Blended Learning in the Vocational Education and Training System in Tanzania: Understanding Vocational Educators' Perceptions

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Abstract

In a constructivist world of teaching and learning, opportunities to acquire and develop the knowledge and practical skills necessary to design, establish, and deploy blended learning in vocational education and training (VET) programs delivery is a labour-market-driven. The paper examines VET educator's pleas about the need for the design, adoption and deployment of blended learning in VET programs delivery in Tanzania. A single case study design with an in-depth interview and focus group discussion was conducted with 15 VET educators in three VET colleges in both Morogoro and Dar es Salaam regions. Snowball and purposive sampling were used to obtain sample respondents. For the data analysis, content analysis was employed to condense data obtained from interviews and focus group discussion. It was found that continuous professional development, institutional arrangements, and support should be provided online to facilitate the design, adoption and use of blended learning in VET. We recommend that locally designed blended learning should be relevant to the environment of both students and teachers. In reality, the interplay between blended learning, imparting knowledge and practical skills remain the key focus of future research.

KeyWords: Blended Learning; Vocational Education and Training; Learning Technologies and Professional Development; Tanzania

1. Introduction

Innovations in information communication and technology (ICT) for education resolutions have changed the teaching and learning processes among teachers and learners at almost all levels of education. As teaching and learning change, population demands for education also change rapidly. These changes have been triggered by technological innovations in education and jobs in most of the developing countries including Tanzania. For instance, in 2009, Tanzania's population was about 34 million people (Komba, 2009) and six years later (in 2014) the number had increased to 45 million people (United Republic of Tanzania, 2013), while currently (in 2016) the number is approximately 51,045,882 million people (Central Intelligence Agency (CIA) data as of July, 2015). With the current intense population increase, people have become curious about new learning technologies that would help to offer education without

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any restriction of time and location as well as employable skills. As Afeti (2015) wrote, the huge deficit in the employment statistics is not related to the high population growth rate of African countries and the increasing number of school leavers arising out of national initiatives to achieve universal primary education and Millennium Development Goals (MDGs).

It is estimated that about 700,000 young people add to the labour force each year in Tanzania, while the annual real growth rate in many countries is less than 2%, limiting the prospects for employment creation (Afeti, 2015; Johnson & Adams, 2004). On the other hand, education in Tanzania is treated as a strategic agent for mindset transformation and for the creation of a well-educated nation (United Republic of Tanzania, 2008). As a result, the education that is delivered must enshrine the country vision of development as it offers opportunities to acquire relevant knowledge, skills and attitudes needed in order to survive and thrive in the information and knowledge society.

Available literature has shown that VET programs delivery has not kept pace with rapid learning technological changes, including blended learning and e-learning which have more benefits than challenges; for example, informal skills development, assessing teaching and learning progress, research and communication, improving labour market information and educational attainment (Afeti, 2015; Kitainge, 2004; Sahin, 2010). Also, the wide adoption of ICT in education settings, including VET, has impelled a debate about the design, adoption and implementation of blended learning in VET delivery accelerated by the rapid technological changes occurring in the workplace (UNESCO, 2005).

The second reason is based on the growing demands of secondary school leavers aspiring to join VET programs countrywide. In connection with this point, Afeti (2015) affirms that in Tanzania less than five percent of the labour force is educated above primary school level. As a result government and VET providers need to rethink its provision to the majority who left school at the end of primary school. To achieve the same goal about the application of new learning technologies and possibly those that offers great opportunities to students to acquire skills and attain quality vocational education by placing more emphasis on constructivist teaching and learning as well as solving communal problems is inescapable. However, for the VET educators, learning how to use new learning technologies has been a major challenge while for their students the emphasis may need to be placed on the importance of technologies for their learning and at what time should be used. The fact is that the curriculum taught is outdated, with dilapidated teaching and learning resources and more reactive than proactive approaches (Hunter & Aiken, 1984; Moldovan & Stav, 2011).

