IMPROVING INSTRUCTIONAL DELIVERY IN TECHNICAL VOCATIONAL EDUCATION AND TRAINING FOR SKILLS DEVELOPMENT IN THE ERA OF COVID-19 PANDEMIC IN NIGERIA

Chinwe P. Eze[1], Christopher O. Igwe[2,*] and Alex. O. Nwachukwu[3]

[1,3]Department of Building/Woodwork Technology Education, Federal College of Education (Technical), Umunze

[2]Department of Industrial and Technology Education, Federal University of Technology, Minna

*Corresponding E-mail: christoigwe@gmail.com (Tel: (+2348034040840)

Abstract: The study sought to find out ways of improving instructional delivery in TVET for skills development in the era of covid-19 pandemic. Two research questions and two null hypotheses tested at 0.05 level of significance guided the study. A cross sectional research design was used with a population of 118 TVET trainers (94 TVET teachers and 24 technicians) from four randomly selected tertiary institutions in Nigeria. No sampling was done because the population was manageable. A 29- item structured questionnaire tagged "Instructional Delivery in TVET (IDTVET)" drawn on a 4-point scale was used for data collection by the researchers. The research instrument was validated by three experts in the department of Technology and Vocational Education, Nnamdi Azikiwe University, Awka. A split half method was used to determine the reliability of the instrument which gave a reliability coefficient of 0.89 using Spearman Brown prophecy formula after analyzing the data indicating that the questionnaire was reliable for data collection. Mean and standard deviation were used to answer the research questions while the t-test statistics was used to test the hypotheses at 0.05 level of significance. Findings of the study depicts that the respondents all agreed that a lot of challenges such as abrupt introduction of distance/online teaching and learning occasioned by lockdown were encountered by TVET Trainers during the COVID-19 Pandemic. The study recommended among others that TVET programmes should be strengthened to respond to future disruptions in teaching and learning through training and retraining in digital tools and modern learning technologies.

Keywords: Technical Vocational Education & Training, Skill Development, COVID-19 Pandemic

Introduction

Improvement is the ability or condition of being better than before. According to Sega (2005), improvement is a process of economic, social, political and cultural change in a given society engineered by the efforts of all stakeholders. These stakeholders may include teachers/trainers, local communities and financial partners with a view to improving the living conditions of the citizens through skill development. The trainers through the use of appropriate instructional delivery techniques can produce graduates with basic and relevant skills to become employable. Hence, Onah, et al., (2018) revealed that instructional delivery techniques are not only necessary but essential for developing skills which will be useful in the labour market. Yalams (2017) suggested that instructional delivery in skill courses has to be improved from time to time so as to conform to the current societal needs.

TVET plays a very vital role in developing skills needed to meet the fast changing demands of the labour market. In order to achieve this goal, appropriate instructional delivery technique in TVET should be applied and improved upon by the trainers. According to Oguntuyi (2017), TVET is a structured programme, aimed at providing recipients with the necessary knowledge and skills to continue their studies in the tertiary education level or be integrated into the labour market. Hence, in the era characterized by the rapid technological changes, health and economic uncertainties, it is imperative that stakeholders develop instructional delivery tand redesign curricula to take care of the varied needs of all members of the society. According to Adigun (2017), the contribution of TVET to the Nigeria's Gross Domestic Product (GDP) depends on the quantity and quality of the labour force and services it produces. This in turn depends on the quality of TVET delivery hence the need for adequate funding of the programme for improvement. Akinyemi (2018) agreed that TVET is a crucial platform for acquisition of skills and knowledge for employment and sustainable livelihood adding that it provides the needed employable knowledge, skills and attitudes necessary for effective performance in the workplace.

