

INNOVATION IN TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET) INSTRUCTIONAL DELIVERY: PROBLEMS AND PROSPECTS

Obe, Pauline Ijeoma Ph.D

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

&

Madu, Maureen Anayo, 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 investigated the problems and prospects of innovation in instructional delivery in Technical and Vocational Education and Training (TVET) programmes in public universities in Enugu State, Nigeria. Two research questions and one hypothesis guided the study. The study used survey research design and was carried out in Enugu State, Nigeria. The population of the study was 303 TVET educators, comprising 138 lecturers and 165 instructors of TVET, drawn from public universities with TVET programmes in Enugu State. Questionnaire was used for data collection by the researchers with the help of one research assistant. The instrument was validated by three experts from TVET programmes in University of Nigeria Nsukka. Cronbach Alpha reliability method was used and an overall reliability coefficient of

0.87 was obtained. Data generated were analyzed using mean, standard deviation, and t-test which was used to test the hypotheses at 0.05 level of significance. Generally, the study found out that innovation in instructional delivery of technical and vocational education and training (TVET) programme in public universities in Enugu State is a welcome development and will be of great help in improving skills acquisition techniques, if the challenges associated with innovation are handled appropriately. The paper recommended, among others, the need for TVET educators to employ innovation in instructional delivery in TVET programmes, despite its challenges; also, stakeholders should collaboratively ensure that innovative equipment and facilities that will aid in instructional delivery in TVET programmes are provided in public universities in Enugu State.

Keywords: TVET, TVET innovation, innovation in TVET instructional delivery

Introduction

The development of new digital technology has affected so many areas of education, including the instructional delivery of technical and vocational education and training (TVET). Technical and vocational education and training (TVET) is a programme offered at different institutions that is aimed at acquisition of scientific knowledge and practical skills for economic and technical growth of a country. Audu, Kamin& Balash (2013) defined TVET as the education for work or occupation that is geared towards the needs of the industries and work force. TVET is understood as comprising education, training and skills development relating to a wide range of occupational fields, production processes, services and livelihoods (ILO, 2020). TVET, thus, is considered as a key instrument for equipping the workforce with the skills required for the 'jobs of

tomorrow' (Tether et al., 2005). Technical, Vocational Education and Training is offered at secondary, post-secondary and tertiary levels and has the greatest potential to generate employment, sustain employment and reduce poverty in a society. TVET programme in the tertiary institution offers some programmes, including agricultural education, business education, computer education and industrial technical education based on the capability each institution can carry. This study considered the TVET programmes as a whole, since their instructional delivery is the same. UNESCO (2015) enumerated the component of TVET to include: the development of literacy and numeracy skills, transverse skills, citizenship skills, among others. The development of new digital technology has in many ways transformed TVET skills to embrace the innovation in education, work and society.

Innovation is described as a new or improved product that differs significantly from the previous products and that has been made available to potential users (OECD/Eurostat, 2018). Innovation is capable of introducing new skills demands that impact education, training and employment. European Commission (2011) and OECD (2015) maintained that innovation is the main driver of future social and economic development. Innovation and technical changes are said to be associated with an increasing demand for high-skilled workers, and a declining demand for low-skilled workers in modern economies (Arundel et al., 2006; Edquist, 2005). Innovation, therefore, is perceived as a 'solution' to different types of social, economic and environmental problems, with a specific focus on skill demand. TVET institutions innovate in different dimensions (organizational practices, ecosystem, teaching and learning processes, and products services). This study concentrated on the innovations in the teaching and learning processes (instructional delivery) of technical, vocational education and training programmes.