Nevertheless, VET institutions, teachers, students and other stakeholders should be flexible and adopt newly innovated learning technologies into the entire VET related curriculum. In terms of technology use, VET educators are working on the strange environment compared to other in another part of the world. Only a few VET colleges in Tanzania and those found in big towns and cities have the technological recipe of teaching and learning. In the views of that professional development should be provided to VET educators for becoming better informed about new learning technologies being evolved in the area of education (Miller, 1997). Not only that but also VET colleges should integrate new learning technologies. Students on their side have experienced fast the application of Internet use in their learning and are knowledgeable about the evolution of new learning technologies since they are using Web 2.0 and Web 3.0 technologies for learning. All these need VET educators to consider the ways in which students' out-of-institutions experiences with technology relate to their in-institutions experiences so that appropriate help can be offered to students using the new learning technologies.

2.   *Theoretical Background*

2.1   *Teaching and Learning and the New Learning Technologies in VET*

The growing demand for VET programs in Tanzania has increased both schooling and administrative costs to parents and students. Virtual classrooms, schools, colleges and universities offering classes had increased owing to the increase of new ICT applications (cf. e-learning and blended learning) as a result had changed the ways of teaching and learning. For instance, virtual education allows students to study at their own time, place and pace. As technological changes in education settings, the ways of teaching and learning have also changed. For example, established computer application courses, Internet labs for the students and the installation of Internet cable in staff offices (UNSECO, 2005) are noted in some VET colleges. In line with this, there has been an increase in computer use in education that has influenced dramatic changes in the ways that teaching and learning are delivered. VET educators in some colleges in Tanzania are using computers for teaching and learning. Indeed, the use of ICT in VET program delivery is increasing and myriad technology based models are being developed and deployed. The use of ICT offer opportunities for pedagogical aspects to be engaged in teaching and learning (cf. blended learning, e-learning) (UNESCO & ILO, 2002b). The idea to priorities application of Information Communication Technology for Development (ICT4D) for the purposes of social, political, economic and education development in developing countries has been recognized since 1956 (Heeks, 2009; Putjorn, Ang & Deravi, 2014) when the first digital computer for numerical work was installed in Kolkata, India.

In Tanzania, the first computer use in VET classes occurred at Chang'ombe Vocational Training Colleges in the late 1990s. Mostly, computer courses and other related subjects dominated the use of computers in classrooms. However, few computer labs were strictly used for official purposes. Technical schools[i] like Moshi and Ifunda that were used to train technical students following specific career paths were in place even before independence in 1961 (Moshi, 2014). Nevertheless, no computer and related skills subjects were taught to students (Ministry of Education and Vocational Training, 2007). As a result, the VET curriculum has emphasized the needs of the time. By the end of the first decade of the 2000s, very few VET educators were using computers for teaching (cf. the use of PowerPoint and the preparation of teaching manuals). Likewise, in 2003 National ICT policy was introduced to manage all ICTs related activities in the country. Since then institutions related to education have introduced their ICT policy.

However, ICT4D adoption in VET has been a solid response to achieve VET's institutional vision, goals and aims. In particular, the extensive use of new learning technologies as well as the computer-supported learning environment has made it possible to design and utilize new learning pedagogies in VET program delivery that are realistic, collaborative, authentic, and engaging (Heinze, & Procter, 2004). For example, any applications of Web 2.0 technologies and experiences in VET such as weblogs, wikis and social networking could yield affordable results in the provision of VET programs delivery. Köse (2010) explains that Web 2.0 is the second generation of the Web, assembling interactive, online applications and systems that computer users can use to form and share information, communicate with other users and adjust electronic content according to their needs.

2.2   *VET Practices in Tanzania (1940 to Date)*

Literally, VET programs in Tanzania, as it used to be in most part of developing countries, started as an apprenticeship training during the colonial regime based on the 1940 ordinance; Cap.81 of the Laws (Moshi, 2014). Most of the VET programs were practically oriented and offered within Moshi and Ifunda technical school premises. From then, VET practices have undergone extensive reformation and renovation, to the point that current VET programs are practiced widely in the country via public institutions under the Vocational Education and Training Authority (VETA) and private institutions. Other institutions providing employment-preparations skills for trained labour (VET programs) include

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Folk Development Colleges (FDC), technical secondary schools and private vocational schools and centers. However, owing to technological changes, the number of students aspiring to VET programs has increased, while the mode of VET programs delivery seems to have slowly shifted from mainly workshop practices to newly technologically innovated modes. This has been influenced by a notion that VET prepares manpower to serve mainly the industrial sector forgetting that VET also offers manpower to serve other sectors like hospitals, the tourist industry, hotels, entrepreneurship and trade (Afeti, 2015; Johnson & Adams, 2014).

