

**REINFORCING SCIENCE AND TECHNOLOGY IN TECHNICAL
VOCATIONAL EDUCATION AND TRAINING (TVET): IMPERATIVE
FOR EFFECTIVE RESPONSE TOWARDS COVID-19 CRISIS**

Obe Pauline Ijeoma Ph.D

Department of Industrial Technical Education
University of Nigeria, Nsukka, Enugu state.
Pauline.obe@unn.edu.ng

&

Maureen Anayo, Madu Ph.D

Department of Business Education
University of Nigeria, Nsukka, Enugu state.
maureen.madu@unn.edu.ng

&

Onah Eunice N. Ph.D

Department of Computer & Robotics Education,
University of Nigeria Nsukka, Enugu state.
eunice.onah@unn.edu.ng

Abstract

This study focused on reinforcing science and technology in Technical vocational Education and Training (TVET) of federal university in Enugu State Nigeria. Two research questions and one hypothesis guided the study. The study made use of survey research design and was carried out in Enugu State, Nigeria. The population was 89 TVET lecturers which comprises of 46 men and 43 female TVET lecturers of (2019/2020) academic session) from the federal university in Enugu State. The only federal University in Enugu State is the University of Nigeria Nsukka. There was no sampling since the population is of manageable size. Structured Questionnaire was used as the instrument for data collection. The instrument was validated by three experts. Cronbach Alpha reliability method was used and an overall reliability coefficient of .85 was obtained. The data was collected by the researchers. Out of 89 copies of the questionnaire administered, only 85 copies were retrieved giving a 96% return rate. Data generated were analysed using mean, standard deviation and t-test. The study found out among other things that there is urgent need for reinforcement of science and technology especially in Technical vocational Education and Training (TVET) for effective response toward Covid-19 crisis and its kind in Nigeria and the world at large. The paper recommended among other things that TVET stakeholders should collectively join hands in reinforcing science and technology in TVET

in federal university in Enugu state for effective mitigation and management of covid-19 crisis in Nigeria.

Keywords: COVID-19, Science and Technology, Technical vocational Education and Training (TVET).

Introduction

The coronavirus disease 2019 otherwise known as Covid-19 is a global health crisis that has created devastation in the world at-large as seen in academic, social, economic, political life among others. Covid-19 is described as an illness caused by a novel virus called coronavirus with symptoms projecting a severe acute respiratory syndrome (Unesco 2020). The coronavirus disease was first identified amid an outbreak of respiratory illness cases in Wuhan City, Hubei Province, China. It is said to be transmitted through contact with respiratory fluid. Covid-19 brought with it shocks, health crisis, loss of life and loss of livelihood thus causing risk to families which leads to violence, forced marriage, rape, exploitation among others. The International Labour Organization (ILO) in Unesco, 2020 indicated that Covid-19 has created unscrupulous impacts globally with no hope of knowing when global normality will return to the world at-large. Efforts to stem the spread of Covid-19 through preventive measures led to social-distancing, self-isolation and other preventive measures among individuals.

African countries in response to prevent the spread of Covid-19 have taken steps ranging from closing their borders to closing schools, training centers and public sectors (Unesco 2020). Closures of schools and many public places according to *Bao, Hang, Zhang, Hogan, Tiffany, (2020)* and *linzon (2020)* have created unscrupulous impact not only on students, teachers, and families but also have far-reaching economic and societal consequences. The impact is more severe to the disadvantaged children and their families, which has led to interrupted learning, compromised nutrition and childcare problems with consequences leading to loss of jobs, unemployment, poverty, lack of health care services and insecurity evidenced in Africa and the world at large, (Unesco 2020).

In response to these alarming issues, the world health organisation (WHO) noted that government and other organisational bodies have tried to manage the impact of Covid-19 but more effort is needed to address the critical social and economic impacts on people. The United Nations Development Programme

(UNDP), stressed that consideration should not only be on the management of Covid-19 now but for preventions against similar pandemic from recurring in future. Unesco in their effort to reduce the impact of Covid-19 in education setting recommended the use of distance learning programs and open educational applications and platforms for schools and teachers to reach learners and limit the disruption of education. This has not favoured the kids in rural and underdeveloped communities as they are not equipped with digital tools. Government of different states also adopted local media channels such as radio programmes to reach out to students in remote communities. These efforts have not yielded much as the challenge to educate children where they are, within the infrastructure and setting they are, has not being easily attended especially to the disadvantaged children. Students of technical vocational education and training (TVET) also in their effort to manage Covid-19 crisis in several African countries have shown their inventiveness through a number of initiatives ranging from the production of reusable masks to the creation of foot-operated hand washing pumps and the production of visors and disinfection booths among others. These efforts of TVET students if strengthened will go a long way in managing crisis now and even in the future.

