Enhancing the Teaching of TVET Programme through the use of Virtual Learning Strategy for Effective Lesson Delivery in Tertiary Institutions in Enugu State

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Abstract
The study was conducted to enhance the teaching of TVET programme through the use of virtual learning strategy for effective lesson delivery in tertiary institutions in Enugu State. Two research questions and two null hypotheses guided the study. A descriptive survey research design was adopted while the population for this study was 230. This consisted of 113 Lecturers and 117 Instructors. A sample of 34 lecturers and 35 Instructors was used for the study through random sampling technique. Instrument for was collected using structured questionnaire. The questionnaire has a total of 28 item. The instrument was validated by three research experts with the reliability index of 0.77 established using Cronbach's Alpha. Mean with standard deviation were used to answer the two research questions while t-test was used to test the two null hypotheses at .05 level of significance. The findings of the study revealed that to equip students with necessary digital devices such as laptops, tablets and smartphone among others are the strategies required. It was also revealed that, insecurity, instability of power supply among others are the challenges affecting the teaching of TVET programme with the use of virtual learning strategy for effective lesson delivery.
Keywords: Teaching, TVET, Virtual Learning, Lesson, Tertiary Institution.

Introduction

One of the concepts that are changing the frontier of knowledge acquisition in today's educational environment is the use of virtual learning for teaching and learning process. As the world changes, the process of teaching and learning continues to witness a paradigm shift from the traditional method of teaching and learning to a more active but learner-centered approach capable of addressing learners' 21st-century skill needs (Schleicher, 2012).Studies have identified the benefits of innovative teaching to include development of globally competitive learners, creation of lifelong learners, maintaining of learners' motivation to learn, and encouraging deeper learning compared to surface learning, among others (Lunde & Wilhite, 1996; Teo & Wong, 2000).

Teaching is the process of imparting knowledge, skills, values, and attitudes to learners. It involves a range of activities, from planning and delivering lessons to assessing and providing feedback. Adeola (2011) stated that teaching is the process of imparting students with knowledge, skills and attitudes in order to bring about a desirable change in them. Therefore, Teachers use various methods, such as lectures, discussions, hands-on activities, and technology integration, to facilitate learning and ensure that students grasp the material being taught. Teachers are the most important factor in students learning as a result the application of pedagogical knowledge into classroom-oriented plan of actions constitute most essential upon which the success of the school, its administration and the entire education system rest upon (Ugwoke, Olinya, Anorue& Abdullahi, 2020). The ultimate goal of teaching is to foster learners' intellectual and personal development, preparing them for future challenges and lifelong learning.

Learning is the process of developing or improving new knowledge, technique, skills, attitudes, or behaviors through experience, study, or teaching. Biggs (2007) is of the view that wise and effective teaching does not simply involve applying general principles of teaching, rather it should aim at engaging students in learning related activities that enable them theorize, generate ideas, reflect and solve problems in

the target content areas. It involves the assimilation of information and the ability to apply it in various contexts. Learning can occur formally, such as in educational settings like schools or informally, through everyday experiences, observation, and practice. It is a fundamental aspect of human development and adaptability, enabling individuals and understand the world around them. Mbah (2012), learning is not only about verbal knowledge acquired through instruction, study. Rather, modern and proper use of the term learning embraces work or activities in every aspect of life.

In other words, Technical vocational Education and Training (TVET) is used as a comprehensive term referring to that aspect of the educational process involving in addition to general education, the study of technologies and related sciences, and the acquisition of practical skill, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life (UNESCO, 2002). Technical vocational Education and Training (TVET) is a form of education that focuses on providing individuals with the knowledge, skills, and competencies needed for specific trades, crafts, and careers. TVET programs combine theoretical knowledge with practical hands-on learning to prepare students for employment in various industries. These programs often incorporate the latest technologies and equipment relevant to the specific fields of study. According to Osinem (2017), TVET systems need to prepare their learners to be responsible and well-informed producers and consumers, and for them to be able to act competently, creatively and as agents for sustainability in their workplace and in society at large.