2.3   VET Current Situation, Organization and Administration
2.3.1   Current Situation

  The VET system in Tanzania focuses on the provision of skills to the labour force that enables them to enter and re-enter skills training and retraining with a view to acquiring and maintaining decent employment and employability (Moshi, 2014). In this respect, vocational education is defined as a practically oriented, illustrated, and attempted job or career skills instruction that includes a variety of components such as agricultural education, business education, family and consumer sciences, health occupations education, and marketing, technical, trade and industrial education (URT, 2008). Most VET providers in Tanzania (public and private institutions) confer certificate and diploma levels in soft skills (cf. secretarial courses), and blue collar-tradition-programs are offered in diverse careers such as lumbering, cooking, plumbing, carpentry, painting, mechanical, electrical, masonry, computer application courses; tailoring, cloth and design, and music artists (UNESCO, 2013). These VET courses are offered to those who aspire to upgrade their competence in their career, and for those who want to acquire new skills on their expected career.

  However, owing to Web 2.0 facilities such as the Internet, e-learning platforms, blended learning facilities and affordable power sources, most VET centers have not practiced blended learning. Hence, it is a challenge to practice blended learning delivery models. VETA is looking, as well, at the possibilities of adopting blended learning, online learning and e-learning for teaching and learning so as to capitalize on the benefits therein to learners and educators. In support of that, Moshi (2014) reports that among the alluring future plans of VETA are mainstreaming ICT to training systems and establishing e-learning systems that are based on the blended learning platform. That is, VET colleges and centers should establish educational technology units that would be providing technical and pedagogical support to both VET educators and students.

  ICT has been adopted in VET as a subject geared to teaching computer related skills and methods rather than envisioned on future requirements for workplace and opportunities to acquire the skills, knowledge and attitudes needed to survive and thrive in the current growing information community. However, few specific VET institutions have been established to prepare ICT specialists as an initial step to adopt and deploy blended learning in VET programs delivery. Currently, most VETA owned colleges and centers have ICT units used for teaching and learning ICT-related skills. That is remarkable progress in a bid to design and adopt blended learning.

2.3.2   Organisation and Administration

  In Tanzania, the Ministry of Education and Vocational Training (MoEVT) is responsible for the organization and administration of VET programs offered by both public and private institutions. However, the Vocational Education and Training Authority (VETA) under MoEVT, set standards and issues VET guides for implementation through a network of public and private colleges; as well as

vocational centers (Moshi, 2014). VETA is an autonomous agency of the government financed through a payroll levy. The role of VETA recognized countrywide with its regional and some district VET centres offering diverse VET courses depending on individual and societal demands (VETA, 2010).

