GENDER DISPARITY IN COMPETENCY AND UTILIZATION OF ELECTRONIC MEDIA IN TECHNICAL COLLEGES OF PLATEAU AND NASARAWA STATES, NIGERIA

Polit, Sylvester Danjuma (Ph. D)
Department of Science and Technology Education
University of Jos
syllvesterpolit@gmail.com
&
Duktur, S. Levong (MABEN)
Department of Vocational Education
Faculty of Technology Education
School of Postgraduate Studies
Abubakar Tafawa Balewa University Bauchi
dukturn@gmail.com

Abstract
This study investigates gender disparity on teachers' level of competency and utilization of Electronic Media (EM) facilities for teaching Mechanical Trades (MTs) in technical colleges in Plateau and Nasarawa States. A descriptive survey design was adopted for the study. Population of the study consisted of 38 MTs teachers from 6 government technical colleges in Plateau and Nasarawa States. Two research question and two hypotheses were formulated to guide the study. The instrument was 'Questionnaire of Competency and Utilization of Electronic Media' (QCUEM). The instrument was subjected to face and content validity by three experts from the University of Jos and obtains the internal consistency of the instruments at 0.951. Tools for Data analyses were mean and standard deviation while the t-test was used to test hypotheses of no significant difference at 0.05 level of significance. The study found that; MTs teachers in technical colleges in the study areas lacked the operational competency and hardly utilize EM for instruction. Also, the MT teachers agreed that EM competencies are highly required for effective instructional delivery in the 21st century. The study found no significant difference on competency and utilization of EM based on gender. The study concluded that there is no significant influence of gender on EM competency and utilization in technical colleges and technical colleges in Plateau and Nasarawa States and so recommended among others that teachers irrespective of their gender should be encouraged to self-develop their digital skills for an effective utilization of EM facilities for instructional delivery of MTs in the technical colleges in Plateau and Nasarawa States.

Keywords: *Competency, Utilization, Electronic Media, Mechanical Trades, Gender, Technical colleges.*

Introduction

Technical colleges are post-basic level of Technical Vocational Education and Training (TVET) system in Nigeria. Technical colleges are established to produce craftsmen in various fields such as Building trades, Electrical Installation and Maintenance, Woodworking trades, Mechanical Trades (MTs), business education, home economics, among others. Students of technical colleges and technical colleges upon graduation are expected to either be employed in the industry or be self-employed. Emennu and Ojadi (2021) stated that in order to achieve this goal, technical college curriculum is split into different trades with corresponding modules so as to enable learners choose and accomplish trades of their interest successfully. High-quality skills training requires among others qualified instructors and adequate supply of instructional facilities.

"Mechanical Trades" (MTs) is a broad term that encompasses various trades such as Fabrication, Air Conditioning and Refrigeration, Auto-Electrical Works, Motor Vehicle Mechanic Works, Welding, Forging, Foundry, Fitting, and Machining operations (Koko, 2022). The MTs curriculum is specifically designed to equip students with the skills and knowledge needed to meet the demands of the modern industry at the craftsman level. Upon completion of the training, students undergo examinations and receive certification as qualified craftsmen from the National Business and Technical Examination Board

(NABTEB) based on the National Board for Technical Education (NBTE) curriculum, leading to the award of the National Technical Certificate (NTC). With ongoing technological advancements, the practical content of MTs in most countries of the world include skills development in working with computerized machinery before graduation. This is because meaningful skill acquisition in MTs in particular, or any TVET course in the 21st century cannot be achieved in the absence of EM facilities at any level. Therefore, it is essential that appropriate EM facilities are available and adequate for teachers and students to acquire skills and competencies effective to achieve the objectives of their training (Ede & Ariyo, 2015).

Meaningful skill acquisition in the technical colleges in the 21st century cannot be achieved in the absence of Educational Technology facilities at any level of education. Educational Technology (EdTech) is a broad term that refers to the use of various tools and methods to enhance the teaching and learning process. It can involve the theory and practice of designing, developing, implementing and evaluating educational approaches, as well as technological tools and media that assist in the communication of knowledge (Dange, 2024). Abifarin (2015) sees EdTech as a branch of education which deals with the totality of how educators provide themselves with materials and methods that aid in teaching and learning. The demand for EdTech materials' utilization in the teaching and learning of trades in TVET is very important as it could enhance students' academic achievement, retention, and application of skills. Among the most important EdTech resources are the Instructional Media which are classified into Print and

Electronic Media.

