



THE PROMOTION OF OPEN DISTANCE AND FLEXIBLE LEARNING IN NIGERIA THROUGH THE USE OF ICT IN TECHNICAL AND VOCATIONAL EDUCATION TRAINING

BANJO ABOSEDE OLUBUNMI *PhD*, YINUS ABDULFATAI AYINDE
Mass Communication Department, The Federal Polytechnic, Ilaro.
Building Technology Department, The Federal Polytechnic Ilaro.
Email: Olubunmi.banjo@federalpolyilaro.edu.ng. +2348037232574
Email: updateyinusfatai@gmail.com. +2348163639038

Abstract

ICTs are transforming education by reducing barriers to learning and increasing knowledge accessibility for everyone worldwide. Technology-enhanced learning has the potential to empower learners by offering them a variety of pathways that offer options and channels to satisfy their education and training goals. This type of learning will be crucial in the creation of a culture of lifelong learning. The purpose of this study is to promote open, flexible, and distance learning in Nigeria through the use of ICT in technical and vocational education training. The study is a quantitative research method and a questionnaire was adopted as an instrument for data collection. There were 150 students from Open Distance and Flexible e-Learning at The Federal Polytechnic, Ilaro, Ogun State and Yaba College of Technology, Lagos State Southwest Nigeria. who were administered a questionnaire. The result of the study revealed that ICT use foster contact and cooperation between teachers and students ($X = 3.74$, $SD = 1.06$) and offered the chance to hold thousands of classes on hundreds of subjects and courses accessible whenever, wherever, and as conveniently as needed by students. ($X = 3.57$, $SD = 1.16$). Also, the result of the hypothesis revealed that ICT significantly promotes Open Distance and Flexible learning in Nigeria ($r = 0.68$, $p < .05$). The study recommended that regular training and re-training programmes on ICT should be organized to enable teachers to meet the challenges of emerging issues in Technology and environment.

Keywords: Vocational Education, ICT, Technical Education, Distance Learning

Introduction

Information and Communication Technology (ICT) has become one of the key cornerstones of modern society. Along with reading, writing, and mathematics, mastering ICT by comprehending its fundamental skills and concepts in the present day is considered the most vital parts of learning and education. For the facilitation of more advanced kinds of learning, information and communication technology must be used in Nigerian vocational and technical education delivery. Without question, learning theory and research serve as a vital source of inspiration and a solid foundation for creating environments that support learning (Banjo 2022). Technology for Information and Communication remains the vital parts of mediated learning, information access, and computer-based learning which are the three main areas for information and communication technology integration or use in vocational and technical education. The key areas for information and communication technology integration or use in vocational and technical education include mediated learning, access to information, and computer-based learning. Access to information is made possible using the Education Management Information System (EMIS), the Internet/Intranet, and other channels of communication. Many governments now view information and communications technology (ICT) remains a crucial element of a reactive, Technical and Vocational Education (TVE) that is driven by need and training education (TVET), Technical and Vocational Skills Development (TVSD) system aimed at meeting the demand for students in formal and non-formal learning settings (UNESCO, 2008).

Open and Distance Learning is more cost-effective and can take place while continuing full-time employment (Moran and Rumble, 2004). People who live in remote areas find that ODL permits them to enroll in programmes, which otherwise would not be available to them.

Education is universally acknowledged as the solution to the world's socioeconomic problems; nations and individual citizens look to education to alleviate poverty, ignorance, climatic change, mental deficiency, joblessness, hunger, inadequate shelter, poor governance, and poor communication systems, among other issues. (Oduntan and Banjo, 2022)



Technical and vocational education (TVE) focuses on preparing students for employment by providing ideal information, abilities, and attitudes for the workplace. Technical and vocational education can take many different forms, including formal, informal, lifelong learning, continuing education, and in-service and training, with a range of companies providing services, including institutions that are accessible to everyone, semi-public, or corporate institutions. A primary focus of technical skills and vocational schooling is developing employable skills oriented toward the working world. So, its delivery systems are in a good position to prepare the talented and innovative workforce it needs to generate wealth and escape poverty.

Objectives of the Study

This study's main goal is to evaluate the use of ICT in Technical and Vocational Education Training to promote Open Distance and Flexible Learning in Nigeria. The secondary objectives are to:

- i. examine ways in which the use of ICT in TVET enhances Open Distance and Flexible learning in Nigeria.
- ii. examine the challenges encountered in using ICT to promote Open Distance and Flexible Learning in Nigeria.

