

Digital Literacy Assessments In Technical And Vocational Education and Training (TVET) Sustainability

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ABSTRACT

Appreciation and application of digital devices (smartphone, tablets, laptops, desktop PCs etc.), and their technologies in solving political, economic, technological, and educational problems in our society is unbalanced. To attain sustainable in TVET, the use of digital devices and application cannot be underscored. This research work conducted and investigative research to examine the deployment of digital devices, its application and technology in teaching and learning towards sustainable development TVET in Nigeria. The sampled area was polytechnics in the southwest Nigeria, and sampled population was two thousand and fifty. Systematic sampling was used as audience was the Deans of School, HODs of academic departments, directors of APU (academic Planning Unit), and Directors of the school computer centers of the institutions sampled and some other academic staff. Structure questionnaire and observation technique was used to gather data. Data gathered was carefully examined and analyzed. It was discovered that owners of institutions sampled especially federal institutions had invested huge sum of money on digital device application for teaching and learning. Maintenance and technical proficiency of some of the staff in using the devices, lack of supports to staff, misplace priority and corruption was a burden towards digital competence, digital usage, and digital transformation. Subsequently it is affecting sustainable in TVET.

Keywords: Digital devices, Digital Literacy, smartphone, tablets, laptops, desktop PCs, Sustainable Development, TVET.

SMART-SMART-iSTEAMS Conference Proceedings Paper Citation Format

Ojo, O., Oloyede, A., Onadokun, I.O. & Akinade O.A. (2018): Digital Literacy Assessments In Technical And Vocational Education and Training (TVET) Sustainability- SMART-iSTEAMS Multidisciplinary Conference, February, 2018, Ogwuashi-uku, Delta State, Nigeria. Pp 75-86

1. INTRODUCTION

There is no doubt that appreciation and application of digital devices is increasing day by day in our society. Hence digital literacy is paramount in solving problems towards attainment of sustainable developments in all ramifications of life. Digital literacy is all-inclusive knowledge, skills, behaviors, and exposures acquired towards appreciation and application of digital devices (smartphone, tablets, laptops, desktop PCs etc.), and their technologies in solving political, economic, technological, and educational problems in our

society. Survival and achievements of aim and objectives of TVET can only be accomplished through digital competence, digital usage and digital transformation by facilitators and digital competence, and digital usage of learners (Yekini, N.A , 2016).

The genesis of digital literacy could be traced to computer literacy up to current subcategories of extensions like electronic that, digital literacy has three levels digital competence, digital usage, and digital transformation. See figure 1 for digital literacy levels and their networking (Douglas A.J. Belshaw, 2011).

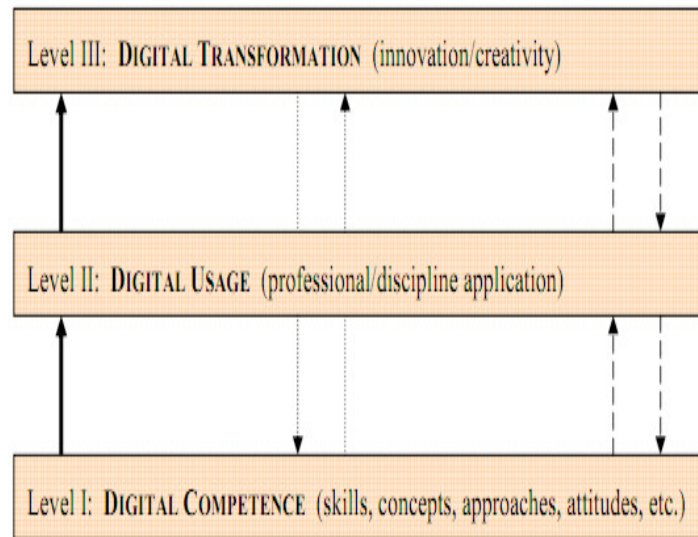


Figure 1: Digital Level Literacy
Source: A.J. Belshaw (2011)

TVET is acronym for Technical and Vocational Education and Training (TVET) it is an education, training or learning activity which provides knowledge, skills and attitudes relevant for employment or self-employment Vanuatu (n.d). If access to TVET is to upsurge, new ways of developing and delivering courses has to be explored, then open distance learning must be encouraged (Louise Moran & Greville Rumble, 2004). ODL required use of digital devices hence digital literacy is required. Consequently Sustainable Development in TVET will be enhanced.