Electronic Media (EM) connotes the application of electronic gadgets such as computers, tablets, smart/interactive boards, printers, digital cameras, digital videos, software applications, CD textbooks, USB drives, and CDROM in teaching and learning. Learning with EM gives students some element of control over time, place, path, and/or pace. The Internet and the proliferation of Internet access devices give students the ability to learn anytime, anywhere. Learning is neither restricted within the walls of a classroom nor restricted to the pedagogy used by the teacher (Carroll & Conboy, 2020). EM has fundamentally changed the way individuals access information and elaborate knowledge. While raising the demand for new skills, they also create new opportunities for education and training. The Federal Republic of Nigeria (FRN, 2016) stressed the need to employ EM to improve the quality of education, especially TVET in preparation for its recipients with the needed skills to fit into the workforce of the 21st century. Effective teaching and learning skills require sufficient instructional materials because learners will be actively involved in the process by interacting with the devices and equipment. But instructional media are not ends to themselves; teachers must have the competencies to operate them during instructional delivery.

Competency refers to the ability of the teacher or the student to operate EM facilities and access the needed results or information for teaching and learning. Falloon (2020) defined digital competence as "the ability to use communication technology tools to access, manage, integrate, evaluate, and create information, as well as the ability to successfully integrate it into everyday life." Therefore, teachers should integrate digital-age abilities or competencies into their professional activity and should not only learn fundamental computer applications, but also how to manage information, produce material, and use technology to keep students linked (Portillo, Garay, Tejada & Bilbao, 2020). As a result, effective technology integration occurs when students are given the choice to choose technological tools that help them access timely information, analyze and synthesize it, and deliver it professionally. But the presence of EM technologies for teaching does not guarantee its effective utilization by teachers.

The term "EM utilization", as defined by Nwangwu (2018) as the presentation and distribution of instructional content through a web environment (e-teaching) or systems offering an integrated range of tools (stand-alone computer instruction, CD-ROM among others) to support learning and communication. Similarly, the present study defines EM utilization as the actual, effective and consistent use of EM technologies (hardware and software) by MTs teachers in instruction preparation, delivery, and assessment in technical colleges. Okparneka and Nwogu (2019) identified many problems of EM utilization in the teaching and learning processes in technical colleges including unavailability and inadequacy of EM, lack of confidence among teachers during integration, lack of access to resources, poor power supply, technical problems with the use of software and high cost of computers and accessories among others as a constraint

to the utilization of EM in teaching. One influencing factor in the context of competency and utilization of EM is gender.

An important advantage of EM is its gender sensitivity with deep considerations for male and female users. Oqua and Ugbe (2022) reported that gender could be a factor in low teacher utilization of resources for instructional delivery. Thus, considering gender as a factor in this study could yield possible results. Gender sensitivity of EM in TVET refers to the use of EMs that are designed to be gender-neutral and inclusive in the instructional delivery of TVET programs. Gender in this study means the physical attributes of a person as a male or female. While the study of some researchers show male dominance in the level of utilization of EM (Oqua & Ugbe, 2022; Adeoye, 2023), other researchers show female dominance (Idaka & Uzoechi, 2016; David-West & Akammeze, 2020). Despite the debates and conflicts in the literature about gender equality/inequality or parity/disparity, other researchers have shown that there is no indication of gender supremacy in competency and utilization of EM among the female and male (Kaigama & Fxafatirimam, 2020). Other studies have also shown that gender was not a significant factor in the students' achievement in TVET classes when EM were used (Akanbi, 2020; Onwusa & Nwaosa, 2021)). Since the gender debate remains inconclusive, this study considered it as an important variable, especially in the aspect of competency in the utilization of EM.

The competency of EM encourages its utilization. For EM technology to be exploited in schools, teachers should be trained to be experts in their utilization. All the problems affecting the educational system in Nigeria today are the lack of competent teachers to utilize EM for an effective instructional delivery. Schools are still relying massively on traditional method of talk-and-chalk without realizing that EM are fast becoming the chalkboard of tomorrow (Ima-Obong & Imoh-Obong, 2018). Cyril (2017) and Eze and Osuyi (2018) pointed out that the traditional chalk-and-talk teaching method often used for instructing the students, have often created negative attitude towards trades courses in the technical colleges. Buttressing further the NABTEB Chief Examiner's reports linked poor performance in examinations to the state of instructional media availability and utilization in technical colleges and technical colleges (NABTEB, 2014, 2016, 2017). Therefore, the academic performance of the students in the 21st century will largely be influenced by the application of EM in the technical colleges and technical colleges. It is however, uncertain whether technical colleges and technical colleges in Plateau and Nasarawa States have competent teachers who can effectively utilize EM to enhance instructional delivery of their students to acquire the most needed 21st century skill, hence the need to for the present study.

