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Contribution of ICT in Enhancing Quality and Accessible Life-long Learning in TVET Through Open Learning for Sustainable Development

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Abstract

Purpose: TVET systems need sustained transformation and revitalization to realize its enormous potential to impact on sustainable development through its integration into TVET curriculum. There is need for a paradigm shift towards quality and accessible lifelong learning (LLL) in provision of Education for Sustainable Development (ESD) in TVET institutions globally through open learning. ICT plays a vital role in the human capacity development for sustainable development through TVET. Provision of competency-based education and training by TVET would provide the enabling transition to sustainable economies, environments and societies by equipping persons with skills, knowledge and attitudes that motivates adoption of sustainable lifestyles. This would enable them to face and to resolve global challenges and ultimately to become proactive contributors to creating a more just, peaceful, tolerant, inclusive, secure and sustainable world. The objective of the study was to establish the contribution of ICT in enhancing quality and accessible lifelong learning through open learning in TVET.

Methodology: The study employed explorative and descriptive research methodologies. Purposive sampling was done with the target population of all the TVET institutions in the Nyeri County, Kenya where data collection tools were used. Data analysis and presentation was carried out using the statistical tools.

Findings: The findings of the study were that ICT has extensively contributed in enhancing quality and accessible LLL through open learning in TVET. The conclusions were that ICT has played a vital role and a remarkable contribution towards enhancement of LLL provision in TVET.

Conclusion and Recommendations: There are emerging lifestyle problems that could be resolved though provision of CBET in TVET geared towards lifestyle change. However, TVET institutions needs more integration of ICT in life skills CBET to enhance quality and accessible LLL through open learning. The study recommended that TVET institutions put in place suitable frameworks to enhance accessibility of quality LLL for sustainable development.

Keywords: *Life-Long Learning, Sustainable Development, Open Learning, Information Communication Technology, TVET*

1.0 INTRODUCTION

Open Learning (OL) and Lifelong learning (LLL) are two terms used to describe learning experiences centered on the learner's interests and offered outside the normal classroom set up. Initial barriers of quality and accessible learning have to be overcome through delivery of resources though it does not guarantee learning. ICTs have been an integral element in the growth of diverse forms of education, which have brought new opportunities for open and lifelong learning in many countries. ICT impacted on education before the widespread use of the Internet, through the application of print, audio-visual and broadcast media to distance education. It has enabled those with adult roles and responsibilities to continue formal study leading to higher education qualifications on a mass scale. The practice of lifelong learning itself has been facilitated by the demonstrable fact of numerous adults studying beyond school age using a range of media, and pursuing both occupational and leisure. (Thorpe, 2012)

The main ICT impacts on TVET can be pointed out as expanding access and improving the quality of TVET systems. However, the aim is to reach substantial improvement in social and environmental concerns, along with shifting labour market needs. The importance of TVET has been increasingly recognised and therefore TVET is being re-shaped based on a holistic and lifelong learning approach to provide multiple and flexible pathways of learning using innovative methods and ICTs. TVET for Sustainable Development1 is required to enable transition to greener economies and societies by equipping learners with skills for green jobs and motivating people to adopt sustainable lifestyles. It also empowers people to be global citizens who engages and assumes active roles, facing and resolving challenges as well as becoming proactive contributors towards creating a more just, peaceful, tolerant, inclusive, secure and sustainable world. (Müller-Norouzi, 2017)

ICTs need to be harnessed with the purpose of providing more widespread access to TVET through open learning, in line with lifelong learning major objective of reducing the gap between school and workplace learning. Open Educational Resources (OER) are seen as having the potential to expand access to lifelong learning opportunities and achievement of quality education. However, expansive use of ICTs faces major challenges in terms of capacity development, access, connectivity, localization, customization and content development. (UNEVOC, 2018). OL and LLL concepts are means for preparing new type of highly qualified personnel, adopting the technological innovations, achieving a competitive and growing economy and for molding of personality, capable of participating in the socio-economic process actively. The purpose of such education is not only human adaptation to changes in professional activity, but also the continuous development of human personality, inoculation of an appetite for self-education, development of skills to think independently, to acquire new knowledge and exercise judgments. (Svetlana A. Dudko1, 2016)

Objectives of the Study

The objectives of this study are as listed in this section.