Instructional delivery is the art of teaching that creates impact in the intellectual, economic and social development of a learner. Chapuis

(2003) defines instructional delivery as a combination of knowledge and skills required for effective teaching. Logan and Logan, in Agina-Obu & Onwugbuta-Enyi (2017), described instructional delivery as a creative process which involves an imaginative person, who utilizes prior experiences, combines material, methods, ideas and media in new and existing ways which help learners integrate learning and reinforce concepts. Chika and Ebeke (2007) observed that among many factors that influence learners' achievement in schools, teachers' instructional delivery seems to be the most critical intervening factor. A good instructional delivery, therefore, is the door way through which individuals could be imparted with skills and knowledge leading to reduction of unemployment, increase in economic development, poverty reduction and transformation of people's attitude in their occupations. Innovations in TVET instructional delivery approaches and techniques refer to the development and implementation of new and relevant teaching and learning processes that aim to improve effectiveness, equity and delivery of TVET programmes. Innovations in TVET teaching and learning are mostly seen in the use of information and communications technology (ICT). ICT can be seen as any device, networking components, applications and systems that allow people to interact in the digital world. It is also considered as the use of technological tools for exploring knowledge, supporting learning by construction to improve the effectiveness of teaching and learning (Januszewski, 2001). The use of ICT in instructional delivery of TVET will help learners to familiarize themselves with new technology being used in different economic sectors and to develop the technical skills necessary in modern processes and implementation. ICT applications, according to Adaka (2010), provide assistive technology and bring to mind high-technology (hi-tech) devices that enhance meeting the needs of all categories of learners. Some of the ICT applications that should be used in TVET instructional delivery include; distant learning, open learning, fixable learning, blended learning, mobile learning, virtual reality, among

others. These applications can only be successful if the ICT tools and resources, such as computers, smart board, projectors and other projected materials that facilitate learning and improve performance are available. Bukhari (2010); Singh and Hardaker (2014); Ahmed (2010); Hu and Hui (2012); Fu et al. (2007) are of the view that non- or poor availability of infrastructures and awareness and abysmal management of innovation tools have been hindering most teachers from using innovative instructional delivery in TVET programmes. Drent & Meeliseen (2008) maintained that some challenges in the use of innovative facilities are seen in the installation, operation, maintenance of facilities, staffing, among others. Other barriers, according to UNESCO-UNEVOC (2019), include internal resistance to change teaching methods, pedagogical practices, the lack of access to new pedagogical equipment and others. Cedefop (2015), in his study, indicated that some of the barriers that may hinder the innovation in TVET instructional delivery are the culture of teachers and schools, such as pressure of work, habit, lack of confidence, among others. Universities must, therefore, seek effective ways of ameliorating the challenges facing the innovation in TVET instructional delivery. Tinio (2002) is of the view that issues like digital culture and literacy, ICT and teacher professional development, global awareness, investment benefits in ICT, resource constraint context, effectiveness, cost, equity, and sustainability should be looked into. Also, the acquisition of innovation skills in TVET instructional delivery should be addressed in pre-service teacher training and built on and enhanced in-service. Some prospects of using innovations in TVET instructional delivery, according to Frederick (2015), should include: empowerment of learners, enhancement of creativity and flexibility to instructional delivery, achievement of better value, development of professional workforce and fulfilled and curious citizens. Teachers and trainers will also need support through professional development programmes. More so, there should be monitoring, evaluation and quality assurance systems as it concerns innovation in TVET instructional delivery in the universities. Lack of innovation in TVET instructional delivery in

universities has contributed much in lack of student engagement, satisfaction, perceptions, achievement, progression and motivation evidence in unemployment rate of TVET graduates (Cedefop, 2015). Seatter and Ceulemans (2017) maintained that traditional methods of TVET instruction, such as lecture-driven delivery, have inadequately equipped students with the required competencies to make the transition from the classroom to today's real-world work. This can be attributed to the challenges encountered in the use of innovative instructional delivery in TVET programmes. This study, therefore, aimed at investigating the challenges that hinder the application of innovations in TVET instructional delivery and ways of emolliating them.

Purpose of the Study

The general purpose of this study is to investigate innovation in TVET instructional delivery, with its problems and prospects in technical vocational education and training programmes in Enugu State, Nigeria.

Specifically, the study determined:

1. To investigate the challenges of innovation in instructional delivery of TVET programmes in public universities in Enugu State.
2. To investigate the challenges of innovation in instructional delivery of TVET programmes in public universities in Enugu State.