Research Questions

1. What are the EM competencies required for instructional delivery of MTs by male and female teachers in technical colleges and technical colleges in Plateau and Nasarawa States?
2. To what extent do male and female teachers utilize EM for instructional delivery of MTs in technical colleges and technical colleges in Plateau and Nasarawa States?

Hypotheses

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

1. There is no significant difference between the mean responses of male and female teachers on EM competencies required for instructional delivery of MTs in technical colleges and technical colleges in North Central Nigeria.
2. There is no significant difference between the mean responses of male and female teachers on the utilization of EM for instructional delivery of MTs in technical colleges and technical colleges in North Central Nigeria.

Method

The descriptive survey research design was used in this study. The population of the study was 38 Technical colleges and Technology Trades teachers in 20 government technical colleges and technical colleges in the North Central geo-political zone of Nigeria. There was no sample as all the teachers were used due to their minimal number. Instrument for data collection was a five-point rating scale questionnaire

tagged: "Questionnaire of Competency and Utilization of Electronic Media" (QCUEM) containing 10 items for competency and 38 items for utilization, totaling 48 items. The Instrument was validated by experts in the Abubakar Tafawa Belawa University and University of Jos. The Cronbach Alpha method was use to obtain the internal consistency of the instruments and a coefficient of .951. The tools for data analyses were Mean and standard deviation. The decision is when the calculated value is within or above 3 is accepted but below 3 is rejected. The t-test was used to test hypotheses of no significant difference at 0.05 level of significance. The t-test decision was taken based on the T-calculated value (T-cal) and the T-table (T-tab) value at 0.05 level of significance. If the T-cal is equal to or greater than the T-tab, at 0.05 level of significance, the null hypothesis would be rejected, but if the T-cal is less than the T-tab, at 0.05 level of significance, the null hypothesis would be accepted.

Results

Research Question One: What are the EM competencies required for instructional delivery of MTs by male and female teachers in technical colleges and technical colleges in Plateau and Nasarawa States?

Table 1: Analysis of Responses of Male and Female Teachers on EM Competencies Requirement for Instructional Delivery in the Technical Colleges in Plateau and Nasarawa States

S/N	EM Competencies Required for instructional delivery	Male Teachers (N=29) Mean	Male Teachers SD	Remarks	Female Teachers (N=9) Mean	Female Teachers SD	Remarks
1.	Ability to use online videos to view practical processes from industries.	4.43	0.972	HR	4.51	0.831	HR
2.	Ability to use internet networking between schools and industries.	4.47	1.055	HR	4.46	0.770	HR
3.	Ability to set up internet networking between different schools, industry-based supervisors, and different industrial interest groups	4.04	0.954	HR	4.58	0.947	HR
4.	Ability to adopt online simulation to be exposed to industrial operations, processes, and best practices.	4.89	0.873	HR	4.59	0.845	HR
5.	Ability to Adopt social networks (such as Facebook, WhatsApp, Twitter, etc.) as teaching tools.	4.30	0.871	HR	4.54	0.672	HR
6.	Ability to create online interactive audio and video for instructional purposes.	4.28	1.022	HR	4.45	0.971	HR
7.	Ability to read industrial journals online.	4.87	0.891	HR	4.41	0.629	HR
8.	Ability to use browsers to support access and navigation in the World Wide Web.	4.09	0.785	HR	4.45	0.870	HR
9.	Using the Internet to organize ethics competitions among TVET students.	4.39	0.623	HR	4.51	0.617	HR

10.	Establishing online job skill training fora in TVET for students and teachers.	4.50	0.704	HR	4.51	0.994	HR
Grand Mean/SD		4.43	0.875	HR	4.50	0.815	HR

Key: VHR=Very Highly Required, HR=Highly Required, MR=Moderately Required, SR=Slightly Required, NR=Not Required. Decision Rule=≥3.00. SD=Standard Deviation

Table 1 shows all items regarding competencies required by male and female teachers to operate EM for instructional delivery of MTs in the technical colleges and technical colleges in Plateau and Nasarawa States are accepted as highly required as indicated by their mean values ranging from 4.04 to 4.87 which are above the criterion value of 3.00. The grand means of 4.43 and 4.50 for the two respondent groups shows that the acquisition of those digital operational competencies was highly required by teachers to be able to operate electronic media for instructional delivery of MTs in the technical colleges and technical colleges. The standard deviation scores of 0.875 and 0.815 for male and female teachers respectively shows that the respondents were not far from the mean and from the opinion of one another in their responses.