The primary goal of TVET is to equip students with the skills and knowledge required to perform specific job roles effectively and to meet the demands of the labor market. TVET programs can cover a wide range of areas, including automotive repair, Electrical Electronics Technology, construction, healthcare, information technology, hospitality, and many other vocational fields. By offering a practical and skills-based approach to education, TVET helps individuals develop expertise in their chosen fields, increasing their employability and enabling them to contribute meaningfully to the workforce. TVET programs are designed to meet the needs of both individuals seeking to enter the workforce for the first time and those looking to upgrade their skills or switch careers. Overall, TVET plays a crucial role in bridging the gap between education and industry, ensuring that individuals have the necessary skills to succeed in a competitive job market. Some of the goals of Technical Vocational Education and Training (TVET) shall be to: Provide trained manpower in the applied sciences, technology, and business' Provide training that enables students acquire continues education that makes students self-reliant, wealth creators and providers of employment and provide training that enables students to acquire the skills and competencies in order to take advantage of life's opportunities, among others (NPE, 2013).

However, Indiana University Committee on Classroom (1997) defined learning environment as a physical, intellectual, and psychological environment which facilitates learning through connectivity and community". Following this definition, the Joint Information Systems Committee (2000) recommends that the term 'virtual learning should also refer to 'the components in which learners and instructors participate in "on-line" interactions of various kinds, including distance on-line learning'. With these definitions and additions in the minds of computer and technology scientists, software developers, and education managers, comes the realisation that virtual learning is indeed describes a particular toolset designed for and with instructors and learners in mind. This toolset offers the ability to schedule a range of learning activities and make tools available rather than just managing contents (Sclater, 2009).

However, virtual learning provides necessary tools which might enhance student's learning experience and also provides flexible environments where students might choose to learn at a time suitable. Virtual learning is therefore a mode of education that takes place online, where students and instructors interact through digital platforms rather than being physically present in a traditional classroom setting. It usually involves the use of technology such as computers, internet, and various software to deliver educational content, facilitate communication, and assess learning. Virtual learning offers flexibility in terms of when and where learning takes place, making it suitable for students of all ages and backgrounds. It can include live video sessions, pre-recorded lectures, online discussions, virtual assignments, and assessments. While virtual learning can offer convenience and accessibility, it also requires self-discipline and motivation from students to stay engaged and succeed in their studies. European Schoolnet (2003) argues that the evolution of virtual learning, its success is dependent upon the integration of such components as course outlines, email, conference tools, threaded discussions, home pages, assignments, assessments, feedback tools, multimedia resources, Web publishing, chat and diagnostic tools, file upload with tools for building knowledge and linking administrative information.

To enhance virtual learning strategies the teaching and learning of TVET programme in order to ensure the quality, accessibility, and effectiveness of vocational education, providing students with valuable skills and knowledge to succeed in their chosen careers. By leveraging technology and online resources, TVET programs can adapt to the evolving needs of learners and industries, preparing individuals for the demands of the modern workforce.

Statement of the Problem

Technical and Vocational Education and Training (TVET) programs play a crucial role in equipping students with practical skills and knowledge essential for the workforce. However, in the tertiary institutions in Enugu State, the traditional methods of delivering TVET lessons have faced significant challenges, including limited resources, inadequate infrastructure, and a lack of access to modern technological tools. These limitations have often resulted in suboptimal teaching outcomes, reduced student engagement, and insufficient practical exposure, which are essential for TVET effectiveness.

In recent years, virtual learning strategies have emerged as a promising solution to address these challenges. Virtual learning offers flexibility, a vast array of digital resources, and the ability to simulate practical experiences in a controlled environment. Despite its potential benefits, the adoption and integration of virtual learning strategies in TVET programs within public universities in Enugu State remain limited. This gap highlights a critical need to explore how virtual learning can be effectively utilized to enhance the teaching and learning process in these programs.

The research investigated the current state of virtual learning adoption, identify barriers to its implementation, and propose strategies to enhance its integration for more effective and efficient teaching of TVET programs. This study aims to contribute to improving the quality of TVET education, thereby better preparing students for the demands of the modern workforce.

Objectives

The study was designed to determine the following specific objectives;

1. The strategies required for enhancing the teaching of TVET programme through the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state.
2. The challenges affecting the implementation of teaching of TVET programme with the use of virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu state.

Research Questions

The following research questions guided the study

1. What are the strategies required for enhancing the teaching of TVET programme through the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state?
2. What are the challenges affecting the implementation of teaching of TVET programme with the use of virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu state?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

1. There is no significance difference between the mean responses of Lecturers and Instructors regarding the strategies required for enhancing the teaching of TVET programme with the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state.
2. There is no significance difference between the mean responses of Lecturers and Instructors regarding the challenges affecting the implementation of teaching of TVET programme with the use of virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu state.