Technical vocational education and training (TVET) according to Nwobasi, (2011) is defined as that aspect of education that involves the acquisition of techniques and application of the knowledge of science for the improvement of man's surrounding. Uwaifo, (2009) described TVET as that aspect of education that deals with manpower training in professional areas such as engineering, agriculture, business, home and economics to improve the economy of a country. The Federal Government of Nigeria (FRN) 2004, in its educational policy captures the role of TVET as human capital development that leads to the acquisition of applied and practical skills for useful living within the society. The role of TVET as captured by the policy include: to enhance the productivity of the country, to reduce poverty, to develop human and social capital, promote skills acquisition, provide for expertise needed for more sustainable societies and economy of a country among others. Technical vocational education and training can only perform these roles if their science and technology is reinforced projecting in the availability of instructional resources to the TVET programme. Edokpolor, (2018) noted that the reason for the most social problems encounter in society today is because of the lack and inadequate physical facilities and instructional resources for effective teaching and learning in TVET education.

The weakness of technical vocation education and training TVET in performance of their roles is mostly revealed during Covid-19 crisis hence the need for urgent reinforcement of science and technology in technical and vocational training for crisis management. Science is the study of the natural world based on the fact learned through experiments and observation while technology is the use of science in industry, engineering, etc. to invent useful things or to solve problems. Reinforcement of science and technology of TVET in this study simply mean strengthening of the production, supply and utilization of the physical facilities and instructional resources for effective teaching and learning in TVET education in federal university in Enugu state. The reinforcement should be in inform of the digitization of classrooms, the development of emergency plans to ensure continuity of training in the event of a crisis, the creation or updating of training curricula adapted to the needs and context of the African countries, and support for the empowerment of young learners who can provide innovative, sustainable solutions in the health field among others.

Reinforcement of science and technology in TVET will provide students with insight into how different processes of knowledge are initiated and progressed, and how innovative technological processes are developed, employed and utilized. Isah, (2013) maintained that reinforcement of science and technology of TVET education will take into account the principals and standards in TVET education, the socio-economic conditions, the informal sector needs of the society and labour market demands among others. The reinforcement of science and technology of TVET in federal university in Enugu state should come inform of financial support by stakeholder, making TVET products to be relevance to the labour market, making the physical facilities to be accessible for trainees and having quality standard delivery to mention but a few. There is need therefor to reinforce the science and technology of TVET for greater innovations, creativity and sustainability for effective responses towards covid-19 crisis.

Problem of the study

The global social and economic sustainability is now leading to a new conviction that TVET human potentials are the major agent for sustainability in the growth of any nation even in crisis management. In fact, an effective TVET system is considered as a critical pillar of successful social and economy development for sustainability within a country. The expectation of TVET to maintain sustainability

even in crisis was not achieved during Covid- 19 pandemic hence there is hunger, health crisis, loss of life, loss of jobs, poverty, insecurity to mention but a few throughout the world. This situation could be attributed to the insufficiency of the science and technology of TVET in federal universities to address the Covid-19 crisis. It then becomes imperative that the science and technology of TVET should be reinforced for effective responses towards Covid-19 crisis and its kind.

Purpose of the study

The general purpose of the study is to decide reinforcing science and technology of TVET as imperative for effective response towards Covid-19 crisis specifically the study determined:

1. The need for reinforcing science and technology of TVET for effective response towards Covid-19 crisis.
2. The way of reinforcing science and technology of TVET for effective response towards Covid-19 crisis.

Research Questions

The following research questions guided the study:

1. What is the need for reinforcing science and technology of TVET for effective response towards Covid-19 crisis?
2. What are the ways of reinforcing science and technology of TVET for effective response towards Covid-19 crisis?