2.4   *Blended Learning in VET Teaching and Learning Systems*

  Although blended learning has been in place in diverse modality, there no single unified definition of blended learning in VET let alone in other fields of study. Studies report that blended learning is a combination of face-to-face and online learning experiences/approaches (Garrison, & Vaughan, 2008; Hoic-Bozic, Mornar, & Boticki, 2009; So & Bonk, 2010). These and many dozens of studies have examined blended learning as just a combination of teaching and learning modalities. However, the modalities differ from one domain to another. For example, there are those who combine e-learning and face-to-face learning and label it as a blended learning. Similarly, Zhu (2014) has an opinion that blended learning is a mix of a wide range of instructional media such as online instruction, mentor-led-support, webinars, jobs aid, collaborative platforms, courseware, simulations, e-learning and traditional teaching and learning (print-media, classroom) (Dziuban, Hartman, & Moskal, 2004). That is, with multiple ICTs integrated together learning can take place. In this context, blended learning in the VET system can generally be described as the integration of various vocationally based learning activities (individual and classroom activities) together with ICTs to enhance teaching and learning. In this study, blended learning should be understood as the integration of ICTs into the normality of teaching and learning in VET. This may include a mix of the classroom (face-to-face) instruction and online instruction. Holmgren (2012) stressed that the adoption of blended learning in the VET systems can also facilitate the accessibility in VET education and be enablers of the populace and hence enhance poverty reduction in developing countries. Figure 1 illustrates blended learning from diverse learning activities (combined face-to-face learning and e-learning).
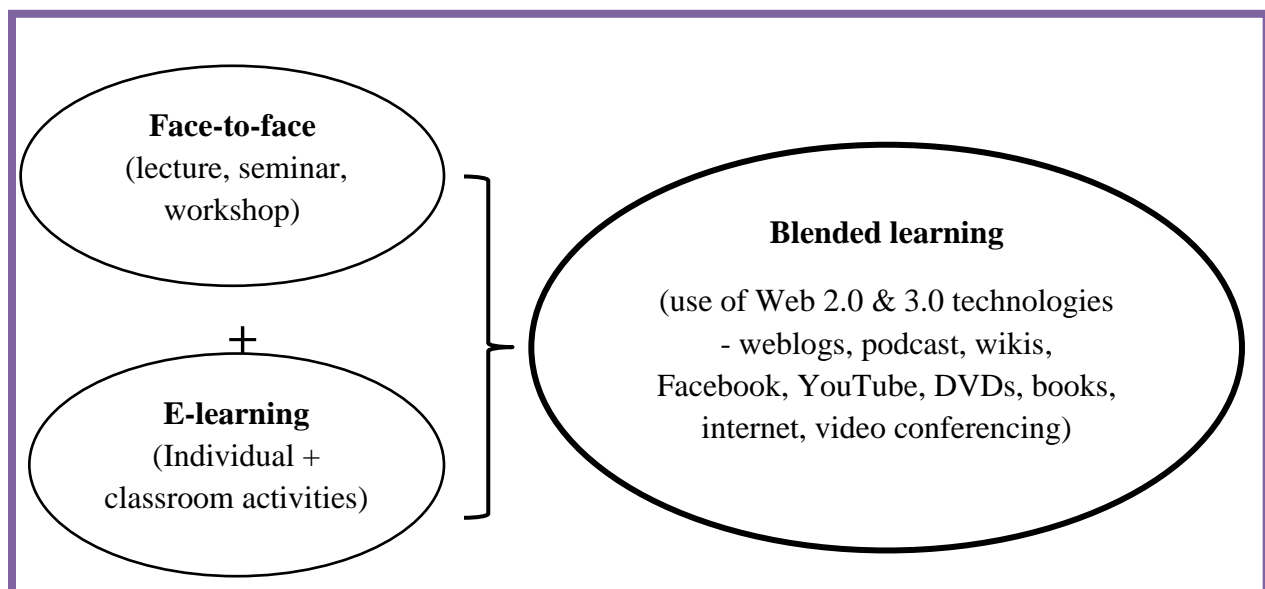

Fig. 1 Blended learning delivery model

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The ongoing debates on deploying blended learning in the VET program delivery entail the idea that for vocational pedagogy to succeed, there must be more technological shifts from a reactive approach to a proactive approach to teaching and learning by designing and adopting the newly innovated learning technologies and allowing curriculum reform and revision to incorporate the same in the VET system of teaching and learning. The focal point is that locally designed blended learning is one step toward a proactive approach that aims to reform vocational pedagogy in Tanzania by focusing on how students learn but also on how they advance after college. Based on a blended learning ethos, the deployment of new learning technologies that allows easy access to quality VET programs; and open up education and training systems to all are recognizable. However, this study aims to examine VET educators' opinions on the vital need for the design, adoption and implementation of blended learning in VET programs delivery in Tanzania.

3. *Research Objectives*

The study aimed to examine VET educators' opinions on the needs for the design, adoption and deployment of blended learning in VET program delivery in Tanzania. More specifically, the following research objectives emerged to inform the study:

a) Examine VET educators' conceptions of blended learning in VET programs delivery.
b) Investigate VET educators' views on the ongoing debate on deploying blended learning in VET programs delivery.
c) Examine the urgent needs for the design, adoption and deployment of blended learning in VET programs delivery.

4. *Research Questions*

This study was guided by the following research questions:

a) How do VET educators conceive of blended learning in VET program delivery?
b) How do VET educators view the ongoing debate about deploying blended learning in VET program delivery?
c) How far are the design, adoption and deployment of blended learning urgently needed in VET program delivery?