Hypothesis One: There is no significant difference between the mean responses of male and female teachers on EM competencies required for instructional delivery of MTs in technical colleges and technical colleges in North Central Nigeria.

Table 2: Result of T-test on Mean Responses of Male and Female on EM Competencies Required for Instructional Delivery of MTs in technical colleges and Technical Colleges in Plateau and Nasarawa States

Group	N	X	SD	Df	T-cal	T-tab	α	Decision
Male	29	4.46	0.8358	150	4.34	1.96	0.05	Significant
Female	9	3.68	0.882					

N=Number of respondents, X=Mean, SD=Standard Deviation, DF=Degrees of Freedom, α=Level of significance, Result [T-cal (4.34) > T-tab (1.96) at p > 0.05] significant

Table 2 shows the T-test result on difference between the mean responses of male and female on EM competencies required for instructional delivery in the technical colleges and technical colleges. The result for male teachers yielded a mean score of 4.46 with standard deviation of 0.8358 and the female teachers mean score was 3.68 with a standard deviation of 0.882. The result further reveals that T-cal(150) = 4.34, T-tab = 1.96. Since the calculated T (4.34) is greater than the T tabulated (1.96) at 0.05 level of significance with 150 degrees of freedom, the null hypothesis was rejected, it can be inferred that there was a significant difference between the mean responses of male and female on EM competencies required for instructional delivery in the technical colleges and technical colleges in Plateau and Nasarawa States.

Research Question Two: To what extent do male and female teachers utilize EM for instructional delivery of MTs in technical colleges and technical colleges in Plateau and Nasarawa States?

Table 3: Analysis of Responses of Male and Female Teachers on Utilization of EM for Instructional Delivery of MTs in Technical Colleges in Plateau and Nasarawa States

S/N	EM Facilities	Male Teachers (N=29) Mean	Male Teachers SD	Remarks	Female Teachers (N=9) Mean	Female Teachers SD	Remarks
1.	Desktop computers	2.13	1.110	FU	2.57	0.919	FU
2.	Internet Modem	1.70	1.055	NU	1.82	1.025	NU
3.	DVD, CD ROM	1.93	1.165	NU	2.15	1.134	NU
4.	Smart Phones	2.19	1.323	FU	2.25	1.253	FU
5.	Digital Camera	2.09	1.203	FU	2.10	1.203	NU
6.	Printers	1.95	1.213	NU	1.97	1.315	NU
7.	Smart/interactive boards	1.50	1.034	NU	1.47	1.033	NU
8.	Multimedia Television	1.52	0.916	NU	1.52	0.953	NU
9.	Teleconferencing Devices	1.58	1.113	NU	1.34	1.125	NU
10.	Blogs	1.55	1.121	NU	1.58	1.123	NU
11.	Digital Projectors	1.60	1.139	NU	1.57	1.132	NU
12.	Laptop Computers	1.73	1.212	NU	1.75	1.315	NU
13.	DVD Player/ Recorders	1.62	1.182	NU	1.60	1.176	NU
14.	CCTV Cameras	1.52	0.961	NU	1.49	0.974	NU
15.	Film and projector	1.67	1.141	NU	1.68	1.151	NU
16.	Satellite Dish	1.77	1.315	NU	1.58	1.73	NU
17.	Flash Drives	1.74	1.639	NU	1.64	1.711	NU
18.	Slide Projectors	1.67	1.156	NU	1.88	1.046	NU
19.	Radio	2.06	1.402	FU	2.68	1.572	FU
20.	Multimedia Projector	1.81	1.345	NU	1.90	1.287	NU
21.	Google	2.86	1.407	FU	2.59	1.603	NU
22.	Simulators	2.20	1.504	FU	2.67	1.743	NU
23.	CNC Machines	1.87	1.293	NU	1.64	0.928	NU
24.	AutoCAD	1.65	1.128	NU	1.72	1.094	NU
25.	Internet	1.95	1.205	NU	1.87	1.632	NU
26.	E-mail	1.86	1.301	NU	1.95	1.275	NU
27.	World Wide Web (www)	1.66	1.243	NU	1.43	1.154	NU
28.	Local Area Network (LAN)	1.60	1.110	NU	1.23	1.284	NU
29.	Metropolitan Area Network (MAN)	1.39	1.012	NU	1.51	1.018	NU
30.	Electronic Databases	1.54	1.069	NU	1.76	0.985	NU
31.	e-books	1.62	1.181	NU	1.35	1.085	NU
32.	e-journals	1.49	0.959	NU	1.54	1.240	NU
33.	e-library	1.72	1.304	NU	1.98	1.432	NU
34.	Facebook	2.52	1.420	FU	1.65	1.250	FU
35.	Twitter	1.70	1.070	NU	1.83	0.917	NU
36.	Skype	1.45	0.953	NU	1.67	0.716	NU
37.	Zoom	1.35	0.805	NU	1.54	0.772	NU
38.	You Tube	2.30	1.431	FU	2.57	1.285	NU
Grand Mean/SD		1.79	1.187	NU	1.81	1.179	NU