This research work is to examine the level of digital literacy and disposition to digital devices application and technology in teaching and learning towards sustainable development TVET in Nigeria.

2. LITERATURE REVIEW

2.1.1 Evolution of Digital Literacy

Here I present the trends of digital literacy from early 60s to this modern day of appreciation and application of digital devices and it technology. There have been four major platform innovations since the invention of the digital computer: batch processing, timesharing, the personal computer and the Internet.

The first digital literacy course was offered at Dartmouth College in the 60s **CSU (2015)**. The diagram below illustrate the diagram below illustrate trends in digital literacy transformation between 70s and modern day of advancement in digital technology and it is application.

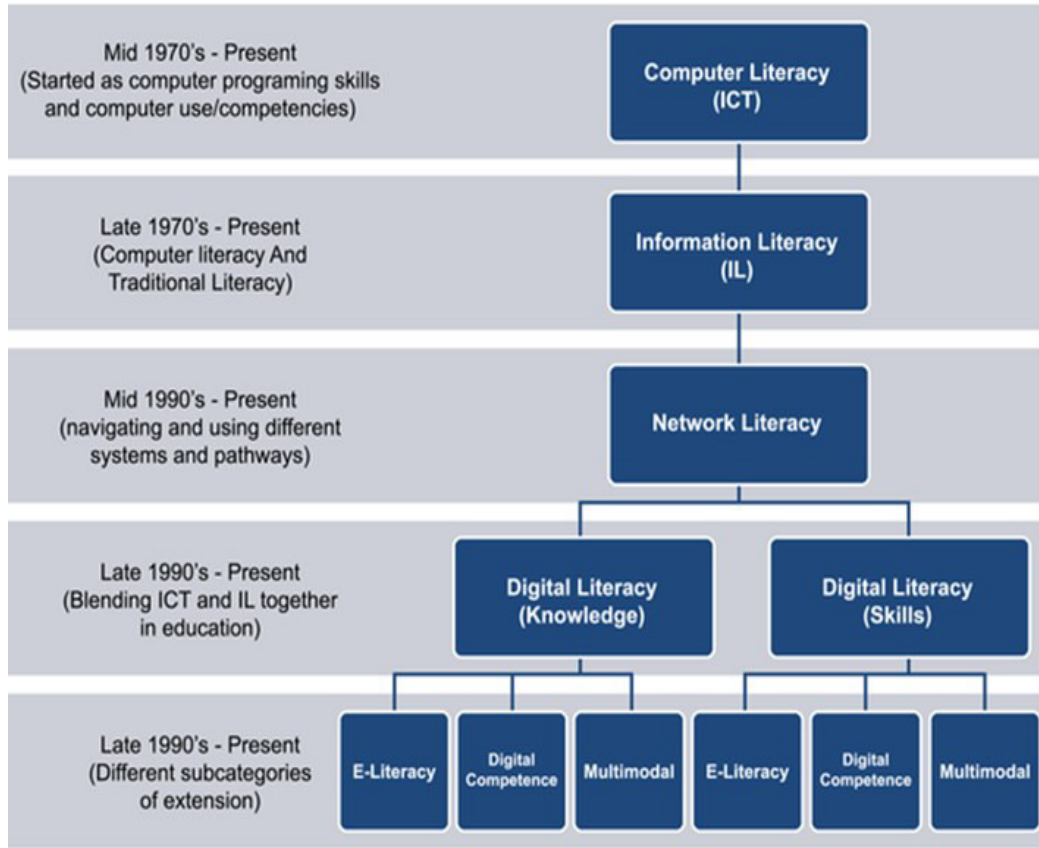


Figure 2: Trends in Digital Literacy Transformation

Source: A.J. Belshaw (2011)

2.2 Digital Literacy In Education

Digital literacy is necessary to become digital citizens so that students can be prepared for a new breed of workplace and new world. “Digital literacy should be the fourth pillar of a student’s education alongside reading, writing and mathematics and be resourced and taught accordingly.” One essential component of digital literacy when it comes to the field of training is deep learning; of which there are six core skills: Collaboration; Creativity; Critical thinking; Citizenship; Character; Communication (House of Lords Report, 2017). Educational leadership should ensure that ICTs which is bedrock of digital literacy are incorporated in these key areas of Training culture: Leadership and Vision: Acquisition of skills needed for planning and developing an ICT strategy, suitable infrastructure, and staff development. This indicator relates to school leadership; Learning and Teaching; Developing motivation, skills, and competences required for the successful implementation of the ICT strategy for the school.