5.   Methods
5.1   Design and Participants

This is study employed a qualitative single case study design. The design allows researchers to explore or describe a phenomenon in context using varieties of data sources (Baxter & Jack, 2008; Vohra, 2014).The design was chosen because blended learning was a case in the VET program delivery, and VET colleges were our context of the study. It was in this setting, the design was used to produce detailed descriptions of blended learning in the VET program delivery. In-depth interviews and focus group

discussions were used to inform the study. Owing to limited ICT4D VET educators, 15 VET educators with ICT4D know-how and who had involved in teaching diverse VET courses through blended learning approach were sampled via snowball and purposive stratagems. Of these five were selected for in-depth interviews based on their teaching experiences and having used computers for teaching for at least five years. 10 VET educators were selected purposively to form three focus group discussions; of which each group had three to four participants. Two weeks before actual data collection, research permit was requested to 10 colleges and permitted to researchers with conditions to display the aim of the research. Researchers accepted and displayed the aim of the research. An arrangement was made for successful data collection process. Before data collection process, participants have assured anonymity, storage, confidentiality of the information offered. Strategies used to obtain respondents and arrangement for data collection are displayed in Table 1.

Table 1 Strategies for sampled interviewees and data collection techniques

VET Colleges	Number of respondents	Sampling strategies	Techniques		Grand Total
			Interview	FDG*	
X	5	Purposive + snowball sampling	2	3	5
Z	5	Purposive + snowball sampling	1	4	5
Y	5	Purposive + snowball sampling	2	3	5
Total	15		5	10	15

FDG*- Focus group discussion

5.2 *Context of the Study*

The study was conducted in three VET colleges managed and governed by the government via its agency: VETA in Tanzania. Before the data collection process, participants requested anonymity of the college names; their request was granted and the visited VET colleges were assigned pseudonyms: X, Z and Y. Conspicuously, although researchers were permitted to conduct research in ten colleges, the selection of the VETA colleges was based on the fact that VETA has a gigantic network of VET colleges (about 28 VET colleges) nationwide (Jumanne, 2015). Furthermore, the three visited colleges out of 10 were recommended by three senior VET educators who were also endorsed by three different groups of senior students based on how their teachers apply computers and the Internet in teaching and learning process.

5.3 *Data Analysis*

In this study, content analysis (cf. latent analysis) was employed. The transcripts of the in-depth interviews and the focus group discussions were categorized (coded) by identifying themes as well as assigning meaning to the text. The process was accurately managed to increase trustworthiness by (i) data treatment involved reading and re-reading the text, (ii) focusing on the objectives of the study and reviewing the research questions, (iii) identifying key questions to answer and themes as emergent from findings, (vi) looking for consistencies and difference of responses provided, (v) thereafter we explored

the connections and relationships between research questions and themes expressed within the responses, (vi) data pertaining to the same theme were amassed together based on relative importance and implication.

6. *Findings And Discussion*

The study involved 15 VET educators from three VET colleges. Of these, 10 were male (66.7%) and 5 were female (33.3%) with ages ranging from 35 to 58 years old. 10 VET educators were selected from two VET colleges in the Morogoro region and five educators from one of the Dar es Salaam region VET colleges. Data obtained were analysed according to themes as they emerged from the respondents' responses. Findings are presented and discussed based on the themes.

6.1 *Conceptions of Blended Learning in VET Programs Delivery*

Both interviews and focus group discussions were used to inform the study that generated diverse themes forming the basis of the analysis. Conceptions of the blended learning theme were significance as it unveiled educators' understandings of the term blended learning and paved the way to the next questions in the interviews and the focus group discussions. First, we organized one-to-one interviews followed by intensive focus group discussions. During interviews, respondents were asked how they conceive of blended learning in the VET program delivery. VET educators' responses revealed diverse knowledge and understandings with regard to blended learning. Interviewees demonstrated that blended learning is an educational approach that allows combinations of diverse teaching and learning techniques and technologies. Results also showed that some VET educators were familiar with the use of ICTs and Web 2.0 technologies in education, although they were not fully utilized in VET program delivery. Interestingly, during the interviews, the majority of the VET educators stated that blended learning enables both students to take education from anywhere, at any time with the support of computers connected to the Internet. During the interview one of the VET educators responsible for on-campus and off-campus training had the following to say:

> …I heard the term 'blended learning' the first time when I attended a five days short course training on Web 2.0 technologies in South Africa….that is a mix of diverse learning techniques and technologies…Since then I have been trying to blend my teaching and students' learning activities as a personal effort…