Research Method

The researcher adopted a descriptive survey research design. This was because descriptive survey research design aims at exploring opinion of a given population on existing practices and conditions (Abiola, 2002). This study covered two (2) government own Universities offering TVET programs in Enugu State, Nigeria.These universities are; University of Nigeria Nsukka (UNN) and Enugu States University of Science and Technology (ESUT). The population of the study was 230 which consisted of (113) Lecturers and (117) Instructors from the two University. A random sampling technique was used to select the sample of thirty-four (34) lecturers and thirty-five (35) instructors from two universities. The researcher drew 30% of the lecturers and instructors through random sampling technique according to Dessel, (2013). The instrument for data collection was a structured four-point scale questionnaire with a 28-items statement developed by the researchers.

The questionnaire had two sections, namely: A and B. Part A comprised the respondents; data while B had the questionnaire items with response options of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) assigned numerical values of 4, 3, 2 & 1 respectively. The instrument was validated by three research experts with the reliability index of 0.77 established using Cronbach's Alpha. In analyzing the data collected, mean and standard deviation were used to answer the research questions. Upper and lower limits of the mean were used as the basis for decision making, thus; Strongly Agree (SA): 3.50 - 4.00, Agree (A): 2.50 - 3.49, Disagree (D): 1.50 - 2.49, Strongly Disagree (SD): 1.00 - 1.49. The null hypotheses were tested at .05 level of significance and appropriate degree of freedom using t-test.

Results

The results were presented in line with the research questions and corresponding null hypotheses that guided the study are presented below.

Research Question 1

What are the strategies required for enhancing the teaching of TVET programme through the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state?

Table 1: Mean and standard deviation of respondents regarding the strategies required for enhancing the teaching of TVET programme through the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state.

1	Strategies Required for enhancing the teaching of TVET Programme through the use of virtual learning include to;	Lecturer (34)		Instructors (35)		Overall (69)		Remark
		$\overline{x_1}$	SD_1	$\overline{x_2}$	SD_2	$\overline{X}$	SD	
1	To utilize platform such as video-conferencing tools, discussion forum and virtual, class room for real-time interaction between Teachers and students	3.20	0.82	3.23	0.67	3.22	0.75	Agree
2	Integrate various multimedia resources including video, simulations, interactive presentation and digital textbooks to enhance understanding of TVET courses	3.51	0.50	3.47	0.59	3.49	0.55	Agree
3	Provide access to virtual laboratories and simulation to practice technical skills	3.22	0.76	3.15	0.80	3.19	0.78	Agree
4	Equip students and Teachers with digital devices such as laptop, tablet & smart phone	3.11	0.85	3.20	0.88	3.16	0.87	Agree
5	Provide access to high-speed internet to facilitate seamless virtual learning	3.30	0.73	3.34	0.75	3.32	0.74	Agree
6	Provide continuous professional development for TVET Teachers on the use of virtual learning Tools	3.17	0.90	3.22	0.67	3.19	0.79	Agree
7	Use learning management system (LMS) Like Moodle, Black Board, or Google Classroom to facilitate lesson progress	3.24	0.66	3.29	0.76	3.27	0.71	Agree
8	Create online assessment tools to evaluate both theoretical and practical skills effectively	3.23	0.66	3.60	0.50	3.42	0.58	Agree
9	Provide grants and scholarship to students and teachers	3.52	0.57	3.42	0.79	3.47	0.68	Agree
10	conduct awareness campaigns on the benefit of virtual learning for TVET programs	3.60	0.48	3.48	0.50	3.54	0.49	Agree
11	Create channels for regular feedback from students to improve the learning experiences	3.18	0.91	3.28	0.72	3.23	0.82	Agree
12	Encourage knowledge sharing among TVET Educators to exchange best practices in virtual learning	3.14	0.81	3.35	0.66	3.25	0.74	Agree
13	To arrange for virtual guess lectures and workshops by industry expert to provide real-world insights	3.23	0.66	3.19	0.72	3.21	0.69	Agree
14	Seek funding from government and private sector partners to support the development of virtual learning facilities.	3.02	0.86	3.49	0.50	3.26	0.68	Agree
15	To develop a technical support system to assist with troubleshooting and maintaining equipment and software	3.00	0.89	3.11	0.85	3.06	0.87	Agree
	Grand Mean	3.24	0.74	3.32	0.69	3.29	0.72	Agree

Data in Table 1 indicate that the respondents agree that all the items presented with the mean ranging from 3.06 to 3.54 are the strategies required for enhancing the teaching of TVET programme through the use of virtual learning. The standard deviation ranged from 0.49 to 0.87, the values is low and this shows that the responses are clustered around the mean. It can be deduced from the mean values that all the identified items are the strategies required for enhancing the teaching of TVET programme through the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state.