This indicator relates to teaching staff; Productivity and Professional Practice: Quality of teaching aids and processes resulting from the realization of the ICT strategy. This indicator relates to teaching staff and students; Support, Management, and Operations: Quality of the realization of the ICT strategy of the school and provision of technical, professional, and moral support to staff. This indicator relates to school leadership, and administrative and technical staff; Assessment and Evaluation: Assessment of the quality of the educational process and the role of ICTs strategy within school culture. This indicator relates to school leadership, administrative, teaching and technical staff and may be realized at least partly; and Social, Ethical and Legal Issues: Quality of the ICT strategy concerning individual and group rights (Andrea Karpati, 2011)

2.3 Digital Literacy in TVET

Digital devices and technology are now major drivers of research, innovation, growth and social change. Digital literacy is needed in TVET towards achievement of sustainable goal via the following: function skills, creativity, critical thinking, cultural and social understanding, collaboration, ability to find and select information: effective communication; and e-safety. Digital devices has the ability to provide the means by which the widely-used concept of lifelong learning has an operational meaning. Without ICT, concepts like equal access to education and education for all are condemned to the fate of a slogan George & Alison (2010).

3. METHODOLOGIES

We adopt the use of questionnaire and observations for gathering data used in research. The questionnaire was structured and distributed to the sampled population by the researchers. We then observed the digital devices infrastructure available in the various institutions sampled with respect to their qualities, appreciation and applications. The questionnaire will be structure to accommodate and get information in the following categories:

- i. Personal background information
- ii. Experience with digital devices for teaching
- iii. Support to teachers for digital devices use
- iv. Digital device based activities and material used for teaching
- v. Digital device based activities and material used for teaching
- vi. Digital device based activities and material used for teaching
- vii. Teacher's skills in using digital devices

Response to questions in each category is tabulated and present as in table I - XI

Category I: Personal Background Information of Sampled Population

Table I: Age

Age Range	Response
Under 30	197
From 30 to 39	617
From 40 to 49	819
50 or more	417
Total	2050

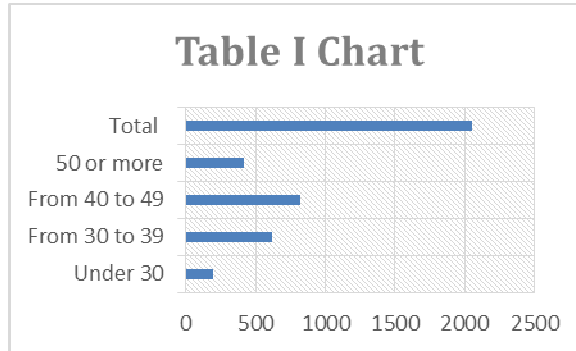


Table II: Gender

Gender	Response
Female	313
Male	1737

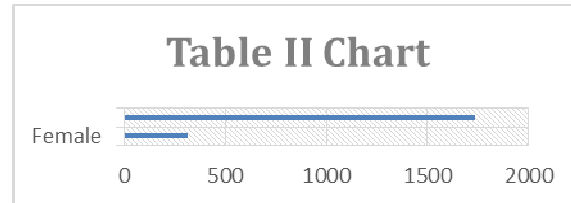
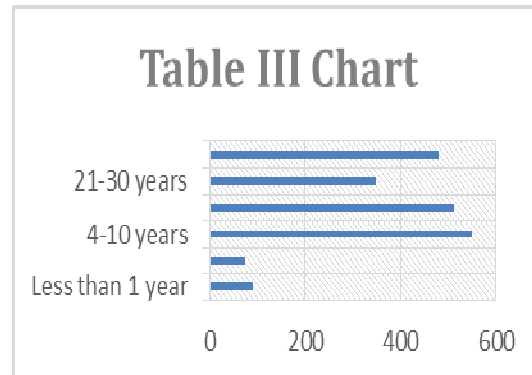


Table III: Length of Services In Polytechnics Sector.