Main Objective

The objective of the study was to establish the contribution of ICT in enhancing quality and accessible lifelong learning through open learning in TVET for sustainable development.

Specific Objectives

1. Identify ways in which ICTs have improved quality and accessible life-long learning through open learning.
2. Determine the available ICTs for the support of quality and accessible lifelong learning in TVET institutions.
3. Establish the ICTs requirements for enhancement of lifelong and open learning in TVET institutions.

Problem Statement

TVET institutions are instrumental in the provision of Lifelong learning (LLL) defined as the process of accomplishing personal, social and professional development throughout the life-span of individuals in order to enhance the quality of life. The OL and LLL concepts are means for preparing new type of highly qualified personnel, adopting the technological innovations, achieving competitive and growing economy and for molding personality, capable to participate in the socio-economic process actively. Integration of ICT in TVET would enhance access to quality lifelong learning to all, through open learning. According to the cited UNESCO report, open learning is one of the most rapidly growing fields of education, and its potential impact on all education delivery systems has been greatly accentuated through the development of ICTs. TVET has the potential of technology including multimedia, online learning, mobile technology, Massive Open Online Courses (MOOCs) and Open Educational Resources (OER) as provisions of learning support. However, the impact of utilization of these technologies in the enhancement of OL and LLL in TVET is yet to be fully realized. This study was to find out the contribution of ICTs in enhancing quality and accessible lifelong learning through open learning in TVET for sustainable development.

Justification

The effects of technological advancement are felt by the whole population regardless of the status. Upgrade of skills is necessary if one has to cope with the technological changes. OL and LLL gives the masses an opportunity to learn new elements of technology as well as help them keep abreast with the technology. By integrating working and learning, people learn within the context of their work on real world problems. They construct solutions to their own problems, and the system advises them when they are getting into trouble and provides directly relevant information. The direct usefulness of new knowledge for actual problem situations greatly improves the motivation to learn the new material because the time and effort invested in learning are immediately worthwhile for the task at hand and not merely for some putative long-term gain. Mobile communication and internet have transformed the way of life hence use of ICTs is a necessity for all and this upgrade can only happen through OL and LLL.

2.0 LITERATURE REVIEW

Professional work cannot simply proceed from a fixed educational background, rather education must be smoothly incorporated as part of work activities. Similarly, learning takes place not only at all ages and in virtually all professions, it takes place among heterogeneous groups of people in families, clubs, and virtual communities. Insights gained from these individual situations need to be developed into broad and effective theories of learning, innovative and intelligent systems, practices, and assessments across many professional genres. A lifelong learning approach permits integration of the best features of school, community, home, and workplace learning. (Fischer, 2010)

Around the world, gaining employment depends on a person's ability to effectively and efficiently use modern technology. ICTs facilitate the implementation of education and training, the provision of learning content, and communication between teachers and learners. TVET like other educational streams, is expected to focus on developing higher-order and industry-responsive skills needed in a globalizing the world. These transcend the basic TVET and are oriented towards the skills required for working and living such as entrepreneurship, communication, problem solving, teamwork, digital literacy and transferable skills such as critical thinking, creativity, leadership, the ability to work independently and be equipped for lifelong learning. (Majumdar, 2017). In addition to the provision of lifelong learning available in TVET, there is a trend for offering opportunities by creation and expansion of a range of community initiatives. The aim of OL and LLL is to improve knowledge, skills and competence with a personal, civic, social or employment-related perspective with the unique characteristic being the fact that they center on individuals. (Svetlana A. Dudko1, 2016)

There is practically no doubt that the foundation of LLL provision is going to be the information technology and e-learning together with the emerging mobile-learning technologies, World Wide Web and personalization which is widely accepted in business and service-oriented portals but is less used in e-learning. There is now an established consensus that the concepts of environmental, social and economic sustainability are interlinked and must be addressed through an integrated approach. TVET programmes not only provide for skills that are necessary for employability, productivity and competitiveness but also for community development, social cohesion and addressing environmental issues. The transformative change required in TVET must include integration of the three dimensions of sustainable development as stipulated in SDG 4 on education, "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". Integration of ICTs in the provision of these skills by the TVET through OL and LLL has greatly contributed towards expansion of TVET hence enhancing sustainable development.