Key: VHU=Very Highly Utilized, HU=Highly Utilized, U=Utilized, FU=Fairly Utilized, NU=Not Utilized. Decision Rule=≥3.00. SD=Standard Deviation

Table 3 shows the responses of teachers on utilization of EM for instructional delivery of MTs among male and female teachers in technical colleges and technical colleges. The result revealed that except for desktop computers, Facebook, radio and smart phones that were found to be fairly utilized, most of the other EM devices were not utilized by both the male and the female teachers. This is indicated by their mean values ranging from 1.23 to 2.67 which are far below the criterion mean value of 3.00. Also, the grand means of 1.79 and 1.81 respectively for male and female teachers is an indication that the respondents were not far from the mean and from the opinion of one another on low utilization of EM for instructional delivery of MTs in technical colleges and technical colleges in Plateau and Nasarawa States.

Hypothesis Two: There is no significant difference between the mean responses of male and female teachers on the utilization of EM for instructional delivery of MTs in technical colleges and technical colleges in North Central Nigeria.

Table 4: Result of T-test on the Mean Responses of Male and Female Teachers on Utilization of EM for Instructional Delivery in Technical colleges and Technical Colleges in Plateau and Nasarawa States

Group	N	X	SD	Df	T-cal	T-tab	α	Decision
Male	29	1.80	1.17	150	-1.94	1.96	0.05	Insignificant
Female	9	2.25	1.27					

N=Number of respondents, X=Mean, SD=Standard Deviation, DF=Degrees of Freedom, α=Level of significance, Result [T-cal (-1.94) < T-tab (1.96) at $p < 0.05$] Insignificant

Table 4 shows the t-test result on difference between the mean responses of male and female teachers on extent of utilization of EM for instructional delivery in the technical colleges and technical colleges. The result for male teachers yielded a mean score of 1.80 with standard deviation of 1.17 while the female teachers mean score was 2.25 with a standard deviation of 1.27. The result further reveals that T-cal(150) = -1.94 and T-tab = 1.96. Since the T-calculated (-1.94) is less than the T-tabulated at 0.05 level of significance with 150 degrees of freedom (1.96), the null hypothesis was retained and it can be inferred that there was no significant difference between the mean responses of male and female teachers on the extent of utilization of EM for instructional delivery of MTs in the technical colleges and technical colleges in Plateau and Nasarawa States.

Discussion

From the research question 1 in Table 1 reveals that both male and female teachers agreed that all the itemized digital operational competencies are highly required and their acquisition are highly needed by teachers to be able to operate EM for instructional delivery of MTs in the technical colleges and technical colleges. The result show that respondents concurred that digital competencies are equally required of MTs graduates of technical colleges and technical colleges for relevance in the electronic world. This is in agreement with the findings of Bashir, Asukwo, Ibanga and Amusa (2023) who reported that digital competencies are key in the 21st century as communication has gone beyond human and human to human to machines. The result of hypothesis 1 (table 2) in relation to the research question proved that a significant difference did not exist between the mean ratings of male and female teachers on the EM competencies required for instructional delivery of MTs in technical colleges and technical colleges. This is in line with the study of Nwangwu (2018) also revealed that the gender variable was not a predictor of EM integration in teaching and learning.

