OVERCOMING THE BARRIERS TO EFFECTIVE DEPLOYMENT OF ICT EQUIPMENT AND TRAINING IN TVET INSTITUTIONS

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Abstract

Today, Information and Communication Technology (ICT) is impacting every aspect of human existence and its contribution to Technical and Vocational Education and Training (TVET) especially in the area of meeting the dynamics of knowledge economy cannot be underestimated. This study investigated the barriers to effective deployment of ICT equipment for teaching in TVET institutions and how these can be overcome with a view to solving the problem of students' low level of ICT competency. The study was descriptive in design and used the survey method hence questionnaire was packaged to collect data.The survey was conducted at The Federal Polytechnic, Ilaro, Ogun State and Lagos State Polytechnic, Lagos State. Students from both institutions made up the population. Two hundred (200) respondents (100 students from each institution) were randomly used as sample for the study. A research question and hypothesis was developed from which the instrument used to gather data was developed. Data obtained were analyzed using mean rating and Pearson Product Moment Correlation. The results revealed that lack of infrastructure, inadequate software, insufficiency of funds for maintenance and irregular power supply among others are barriers to effective deployment of ICT equipment for teaching in TVET institutions and are contributory to students low level of proficiency. It was recommended among others, that government should increase subvention to TVET institutions for them to adequately purchase and maintain ICT equipment and the required applications for teaching in TVET institutions.

Key Words: ***Barriers, Deployment, ICT, Technical and Vocational Education and Training (TVET) Institutions, Students' proficiency***

Introduction

In this era of global integration, information and communication technology (ICT) is used in our daily activities and has therefore become indispensable. The benefits of ICT are limitless. It provides governments, businesses, and citizens with access to relevant information and allows them to communicate, make informed decisions and greatly facilitates efficient resolution of various economic, social, financial, and educational challenges. As a consequence of its significance to the business world, the demand for ICT skills from all categories of workers is growing steadily. Consequently, graduates of TVET institutions must be well-trained to meet the needs of the twenty-first century.

TVET according to Butterfield (2000), is educational program designed to direct students toward skill development while also teaching them the attitude and knowledge required for proper skill application. That is, it is an education geared towards the development of certain skill jobs. UNESCO and the International Labour Organization (ILO) "2002" define TVET as an extensive term that encompasses all facets of learning procedures such as acquisition of practical skills and knowledge for occupation in various sectors of the economy, technologies and related sciences. In this regard, the knowledge of technologies and related sciences is critical for effective participation in the labor market, and this can be realized through adequate integration and deployment of ICT for teaching and learning in TVET institutions (Saud et al, 2011).

Ratheeswari (2018) gave a definition of ICT which incorporates three important elements: scientific, technological, and engineering discipline, as well as managerial strategy. He viewed ICT as a change agent to working conditions, information management, educational methods, scientific research, and accessibility to ICT facilities.

According to Marope, et al (2015), National Board for Technical Education (NBTE) in 2008 introduced a short-term course and training workshop for capacity building of polytechnic and monotechnics tutors towards the successful

integration of ICT into TVET programs. To this effect, NBTE gave a policy directive that ICT facilities should be deployed as teaching tools in the curriculum of all TVET programs (Hollander and Mar, 2009).

Team (2017) reported in a paper published by Japan's National Institute of Multimedia Education that expanding the use of ICT in teaching and incorporating technology into the TVET curriculum is of a great significance to students' achievements. This will enable practical skills to be taught digitally via an orderly ICT infrastructure rather than learning through hands-on experience (Saud et al, 2011). Herd & Richardson (2012), identified five reasons for the adoption of ICT in TVET: the requirements of a knowledge economy, high demand of ICT experts in the workplace, the demand to increase access to career and technical education and training, the shortage of qualified tutors, and the need to offer opportunities for professional growth. However, Chinien (2003) outlined various types of ICT tools that can be used to boost learning outcome in TVET, such as computer, overhead projector, world wide web, a slide projector, a film strip projector, a video projector, simulators, digital cameras, graphical interfaces, scanners, online publishing, internet, and a local area network (LAN), word processing, AutoCAD, power point, an interactive whiteboard, a database, and so on.

In spite of NBTE's policy guideline in the curricular being used by the concerned institutions over the years, it is worrisome that the deployment of ICT for training in TVET education programmes is still not effective. It is based on this view that the researchers concur to investigate the barriers to effective deployment of ICT equipment for teaching in TVET institutions.

Objectives of the Study

The main objective of the study was to investigate the barriers to effective deployment of ICT facilities in TVET education. The specific objectives of the study were to:

- Identify the causes of ineffective deployment of ICT facilities as teaching tools in TVET institutions.
- examine the effect of inadequate deployment of ICT in TVET education on the proficiency level of the concerned students.

Research Question and Hypothesis

The following research question and hypothesis were proposed for this study:

- What are the barriers to effective deployment of ICT as teaching tools in TVET Education?

H_o: Effective deployment of ICT facilities in TVET Education has no significant contribution to the proficiency level of the concerned students.