The conceptual framework in figure 1 demonstrates the contribution of ICT towards enhancement of quality and accessible lifelong learning in TVET. The interaction shows that all learning utilizes ICT and TVET education can be through open learning as well as application of lifelong learning. The shaded part shows the centrality of learners in acquiring quality and accessible TVET through integration of ICT.

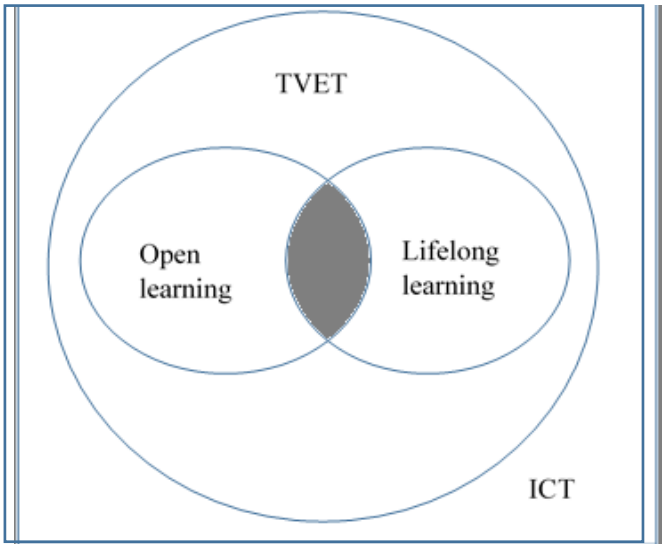

Figure 1: Conceptualization of Integration of ICT in Open, Lifelong Learning and TVET (Research 2018)

Life lifelong learning perspective is drawn from the theories advanced by academia in different countries across the globe. It consists of skills and competencies acquisition throughout an individual life time not necessarily in a formal education set-up but through experiences and applications for improvement of job performance and productivity (Dae, 2007). ICT as an enabler in many aspects of human activities is regarded as a major milestone in the advancement of life long learning. Availability of easy-to-follow content on the internet has elicited a new way of continued learning by all especially the adults in most of application areas including farming, businesses, leisure and even formal employment. However, the aspect of LLL in TVET has not been fully actualized due to the perception towards technical vocational education association with academically weak.

3.0 METHODOLOGY

The researchers used both the survey and descriptive methods to accomplish the research. The survey helped the researchers to explain events as they were on the ground in the following: The Nyeri National Polytechnic (NNP), Mathenge TTI and Mukurwe-ini TTI.

Target Population

The GoK, within the MoE's Directorate of TVET, operates about 44 Public TVET institutions, a number that is set to sharply rise given the ongoing construction and establishment of 60 new TTIs at Constituency level, with the targeted total number of 253 TTIs in the current Medium Term Expenditure Framework (MTEF). Enrolment in 40 TTIs is currently at 79,000, up from 34,000 in 2003(41% are female). GoK is working towards increasing enrolment in TVET to over 250,000 students by 2024 (GoK, June 2015).

The target population included all the staff and part time learners who seek training in areas of interest from each of the three institutions.

Table 1 : Target Population

SNo.	Institute	Staff	Part Time Learner	Total
1	NNP	250	435	685
2	Mathenge TTI	110	87	197
3	Mukurue-ini TTI	52	0	52
				934

Source: Research Data 2018

Sample and Sampling Techniques

There are one hundred and four (104) operational technical vocational education and training institutions in Kenya. The researchers selected a convenience sample of all the TVET institutions Nyeri County. Random sampling was done and approximately 30% of the total target population was sampled which amounted to a total of 136 staff and 159 part time learners.