Research Hypothesis

HO₁: ICT does not significantly promote Open Distance and Flexible learning in Nigeria

HO₂: There are no challenges in using in using ICT to promote Open Distance and Flexible Learning in Nigeria.

Literature Review

The purpose of distance learning is to provide instruction to students who are not physically present in a typical learning environment like a classroom, frequently on an individual basis. Technology and instructional methods are the main topics of distance learning. It is been characterized as a process to create and provide access to learning when the source of information and the learners are separated by time and distance, or both (Honeyman & Miller, 1993, p. 68). Since the 1840s when Issac Pitman has been teaching correspondence shorthand in Great Britain, modern distance learning has been practiced and relied on the growth of postal systems (Moore & Kearsley, 2005, p. 235). According to Sartori, Casarotti, Filliponi, and Pieti (2002, p. 37), the fundamental definition of distance learning takes into account the spatial separation between the teacher and the pupils, and how this distance is filled via the use of technical resources.

A driving force behind social and economic progress is distance learning. In both rich and emerging nations, it is quickly turning into a fundamental component of the mainstream of educational institutions. The globalization of distance learning offers various options for nations to achieve their goals for their whole educational systems. The demand for ongoing skill improvement and retraining as well as technical advancements has sparked a surge in interest in distance learning.

Information Communication Technology (ICT) is the use of technological equipment in storing, disseminating and retrieval of information. The broad definition of ICT encompasses a variety of technologies, including radio, television, the Internet, the Web, satellite and Wi-Fi networks, mobile phones, computer hardware and software, audio- and video-conferencing, virtual reality, social media, wikis, 3D printers, and others. ICT has played a big role in uniting technological innovations and human beings which has brought a big change in our society in terms of social and economic advancement.

The TVET has been considered a lifelong learning system. This implies that the acquisition of knowledge remains endless in as much as one still breathes. The acquisition of knowledge includes both formal and informal, traditional and electronic. ICT in TVET will simply mean the integration of technological innovations into lifelong learning. The following goals and objectives for the TVET planned programme for the new millennium were to utilise modern information and communications technologies in TVET teaching and learning, as stated by UNESCO in its Second International Congress on Technical and Vocational Education, such that will safeguard the value of the traditional teaching method; to support member states in using information/communications technologies as a tool for teaching and learning. ICT in TVET will help to unearth the potential of youths in lifelong learning by linking developed



countries and developing countries through electronic means and gadgets. The teachers will have better opportunities in obtaining training which will further equip them in guiding the students.

ICT in TVET has witnessed some level of development in developed and developing countries in the past decade. The nations with the strongest national policies, backed by budgetary resources and national programs, have made the most success in integrating ICT into technical and vocational training. Australia, South Korea, and numerous nations in the European Union are among these nations. For instance, ICT in TVE has been found to improve student outcomes in Australia. E-Learning Benchmarking survey for Australia in 2011 established that 66% of students anticipated more success in finding jobs as a result of their course's e-learning, and 55% of students affirmed that e-learning assisted them in optimal performance. 42% of students said e-learning helped them get a better job. The US Department of Education released a meta-analysis and evaluation in 2009. studies on online learning and came to the conclusion that because they tended to devote more time to their studies, online learning students performed better than traditional students. These studies expand upon and bolster earlier investigations into the efficiency of distance learning (Marope, Chakroun. & Holmes, 2015).

Furthermore, ICT is needed in businesses and organizations in on and off-the-field training. Pappas (2013) states that to keep their management and staff up to date, about 42% of Fortune 500 companies in the US now provide ICT-based training. They found that doing so reduces training expenses by 50%, shortens training by up to 60%, and increases the rate of information retention by up to 60%. From the research conducted by International Telecommunication Union (ITU) in 2018, on individuals with ICT skills in the various regions of the world, for the three skills categories (low, high and advanced), the highest skill levels were reported in Europe, and the lowest in Africa.

Despite these innovations in TVET, West African countries have not shown significant progress in ICT in education policies, unlike their East, South and Central African Counterparts like Angola, Botswana, South Africa, Uganda etc. Although recently the use of smartphones and other gadgets has spread like wildfire in Africa with the availability of internet services all over African countries, we are yet to fully utilize these ICT gadgets in our education and learning process. The accessibility of mobile devices and internet access needs to be viewed as a guaranteed approach to improve our educational system, especially in TVET education, since the usage of mobile devices is believed to alleviate the government investment burden of acquiring ICT hardware and using it to provide network services for TVET that are required by ICT. The benefits of e-learning, which Belaya (2018) outlined, include those related to time and space, savings as well as cost savings.