Length of Service	Response
Less than 1 year	89
1-3 years	73
4-10 years	549
11-20 years	513
21-30 years	347
More than 30 years	479



Category II: Experience with Digital Device for Teaching

Table IV: Do you use computers and/or the internet for the following activities? *

Computer/internet use	Yes	No
Preparing lessons	817	1233
Students Assignment/feedback	313	1737
Class teaching	417	1633

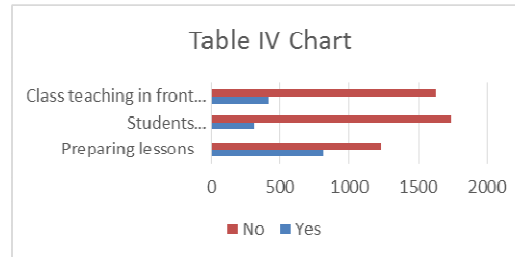


Table V: Period of using Computer in in the school

Period	Response
Never	309
Between 1 to 3 years	416
Between 4 to 6 years	917
More than 6 years	408

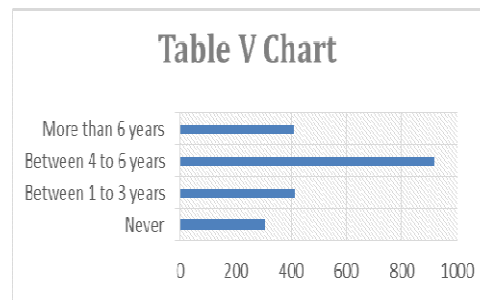
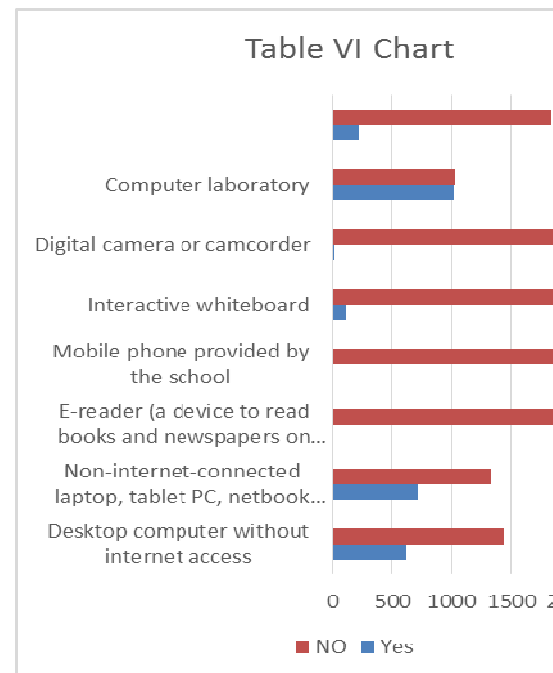


Table VI: Which conditions do you have access to digital devices in your classes?

Access Condition	Yes	No
Desktop computer without internet access	617	1433
Non-internet-connected laptop, tablet PC, netbook or notebook computer	719	1331
E-reader (a device to read books and newspapers on screen)	0	2050
Mobile phone provided by the school	0	2050
Interactive whiteboard	113	1937
Digital camera or camcorder	23	2027
Computer laboratory	102	1029
Does your school provide teachers with laptops (or tablet PC, desktop computers, netbooks, notebooks) for their own use?	219	1831