Hypothesis

1. There is no significant different between the mean response of TVET lecturers (male and female) on the need for reinforcing science and technology of TVET for effective response towards Covid-19 crisis

Methodology

This study focused on reinforcing science and technology of TVET for effective response towards Covid-19 crisis. The study made use of survey research design and was carried out in Enugu State, Nigeria. Two research questions and one hypothesis guided the study. The population was 89 TVET lecturers which comprises of 46 men and 43 female TVET lecturers of (2019/2020) academic session) from the federal university in Enugu State. Questionnaire was used for data collection. Out of 89 copies of the questionnaire administered, only 85 copies were retrieved giving a 96% return rate. The instrument was validated by three experts. Cronbach Alpha reliability method was used and an overall reliability

coefficient of .85 was obtained. Data generated were analysed using mean and standard deviation while t-test was used to test the hypothesis at 0.05 level of significant. Any mean value that is greater than or equal to 2.50 was accepted while mean values less than 2.50 were rejected. However, the null hypothesis was accepted if the p-value is greater than t-value (0.05 level) but the null hypotheses was rejected if the p-value is less than t-value (0.05 level).

Results

Table 1

Mean, standard deviation and hypothesis of the response of TVET lecturers (male and female) on the need for reinforcing science and technology of TVET for effective response towards Covid-19 crisis.

S/ N	Item Statements	Mea n	S.D	P- valu e	Remar ks	Sign
1	Reinforcing science and technology of TVET will enhance high productivity of the country.	2.84	0.74	0.14	Agree	NS
2	Reinforcing science and technology of TVET will make its recipients to be saved from poverty and sustains their security during crisis years.	2.62	0.66	0.08	Agree	NS
3	Reinforcing science and technology of TVET will reduce inequality, filling income gaps that would otherwise exist between the rich and poor.	2.76	0.76	0.18	Agree	NS
4	Reinforcing science and technology of TVET will reduce crimes across the country especially during crisis.	2.62	0.78	0.51	Agree	NS
5	Reinforcing science and technology of TVET will decreases migration that causes the spread of covid-19.	2.86	0.79	0.47	Agree	NS
6	Reinforcing science and technology of TVET will enhance the need of the urban society.	2.45	0.65	0.06	disagr ee	NS

S/ N	Item Statements	Mea n	S.D	P- valu e	Remar ks	Sign
7	Reinforcing science and technology of TVET will reduce vulnerability of children in Nigeria during crisis.	2.58	0.75	0.08	Agree	NS
8	Reinforcing science and technology of TVET will enhance distance learning programme and open educational application.	2.66	0.77	0.09	Agree	NS
9	Reinforcing science and technology of TVET will enhance the inventive spirit in TVET students.	2.70	0.82	0.17	Agree	NS
10	Reinforcing science and technology of TVET will enhance the creativity interest in TVET student	2.64	0.85	0.16	Agree	NS
11	Reinforcing science and technology of TVET will enhance high living conditions for the families in Nigeria.	2.64	0.85	0.17	Agree	NS
12	Reinforcing science and technology of TVET will enhance the need of the rural society	2.47	0.62	0.08	Disagr ee	NS
13	Reinforcing science and technology of TVET will enhance development of human and social capital.	2.87	0.84	0.16	Agree	NS
14	Reinforcing science and technology of TVET will enhance promotion of necessary skills, knowledge and expertise needed for more sustainable society during crisis.	2.77	0.80	0.16	Agree	NS
15	Reinforcing science and technology of TVET will enhance different beliefs of the people	2.49	0.63	0.08	Disagr ee	NS
	Grand Mean	2.70	0.75	0.16	Agree	NS

Keys: SD- Standard deviation; REM-Remark; P-value-hypothesis value, NS-Not significant.

Data in table 1 showed that 12 items out of 15 items listed had their mean values above the cut-off point of 2.50. This indicated that the 12 items were agreed by the TVET lecturers while the remaining 3 items were rejected as the need for reinforcement of science and technology of TVET for effective response towards Covid-19 crisis. More so the standard deviation values of all the 15 items ranges from 0.62-0.85, showing that the respondents were not far from one another in their responses. The hypothesis showed also indicated that all the 15 items in table 1 have their p-values greater than 0.05 level of significance which indicated that the null hypothesis was accepted therefor, there is no significance difference in the mean responses of the TVET lecturers (male and female) on the need for reinforcing science and technology of TVET for effective response towards Covid-19 crisis.

