n_1 =20)			NTC III Students (n_2 =184)		
		SD_1 Decision –			SD Decision		
		x_1			x_2		
1	Erratic power supply	3.79	1.18	Agree	3.95	1.46	Agree
2	Poor internet network	3.42	1.46	Agree	3.98	1.45	Agree
3	Cost of maintaining ICT facilities	3.63	1.5	Agree	3.31	1.66	Agree
4	Lack of adequate ICT tools	3.79	1.23	Agree	3.94	1.45	Agree
5	Lack of conductive classroom	3.68	1.7	Agree	3.97	1.45	Agree
6	Availability of inferior ICT tools	4.36	1.01	Agree	3.95	1.46	Agree
7	Irregular maintenance of ICT facilities	4.36	1.01	Agree	3.92	1.46	Agree
8	Poor handling of ICT facilities there by leading to sudden breakdown	4.36	1.01	Agree	3.92	1.46	Agree
Total		**3.76**	**1.42**		**3.88**	**1.49**	

Source: Field Survey, 2022

Result in Table 2 shows that both teachers and NTC III students in technical colleges in Rivers State agreed that all the Variables highlighted are material related impediments in utilizing ICT for teaching mechanical craft practice in Technical Colleges in Rivers State. This is evident in the Grand Mean scores of 3.76 for teachers and 3.88 for NTC III students, which are both greater than 3.00 which is the acceptable mean value. Also, the closeness in the standard Deviation for both groups which is 1, 42 and 1.49 shows homogeneity in the responses of both groups. This is in agreement with Chisenga in Adiela and Ochogba (2020) that asserted that one major factor against the use of computer in tertiary institutions in erratic power failure.

Furthermore, Rabui *et al* (2021) asserted that lack of adequate search skill and inability to access or use internet by instructors and students are responsible for poor usage of computer in research.

Hypothesis 1

There is no significant different the mean responses of teachers and students on the government related impediments in utilizing ICT for teaching mechanical craft practices in Technical College in Rivers State.

Tables 3: z-Test for Responses on the Government Related Impediments

Categories	n	X	DF	z-cal	z-crit	Decision
Teachers	19	4.02	1.22	191	46	Not Significant
NTC III Students	174	3.88	1.49			

Table 3 shows that teachers Means and Standard Deviation scores were 4.02 and 1.22 respectively, while NTC III student's mean and standard deviation scores were 3.88 and 1.49 respectively. The z-cal value was 0.46, while the z-crit was 1.96 at a 0.5 level of significance. This results shows that z-cal was less than z-crit, which mean the null hypothesis was accepted. therefore, there was no significant different between the mean responses of teachers and students on the government related impediments in utilizing ICT for teaching mechanical craft practice in Teaching College in Rivers State.

Hypothesis 2

There is no significant different between the mean responses of teachers and students on the material factors affecting the use of ICT in teaching EIMW in Technical College in Rivers State.

Table 4: z-Test for Responses on the Material Factors Affecting the Use of ICT in Teaching EIMW

Categories	n	x	SD	DF	z-cal	z-crit	Decision
Teachers	19	3.76	1.42	191	0.35	1.96	Not Significant
NTC III Students	174	3.88	1.49				

Table 4 shows that teachers mean and standard deviation scores were 3.76 and 1.42 respectively, while NTC III Student's mean and standard deviation scores were 3.88 and 1.49 respectively. The z-cal value was .35, while the z-crit was 1.96 at a .05 level of significance. This result shows that z-cal was than z-crit, which means that the null hypothesis was accepted. therefore, there was no significant different between the mean responses of teachers and students on the material related impediments in utilizing ICT for teaching mechanical craft practice in Technical College in Rivers State.

CONCLUSIONS

This study deduced that there are several impediments to the use of ICT in teaching mechanical craft practice such as diversion of funds meant for technical colleges, abandonment of technical college projects, inadequate funds allotted for technical colleges, non-provision of ICT facilities in technical colleges, inability of government to train technical teachers, irregular supervision of technical colleges, erratic power supply, cost of purchasing ICT facilities, cost of maintaining ICT facilities, lack of adequate ICT tools, lack of conducive classroom, poor internet among others.