Hypothesis One

There is no significance difference between the mean ratings of TVET Lecturers and TVET Instructors regarding the strategies required for enhancing the teaching of TVET programme with the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state.

Table 2: t-test analysis between TVET Lecturers and TVET Instructors regarding the strategies required for enhancing the teaching of TVET programme through the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state.

Status	$\bar{X}$	SD	N	DF	t-Cal	t-table	Decision
TVET Lectures	3.24	0.74	34	67	-0.464	1.96	NS
TVET Instructors	3.32	0.69	35				

NB: NS: Not Significant. SD: Standard deviation. DF: Degree of freedom.

Table 2 revealed that t-calculated value is -0.464 while t-critical is 1.96. Therefore, since the calculated value is less than the critical t-value, the null hypothesis is not rejected. This implies that there is no significant difference in the mean scores of TVET Lecturers and TVET Instructors on the strategies required for enhancing the teaching of TVET programme through the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state.

Research question 2

What are the challenges affecting the implementation of teaching of TVET programme through the use of virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu State?

Table 3: Challenges affecting the implementation of teaching of TVET programme through the use of virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu State

S/N	Challenges affecting the implementation of TVET through the use of virtual learning strategy include	Lecturer (34)		Instructors (35)		Overall (69)		Remark
		$\overline{x_1}$	SD_1	$\overline{x_2}$	SD_2	$\overline{X}$	SD	
1	Limited resources to support virtual learning	3.54	0.64	3.45	0.57	3.50	0.61	Agree
2	Student disadvantages background may face greater difficulty to participate	3.15	0.85	3.30	0.66	3.23	0.76	Agree
3	Some stakeholders may be resistance to the implementation of virtual learning	3.52	0.50	3.40	0.59	3.46	0.55	Agree
4	It required time management skill which some student may struggle to complete assignment	3.17	0.74	3.13	0.83	3.15	0.79	Agree
5	Traditional assessment methods may not be suitable for online environment	3.26	0.83	3.40	0.60	3.33	0.72	Agree
6	Student and teachers may encounter technical issue while participating in the virtual learning	3.57	0.50	3.31	0.75	3.44	0.63	Agree
7	There is skeptiacismreguarding the effectiveness of virtual learning for TVET Program	3.31	0.73	3.54	0.65	3.43	0.69	Agree
8	Cost of data, devices and expenses can be a burden on students	3.40	0.60	3.60	0.49	3.5	0.55	Agree
9	Adapting existing curricula to fit a virtual format while maintaining the quality of training is a complex task	3.22	0.94	3.27	0.72	3.25	0.83	Agree
10	Polices and regulations may not support adoption of virtual learning	3.00	0.89	3.09	0.92	3.05	0.91	Agree
11	lack of adequate virtual learning resources	3.08	1.00	3.14	0.90	3.11	0.95	Agree
12	Lack of teacher capacity development programs	3.12	0.80	3.13	0.83	3.13	0.82	Agree
13	Lack of encouragement to teachers by way of incentive	3.48	0.62	3.61	0.50	3.55	0.56	Agree
14	Lack of security	3.26	0.83	3.32	0.69	3.29	0.76	Agree
15	Power supply instability	3.62	1.20	3.58	0.75	3.6	1.01	Agree
	Grand mean	3.31	0.71	3.57	0.69	3.33	0.74	Agree

Data in Table 3 indicate that the respondents agree that all the items presented with the grand mean ranging from 3.05 to 3.60 are the challenges affecting the implementation of teaching of TVET programme through the use of virtual learning strategy for effective lesson delivery in the tertiary institutions. The standard deviation ranged from 0.55 to 1.01, the values is low and this shows that the responses are clustered around the mean. It can be deduced from the mean values that all the identified items are the challenges affecting the implementation of teaching of TVET programme through the use of virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu State