Table 2

Mean and standard deviation of the response of TVET lecturers (male and female) on the ways of reinforcing science and technology of TVET for effective response towards Covid-19 crisis in Nigeria.

S/N	Item Statements	Mean	S.D	Remarks
1	Science and technology of TVET can be reinforced for effective response towards Covid-19 crisis through availability and accessibilities of resource facilities to trainees.	2.87	0.71	Agree
2	Science and technology of TVET can be reinforced for effective response towards Covid-19 crisis by assuring quality and standard delivery of facilities to TVET Education.	2.67	0.66	Agree
3	Science and technology of TVET can be reinforced for effective response towards Covid-19 crisis by assuring uninterrupted funding to TVET Education.	2.96	0.75	Agree
4	Science and technology of TVET can be reinforced for effective response towards Covid-19 crisis by assuring that the TVET principle and standard is be maintained.	2.79	0.77	Agree
5	Science and technology of TVET can be reinforced for effective response towards Covid-19 crisis through training the trainers	2.38	0.65	Disagree

6	Science and technology of T.VET can be reinforce for effective response towards Covid-19 crisis by assuring that the product of TVET is made relevance to the labour market	2.80	0.79	Agree
7	Science and technology of TVET can be reinforced for effective response towards Covid-19 crisis by considering the socio-economic condition of the citizens.	2.57	0.74	Agree
8	Science and technology of TVET can be reinforce for effective response towards Covid-19 crisis by assuring that the informal sector need of the country is considered.	2.57	0.76	Agree
9	Science and technology of TVET can be reinforced for effective response towards Covid-19 crisis through effective supervision.	2.42	0.60	Disagree
10	Science and technology of TVET can be reinforced for effective response towards Covid-19 crisis by assuring that the culture and belief of the people is considered.	2.67	0.83	Agree
	Grand mean	2.70	0.73	Agree

Keys: SD- Standard deviation; REM-Remark.

Data in table 2 showed that 8 items out of the 10 items had their mean values above the cut-off point of 2.50. The 8 items were accepted while the remaining 2 items were not accepted by the TVET lecturers (male and female) as the ways of reinforcing science and technology of TVET for effective response towards Covid-19 crisis in Nigeria. More so the standard deviation values of all the 10 items ranges from 0.60-0.83, showing that the respondents were not far from one another in their responses.

Discussions

The finding of the study in Table 1 which is in respect to the research question 1 revealed the needs for reinforcing science and technology of TVET for effective response towards Covid-19 crisis. The finding shows that reinforcing science and technology of TVET will enhance high productivity of the country, save TVET practitioners from poverty and sustains their security during crisis; reduce

inequality among people of the country, filling income gaps that would otherwise exist between the rich and poor among others. This is in line with Nwobasi, (2011) who defined technical vocational education and training (TVET) as that aspect of education that involves the acquisition of techniques and application of the knowledge of science for the improvement and sustainability of man and his surrounding even in crisis. The findings also is in line with Uwaifo, (2009) who described TVET as that aspect of education that deals with manpower training in professional areas such as engineering, agriculture, business, home and economics to improve the economy of a country for sustainability.

The finding of the study in Table 2 which is in respect with research question 2 revealed the ways of reinforcing science and technology of TVET for effective response towards Covid-19 crisis in Nigeria. The finding shows that Science and technology of TVET can be reinforced for effective response towards Covid-19 crisis through availability and accessibilities of resource facilities to trainees, assuring quality and standard delivery of facilities to TVET education, assuring uninterrupted funding to TVET education, assuring that the TVET principle and standard should be maintained among others. This in agreement with Edokpolor, 2018 who noted that the reasons for the alarming rates of these social problems in Nigeria is because the physical facilities and instructional resources for effective teaching and learning processes in TVET education are inadequately provided and rarely utilized, which in turn, affect students' skills acquisition required to gain and sustain employment after graduation. Hence, there is need for reinforcing science and technology of TVET for effective response towards Covid-19 crisis.

Conclusion

Technical vocation education and training (TVET) is considered as a critical pillar for successful social and economy development of any country. Covid-19 crisis brought about disruption in the health, education, social and economic development of many countries including Nigeria. It has been observed that the Government, organisation and individual including TVET students have in one way or the other made efforts in mitigating the impact of Covid-19 crisis. These efforts especially that of TVET students should be strengthened through reinforcement of science and technology in TVET to ensure sustainability in any country especially in time of crisis. There is therefor need to reinforce the science and technology of technical vocation education and training (TVET) for effective response towards Covid-19 crisis in Nigeria.