Table 2: Sample per Institution

Category	NNP	Mathenge TTI	Mukurue-ini TTI	Total
Staff	83	35	18	136
Part Time Learners	130	29	0	159
Total	**113**	**64**	**18**	**295**

Research Instruments

The tools of data collection translate the research objectives into specific questions, whereby the responses provide the data required to achieve the research objectives. In order to achieve this purpose, each question/item was formulated to convey to the respondent the idea or group of ideas required by the research objectives, and each item aimed at obtaining response which could be analysed for fulfilling the research objectives.

Validity and Reliability of the Instrument

The issue of validity of the data was considered by subjecting the findings to expert opinion. The questions in instruments were subjected to face validity by peers and appropriateness and generalization to the topic were validated by seeking experts' opinion. Validity of the responses was

done by negating some of the questions provided to the respondent. Reliability of response was obtained by providing all respondents with the exact same set of questions. This allowed the researcher to find out whether, each item was clear and easily understood, the respondents interpret each item in the intended way, the items have an intuitive relationship to the study's topic and goals. A pilot test of the instruments was carried out from selected members to improve on clarity and comprehensiveness of the instrument aimed at gathering relevant information on readiness of Technical Education and Training Institutions in adoption of E-libraries.

Ethical Consideration

The study was carried out on personal initiative and full details of the research approach and description of the study were enlisted in the questionnaire.

Methods of Data Analysis

Data collected was checked for errors, unfilled questions and inconsistencies in response or outright contradiction of known facts. It was properly scrutinized to check for extremes such as consensus responses to agree or disagree. The data was coded based on the nature of the scales used to allow for statistical analysis. Qualitative and quantitative methods of data analysis were used. Tables, frequencies and percentages were used to present the results with an aim of giving evidence relevant to the research objectives.

4.0 FINDINGS

The following section presents a discussion of study results based on the research questions as presented in the questionnaire. It describes the implications of the findings in the context of how the ICT enhanced quality and accessible lifelong learning for staff and part time in TVET institutions. The discussions provide a basis for generalization of results in regard to provision of LLL specifically in TVET institutions in Kenya.

Research Question One

In regard to how ICTs has improved accessibility of quality LLL, respondents were giving responses on the extent of agreement with the given statements on ICT infrastructure and technology. 76.5%, of the respondents agreed with the statements, 23.0% disagreed while 1.4% were not sure. Therefore, the results indicated that ICTs has improved accessibility of quality LLL as shown in Figure 2.