The result of the study from research question 2 (table 3) showed MTs teachers in the technical colleges and technical colleges in Plateau and Nasarawa States utilized EM to a low extent. This supports the study by Owo and Deebom (2020) who asserted that inspired of the benefits of using EM facilities for instructional delivery, their use among teachers has been low due to incompetence and other debilitating

factors such as unavailability, irregular power supply, internet connectivity, telephones, dysfunctional nature, and no specific policy for ICT in education. Harrell and Bynum (2018) in giving credence to EM asserted that though change linked to EM is rapid and dramatic, in contrast, some teachers tend to resist change or embrace it slowly. Similarly, the T-test result of hypothesis 2 in Table 4 reveals that there was no significant difference between male and female teachers on the utilization of EM for instructional delivery of MTs in technical colleges and technical colleges in Plateau and Nasarawa States. This depicts that the gender of respondents does not influence the utilization of EM for instructional delivery of MTs in technical colleges and technical colleges. The present study validates other studies that gender was not a significant factor in technology utilization (Akanbi, 2020; Oguguo, Okeke, Dave-Ugwu, Ocheni, Ugorji, Nwoji & Ike, 2020; Onwusa & Nwaosa, 2021). But it contradicts several studies showing that the female gender has more phobia of using technology (techno-phobia) than the male gender (Arowolo, Abdulmalik & Hosea, 2016; Oqua & Ugbe, 2022; Adeoye, 2023). According to these authors, male teachers were more experienced in using computer-based technologies than females. Other researchers show female dominance in technology utilization (David-West & Akammeze, 2020; Idaka & Uzoechi, 2016). The gender debate still remains inconclusive.

Conclusion

Judging from the result of this study, it could be deduced that there is no significant influence of gender on EM competency and utilization in technical colleges and technical colleges in Plateau and Nasarawa States. The implication, therefore, is the need for a more elaborate study to examine the interaction of these variables and possibly, the inclusion of more factors that may interplay to male and female teacher's competency and utilization of EM for instructional delivery of MTs in the technical colleges and technical colleges in Plateau and Nasarawa States.

Recommendations

1. The competency requirements as identified in this study should be packaged into training modules for the training of technical colleges and MTs teachers in the technical colleges and technical colleges who lack the skills and competencies for operating digital machine tools and also be integrated into the curriculum of MTs teacher training institutions such as Colleges of Education and Universities.
2. Gender was neither a criterion for operational competency nor for utilization of EM facilities so, teachers of all genders without discrimination, should be assisted to overcome techno-phobia, anxiety and resistance to acquire and improve competency in the utilization of EM facilities for instructional delivery of MTs in technical colleges and technical colleges of Plateau and Nasarawa States.

References

Abifarin, S. A. (2015). Modern approach to educational technology. Lagos: Miclan Associates Ltd.

Adeoye, M. A. (2023). Gender differences in teacher's digital literacy skills in teaching STEAM. Journal of Educational Technology, 7(3), 462-469.

Akanbi, A. O. (2020). Availability and utilization of e-learning facilities in the teaching of senior school physics in Ilorin, Nigeria. Journal of Education and Learning (Edu Learn), 14(3), 331-337.

Arowolo, D., Abdulmalik, A. & Hosea, I. (2016). Techno-phobia and computer anxiety among teachers in secondary schools. Journal of Educational Computing, 12(1), 45-52.

Bashir, M., Asukwo, A. E., Ibanga, I. J. & Amusa, M. (2023). Digital technological competencies required by teachers of electrical/electronic technology education in tertiary institutions in North-East Nigeria. Vunoklang Multidisciplinary Journal of Science and Technology Education, 11(2), 114-128.

Carroll, N. & Conboy, K. (2020). Normalizing the new normal: changing technology-driven work practices under pandemic time pressure. International Journal of Information Management, 10(1), 10-16.

Cyril, M. U. (2016). Effect of multimedia instruction on retention and achievement of basic machining skills in mechanical craft practice. International Journal of Education and Information Technology, 1(2), 1-7.

Dange, K. A. (2024). The 21st century classroom: The imperative for educational technology in social studies. Nigerian Journal of Social Studies, 27(1), 127-143.