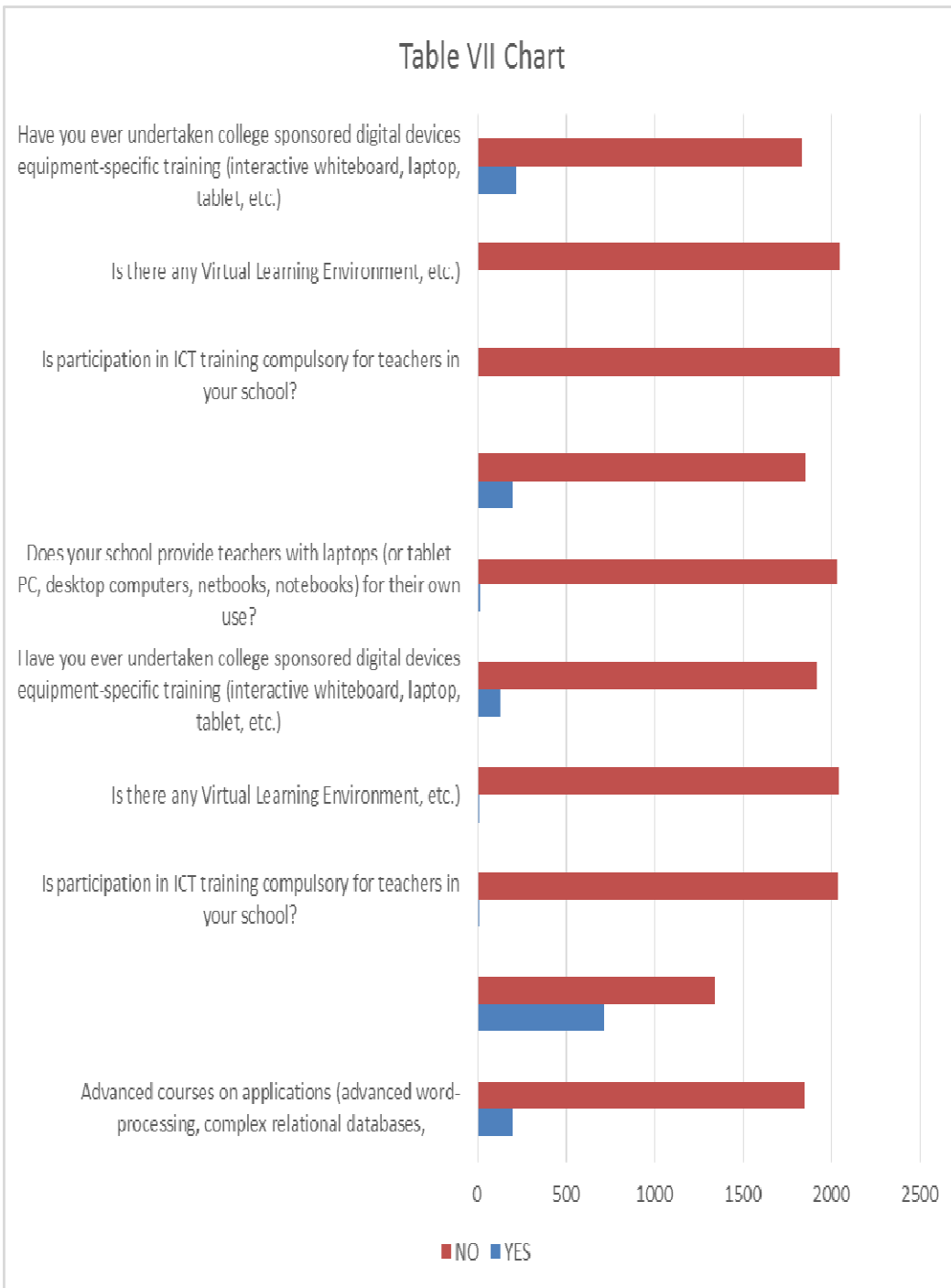


Category III: Support to Teachers for ICT/Digital Device Appreciation & Application

Table VII: Basic ICT/Digital Device support

Questions	YES	NO
Advanced courses on applications (advanced word-processing, complex relational databases,	199	1851
Have you ever undertaken college sponsored professional development in the following areas? Introductory courses on internet use and general applications (basic Word-processing, spreadsheets, presentations, databases, etc.	711	1339
Is participation in ICT training compulsory for teachers in your school?	11	2039
Is there any Virtual Learning Environment, etc.)	9	2041
Have you ever undertaken college sponsored digital devices equipment-specific training (interactive whiteboard, laptop, tablet, etc.)	133	1917
Does your school provide teachers with laptops (or tablet PC, desktop computers, netbooks, notebooks) for their own use?	19	2031
Have you ever undertaken college sponsored professional development in the following areas? Introductory courses on internet use and general applications (basic Word-processing, spreadsheets, presentations, databases, etc.	197	1853
Is participation in ICT training compulsory for teachers in your school?	3	2047
Is there any Virtual Learning Environment, etc.)		2050
Have you ever undertaken college sponsored digital devices equipment-specific training (interactive whiteboard, laptop, tablet, etc.)	219	1831

Table VII Chart



Category IV: DIGITAL DEVICE BASED ACTIVITIES AND MATERIAL USED FOR TEACHING

TABLE VIII: ICT/digital device Used for teaching

Questions	YES	NO
Browse/search the internet to collect information to prepare lessons	319	1731
Browse/search the internet to collect resources to be used during lessons	313	1737
Use applications to prepare presentations for lessons	311	1739
Create your own digital learning materials for students	93	1957
Post home work for students on the school website	13	2037
Use ICT to provide feedback and/or assess students' learning	397	1653
Evaluate digital learning resources in the subject(s) you teach	489	1561
Communicate online with parents	0	2050
Download/upload/browse material from the school's website	57	1993
Look for online professional development opportunities	799	1251