Methodology

Descriptive survey approach was used to conduct this study Population comprised students of The Federal Polytechnic, Ilaro and Lagos State Polytechnic, Lagos. The population was stratified for the purpose of sample selection. For adequate representation, a total of 200 respondents (100 students from each institution) were selected. Structured questionnaire was the main instrument used for data collection and it was designed on 4-point Likert Scale. The content validity test was conducted on the instrument by experts and their observations were taken into consideration in preparing the final copy of the instrument. The reliability co-efficient value of the instrument was 0.84. Two hundred (200) copies of the questionnaire were produced and administered on the respondents. But, one hundred and seventy-five copies were fully filled, returned and use as sample for the study. In analyzing the data gathered, mean rating was used while Pearson Correlation was used to test the hypothesis at 0.05 level of significant.

Research Analysis

Table 1: Show the responses of the respondents to the research question.

Barriers	**SA**	**A**	**D**	**SD**	**Mean**	**Decision**
Inadequate infrastructure	156	17	1	1	3.87	Accepted
High cost of maintenance	91	72	8	4	3.43	Accepted
Inadequate funding	133	27	11	4	3.59	Accepted
Insufficiency of competent teaching staff	45	36	55	39	2.50	Accepted
Resistance to change	34	90	42	9	2.85	Accepted
Lack of appropriate software	142	25	5	3	3.77	Accepted
Incomplete compliance with NBTE curriculum specifications	137	27	9	2	3.73	Accepted
Irregular power supply	162	11	1	1	3.91	Accepted
Accessibility	101	64	7	3	3.54	Accepted
Lack of interest in adaptation to or enhancement of ICT competency	139	21	11	4	3.63	Accepted
Unstable internet connection	136	35	2	2	3.64	Accepted
Grand Mean					**3.50**	**Accepted**

The mean rating revealed that all the barriers listed in the table above were found to be significantly responsible for the ineffective deployment of ICT facilities as instructional tool in TVET education. This was observed from the responses of the respondents which showed mean scores of not less than 2.5 in each of the questionnaire items listed.

Relationship between effective deployments of ICT facilities in TVET training to Students' level of proficiency

Table 2: **Descriptive Statistics**

	Mean	Std. Deviation	N
Deployment of ICT facilities for students training.	3.64	0.636	175
Students level of proficiency	3.51	0.801	175

Table 3: Correlations

		ICT Deployment	Students' proficiency
Deployment of ICT facilities for students training	Pearson Correlation	1	.914
	Sig. (1-tailed)		.000
Students level of proficiency	Pearson Correlation	.914	1
	Sig. (1-tailed)	.000	

a. Listwise N=175

From table two, the average mean and standard deviation responses for ICT deployment are 3.64 and 0.636, while those of students' level of proficiency are 3.51 and 0.801 respectively. Table three shows a correlation of 91.4% between the variables tested with a p-value of 0.000.

Discussion

The research question sought to investigate the barriers to effective deployment of ICT facilities in TVET education. Based on the information gathered and analyzed, all respondents agreed that ICT deployment in TVET education

presents some challenges. Among these challenges are insufficient infrastructure, a lack of funds for employing and training the required quality and number of personnel, and a lack of time to develop materials. This was in consonance with Saud et al. (2010) and Collins et al (2009) earlier submissions on the subject matter. According to Saud et al. (2010), challenges to ICT integration in TVET are lack of time in preparing teaching materials and lack of skill in presenting such materials.While Collins et al. (2009) identified the high cost of purchasing and maintaining software and other equipment as impediments to the process. Unwillingness to change, irregular electricity supply, lack of teacher competency, and lack of computer access were also identified as barriers to full ICT deployment to TVET education.

Pearson Product Moment Correlation was used to test the hypothesis whether deployment of ICT facilities has significant relationship with students' proficiency level in TVET institutions. The correlation coefficient for the relationship between the deployment of ICT facilities in TVET education and students' level of proficiency is 0.914. The correlation revealed a positive relationship, implying that the deployment of ICT facilities into TVET education has to do with the level of proficiency acquired by students. The test is statistically significant with a p-value of 0.000 and a coefficient value of r = 0.914. As a result, the null hypothesis that ICT deployment has no significant relationship with students' proficiency level in their academic pursuits in TVET institutions is rejected while the alternative hypothesis that ICT deployment in TVET education has a significant relationship with students' acquired level of proficiency is accepted.

Conclusion

The rate of unemployment has continued to rise, not solely because of lack of jobs, but due to the very low level of possessed skills by TVET school leavers poorly prepared for the available jobs and lack of the required proficiency for self-reliance. However, the skills required in the workplace are becoming broader and more complex. As a result, the study concluded that the use of ICT for instructional delivery in all fields of learning is now a universal standard or policy that all educational institutions (TVET based) must fully embrace and implement with strong determination to overcome the challenges militating against effective deployment of ICT facilities in TVET institutions.

Recommendations

Based on the findings and conclusions of this study, it was recommended that:

- Government should increase annual subvention to TVET institutions to enable them have more funds for adequate provision and maintenance of their required ICT equipment and applications.
- The supervisory bodies of our TVET institutions should constantly review the curricular to keep trainees' abreast of emerging trends in TVET Education".
- More attention or equal attention should be given to the TVET section like other sections in the Education Ministry.
- Government should encourage industrial organizations to participate in the formulation of the curricula, provide On-the-Job Training (OJT) programmes and certify the competencies offered.

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