Research Questions

The following research questions guided the study:

1. What are the challenges of innovation in instructional delivery of TVET programmes in public universities in Enugu State?
2. What are the challenges of innovation in instructional delivery of TVET programmes in public universities in Enugu State?

Research Hypothesis

There is no significant difference in the mean response of lecturers and instructors on the challenges of innovation in instructional delivery of TVET programmes in public universities in Enugu State.

Methodology

The study adopted survey research design and was carried out in Enugu State, Nigeria. Two research questions and one hypothesis guided the study. The population of the study was 303 TVET educators, comprising 138 lecturers and 165 instructors of TVET drawn from public universities with TVET programmes in Enugu State. There was no sampling, since the population is of manageable size. A structured questionnaire was used for data collection. The instrument was validated by three experts. Cronbach Alpha reliability was used and an overall reliability coefficient of 0.87 was obtained. The data were collected by the researchers with the help of one research assistant. Out of 303 copies of the questionnaire administered, only 288 copies were retrieved, giving a 95% return rate. Data collected were analysed using mean and standard deviation to answer the research questions and t-test was used to test the hypothesis at 0.05 level of significance. 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 (t-calculated) is greater than 0.05 level (t-critical), but the null hypotheses was rejected if the p-value (t-calculated) is less than 0.05 level value of the t-critical.

Results

Table 1

1. Mean and standard deviation of the response of lecturers and instructors on the challenges of innovation in instructional delivery of TVET programmes in public universities of Enugu State.

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2.

S/N	Item Statements	Mean	S.D	P-values	Remarks	SIG
1	Unavailability of ICT tools in the universities	2.73	0.71	0.17	Agree	NS
2	Poor awareness, poor infrastructures and poor management of innovation in TVET instructional delivery	2.61	0.77	0.16	Agree	NS
3	Lack of skill for installation of innovation equipment	2.35	0.76	0.19	Agree	NS
4	Lack of skill for operation and maintenance of innovation facilities.	2.57	0.67	0.31	Agree	NS
5	Lack of time, resources and experienced staff	2.51	0.79	0.19	Agree	NS
6	Resistance to changes in teaching method	2.75	0.69	0.09	Agree	NS

S/N	Item Statements	Mean	S.D	P-values	Remarks	SIG
7	Resistance to change pedagogical practices	2.63	0.72	0.131	Agree	NS
8	Lack of access to new pedagogical equipment	2.54	0.66	0.11	Agree	NS
9	Influence of teachers culture and school culture	2.66	0.77	0.18	Agree	NS
10	Pressure of work and habit to work	2.57	0.64	0.16	Agree	NS
11	Lack of confidence on teachers	2.60		0.14	Agree	NS
12	Lack of investment on the part of government	2.51	0.60	0.06	Agree	NS

Keys: SD- Standard deviation; REM-Remark; NS-Not significant.

The data in table 1 revealed that all the 12 items have their mean values above the cut-off point of 2.50, indicating that the 12 items pointed out the challenges militating against innovation in TVET instructional delivery in public universities in Enugu State. On other hand, the standard deviations of all the 12 items in table 1 range from 0.79-0.60, showing that the respondents were not far from each other in their responses. On the other hand, the hypothesis showed that all the 12 items in table 1 have their p-values greater than 0.05 level of significance. The null hypothesis was, therefore, accepted. This means that there is no significance difference in the mean responses of the

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TVET lecturers and instructors on the items suggested hindering innovations in TVET instructional delivery in public universities in Enugu State.

Table 2

3. Mean and standard deviation of the responses of TVET lecturers and instructors on the solutions to the challenges of innovation in instructional delivery of TVET programmes in public universities in Enugu State.