RECOMMENDATIONS

The following recommendations were made;

1. Government should regularly conduct training for technical college teachers to help them enhance their competence skills in utilizing ICT facilities for teaching mechanical craft practice
2. Government and non-governmental organizations should provide ICT facilities to technical colleges so that teachers can able to utilize them for effective teaching.

REFERENCE

1. Adiela, B. K. & Ochogba, C.O. (2020) Quality Assurance in the Use of Information and Communication Technology in Teaching Courses in Rivers State Tertiary Institutions. *International Journal of Rearch and Innovation in Social Science* iv (iii) 301-308
2. Ajie, P.M.: Ochogba, C.O. & Bassey, I.S. (2023). An Assessment of Workshop Practices for Sustainable Youth Empowerment in Welding and Fabrication Small and Medium Scale Enterprises in Ogba/Egbema/Ndoni Local Government Area, Rivers State. *African Journal of Environment and Natural Science Research* 6 (3) 109-119
3. Amaechi, J.O. & Thomas, C.G. (1016). Strategies of Effective Teaching and Learning Practical Skills in Technical and Vocational Training Programs in Nigeria. *International Journal of Science Research Engineering & Technology* 5(12), 598-603
4. Biswas, R.K (2017). A study on status of information and communication technology use in various teachers training institutes of tribal areas, *International Journal of Advanced Education Research*,2 (6), 375-379.
5. Deebom, M.T & Goma, O.T (2018). Utilization of Information Communication and Technology for Sustainable manpower development among technical educators in tertiary institutions in Rivers State, Nigeria, *International Journal of Innovative Information System and Technology Research,* 6 (2), 48-28.
6. Elom, E.N. (2014). Innovative strategies for enhancing study of mechanical/metalwork technology in higher education institutions. International Journal of Science Research and Education 2(11), 2391-2399
7. Ibidapo, A.B. (2015). Technical and Vocational Education and Training and local technologies for sustainable entrepreneurship skills development. *Journal of Research in Vocational and Technical Education.* 8(1) 107-120
8. Joseph, Z, Makinde, A. A & Yakubu S. (2018). Competency needs of radio, television and electronic works teachers for effective teaching in technical colleges, northern states of Nigerian , *Multidisciplinary Journal of Science, Technology and Vocational education*, 6 (1), 20-31.
9. Lu, Z. Hou, L. & Huang X (2014). A research on a student centred teaching model in an information and communication technology-based English audio-video speaking class1. *International Journal of Education and Development using Information and Communication Technology, 6 (3) 101-123*

10. Mshelizah, A. (2013) Problems of improper maintenance and utilization of mechanical technology workshops, facilities and equipment in technical colleges of Bauchi State. *Journal of Science, Technology & Education,* 1(1), 117-208
11. Nnodim, K.A. & Quintus, C.I. (2023) Suitability of Mechanical Engineering Craft Practice Skills for Self-Reliance among Students in Technical Colleges in Rivers State. *Journal of contemporary Science and Engineering Technology* 2(2) 1-10
12. Nwachukwu, C.E Bakare, J.A & Jika F. O (2016) Effective Laboratory Safety Practices Skills required by electrical and electronics students of technical colleges in Ekiti State. Nigeria *Vocational Association Journal,* 16 (1) 141-147.
13. Ochogba, C. O., & Ordu C.N (2019). Techniques for enhancing student's participation in automobile mechanical works in technical colleges in Rivers State, Nigeria. *International Journal of Research and Innovation in Social Science,* III (V), 220-224.
14. Ogwola, R.I. & Uranta, I.B. (2022*).*Public Sector Management in Nigeria: Setting an Effective and Efficient Peace amid Challenges and Prognosis. *Journal of lexicography and Terminology* 6(2) 18-36.
15. Okoye,R.K.R. & Arimonu, M.O. (2016) Technical and Vocational Education in Nigeria: Issues, Challenges and a way forward. Journal of Education and Practice 7(3) 113-118
16. Onoh B, C, E.C. & Onyebuenyi, P.N. (2017) Electrical Installation and Maintenance Skill Needs of Technical Colleges Graduates for Job Creation and Self-Reliance in Enugu State. Journal of Science and Computer Education 13(2) 224-232
17. Rabui, A.: Bawa, K: Saminu, S. & Ibrahim, Z. (2021). Application if Information and Communication Technology Facilities in Teaching and Learning. *International Journal of Research and Innovation in Social Science,* 7(3) 19-28.