Hypothesis Two

There is no significance difference between the mean ratings of TVET Lecturers and TVET Instructors regarding the challenges affecting the implementation of teaching of TVET programme with the use of virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu State

Table 4: t-test analysis between TVET Lecturers and TVET Instructors regarding the challenges affecting the implementation of teaching of TVET programme with the use of virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu state

Status	$\bar{X}$	SD	N	DF	t-Cal	t-table	Decision
TVET Lectures	3.31	0.71	34	67	-1.542	1.96	NS
TVET Instructors	3.57	0.69	35				

NB: NS: Not Significant. SD: Standard deviation. DF: Degree of freedom.

Table 4 revealed that t-calculated value is -1.542 while t-critical is 1.96. Therefore, since the calculated value is less than the critical t-value, the null hypothesis is not rejected. This implies that there is no significant difference in the mean scores of TVET Lecturers and TVET Instructors on the challenges affecting the implementation of teaching of TVET programme with the use of virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu state.

Discussion of Findings

With respect to the findings in Table 1; it was revealed that the strategies required for enhancing the teaching of TVET programme through the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state. Some of these strategies are to equip students and teachers with necessary digital devices such as laptops, tablets and smartphone also provides grant and scholarships to students and teachers among others. The above findings are in support of (Babalola, Dambo, &Bupo (2019). which state that in computers, software, and online applications have led to the use of modern machines in teaching and learning and these machines, including desktops, laptops, tablets, iPhones, Androids, and various mobile phones, equipped with software programs, have made education less stressful and more engaging for both teachers and students.

However, the findings on Table 2, it was found that there are challenges affecting the implementation of teaching of TVET programme through the use of virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu state. Some of the challenges include the following: Limited resources to support virtual learning, cost of data and devices can be a burden on the students, lack of security, instability of power supply and lack of encouragement to teachers by way of incentive among others. The findings tally with the report of Ugwoke, Olinya, Anorue and Abdullahi (2020) opined that as at today, TVET programs that require skills are being taught using lecture methods due to lack of equipment, lack of knowledge of how to use the digital resources, or no power supply etc. Also, Alio and Ideh (2022) need to be considered as the training of the youth for quality is dependent on the institution instructional development strategies Furthermore, the result of the corresponding hypothesis shows no significant difference in the mean ratings between TVET Lecturers and TVET Instructors regarding the strategies required for enhancing the teaching of TVET programme with the use of virtual learning for effective lesson delivery in the tertiary institutions in Enugu state. This shows that the t-calculated value gotten was low against the t-tabulated value at the appropriate degree of freedom and significance level.

Conclusion

This study examines the strategies required for enhancing the teaching of TVET programme through the use of virtual learning and the challenges affecting the implementation virtual learning strategy for effective lesson delivery in the tertiary institutions in Enugu state. The study finds that the integration of virtual learning technologies can address several challenges associated with traditional teaching methods, such as limited access to resources, inflexible learning environments, and insufficient practical engagement. By leveraging virtual

learning, institutions can provide more interactive, flexible, and resource-rich educational experiences that cater to diverse learning styles and needs. The study highlighted that virtual learning can facilitate better engagement, deeper understanding of complex concepts, and enhanced practical skills through simulations and virtual labs. Additionally, the adoption of virtual learning can bridge the gap between theoretical knowledge and practical application, which is critical in TVET programs. This approach not only prepares students more effectively for the workforce but also in concord with global educational trends towards digitalization and innovation.

Recommendations

Based on the Conclusion drawn, the following recommendations are hereby made: Government should increase funding in education in order to facilitate flexible learning, provide access to a wide range of resources and materials, and promote interactive and engaging learning experience.

1. Educational Administrators and other stakeholders should provide fund for the enhancement of laboratory/workshops that are well networked to help students develop practical skills and competencies that are essential for success in their chosen field.
2. Continuous training and re-training programmes on virtual learning technologies should be organized for Teachers to be able to adjust to the current use innovative technologies in teaching and learning.
3. TVET institutions should collaborate with private partnership with tech companies and non-profits organisations to improve infrastructure and provide training for both teachers and students.
4. TVET curriculum be reviewed to integrating virtual learning into the teaching of TVET programmes to create a dynamic and innovative lesson delivery methods that cater to the diverse learning needs of students.

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