Another female VET educator with six years of experience teaching mathematics and computers related course was found to have interesting conceptions of blended learning in the VET system of delivery and she said:

> …blended learning in VET is more than a combination of well-known traditional education techniques with newly innovated learning technologies…It is concerned with mastering Web 2.0 technologies and its application in my daily work as a vocational tutor…

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From both excerpts, it suffices to argue that the VET educators were knowledgeable about the existence of blended learning in the education arena even though its utilization was an individual perspective as was noted by one of the participants. Most of the respondents had rigorous conceptions of blended learning as it is used to be conceived elsewhere in the literature. In support of their conceptions, Köse (2010) perceived blended learning as a learning approach that contains different types of education techniques and technologies, including e-learning (UNESCO, 2005), and face-to-face learning. Another school of thought generated from the findings was that arguing about combining face-to-face and e-learning in VET systems of delivery is not enough to advance blended learning in VET colleges. However, there should be reciprocal institutional arrangements for its design, adoption and implementation as well as embracing the ethos of Web 2.0 technologies such as wikis, blogs, and other interactive learning technologies to support its implementation. Blurton (1999) clearly indicates that integration of blended learning and e-learning requires unique skills set, provide adequate training to instructors and build information society on the basis of specific knowledge or content area.

6.2 *Web 2.0 Supporting Blended Learning in VET Program Delivery*

In a group discussion, in an ICT specialized VET center in Dar es Salaam, respondents were very interested in the implementation of Web 2.0 technologies at all levels of VET program delivery because they were aware of new learning technologies and skills that are highly needed in the market for graduates to be employable. For instance, it was revealed that new learning technologies reinforced by Web 2.0 interactive technologies support the integration and implementation of blended learning. In support of that, one respondent teaching software programming course had the following to share:

> …At this VET center, we are offering *"soft skills"* VET programs like computer application courses and related skills and not blue collar traditional occupations like mechanics…However… adopting blended learning builds up highly skilled workforce with the know-how…

This idea was supported by other respondents who showed their interest and detailed examples of how to design and use a blended learning approach to deliver VET programs. It was noticed that most of the VET educators in the ICTs VET centers were practicing blended learning by being able to provide online learning support to students like online discussion, questions and answers via skype, posting and sending assignments as well as providing feedback wherever they were. They supported the notion of deploying blended learning in VET by revealing that blended learning in VET can be supported by first deploying Web 2.0 technologies and experiences in all VET programs offered. This can be done by reviewing and incorporating the designed model in the VET curriculum. In a group discussion, the head of technical assistance to students and teachers declared the following:

> ….in order to deploy blended learning in VET program delivery, the approach should be incorporated into the curriculum…so to me I think first we have to review curriculum and secondly provide indoor awareness training as well as short and long-term training….

Findings reported remarkable progress since VET educators are knowledgeable about other supportive ICT tools related to blended learning, Web 2.0. This was a subtheme emerged during focus group discussions as they were asked about their conceptions to blended learning. VET educators testify to be

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well-informed about how to use Web 2.0 technologies. Similarly, VET educators should adopt and implement blended learning based on its core principle of integrating ICTs in teaching and learning. Providing VET colleges and centers with know-how and resources would enable deployment of blended learning. Research conducted by Birkenholz & Stewart (1991) clearly indicates that instructors should have enough knowledge and practical skills necessary to establish, manage, and appraise blended learning in VET program delivery. VET colleges should promote the use of blended learning, and in order to do so, instructors should be trained.

6.3   *Opinions on Deploying Blended Learning in VET Program Delivery*

  The VET educators held strong opinions about deploying blended learning in the VET program delivery. Most of them showed interest in using blended learning while very few stated that deploying blended learning would reduce their incomes as they were used to traveling out of the station to attend students during their field practical, workshop and project work. During the interviews, it was openly disclosed that some of the VET educators depended on off-campus training and supervision to gain extra income as well as through other means but it was the main way to acquire extra income. Here is what one of the respondents, aged 45 years old lamented:

> …listen carefully and you have to report this, apart from newly innovated *"soft skills"* though, VET in Tanzania are "blue collar traditional" programs and we depend on those off campus practical programs for extra income…..Now blended learning influences offering education at anytime, anywhere so do you want to reduce some fringe benefit to educators, how are we going to survive in this miserable life?…