S/N	Item Statements	Mean	S.D	Remarks
1	TVET teachers should incorporate digital culture and literacy.	2.64	0.64	Agree
2	There should be teacher professional development on innovative instructional delivery.	2.59	0.71	Agree
3	There should be awareness of innovation instructional delivery of TVET.	2.67	0.66	Agree
4	TVET stakeholders should invest into innovation of TEVT instructional delivery.	2.55	0.67	Agree
5	There should be equity in the distribution of innovation equipment in universities.	2.63	0.79	Agree
6	Acquisition of innovation skills in TVET instructional delivery should be addressed in pre-service and in-service trainings of TVET teachers.	2.77	0.65	Agree
7	There should be empowerment of learners.	2.52	0.72	Agree

S/N	Item Statements	Mean	S.D	Remarks
8	There should be enhancement of creativity.	2.57	0.66	Agree
9	There should be flexibility in TVET instructional delivery.	2.56	0.77	Agree
10	There should be support for TVET professional development.	2.73	0.71	Agree
11	There should be monitoring and evaluation as it concerns TVET innovative instructional delivery.	2.35	0.77	Agree
12	There should be quality assurance system as it concerns TVET innovative instructional delivery.	2.73	0.64	Agree

Keys: SD- Standard deviation; REM-Remark.

The data in Table 2 revealed that the 12 items listed as the challenges of innovation in instructional delivery of TVET programmes in public universities in Enugu State have their mean values all above the cut-off point of 2.50, indicating that the items suggested are necessary challenges of innovation in instructional delivery of TVET programmes in public universities in Enugu State. The standard deviation of the 12 items ranges from 0.79-0.64, showing that the respondents were not far from each other in their responses.

Discussion

The finding of the study in table 1 revealed that the 12 items that were pointed out as the challenges hindering the innovation of TVET instructional delivery were all accepted by the respondents. The implication of this finding is that the innovation in TVET instructional delivery in public universities in Enugu State is being hindered by many factors which, in turn, affect students' acquisition of the innovative skills and employment after graduation. This is in line with

Cedefop (2015), who noted that lack of innovation in TVET instructional delivery in universities has contributed much in lack of student engagement, satisfaction, perceptions, achievement, progression and motivation evidence in unemployment rate. Drent & Meeliseen (2008) also maintained that challenges of innovation in TVET instructional delivery are seen in the installation, operation, maintenance of facilities, among others. Supporting this, UNESCO-UNEVOC (2019) indicated some challenges to TVET instructional delivery to include; internal resistance to change teaching methods, pedagogical practices, lack of access to new pedagogical equipment, and others. There is need, therefore, to look into ways of eradicating these challenges for proper innovation in TVET instructional delivery in public universities in Enugu State.

The finding of the study in table 2 revealed that the 12 items that were suggested as the challenges to the innovation in TVET instructional delivery in public universities in Enugu State were all accepted as ways to eradicate the challenges for proper innovation in TVET instructional delivery. The implication of these findings is that the effectiveness of using innovation in TVET instructional delivery is based on following the above suggested solutions to the challenges. This is in line with Tinio (2002) who is of the view that issues like digital culture and literacy, teacher professional development, among others, should be looked into for proper innovation in instructional delivery. Also, TVET instructional delivery should be addressed in pre-service teacher training and built on at in-service training of teachers. More so, Frederick (2015) suggested some solutions to challenges of using innovations in instructional delivery to include: empowerment of learners, enhancement of creativity and flexibility to instructional delivery. It is, therefore, necessary that these should be used to address the challenges of using innovation in TVET instructional delivery in public universities in Enugu State.

Conclusion

The importance of TVET instructional delivery in universities cannot be over-emphasized. The digital age has brought in the growing need for innovation in TVET instructional delivery in the universities. However, much needs to be done to address the challenges hindering the implementation of innovations in TVET instructional delivery. TVET programmes in the universities should, therefore, incorporate the way out of these challenges to enhance the production of graduates with high-level skills needed in the digital world of work.

Recommendations

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

1. TVET educators should employ innovation in instructional delivery in TVET programmes, despite its challenges.
2. Stakeholders should collaboratively ensure that innovative equipment and facilities that will aid in instructional delivery in TVET programmes are provided in public universities in Enugu State.
3. TVET stakeholders should organize trainings in form of in-service conference and workshop for the update of TVET teachers' skills and knowledge in innovative instructional delivery.
4. TVET stakeholders should ensure adequate funding to facilitate innovation in instructional delivery that will aid youth employment.

