PERCEIVED EFFECTIVE PEDAGOGICAL STRATEGIES FOR OPEN DISTANCE LEARNING BY TECHNICAL AND VOCATIONAL EDUCATORS IN UNIVERSITIES IN SOUTH EAST NIGERIA FOR SUSTAINABLE GLOBAL COMPETITIVENESS

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Abstract

The continuous development of Information and Communications Technology (ICT), especially the endless spread of internet use, has created new ways of teaching and learning termed open distance learning. Open distance learning which is the technology-based learning approach that relies on the availability and utilization of technology learning resources anytime and anywhere, has imposed major changes in the teaching and learning habits and scenarios. Using the descriptive survey research method, the study ascertained the effective pedagogical strategies that could be used for open distance learning in developing nations like Nigeria. Two research questions guided the study and two null hypotheses were tested at 0.05 level of significance. The population of the study comprised 394 Technical and Vocational Educators from universities in South East Nigeria. Purposive sampling was used to select 130 VTE lecturers as the sample for the study. A structured questionnaire validated by three experts with a reliability coefficient of 0.81 was the instrument for data collection. Data collected were analyzed using mean to answer the research questions while ANOVA was used to test the null hypotheses at 0.05 level of significance, then, post hoc test was used to ascertain where the difference exists. Findings of the study revealed that computer assisted instruction and teleconference are pedagogical strategies that could be used for open distance learning. Based on the findings of the study, it was recommended that the university administrators should make provision for adequate support and resources for open distance learning in the universities, as this would enhance access to university education.

Keywords – Pedagogical strategies, Open distance learning, Sustainable global competitiveness, Technical and vocational educators.

Introduction

Information and Communication Technology (ICT) is gradually changing the process of teaching and learning, in higher institutions in Nigeria. It has led to the development and dissemination of electronic learning and open distance learning that is evident across Universities. There is no doubt that the traditional or conventional teaching process is gradually giving way and the ICT based teaching is setting into the fora of higher education. With the advancement of digital technologies which aim at offering distance courses, new educational opportunities such as open educational resources and massive open online courses have emerged for larger masses to access education (Saykili, 2018). Advances in technology provide educators with the opportunity to try new teaching strategies using available online tools. It also enhances cost effectiveness (Rudenko et al., 2020), and the quality of educational structure (Haleem et al., 2022). Furthermore, it provides education to specific target groups, associating working and family life with education and adding an international dimension to education (United Nations, 2020). A large number of universities across the world are shifting the focus from

traditional education to a web-supported education that can provide fully online or blended (hybrid) learning and open distance learning.

Open distance education is the planned teaching and learning that occurs in a different place from the normal learning setting and requires communication and a special corporate organization via technologies (Moore & Kearsley, 2012). It is any learning process in which all or most of the teaching are conducted by someone geographically removed from the learner, with most of the communication between teachers and learners being conducted through electronic or print medium (UNESCO, 2019). It is a way of learning remotely, without being in regular face-to-face contact with the teacher in the classroom. Open distance learning involves the physical separation of the student and the instructor, at least in certain stages of the learning process (Anderson & Rivera-Vargas, 2020). It is suitable for those having work obligations, family constraints and students who lack a convenient location to access the classes (Snoussi & Radwan, 2020). Although there are semantic differences between the concepts such as; distance education, electronic learning, web learning, internet-based education, online learning and remote learning, which have gained ground in the literature in the course of time, but these concepts are correlated. For instance, Bates (2018) opined that online learning is a version of distance education.