  Surprisingly, the same respondent declared that she used mobile phones, email and social networking like Facebook for communication with students when important issues that required urgent notifications from students. However, the majority were observed to hold almost the same views about deploying a blended learning approach to VET, although they were surrounded by hindrances related to blended learning implementation. One of the VET educators who viewed blended learning in a supportive way and its implementation as just a matter of time owing to the vast technological transformation and investment made so far in the various VET colleges; had the following to share:

> ….regardless intermittent power outages and other hurdles…..remarkable improvement has been made in VET colleges. For instance, the college has installed cable Internet in each office with desktop computers, increased computer café with the Internet ….so to me blended learning in VET program delivery is just a matter of time….

  Based on these findings, it is very common for any new promoted innovative technologies in any field to be resisted by stakeholders and these have the higher degree of skepticism with little financial stability (Choi, Kim, & Lee, 2010; Robertson, Swan, & Newell, 1996). VET educators who are not familiar with the relevant utility of the blended learning approach in the modern technological era; opt to resist any shift to new teaching and learning approaches. This is supported by Diffusion of Innovation theory (Rogers, 1983); wherein innovation is communicated through different channels over time among members of a social system (cf. VET educators). However, it was observed that changes in teaching and learning as influenced by new learning technologies are inexorable and that whose implementation is likely to produce the best graduates of the time. In accordance with these findings Arh, Pipan, Blažič, Debevc and Peternel (2009) report that Free and Open Education Resources (EOR) can efficiently address

many of these issues, and provide higher quality, reduced costs and increased availability of different platforms and other educational applications available (Machumu & Kissanga, 2014).

   In support of that, respondents in one group discussion stated that to address changes in workplaces as prompted by labour market demand; locally designed blended learning should be in place as a means to enhance manpower development and VET accessibility. Here is a claim from one of the interviewed respondents:

> …in my view adoption of blended learning in VET programs delivery is online with technological demands from workplaces…..However, locally designed and implementation should go hand in hand with the mushrooming of VET centers countrywide…This is in line with the utilization of social networks and mobile phones for teaching and learning…

   In juxtaposition to these findings, the design of locally blended learning models should be influenced by VET educators' professional training that stimulates changes in mindsets, attitudes and views of blended learning. However, institutional arrangement by VET providers should be in place as a means to support blended learning design, adoption and implementation. In support of that Jumanne (2015) report that owing to little funds allocated for the administration of the VET programs especially for ICTs related subjects, VETA was argued to adopt, implement and integrate e-learning, blended learning, mobile learning and application of social networks as a platform for teaching and learning. The idea concurs with that of Robertson & Newell (1996) who argued that networks play a great role in the diffusion of technological innovations like social networks and mobile learning in education settings. UNESCO (2002a) posits that large distance learning programs including those of computer-mediated teaching and learning may produce graduates at considerable lower costs than conventional institutions (Komba, 2009).

6.4   *Need for blended Learning in VET Delivery*

   Results show that a flexible VET delivery system is urgently needed; changing ways of teaching and learning, change in technology, labor market skills, employability and long life learning skills to VET graduates and educators' guaranteed the need for the design, adoption and implementation of blended learning in VET program delivery in Tanzania. However, during interviews, respondents exposed that increased VET programs aspirants and the number of admitted students have never matched with VET colleges' capacity to offer VET programs in the country. The same has observed from group discussion as one of the participants affirmed that:

> …students applying for VET programs have gained more in both soft skills and blue collar traditional occupations than our expectation and new mechanisms have been devised for screening…in order to match with our capacity of offering quality education…

   The excerpt reveals that students are denied their right to education as a result of the incapability of VET providers. However, policy and other education enactments in Tanzania confirm that the application of ICTs and related innovations offer new opportunities to enhance education and to improve the quality of delivery of education in all areas (Machumu & Kisanga, 2014; URT, 2007; URT, 2008). Based on these findings, to curb the same, there should be high level mental efforts that go hand in hand with innovative technological changes in teaching and learning approaches, including devising e-learning, mobile learning and blended learning (Miller,1997) supported with Web 2.0 and Web 3.0 technologies and being incorporated in VET program delivery.