References

- Adaka, T.A. (2010). The need for training teachers in the use of digital Assistive technology for effective teaching of pupils with learning disabilities at the Primary School level. In Nkadi & Uchenna (Eds). *Teacher Preparation and the Vision 20-20-20 in Nigeria*. Enugu: Timex.
- Agino-Obu, T.N & Onwugbuta-Enyi, J. (2017). Teaching and measuring teaching performance in science. *Journal of Education and Science*, 7(1), 178-188.
- Arundel A., Lorenz E., Lundvall B-A. and Valeyre A. 2006. *The Organization of Work and Innovative Performance: A comparison of the EU-15*. DRUID Working Paper No. 06-14.
- Audu, R., Kamim Y. B. & Balash, F. (2013) Technical Vocational Education: as a veritable tool for Eradicating youth unemployment. *Journal of Humanities and Social Sciences* (2). 10-17.
- Bukhari, R. A. (2010). *Information technology for e-Learning in Developing countries*, (pp. 1–85). School of Business and Informatics: University of Boras.
- Cedefop, (2015). *Vocational pedagogies and benefits for learners: Practices and challenges in Europe* (Research Paper, No 47). Luxembourg, Publications Office of the European Union.
- Chapuis, L. (2003). *Pedagogy: Embedding learning technologies*. Australian Capital Territory Education and Training. Retrieved on 21/7/2020 from <http://www.principals.in/uploads/pdf/Pedagogy.pdf>
- Chika, P.E. and Ebeke, J.E. (2007). Role of principals professional qualification on principals' instructional leadership and effect on teachers job performance. Retrieved August 5, 2010 from <http://www.edprincipalsroleoninstructionalleadershipandeffectonteachersjobperformance.html>.
- Drent, M. & Meeliseen, M. (2008). Which factors obstruct or stimulate teacher educators to use ICT innovatively, *Journal of Computers & Education*, 51, 187-199.

- Edquist, C. 2005. Systems of Innovation: Perspectives and Challenges. In Agerberg J., Mowery D. C. and Nelson R. R. *The Oxford Handbook of Innovation*. Oxford, Oxford University Press.
- European Commission. 2011. *Europe 2020 Flagship Initiative Innovation Union*. Luxembourg, Publications Office of the European Union.
- Frederick, T. F. (2015). Prospects and challenges of E-learning in Nigerian University Education using National Open University of Nigeria Akure Study Centre. Unpublished Bachelors' Degree project, Department of Science & Technical Education, (Computer Education Unit), Adekunle Ajasin University Akungba Akoko, Kogi State, Nigeria.
- Januszewski, A. (2001). Educational technology: the development of a concept. Englewood, CO: Libraries Unlimited Inc.
- OECD. 2015. *OECD innovation strategy 2015: An agenda for policy action*. Paris, OECD Publishing.
- OECD/Eurostat. 2005. *Guidelines for Collecting and Interpreting Innovation Data — The Oslo Manual*. Paris, OECD Publishing.
- Tinio, V.L. (2002). Information and Communication Technology in education. Retrieved on 20/4/2019 from <https://learningportal.iiep.unesco.org/en/issue-briefs/improve-learning/curriculum-and-material/information-and-communication-technology-ict>
- Tether, B., Mina, A., Consoli, D. and Gagliardi, D. 2005. *A Literature Review on Skills and Innovation. How Does Successful Innovation Impact on the Demand for Skills and How Do Skills Drive Innovation?* ESRC Centre on Innovation and Competition, University of Manchester.
- Seatter, C. S., and Ceulemans, K. 2017. Teaching sustainability in higher education: Pedagogical styles that make a difference. *Canadian Journal of Higher Education*, 47(2), pp. 47-70.
- UNESCO. 2015. Qindao Declaration – International Conference on ICT and Post-2015 Education. Paris, UNESCO Publishing.

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Instructional Delivery: Problems And Prospects

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UNEVOC International Centre for Technical and Vocational
Education and Training.