Some studies have shown the effectiveness of distance learning. Studies such as; Bušelić (2012) reported that distance learning provides better individualized instruction which promotes self-directed learning. Hawkins et al (2013); Simonova, et al., (2023) found distance learning to be positively associated with students' outcomes. It could also enhance the preparation of students for global competitiveness as they interact with technology. Apart from its obvious advantages, distance learning also has its disadvantages such as increasing chances of distraction. Also, peer to peer communication and interaction in a group discussion are not often feasible (Klisowska, Sen & Grabowska, 2021). Furthermore, the barriers associated with technology infrastructure are equally encountered by institutions during distance learning. Ertmer (1999) identified equipment, access, time, technical support, pedagogy, belief and personal preferences as barriers to effective integration of distance learning in education. In order to improve the open distance learning in tertiary institutions in developing nations like Nigeria, effective pedagogical strategies should be used to make learning more interesting and meaningful. Pedagogical strategies incorporate an array of teaching strategies that support intellectual engagement to enhance learning. It improves the teachers' confidence (Chen, 2004). Some of the remote pedagogical strategies that could be used in combination with conventional (face-to-face) teaching methods include but not limited to; the use of computer-assisted instruction, teleconference, telematics education, virtual laboratories, among others.

Computer-assisted instruction (CAI) is defined as the teaching and learning strategy mediated by the use of computer and its accessories. It involves the use of the computer as an auxiliary tool in learning, such as accessing information using the internet and making calculations using various software (Owusu, 2010). CAI contributes to the acquisition of varied knowledge as well as promotes learner independence and the urge for schoolwork (Fafchamps & Mo, 2018). It improves teaching and students' learning interests and concept understanding (Paje, Rogayan & Dantic, 2021). Teleconference is an interactive educational tool that is useful for the creation of flexible educational environment. It is real time exchange of information between humans located at different physical spaces who are connected via a telecommunication system (Panagiotakopoulos et al., 2016). Teleconference enables the immediate connection of the facilitator and the learner through a telecommunication system. With the use of teleconference, learning

instructions in the form of images, animation, video and audio could be transmitted to the learners remotely. Teleconference supports the lead role and work of the educators while enhancing communication and interaction for the benefit of learners (Milioritsas & Georgiadi, 2010). It could be used to promote learning (Ellaway, Dewhurst & Cumming, 2003). The realities of open distance learning without effective pedagogical strategies could be very challenging in education sector especially within various departments of the universities (including the department of Technical/Technology and Vocational Education).

Technical/Technology and Vocational Education (TVE) is defined as a range of learning experiences relevant to the world of work and occurring in a variety of learning contexts, including educational and workplace-related (Oketch, 2007). It involves the acquisition of skills, competencies and knowledge for the world of work (UNESCO-UNEVOC, 2019). It is the type of education or training designed to equip the learner with the necessary skills needed to start and progress in specific occupations and provide on-the-job training for those already engaged in one form of job or another (Obidile, 2014). TVET, according to Mar (2011), encompasses all areas of the educational process that, in addition to general education, involves: the study of technologies and other related sciences; the attainment of practical skills, knowledge, attitudes and understanding relating to occupations in different sectors of social and economic life; a means of training for occupational engagements and for efficient participation in the labor world; an area of lifelong learning and training for effective citizenship; a tool for enhancing environmentally appropriate sustainable development; and a method of improving poverty reduction. TVET contributes significantly to skills development that are targeted to serve the different needs of the national and international labor markets. TVET develops individual's capability to design, produce and use technology products and systems, as well as to assess the appropriateness of technological action (Okoye & Okwelle, 2017). Technical and vocational educators are facilitators who teach in the TVE department.

The TVE department is made up of different units such as; Business Education, Technical/Technology Education, Agricultural Education, Computer education and Home Economics Education with their respective options (NCCE, 2003). Technical and vocational educators teach learners in the regular school programme and they also teach learners who opt for open distance learning in the universities. They should therefore engage those students that opted for open distance learning with remote pedagogical strategies that are effective in the teaching and learning processes. Considering that the use of technology in the teaching and learning processes has challenged the teachers' pedagogical strategies, it becomes important to ascertain the effective pedagogical strategies that could be used in the teaching and learning processes with the use of technology. Ascertaining this, becomes important because, if the situation is left unattended, attaining global competitiveness may be stifled.