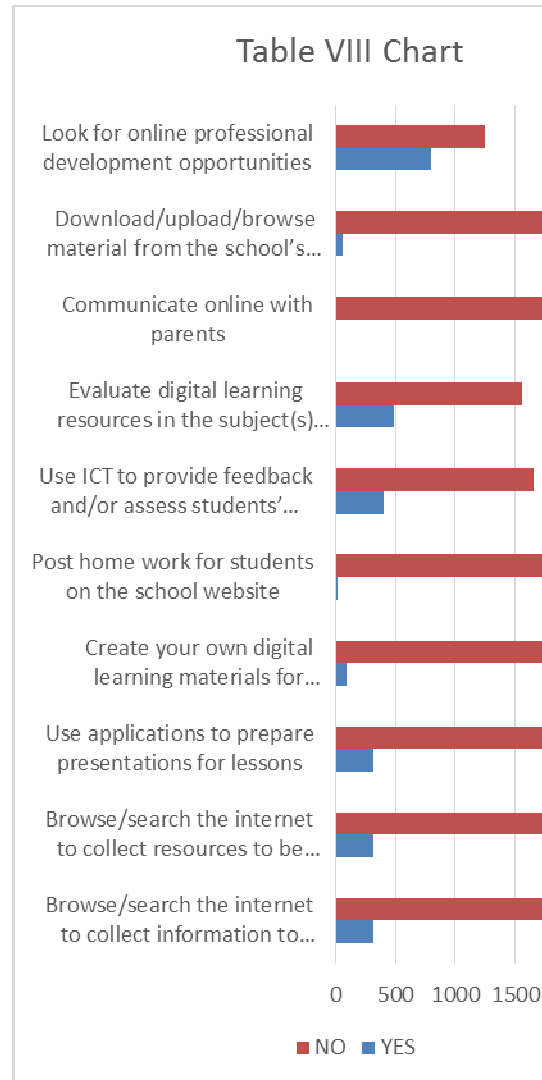
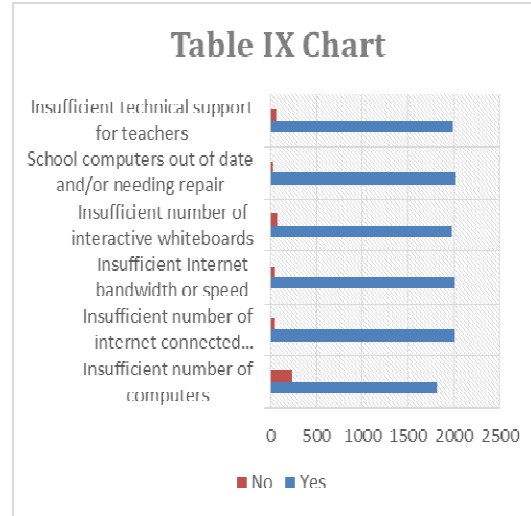


TABLE IX: Factor that militate use of ICT/Digital devices in teaching

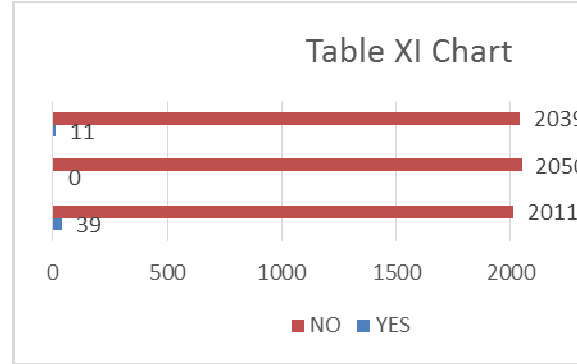
Questions	Yes	No
Insufficient number of computers	1817	233
Insufficient number of internet connected computers	2013	37
Insufficient Internet bandwidth or speed	2014	36
Insufficient number of interactive whiteboards	1979	71
School computers out of date and/or needing repair	2019	31
Insufficient technical and general supports for teachers	1993	57