Distance learning can be seen as learning in the comfort of your zone. This can be seen as the provision of a credible and sound education to people leaving off campus, in rural areas or people due to one reason or the other may not be able to be in the physical classroom. This kind of education is mostly facilitated through ICT usage and the Internet (Olakunri, 2006). Distance learning has been adopted by developed countries as one of the ways of delivering quality education in TVET. This is driven by its efficient and effective use in human resources development and in achieving rapid growth in the economy. "The European Community in a quest to expand access to skills training in relation to the requirement of the labor market lunched The University for Industry (UFI) with a key focus on the use of information and telecommunication technologies to provide access to adult learners to a broad range of highly flexible training opportunities including those in the trades and technical areas. In addition to commissioning the development of media-based learning materials, UFI aims to establish a network of over 1000 learning centers throughout Great Britain where learners can access the required technology and support services to participate in the UFI e-learning model par.63, p.5" (World bank, Africa, 2001). A result of a work carried out in Australia shows that students feel free to ask questions in an online class than in a conventional classroom, even when they know little about the privacy setting and other risks associated with the use of social media (The European Training Foundation, 2018).

The inaugural UNESCO-UNEVOC TVET Summit in Africa held in Nairobi Kenya in 2007, titled "Access to and Inclusion in TVET in Africa Through New ICT-based Solutions" animadvert that Africans make a priority to invest in the area of ICT during Africans' second decade of education (UNESCO, 2007). This focuses on obtaining knowledge and skills that will help expand the prospects for gainful employment, environmentally friendly living, self-empowerment, and socioeconomic growth in both urban and rural locations. The breadth and depth of the difficulties in providing TVET to millions of people in Africa cannot be met by formal schooling. Open distance learning with ICT support has opened up new possibilities for education and training throughout Africa. IT will thereby hasten the delivery of educational materials and the control of training and education. E-learning, or the



online delivery of education and training, is taking off like wildfire and has the potential to attract numerous people to study and train at their doorsteps all over the world.

TVET can use open distance learning to give disadvantaged people, such as women, disabled persons, and unemployed ethnic minorities, possibilities. ODL can encourage more people to promote increased participation in technical and vocational education and training as they cannot afford to miss work but yet want to learn and advance their vertical mobility professionally and can seize the opportunity to gain more knowledge. ODL can be supplemented by affiliating with schools, workshops, and industries in a given area for more practical knowledge.

Problems of ICT in TVET in Nigeria

Africa like every other developing continent has its challenges militating against the smooth adoption of ICT in TVET. We shall highlight these problems as follows:

Poor Infrastructural Development: One of the major challenges facing the growth of Africa as a continent with great potential both in human and natural resources is inadequate infrastructure e. g. inconsistent power supply. Kafka (2013) opines that lack of infrastructure, high initial cost and ongoing cost, etc are among the challenges facing ICT in TVET. Overcoming technical infrastructures also constitute a problem for ICT in TVET (UNEVOC, 2015). Many countries in West Africa's economy have suffered stunted growth in technology as a result of this factor. Companies, schools, and individuals suffer a breakdown in production and experimental process because the power supply at the point of production suffers from an off situation. For ICT to be integrated in schools there should be a steady power supply (UNESCO, 2013; UNESCO, 2015). If ICT equipment and internet services are adequately provided and there is insufficient/inconsistent power supply, all these equipment will be directly or indirectly affected which will result in untimely damage to these facilities. No technological improvement occurs in this kind of situation, as it affects the overall productivity of the economy. Birshir & Hisyam (2016) opines that institutions do not have the technical expertise to enforce ICT development in Nigeria. In Malawi, the problem of ICT in ODL is exacerbated by poor electricity in some parts of the country which limits students' access to learning materials (Chimpololo, 2013).