Global competitiveness is the ability to build the framework (policies, regulations, management tools and visions) that allow a nation to provide and maintain resources (human and material) relevant to the current and future needs. It provides a baseline to gauge performance and identify improvement opportunities in any country. One of the indices of global competitiveness is technological readiness (World Economic Forum, 2015). According to the congress, technological readiness measures the agility with which an economy adopts existing technologies to enhance their productivity, leveraging on information and communication technologies (ICTs) for increased efficiency. The growing uncertainty in education underpinned by technological advancement, is the driving need for more remote pedagogical strategies to be identified and adopted in the teaching and learning processes to enhance global competitiveness.

Years of experience is the moderating variable that the study considered, as it could

influence the responses of the respondents on the effective pedagogical strategies that could be used for open distance learning. There could be a significant difference or otherwise in the respondents' responses on effective pedagogical strategies that could be used for open distance learning. Studies like Fahrman, et al. (2020); Cobo-Rendon, et al. (2021) found that years of experience was a factor that influenced the utilization of technology in the teaching and learning processes. There is therefore need to ascertain whether the findings of the present study could differ with the result of the previous studies.

Statement of the Problem

The tremendous advancement of technology and computer applications in education sector has made the educational institutions to find ways to adapt their teaching and learning strategies to technological advancement. This adaptation of teaching and learning strategies has become an issue for consideration. Given the current situation where there is a significant growth in demand for online learning technologies as a result of technological advancement, researchers have been involved on how to maximally utilize the opportunities provided by technologies to enhance the education process. In fact, a number of researchers have anticipated a significant growth in demand for online learning technologies as millions of people in the world have access to the internet (Shuck, 2016). Noting that ineffective pedagogical strategies in education could cause a deplorable development in the nation's education system, therefore, constant identification and adoption of effective pedagogical strategies is imperative. Hence, the need to ascertain the effective pedagogical strategies for open distance learning in universities.

Research Questions

The following research questions guided the study;

1. What computer-assisted instruction strategies are effective for open distance learning in universities in South East Nigeria?
2. What teleconference strategies are effective for open distance learning in universities in South East Nigeria?

Null Hypotheses

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

1. There is no significant difference in the mean ratings of the respondents on effective computer-assisted instruction strategies for open distance learning in universities in South East Nigeria, as a result of years of experience.
2. There is no significant difference in the mean ratings of the respondents on effective teleconference strategies for open distance learning in universities in South East Nigeria, as a result of years of experience.

Methodology

The design of the study was a survey research design. The study was carried out in Universities in South East Nigeria. The population of the study comprised 394 Technical and Vocational Educators. Judgmental sampling was used to select 130 VTE lecturers as the sample for the study. A Structured questionnaire was the instrument for data collection. The instrument was validated by three experts from the Department of Technology and Vocational Education, Nnamdi Azikiwe University, Awka. The instrument was titled 'Perceived Effective Pedagogical Strategies for Open Distance Learning in Universities (PEPSODLU)'. It consisted of two sections. Section A sought for the background information of the respondents and Section B contained 15 items covering the research questions. The instrument was a 5-point scale with: Very Highly Effective (VHE=5), Highly Effective (HE=4), Moderately Effective (ME=3), Lowly Effective (LE=2) and Very Lowly Effective (VLE=1).

For the test of reliability, 15 copies of the questionnaire were administered to TVE lecturers in the universities who were not part of the population of the study. Cronbach alpha's method was used to test the reliability of the instrument and the reliability

coefficient value of 0.81 was obtained. The researchers administered the instrument with the help of four research assistants whom they briefed on how to administer the questionnaire. Out of the 130 copies of the questionnaire distributed, 122 copies were duly filled and were used for data analysis. Data collected were analyzed using Mean, ANOVA and Post hoc test. Mean was used to answer the research questions while ANOVA was used to test the null hypotheses at 0.05 level of significance and Post hoc test was used to ascertain where the difference exists. Regarding the decision rule, any item with a mean rating of 3.00 and above was regarded as effective pedagogical strategy for open distance learning and any item with a mean rating below 3.00 was not regarded as effective pedagogical strategy. For hypotheses testing, where the p-value was greater than 0.05, the null hypothesis was retained and where otherwise, the null hypothesis was rejected.