179

Statement of the problem

Undoubtedly, Coronavirus Pandemic (COVID-19) has posed significant challenges to education generally including TVET. According to International Labour Organisations (2020), Covid-19 is one of the most significant health crisis that the world has faced in the past 100 years. It has disrupted peoples' way of daily living including how to work and learn. Consequently, TVET trainers were abruptly introduced to unprecedented online and distance learning occasioned by the new norm of social distancing. Aggarwai (2020) noted that COVID-19 has seriously disrupted skills development around the world such that training and educational institutions have made a massive and unprecedented shift to online platforms and tools as the only way to ensure continued delivery of learning and skills development. However, Aggarwai decried that instructors were not properly trained to deliver online courses and as such adapting TVET curricula and training to online formats was difficult. In the same vein, United Nations (2020) noted that in the higher education sub-sector, while online learning has generally taken place through recorded lectures and online platforms, some universities have postponed teaching and learning until further notice, due to lack of information technology (IT) infrastructure for both students and teachers. Notably, the TVET sector in Nigeria is faced with acute shortage of certified personnel, equipment and infrastructure. Given the severe disruption in TVET delivery, it is of crucial importance to identify adequate, quick, practical and innovative solutions to respond to this crisis through improved instructional delivery for skill development in Nigeria.

Purpose of the study

The main purpose of this study is to determine the strategies for improving instructional delivery in TVET for skill development in the era of covid-19 pandemic in Nigeria. Specifically, the study sought to determine the:

1. Challenges encountered by TVET Trainers in improving instructional delivery for skill development in the era of covid-19 pandemic in Nigeria.

2. Emerging innovations that could be used by TVET Trainers in improving instructional delivery for skill development in the era of covid-19 pandemic in Nigeria.

Research questions

1. What are the challenges encountered by TVET Trainers in improving instructional delivery for skill development in the era of covid-19 pandemic in Nigeria?

2. What are the emerging innovations that could be used by TVET Trainers for improving instructional delivery for skill development in the era of covid-19 pandemic in Nigeria?

Hypotheses

Ho_1: There is no significant difference between the mean responses of TVET teachers and technicians on the challenges which they encountered in improving instructional delivery for skill development in the era of covid-19 pandemic in Nigeria.

Ho_2: TVET Teachers and Technicians do not differ significantly in their mean responses on emerging innovations that could be used for improving instructional delivery for skill development in the era of covid-19 pandemic in Nigeria.

Methodology

A cross sectional survey research design was used in this study. According to Gall, *et al.*, (2007), a cross sectional design is meant to describe survey that involves a single snapshot of data collection from a sample to represent the population to which the findings can be generalized. The population of the study comprises of all the teachers and technicians in the tertiary TVET institutions in Nigeria. A sample of 118 TVET Trainers (94 TVET Teachers and 24 Technicians) was drawn from the four randomly selected tertiary institutions offering TVET across the country.

The instrument used for data collection was a 29 item structured questionnaire, developed by the researchers, titled "Instructional Delivery in TVET (IDTVET)". The instrument was based on four-point Likert type rating scale of Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD) with numerical values of 4, 3, 2 and 1 respectively. It subjected to face and content validity by three experts from the Vocational and Technology Education Department of Nnamdi Azikiwe University, Awka. To ascertain the internal consistency of the instrument, a pilot test was conducted at the School of Technical Education, Enugu State College of Education (T), Enugu through research assistants. A split half method was used to determine the reliability of the instrument which gave a reliability coefficient of 0.89 using Spearman Brown prophecy formula after analyzing the data indicating that the questionnaire was reliable for data collection.

Data collection was done by the researchers with the help of two research assistants where 106 out of the 118 administered instruments were retrieved (representing 89.8% return rate). Mean and standard deviation were used to answer the research questions while the t-test statistics was used to test the hypothesis at 0.05 level of significance. Mean values of 2.50 and above were regarded as Agreed while mean values below 2.50 were regarded as Disagreed. Also it was decided that where the calculated t-value was equal or greater than the table t-value, it indicates significant difference, the null hypothesis was rejected but if otherwise, the null hypothesis was accepted.