In connection with that, VET educators were asked *what is needed with regard to the design, adoption, and deployment of blended learning in VET program delivery.* The following aspects were given first priority: teachers' professional development; the recruitment of new VET educators with computer and related skills; institutional support by allocating stand-alone budgets to enhance blended learning facilities; the establishment of e-learning systems in all VET colleges; students' awareness; and curriculum review to incorporate a blended learning delivery approach. As it was unveiled:

> …blended learning is not a problem to me….while well-designed training should be offered…so that I should be able to deliver the best education to my students…since this thing seems to be new in our context…

Arguably, VET educators have the high zeal to practice blended learning; however, awareness and technical support should be in place for them to master the new skills. For example Jummane (2015) report that the government of Tanzania is in need of professionals who had acquired ICTs knowledge and skills in a bid to curb related problems in the VET program delivery. In support of that, another respondent had the following to share in the group discussion:

> …we need clear guidance, technical advice to technical problems as well as an educational technology unit whereby both students and staff will have opportunities to learn from experienced experts…

In a group discussion, two contradictory ideas emerged when respondents were asked if there were a pressing need for the design, adoption and implementation of blended learning in VET program delivery. Here is one of the comments:

> …I have been teaching VET programs since 1980 and I think…learning technologies have nothing to do with the pedagogical aspect in the domain…and for sure there is no urgent need….and let funds go to other sectors like health and agriculture…

In connection with these findings, the majority of VET educators expressed diverse, views and recommendations with regard to the design, adoption and implementation of blended learning in VET program delivery in Tanzania. The majority of respondents to in-depth interviews and focus group discussions agreed that there was a dire need for designing locally blended learning models and being implemented owing to change the nature of teaching and learning processes in the discipline. This awareness and needs call for stakeholders, including government, private companies and bilateral partners, to join hands in assisting the implementation of blended learning as a mean to influence the provision of quality VET education to all aspirants. In support of that Arh et al. (2009) argued that in spite of substantial investment in computers and connectivity of VET, the skills and motivation of teachers in VET to apply ICT in their daily teaching activities are still inadequate and under expectations. However, being aware of technological changes in the VET sector as a result of ICTs adoption is just one step to the successful implementation of a well-designed blended learning model that align with the VET programs. Although some of the respondents were not okay with blended learning initiatives, it was observed that inadequate competencies and lack of blended learning materials and high costs of infrastructure hinder their motivations to acquire ICT relevant skills.

7.   *Conclusion and Recommendations*

Based on these findings, the VET system in Tanzania has undergone incredible changes since 1940 from having two technical schools based on apprenticeship training to the current situation whereby there has been a vast increase of VET colleges both private and public offering diverse job-oriented skills. As technology changes, also, the demand for new skills has been changing to cope with labor market and employability demand. Notwithstanding, teaching and learning approaches have been innovated to facilitate quality learning processes; in this regard, blended learning in VET as reported offers new opportunities to merge traditional VET teaching and e-learning based on real-life working processes. We recommend that prior to its adoption in VET; a locally designed model should be invented online with teachers' continuing professional development (CPD); curriculum review and the establishment of educational technology units.

It was recommended that that work-related training (professional development) was required to maintain professional standing and excellence in diverse format. Also, in a bid to deploy blended learning in VET program delivery, VET educators were advised to find out short and long-term training. As it is known in Tanzania, education is treated as a strategic agent for mindset transformation and for the creation of a well-educated nation (URT, 2008), sufficiently equipped with the knowledge needed to solve completely and competitively the development challenges facing the nation. However, in a constructivist, teaching and learning through blended learning approach encourage teachers and students to acquire and develop the knowledge, life skills, employability skills and practical skills necessary for workplaces and lifelong learning. VET educators should demonstrate their competence in technology pedagogical and content knowledge in regard to subject taught is of paramount importance as it enhances students learning. Although the deployment of blended learning in the VET system in Tanzania seems to be on the premature stage, we recommend that its theoretical context should be retained.

Acknowledgments

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[i] Techical schools in Tanzania were founded to train the labour skills related to mechanical and industrial arts and related sciences during the colonial era. After independence, National Vocational Education and Training Centers were established and other skills were included to prepare people for specific skills and to develop expertise in techniques related to technology, office management, business and applied sciences.

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