Findings

Research Question 1: What computer-assisted instruction strategies are effective for open distance learning in universities in South East Nigeria?

Table 1: Respondents' mean ratings on effective computer-assisted instruction strategies for open distance learning

S/N	Items	X	Remark
1.	Using computer assisted media such as CD ROMs to share course materials and assignments	4.72	HE
2.	Using computer assisted media such as e-mail to share course materials to students	3.74	ME
3.	Downloading course materials from the internet	3.52	ME
4.	Providing feedback to students using computer assisted media	3.69	ME
5.	Designing lesson experiences with computer assisted media	3.53	ME
6.	Illustrating lesson with charts using computer assisted media	3.56	ME
7.	Incorporating images in the lesson plan using computer assisted media	3.50	ME
8.	Modifying information and ideas with computer assisted media	3.52	ME
9.	Uploading students' scores and grades using computer assisted media	3.58	ME
	Aggregate Mean	**3.71**	**Effective**

Data in Table 1 show that all the items were considered as effective computer assisted instruction strategies with mean scores ranging from 3.50-4.72. The aggregate mean score of 3.71 shows that computer-assisted instruction strategies are effective for open distance learning in universities in South East Nigeria.

Research Question 2: What teleconference strategies are effective for open distance learning in universities in South East Nigeria?

Table 2: Respondents' mean ratings on effective teleconference strategies for open distance learning

S/N	Items	X	Remark
1.	Using videos to present learning materials to students to guide independent learning	3.82	ME
2.	Using audio graphic to deliver lectures to students	3.68	ME
3.	Presenting lessons to students using digital charts	3.51	ME
4.	Presenting lessons to students using web camera	3.71	ME
5.	Designing lessons for students using digital graphics	3.64	ME
6.	Assessing students' performance using audio graphic	3.56	ME
	Aggregate Mean	**3.65**	**Effective**

Data in Table 2 show that all the items were considered as effective teleconference strategies with mean scores ranging from 3.51-3.82. The aggregate mean score of 3.65 shows that teleconference strategies are effective for open distance learning in universities in South East Nigeria.

HO_1: There is no significant difference in the mean ratings of the respondents on effective computer-assisted instruction strategies for open distance learning in universities in South East Nigeria, as a result of years of experience.

Table 3: Analysis of Variance (ANOVA) on respondents' responses on effective computer assisted instruction strategies for open distance learning

Source of variation	SS	Df	MS	F	P	Remark
Between groups	0.372	2	0.168	1.794	0.136	NS
Within groups	20.014	120	0.084			
Total	20.386	122				

Note: NS= Not Significant

Data in Table 3 show the p-value of 0.136 with 2 and 120 degree of freedom. The obtained p-value of 0.136 is higher than the significant level ($p>0.05$). Hence the null hypothesis is not rejected. This indicates that there is no significant difference in the mean ratings of Technical and Vocational Educators on computer-assisted instruction strategies considered effective for open distance learning as a result of their years of experience.

HO_2: There is no significant difference in the mean ratings of the respondents on effective teleconference strategies for open distance learning in universities in South East Nigeria, as a result of years of experience.

Table 4: Analysis of Variance (ANOVA) on respondents' responses on effective teleconference strategies for open distance learning

Source of variation	SS	Df	MS	F	P	Remark
Between groups	2.326	2	1.158	13.692	0.000	Sig
Within groups	18.060	120	0.085			
Total	20.386	122				

Data in Table 4 show that with 2 and 120 as the degree of freedom between and within the groups at 0.05 level of significance, the p-value is 0.000. The obtained p-value is less than the significant value ($p<0.05$). Hence the null hypothesis is rejected. This means that there is a significant difference in the mean ratings of Technical and Vocational Educators on teleconference strategies considered effective for open distance learning as a result of their years of experience. Hence, post hoc analysis was carried out using Scheffe's test to indicate where the significant difference lies.