Results

Table 1: Mean Responses and Standard Deviation of Respondents on the Challenges in Improving Instructional Delivery for Skill Development in the Era of COVID-19 Pandemic in Nigeria

S/N	Items	Teachers			Technicians		
		$\bar{X}_1$	SD_1	Decision	$\bar{X}_2$	SD_2	Decision
1.	Inadequate infrastructure	3.67	0.66	Agreed	3.70	0.54	Agreed
2.	Inadequate electricity supply	3.90	0.85	Agreed	3.82	0.79	Agreed
3.	No internet enabled devices	3.25	0.78	Agreed	3.36	0.48	Agreed
4.	Increased cost of data charges	4.28	0.69	Agreed	3.57	0.55	Agreed
5.	Poor internet connection	3.48	0.93	Agreed	4.39	0.83	Agreed
6.	Repeat of lectures after lockdown	4.30	0.70	Agreed	3.62	0.68	Agreed
7.	No materials due to lockdown	2.36	1.10	Disagreed	2.29	0.70	Disagreed
8.	No practical training due to lockdown	3.89	0.54	Agreed	3.74	0.52	Agreed
9.	Examinations not conducted	3.88	0.81	Agreed	3.36	0.75	Agreed
10.	Trainers lack online teaching skills	3.27	0.84	Agreed	3.72	0.49	Agreed
11.	Rural areas lack of access to the internet	4.84	0.72	Agreed	3.99	0.62	Agreed
12.	Decline in quality of training	3.76	0.67	Agreed	3.59	0.55	Agreed
13.	Lack of motivation for trainers	4.22	0.59	Agreed	4.18	0.72	Agreed
14.	No questions in social media	3.47	0.62	Agreed	3.26	0.60	Agreed
	Grand Mean/SD	**3.76**	**0.75**		**3.61**	**0.64**	

Data presented in Table 1 revealed that the respondents agreed to all the items except item 7 with a mean value less than the criterion mean of 2.50. The grand means of 3.76 and 3.61 for ndicate that the respondents generally agreed that a lot of challenges are confronting the instructional delivery in TVET for skill development especially in the era of COVID-19 pandemic in Nigeria.

Table 2: Mean Responses and Standard Deviation of Respondents on the Emerging Innovations for Improving Instructional Delivery for Skill Development in the Era of COVID-19 Pandemic in Nigeria

S/N	Items	Teachers			Technicians		
		$\bar{X}_1$	SD_1	Decision	$\bar{X}_2$	SD_2	Decision
1.	Increase availability of distant learning	3.96	0.83	Agreed	3.83	0.58	Agreed
2.	Video conferencing like zoom	3.68	0.68	Agreed	3.54	0.52	Agreed
3.	Use of You Tube	3.36	0.57	Agreed	3.28	0.49	Agreed
4.	Developing blogs/discussion forum	3.00	0.94	Agreed	3.18	0.83	Agreed
5.	Developing new written resources	3.59	0.74	Agreed	3.42	0.75	Agreed
6.	Use of Simulations	3.66	0.66	Agreed	3.78	0.48	Agreed
7.	Use of Podcasts	2.44	0.59	Disagreed	2.32	0.83	Disagreed
8.	Creating virtual learning environment like Goggle classroom	2.26	0.70	Disagreed	2.30	0.62	Disagreed
9.	Use Television and Radio	3.82	0.82	Agreed	3.76	0.77	Agreed
10.	Increase availability of distance learning facilities	3.67	1.09	Agreed	3.43	0.92	Agreed
11.	Use of Whatsapp and email,	3.66	0.95	Agreed	3.56	0.87	Agreed
12.	Develop alternative to practical	3.45	0.71	Agreed	3.64	0.65	Agreed
13.	Use of Histagram, Facebook	3.53	0.58	Agreed	3.61	0.68	Agreed
14.	Develop new training programme	3.88	0.99	Agreed	3.72	0.71	Agreed
15.	Train facilitators in online pedagogy	4.21	0.76	Agreed	4.16	0.44	Agreed
	Grand Mean/SD	**3.48**	**0.77**		**3.44**	**0.68**	

The analysis presented in Table 2 indicates that the respondents disagreed to two out fifteen items on emerging innovations contained in the instrument. With grand means of 3.48 and 3.44 indicate that almost all the emerging innovations are needed for improving instructional delivery in TVET for skill development in the era of COVID-19 pandemic in Nigeria.