David-West, B. T. & Akameze, J. N. (2022). Gender differences in utilization of information and communication technology among students in library and information science. American Journal of Education and Information Technology, 6(2), 96-102.

Ede, P. & Ariyo, S. (2015). Availability of instructional facilities in technical colleges in Nigeria. Journal of Vocational Education, 8(2), 45-52.

Emennu, P. & Ojadi, A. (2021). Mechanical trade skills required for job security in industries by graduates of technical colleges in Rivers State. International Journal of Contemporary Academic Research, 2(2), 115-127.

Eze, T. I. & Osuyi, S. O. (2018). Effects of problem-based teaching method on students' academic performance in electrical installation and maintenance works in technical colleges in Edo State. International Journal of Development Sustainability, 7, 661-667.

Falloon, G. (2020). From digital literacy to digital competence: The teacher digital competency (TDC) framework. Educational Technology Research & Development, 68, 2449-2472. https://doi.org/10.1007/s11423-020-09767-4

Federal Republic of Nigeria (2016). National policy on education. Lagos: NERDC Press.

Harrell, S., & Bynum, Y. (2018). Factors affecting technology integration in the classroom. Alabama Journal of Educational Leadership, 5, 12-18.

Idaka, I. E. & Uzoechi, L. I. (2016). Gender, age and employability skills acquisition among university students in Imo State, Nigeria. International Journal of Innovative Education Research, 4(4), 6-15.

Ima-Obong, M. A. & Imoh-Obong, I. (2016). Information and communication technology: A tool for social studies delivery in open educational resources development and expansion in Nigeria. International Journal of America, 1(1), 95-107.

Kaigama, G. G. & Fxafatirimnm, M. (2020). Influence of gender disparity on student's academic performance in technical education of government technical training school Jalingo, Taraba State. African scholars journal of contemporary education research, 18(8), 179-190.

Koko, M. (2022). Mechanical trades in technical vocational education and training. Port Harcourt: Harey Publications.

National Business and Technical Examination Board (2014). Chief examiners report on the 2012 May/June. NBC/NTC Examination. www.nabtebnigeria.org.

National Business and Technical Examination Board (2017). Chief examiners report on the 2012 May/June. NBC/NTC Examination. www.nabtebnigeria.org.

National Business and Technical Examination Board (NABTEB, 2018). Examiner's reports. Benin City Nigeria: New Edition, Longman Publishers Ltd.

Nwangwu, E. C. (2018). Utilization of multimedia technologies by faculty lecturers in instruction delivery in universities in Enugu and Anambra States, Nigeria. Journal of CUDIMAC (J-CUDIMAC), 1(5), 49-62.

Nworgu, B. G. (2015). Educational research: Basic issues and methodology. Owerri: Wisdom Publishers.

Oguguo, B.C.E., Okeke, A.O., Dave-Ugwu, P.O., Ocheni, C.A., Ugorji, C.O., Nwoji, H.N. & Ike, I.C. (2020). Assessment of ICT Skills Relevant for Effective Learning Possessed by Undergraduate Students at the University of Nigeria. International Journal of Higher Education, 9(4), 206-216.

Okorieocha, C. N., Okparaeke, G. M. & Nwogu, P. O. (2019). Availability and utilization of Information and Communication Technology to enhance technical education programme in technical colleges: An implication for national development. Rivers State University Journal of Education (RSUJOE), 22(1&2), 84-98.

Onwusa, S. C. & Nwaosa, F. I. (2021). Gender differences in practical skills achievement and retention scores of students exposed to fabrication and welding craft practice using problem-based teaching method in technical colleges in Delta State, Nigeria. Quest Journal of Research and Humanities and Social Science, 4(9), 13-23.

Oqua, E. A. & Ugbe, E. B. (2022). Assessment of gender and age difference of prospective university student's attitude towards computer-based testing in the University of Calabar, Nigeria. LWATI: A Journal of Contemporary Research, 19(1), 25-33.

Owo, O., & Deebom, M. T. (2020). Assessment of the Technical Skills Acquired by Students of Technology Education for Employment Generation in Rivers State, Nigeria. International Journal of Latest Research in Humanities and Social Science, 3(2), 35-41.

Portillo, J., Garay, U., Tejada, E., & Bilbao, N. (2020). Self-perception of the digital competence of educators during the COVID-19 pandemic: A cross-analysis of different educational stages. Sustainability, 12(1), 1-13.