Insufficient Knowledge: The instructors in TVET need to be adequately trained in the new trends in technologies in TVET. Most TVET teachers are relatively low-skilled or have outdated skills due to the fact that the government fails to assign adequate resources that will help them to maintain the level of innovation and development in the TVET teachers' profession. The institutions given the responsibility to train teachers have not been able to combine pedagogical training with practical training in the evolving technologies in our society these days as would be required by some industries in the labour market. There is a maxim that says “You don't give what you don't have” likewise the teachers. When the teachers and instructors are not adequately trained to brace for the changes in technologies, they will end up producing half-baked students who don't have sufficient knowledge in the field. Mlungish & Dominique (2014) Are of the idea that insufficient ICT training has a direct relationship with the teacher's ability and may compromise their teaching and learning.

Misconception of ICT in TVET through Distance Learning: There is a general misconception that distance learning is not up to standard when measured with the traditional method of learning. Delivering TVET through ICT looks more unrealistic. Studies at the technical level can include substantially more theoretical and cognitive content, which is better suited to distant learning techniques. Also, students at the technical level typically have greater levels of education and are better equipped to engage in independent study. The provision of manual and psychomotor skills can be made easier by using blended program models that include useful workshop-based elements. This misconception is evidenced in the number of ICT TVET-based institutions in West Africa. Countries like Nigeria have no ICT TVET institution, Ghana 2 centres namely: Community Learning Centers and COL Agriculture Extension Training and one in Benin Republic. Zurina & Maizam (2014) says the lower focus on the affective learning goals is highly surprising as improvement in affective learning attributes is one of the strengths of ICT.

In order to facilitate more advanced kinds of learning, information and communication technology must be used in Nigerian vocational and technical education delivery. Without question, research and theory in education serve as a fundamental source of inspiration which provides a strong basis for building settings for support learning. Technology for Information and Communication is primarily being integrated or used in the following sectors of vocational and technical education and many others.

The term Information and Communication Technology Mediated Learning (ICTML) opines the use of multimedia tools to develop course materials. Computer Assisted Instruction (CAI) is used by teachers in the vocational and



technical fields to support their students' learning. In other affluent nations, particularly in the early years of learning, computer-assisted instructions have been used. They offer plenty of chances for students to increase their learning abilities as well as for professors to create more effective multimedia and interactive course materials. Research shows that communication remains a vital part of learning. In the classroom format, this is typically not good. A significant number of classroom designs are one-way teaching models, in which the teacher takes on the role of the actor while the learners and students only react. Traditional teaching methods can be considerably enhanced by computer-assisted instruction to help pupils learn more quickly and effectively.

The internet and intranet are now major sources of interactive tools and information. Intranets are private user-group networks. Intranets are private user-group networks. A network on the school grounds that enables teachers and students to exchange local information like lesson plans and class schedules while simultaneously connecting to the Internet is an example of an intranet. The Internet is a network of interconnected computers that uses protocols that are supported by a variety of hardware platforms. Every computer connected to the Internet has data that is shared globally (Only a small, closed group of people, including professors and students, have access to the material of the intranet)

Nonetheless, the kind of computer system being utilized, information on the Internet could be accessed from anywhere. Also, it implies that anyone can access or disseminate information without regard to its topic, location, age, race, or time frame. Therefore, the Internet is a powerful tool for everyone interested in education. In order to get online and search for information a variety of methods have been developed, including logging onto a distant server, communicating with coworkers online about particular topics, exchanging and transferring files from servers to the World Wide Web, an interactive multimedia-based information access tool, and mailing lists and user groups. Due to its accessibility and multi-media capabilities, the World Wide Web has recently acquired popularity.

The Education Management Information System (EMIS/or EDMIS) is a planning tool for storing and accessing educational data on pupils, pupil grades, pupil test results, courses, staff, and district finances. To help with decision-making, data on students and staff, including demographics, employment-related data, class schedules, vocational education courses completed by employees, and staff performance reports, might be collected in a common format and input at the school, district, and national levels. The EMIS financial data includes details on budgets, cash balances, outlays, receipts, a schedule of debt, and additional financial reports for higher-level management, such as details on a building's profile. Although used everywhere in the industrialized world, EMIS is typically only used by the offices of the ministries of education and the students' affairs offices in universities. The majority of the times, manual methods are used to collect data on educational planning.

Multimedia and telematics can help the growth of diverse attitudes and abilities in technical and vocational education in a variety of ways. By utilising them during the learning process, students can learn how to collect and utilize information that is delivered in a novel and interesting way. Multimedia communication and information retrieval abilities are unquestionably necessary for the basic minimum of business and professional communication. Students interact with complex, realistic information while using multimedia and telematics apps, which promotes higher-order thinking skills like problem-solving, reflection, relationship recognition, analysis, and creative information synthesis. These resources can help students in vocational and technical education acquire the experiences they need to become informed, competent decision-makers, producers, and problem-solving individuals in the twenty-first century.