Table 5: Post Hoc Test of Multiple Comparison of respondents' opinions on effective teleconference strategies for open distance learning based on years of experience

(I) YoE	(J) YoE	MD	Std Error	P	LB	UB
1-5 yrs	6-12 yrs	.10252	.04042	.073	.0125	.2026
	>12 yrs	.02546*	.04415	.002	.0839	.1339
6-12 yrs	1-5 yrs	.10252	.04042	.076	.0125	.2026
	>12 yrs	.02701*	.04726	.030	.0145	.2443
>12 yrs	1-5 yrs	-.02546*	.04425	.005	-.1339	.0839
	6-12 yrs	-.12701*	.04726	.030	-.2443	.0145

Note: *. P<0.05; YoE= Years of Experience; MD=Mean difference; LB= Lower Bound; UB= Upper Bound. LB & UP determined at 95% Confidence Interval

Data in Table 5 indicate a significant difference in the opinions of Technical and Vocational educators with 1-5 years and above 12 years of experience; and between 6-12 years and above 12 years of experience ($p < .05$). However, there is no significant difference in the opinions of Technical and Vocational educators between 1-5 years and 6-12 years of experience ($p > .05$).

Discussion of Findings

The findings of the study in research question one revealed that respondents agreed that the effective computer-assisted instructional strategies for open distance learning include; Using computer assisted media such as CD ROMs to share course materials and assignments; Using computer assisted media such as e-mail to share course materials to students; Downloading course materials from the internet; Providing feedback to students using computer assisted media; Designing lesson experiences with computer assisted media; Illustrating lesson with charts using computer assisted media; Incorporating images in the lesson plan using computer assisted media; Modifying information; and ideas with computer assisted media and Uploading students' scores and grades using computer assisted media. This is in line with the studies of Onditi and Ajwang (2020); Zhussupbayev et al. (2023), which found that computer-assisted learning strategies are effective for online learning. This finding could be as a result of the hybrid learning which is easily obtainable in our environment due to inadequate infrastructural facilities for online learning. The result of test of null hypothesis one revealed that there is no significant difference in the mean ratings of the respondents' opinions on effective computer-assisted instruction strategies for open distance learning in universities in South East.

The findings of the study in research question two revealed that respondents agreed that effective teleconference strategies for open distance learning include; Using videos to present learning materials to students to guide independent learning; Using audio graphic to deliver lectures to students; Presenting lessons to students using digital charts; Presenting lessons to students using web camera; Designing lessons for students using digital graphics; and Assessing students' performance using audio graphic. This is in line with the study of Panagiotakopoulos, Tsiatsos, Lionarakis and Tzanakos (2013), which revealed that teleconference strategies are effective strategy for online instruction. The author maintained that teleconference has adjusted for many of the disadvantages associated with distance learning and traditional in-person training in tertiary institutions. The result of test of null hypothesis two revealed a significant difference in the mean ratings of the respondents' opinions on effective teleconference strategies for open distance learning. Using the post hoc test analysis, the significant difference was shown between the Technical and Vocational Educators who had 1-5 years and above 12 years of work experience; and between 6-12 years and

above 12 years of work experience. However, there was no significant difference in the opinions of Technical and Vocational educators who had 1-5 years and 6-12 years of work experience. The difference seen could be as a result of variations from personality traits, individual differences and work environment. This entails that while technological facilities are being incorporated in education system, personality traits, individual differences, work environment, among others which could contribute in directing the attitude of facilitators towards technological use and acceptance, should also be considered.

Conclusion

The study concluded that computer assisted instructional strategies and teleconference strategies are effective pedagogical strategies for open distance learning. It is therefore imperative that Technical and Vocational Educators should adapt them when open distance learning becomes imminent.

Recommendations

1. The University administrators should make provision for adequate support and resources for open distance learning in the universities, as this would enhance access to university education.
2. There is need to increase the awareness and understanding of open distance learning to staff, students and the public, for optimal adaptation and use. This could be done through organized training, workshops and conferences.

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