Recommendation

Based on the findings of the study, the following recommendations were made:

1. TVET stakeholders should collectively join hands in reinforcing science and technology in TVET education in federal university in Enugu state.
2. There should be availability and accessibilities of resource facilities to trainees.
3. There should be quality and standard delivery of facilities to TVET Education.
4. There should be uninterrupted funding to TVET Education and
5. The TVET principle and standard should be maintained.

References

- Bao, Xue; Qu, Hang; Zhang, Ruixiong; Hogan, Tiffany P. (2020). "Literacy Loss in Kindergarten Children during COVID-19 School Closures". SocArXiv. doi:10.31235/osf.io/nbv79. Retrived from en.wikipedia.org 12/8/2020.*
- Edokpolor, J. E., & Dumbiri, D. N. (2019). Resource adequacy and utilization for teaching and learning effectiveness in vocational education programmes in South-South Nigerian Universities. *Journal of Vocational Education Studies*, 2(1), 1-12. DOI: <https://doi.org/10.12928/joves.v2i1.727>.
- Federal Republic of Nigeria FRN (2004). *National policy on education* (4th ed). Lagos: Nigerian educational research and development council (NERDC).
- Isah (2013) principle and strategies of quality tvet management in Nigeria. *A seminar paper, in the department of Technical and Vocational Education TVE Islamic university of Technology IUT Board bazar Gazipur-1704, Bangladesh*
- Kanu, Ikechukwu A. (2020). Saint Augustine and COVID-19 Pandemic: The Future and Divine Providence. *Tansian University Journal of Arts, Management and Social Sciences*. Vol. 7. pp. 151-162.
- Kanu, Ikechukwu A. (2020). COVID-19 Pandemic and the Health of African Migrants. *AMAMIHE: Journal of Applied Philosophy*. Vol. 18. No. 2. pp. 56-64.

- Kanu, Ikechukwu A.; Kanu C. Chiugo and Ejikemeuwa J. O. Ndubisi (2021). (Eds.). *Covid-19 pandemic, ICT and Education System in Africa: Challenges and Opportunities*. Association for the Promotion of African Studies, USA. DOI: 10.13140/RG.2.2.27989.45282
- Kanu, Ikechukwu A.; Kanu C. Chiugo and Ejikemeuwa J. O. Ndubisi (2021). (Eds.). *The Socio-Religious Dynamics of Covid-19 Pandemic in Africa*. Association for the Promotion of African Studies, USA. DOI: 10.13140/RG.2.2.16245.40167
- Kanu, Ikechukwu A. (2020). COVID-19 and the Economy: An African Perspective. *Journal of African Studies and Sustainable Development*. Vol. 3. No. 2. pp. 29-36.
- Lindzon, J. (2020) "School closures are starting, and they'll have far-reaching economic impacts". *Fast Company*. Retrieved from [Wikipedia.html](https://www.fastcompany.com/90500000/school-closures-are-starting-and-theyll-have-far-reaching-economic-impacts) 12/8/2020
- Nwobasi, P. A. (2011). The Roles of Technology and Vocational Education in Enhancing Entrepreneurial Skills in a Global Economy, Retrived from <https://docplayer.net/33638798> 12/7/2020.
- UNESCO, (2020) COVID-19 Educational Disruption and Response". Retrieved from en.wikipedia.org 10/8/2020
- UNESCO, (2020) "Adverse consequences of school closures". Retrieved from en.wikipedia.org 10/8/2020.
- UNESCO (2020) "Coronavirus deprives nearly 300 million students of their schooling:.. Reuters". Retrieved from en.wikipedia.org 1/8/ 2020.
- UNESCO (2020) 290 million students out of school due to COVID-19: UNESCO releases first global numbers and mobilizes response". Retrieved from en.wikipedia.org 12/8/2020.
- Uwaifo, V. O., & Uwaifo, I. U. (2009). Training technology and vocational education teachers for the new 9-3-4 education system in Nigeria: Its problems and prospects. *International NGO Journal*, 4(4), 160-166.