Table 3: t-test Analysis of the Respondents' Responses on Challenges in Instructional Delivery for Skill Development in the Era of COVID-19 Pandemic in Nigeria

Respondents	N	$\bar{X}$	SD	DF	t-cal	t-crit	Decision
Teachers	86	3.76	0.75				
				104	0.91	1.960	Not Significant
Technicians	20	3.61	0.64				

From the result in Table 3, it shows that at 104 df, the t-calculated value of 0.91 is less than the t-critical value of 1.960 at 0.05 level of significance. Therefore the null hypothesis is accepted. This indicates that there is no significant difference in the mean response of TVET Teachers and Technicians on the challenges encountered by TVET Trainers in improving instructional delivery in TVET for skill development in the era of COVID-19 pandemic in Nigeria.

Table 3: t-test Analysis of the Respondents' Responses on Emerging Innovations for Instructional Delivery for Skill Development in the Era of COVID-19 Pandemic in Nigeria

Respondents	N	$\bar{X}$	SD	DF	t-cal	t-crit	Decision
Teachers	86	3.48	0.77				
				104	0.23	1.960	Not Significant
Technicians	20	3.44	0.68				

The result in Table 4 showed that at 104 df, the t-calculated value of 0.77 is less than the t-critical value of 1.960 at 0.05 level of significance. Therefore the null hypothesis is accepted indicating that there is no significant difference in the mean response of TVET Teachers and Technicians on the emerging innovations that could be used in improving instructional delivery in TVET for skill development in the era of COVID-19 pandemic in Nigeria.

Findings

1. COVID-19 pandemic has posed significant challenges to TVET instruction.

2. ICT equipment, devices and digital skills of TVET trainers are indispensable toold in the era of COVID-19 pandemic. Whatsapp was used more to share lecture notes in some courses

3. Infratructural dearth and challenges access hampers efforts ICT implementation.

Discussion of findings

The findings in Table 1 generally revealed that COVID-19 pandemic has posed significant challenges to TVET instruction. TVET trainers and students have struggled with online and distance education, which was introduced abruptly under the new norm of social distancing. TVET institutions more especially experienced a major challenge of providing hands-on practical training using tools and machines through online training. This finding is line with the views of Hayashi and Matsuda (2020) who stated that current TVET instructors and students have struggled with online and distance education, which was introduced abruptly under the new norm of social distancing. As such TVET institutions experienced the significant challenge of providing hands-on practical training using tools and machines through online training. This turbulence, according to Hayashi, *et al.*, (2021) will have a negative impact on the employment outcomes of TVET graduates who will not be adequately equipped with skills. International Labour Organisations (2020) further stated that these challenges were experienced because TVET mangers, trainer and learners were not adequately prepared for this abrupt transition to remote learning, given the lack of necessary skills and infrastructure to accommodate distance teaching and learning.

The findings in Table 2 highlighted the importance of infrastructure (networks, ICT equipment and devices) and the digital skills of TVET trainers, as they become crucial for ensuring an equitable and optimal learning environment, especially in the rural areas. This finding is in line with assertion of ILO, (2020) which stated that the COVID-19 crisis has become a catalyst for TVET providers worldwide to develop innovative learning solutions in a short period of time and it has accelerated the provision of online distance learning at an unprecedented pace and scale, thanks to digital tools and modern learning technologies. Aggarwai (2020) also stressed that although the shift to online learning during the pandemic was seen as an emergency response, the crisis has also provided an opportunity for developing more flexible learning solutions in the future using the online format. In Tables 3 and 4, the respondents through the result of the test of hypotheses indicate that both TVET Teachers and Technicians were in agreement with the challenges and emerging innovations that could be used by TVET Trainers in improving instructional delivery for skill development in the era of COVID-19 in Nigeria.