Category VI: ICT IN SCHOOL MANAGEMENT

Table: X:

Questions	YES	NO
Do you use any Electronic Register System in your school? *	39	2039
Do you use any Learning Management System (LMS) in your school? *	0	2039
Do you use any Content Management System (CMS) in your school?	11	2028



4. DATA ANALYSIS AND ITS IMPLICATION ON TVET SUSTAINABILITY

Data gathered was presented as in table I to XI. Each of the data belong to a category. The analysis is done based on the table and implication of each analysis was given. Table I - III gives data on the background of the sample population. Table I, from the sampled population. 9.6% were under 30, 30.1% were in the range of 30-39, 30.95 were between 40-49, and 20.3% were 50yrs and above. The implication of this is that larger percentage of the sampled population still have appreciable years to be spent in the service as the retirement age for academic staff in this sector is 65years. Table II, about 15.3% of the sampled population were female.

The implication of this is that many undergraduates of the polytechnic will not be able to have motherly touch and guidance apart from the one they get from their various homes. In this case we suggest that empirical research should be carried out to investigate the sharp gap in gender participation teaching learning in polytechnic sector. Table III, about 92.1% of the sampled population have been in the service within the range of 4 to 30 years. The implication of this is that the sector can be boast of experience staffs.

Table IV - VI gives data on the sample population experiences on use of digital devices for teaching and learning. In table IV, about 37.7% of the sampled population uses digital devices for preparing lesson, class teaching, and student's assignment/feedback. The implication of this is that the sector is highly deficiency in the use of digital device for teaching and learning. Table V, about 15.1% never used digital devices in school. 65.02% have been using digital devices within range of 1-6years, while 19.9% have been using digital device for more than 6years. Refer to table III, about 95.6% of the sampled population have been in the service between 1-30years and only 65.02% uses digital devices in school. In table VI, the condition of access to digital devices in classes fell below acceptable requirement for digital devices usage in education in this modern day.

In summary, table IV-VI data implied that teacher's experiences with digital devices for teaching fell below average and this could be dangerous to TVET sustainability.

Table VII, gives data on support to teachers for digital device appreciation and usage. Far above average of the sampled population never undergone any sponsor training in usage or handling of digital devices, teacher were not provided with digital devices to assist them in teaching and learning. No virtual learning in all school sampled, and participation in ICT training is not made compulsory. Consequently there is no adequate supports to TVET teacher in appreciation and application of digital devices in teaching and learning.

Table VIII, give data on various digital devices and application used for teaching in TVET. About 15.4% used internet to collect information for lessons plan and resources during teaching. 9.8% uses applications to prepare presentation for lessons/creation of own digital materials for students, 0.06% post home work for students on the school website. None of the sampled population do communicate with parent online, only 2.7% download /upload/browse materials from the school website. Based on the data on table VII, as there is no appreciable support to teachers in appreciation and application of digital device, certainly the data in table VIII is expected and is true reflections of lack of support to teachers. The implication of this is that TVET graduates will not be digital device savvy in this modern day that is been drive by ICT and its technology which is an integral part of digital world.

Table IX gives data on factors militate the use of digital devices in TVET. Larger percentages of sample population are of the opinion that, insufficient number of computers, non-availability of internet, interactive whiteboard, some digital devices available are out of date, and no adequate support for teachers.

Table X provides information on application of digital devices in school management, the data shows that the use of digital devices and technology in TVET fell below acceptable standard as 19%, 0%, and 0.05% of sampled population agreed to use of electronic register, learning management system (LMS), and content management system in their schools.

5. RECOMMENDATION AND CONCLUSION

Based on the data gathered and analysis, we strongly recommended that: researchers should investigate the sharp gap in gender participation in TVET refer to table I; stakeholders should provide robust supports to TEVT teachers for better appreciation and application of digital devices/ICT in teaching and learning; and the condition of access to digital devices in TVET must be improve to meet up with modern day requirement of ICT driven environment by rapid digital devices/ICT infrastructure development in TVET institutions. There is no doubt that TVET is the key factor towards entrepreneurship development, self-dependent and economy sustainability. Hence there is need for sustainability of TVET in other to meet up with millennium economy goal. In this era of digital device/ICT driven economy, stakeholders in TVET must do everything possible to enhance TVET relevance in economy development. The best approach to this is to improve digital devices/ICT appreciation and application in TVET so that we can achieve TVET sustainability.

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