Methodology

This study used a survey research methodology. Students at Government Technical College, Idi-aba, Abeokuta, Ogun State, make up the study's population. The Cluster sampling technique was used. A sampling method with 150 students in total was selected from The Federal Polytechnic, Ilaro, Ogun State and Yaba College of Technology, Lagos State. Data gathering involved the use of a standardized questionnaire. The demographic information for respondents, including their age and gender, was presented in Section A of the questionnaire. The second section of the survey asked about how ICT was used in TVET to enhance Open Distance and Flexible learning in Nigeria while the third section was on the challenges encountered in using ICT to promote Open Distance and Flexible Learning in Nigeria. SPSS version 21 was used to analyse the data that was gathered. The research questions were examined using frequency tables, percentages, means, and standard deviation, while the hypothesis was examined using Pearson correlation.

Data Analysis



Research Hypotheses

HO1: ICT does not significantly promote Open Distance and Flexible learning in Nigeria

		ICT	Distance Learning
ICT	Pearson Correlation	1	.68*
	Sig. (2-tailed)		.000
	N	150	150
Distance Learning	Pearson Correlation	.68*	1
	Sig. (2-tailed)	.000	
	N	150	150

The result of the hypothesis revealed that ICT significantly promotes Open Distance and Flexible learning in Nigeria ($r = 0.68, p < .05$). This implies that the use of ICT will in TEVET promotes Open Distance and Flexible learning in Nigeria. As a result, the alternative hypothesis of a substantial association between use of ICT and the null hypothesis of no significant relationship was accepted and Open Distance and Flexible learning was accepted at a .05% level of significance.

HO2: There are no challenges in using in using ICT to promote Open Distance and Flexible Learning in Nigeria

		ICT	UIC	PO	CA
Pearson Correlation	ICT	1.	.898	.806	.925
	UIC	.898	.1	.752	.881
	PO	.806	.753	.1	.852
	CA	.925	.881	.852	1
Sig. (2-tailed)	ICT	.	.000	.000	.000
	UIC	.000	.	.000	.000
	PO	.000	.000	.	.000
	CA	.000	.000	.000	.
N	150	150	150	150	150

NB:
=

Information Communication and Technology, **UIC** = Unstable Internet

Connection; **PO** = Power Outage, **CA** = Cyber Attack

Based on the above analysis, there was likelihood of challenges against the use of ICT for the promotion of ODFL in Nigeria. Evidently, unstable Internet connection ($r = .898, p < .05$) will affect promotion of ODFL, also, power outage ($r = .806, p < .05$) will affect, as well as cyber-attack ($r = .925, p < .05$) will affect the promotion of ODFL in Nigeria if adequate provisions are not made. Consequently, alternative hypothesis was accepted. This implied that there were challenges in using ICT for the promotion of ODFL in Nigeria.

Conclusion

This study is centered on the use of ICT in TVET in promoting Open Distance and Flexible learning in Nigeria. The study employed a survey method and 150 students of The Federal Polytechnic, Ilaro and Yaba College of Technology were selected through cluster sampling technique. The result showed that ICTs foster contact and cooperation between teachers and students ($X = 3.74, SD = 1.06$) and offer the chance to hold thousands of classes in hundreds of subjects and courses accessible whenever, wherever, and as conveniently as needed by the students. ($X = 3.57, SD = 1.16$). Also, the result of the hypothesis revealed that ICT significantly promotes Open Distance and Flexible learning in Nigeria ($r = 0.68, p < .05$). These findings support the study of Mlungish & Dominique (2014) who reported that the idea that insufficient ICT training has a direct relationship with the teachers' ability and may compromise their



teaching and learning. It also aligns with the study of Kafka (2013) who opined that lack of infrastructure, high initial cost and ongoing cost, etc are among the challenges facing ICT in TVET.

Recommendations

- i. Government and relevant authorities in education should try as much as possible to improve on the speed of network connections and internet services so as to ensure smooth running of internet connections.
- ii. Government, Ministry of education and other stakeholders should increase their ICT investment infrastructures in TVET and other higher institutions of learning.
- iii. Government should engage in regular training and re-training programmes on ICT should be organized for Teachers to be able to cope with the challenges of emerging issues in Technology and environment.

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