183

Conclusion

The COVID-19 pandemic has affected economies, academic activities and societies around the world and caused an unprecedented fall in economic activity, the loss of working hours and income, and a sharp rise in unemployment and underemployment. In fact the shock of COVID-19 pandemic on education including TVET has been unprecedented. It has set back the attainment of TVET goals of producing adequate and skilled manpower for the labour market. The key question is how all these new learning systems and achievements can be sustained to ensure long-term positive impacts at the system level and an equitable, flexible and effective learning environment for all. Hence, the pandemic has challenged some of the current TVET strategies, systems and processes, while highlighting existing gaps. We are all expected to respond to these challenges and gaps by searching for innovative ways to improve instructional delivery of TVET for skill development especially in the era of COVID-19 pandemic in Nigeria.

Recommendations

1. Government should improve internet infrastructure and ensure affordable connectivity
2. Government and private sectors should invest in the development of adequate crisis-response plans for the education sector especially TVET at all levels.
3. Policy makers should inculcate successful emerging innovations in online training programmes, learning platforms and resources into the TVET system.
4. Government should develop and reinforce capacities of TVET Trainers, students and institutions to adjust to constantly evolving circumstances whether COVID-19 or any other future crisis.
5. Government should provide financial support for TVET Trainers and students to enable them access the internet and hardware devices for teaching and learning.
6. Government should establish monitoring and evaluation conditions for distance teaching and learning of TVET programmes.

REFERENCES

Adigun, A. (2017). *Technical vocational education: Tool for revamping economy*. An Address presented at the 3rd National conference of School of Vocational and Technical Education, Adeniran Ogunsanya College of Education (AOCOED), Otto-Ijanikin, Lagos, Nigeria.

Aggarwai, A. (2020). *The skills challenge in the time of COVID-19*. Retrieved from www.apskills.ilo. org>news>global-challenges-global-solutions-the-skills-chall.

Akinyemi, T. (2018). *Prospects, issues and challenges of technical and vocational education and training (TVET) in revamping Nigeria depressed economy*. Lead paper presented at the 3rd National conference of School of Vocational and Technical Education, Adeniran Ogunsanya College of Education (AOCOED), Otto-Ijanikin, Lagos, Nigeria.

Gall, M. D., Gall, J. D., & Borg, W. R. (2007). *Educational research: An introduction* (8 ed.). Boston: Prentice-Hall Inc.

Hayashi, R., Garcia, M., Sudarshana, H. D., Balasuriya, A., & Hirokawa, T. (2021). *COVID-19 impact on technical and vocational education and training in Sri Lanka* [ADB Briefs, No 168]. Manila:

Hayashi, R., & Matsuda, N. (2020). *COVID-19 Impact on job postings: real-time assessment using Bangladesh and Sri Lanka online job portals*. [ADB Briefs, No. 135]. Manila:

Onah, F.C.; Ejiofor, T.E.; Ahua, J.T. & Dogo, S.K. (2018). Innovative tecniques in agricultural education instructional delivery for matching skills demand and supply in Nigeria. *Journal of Centre for Technical Vocational Education, Training and Research*, 3(2), 56-65.

Sega, N. A. (2005). *Refocusing technical education in Nigeria*. A Paper Presented at the Federal College of Education (Technical) Asaba, Nigeria.

International Labour Organisations (2020). *Skills development in the time of COVID-19: Taking stock of the initial responses in technical and vocational education and training*. Retrieved from https://www.adgs.un.org/goals/goal8.

Oguntuyi, L. (2017). *Technical vocational education: Tool for revamping economy*. Keynote Address presented at the 3rd National Conference of School of Vocational and Technical Education, Adeniran Ogunsanya College of Education (AOCOED), Otto-Ijanikin, Lagos, Nigeria.

United Nations (2020). *Policy brief: Education during COVID-19 and beyond*. Retrieved from https://www.un.org/sites/un2.un.org/files/the_world_of_work_and_covid-19.

Yalams, S.M. (2017). Refocusing TVET instructional delivery in Nigerian schools in the digital era. *Journal of Technical and Vocational Education, Training and Research*, 2(1), 1-15.