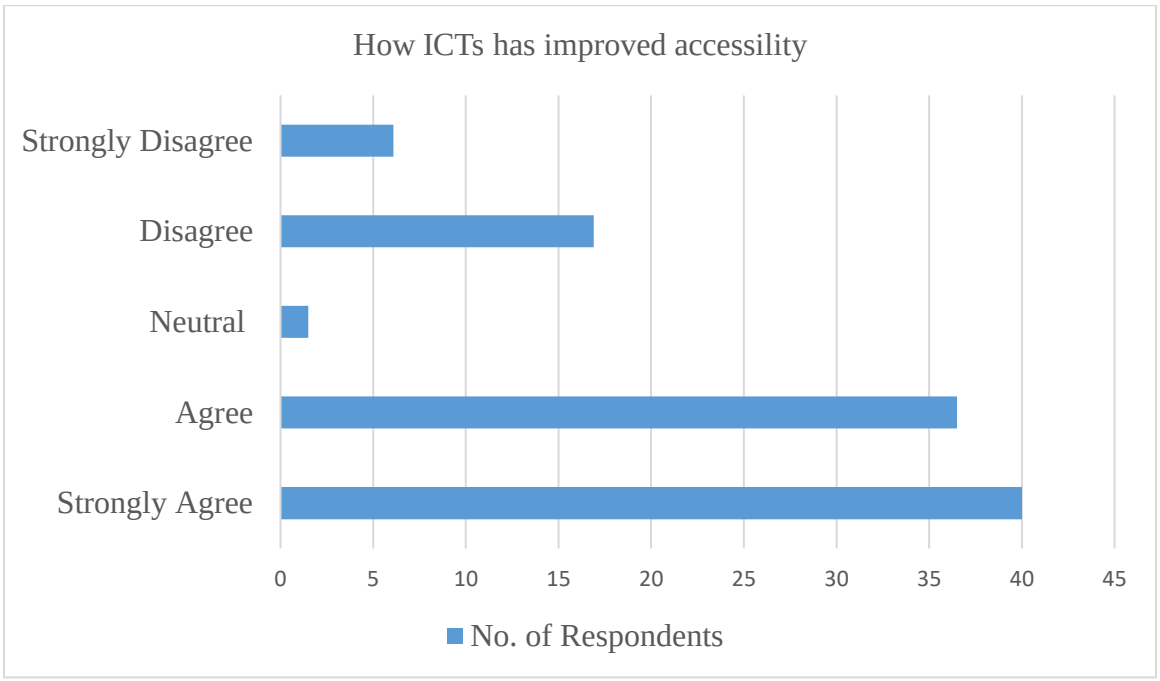

Figure 2: ICT Infrastructure and Technology

Research Question Two

The respondents were required to indicate the availability of the ICTs by agreeing or disagreeing with the list of ICTs provided. 61.0% of the respondents agreed that the listed ICTs were available 35.1% disagreed while 3.9% were not sure. The results in Figure 3 indicated that the respondents were in agreement that there were various ICTs available in support of quality and accessible LLL.

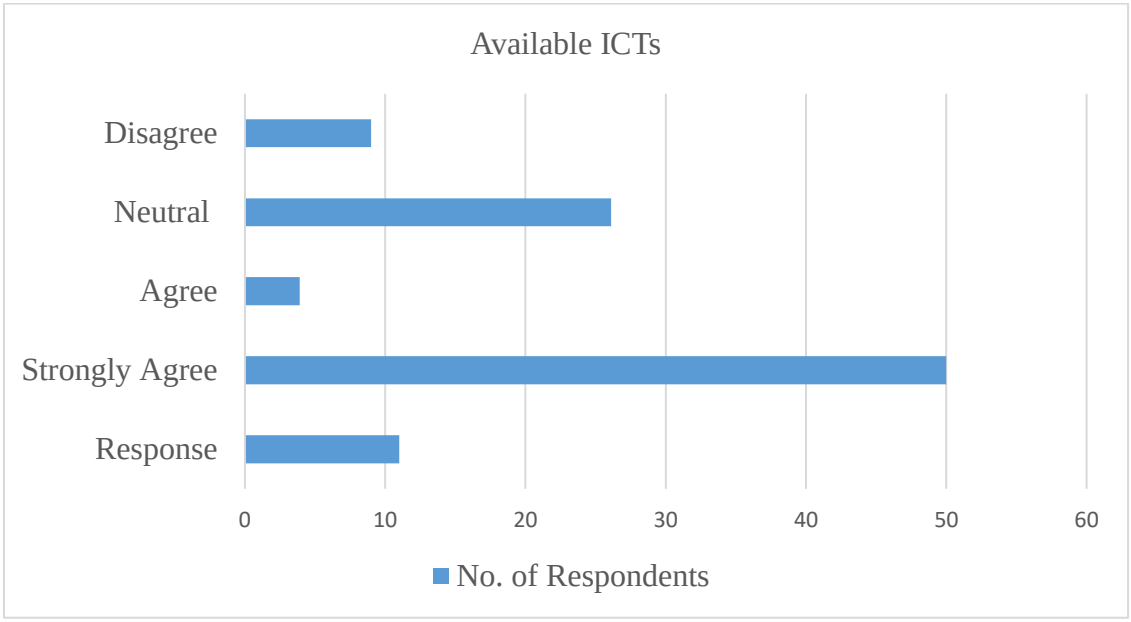

Figure 3: Available ICTs

Research Question Three

On the ICTs requirements for LLL and open learning the respondents were required to state the extent to which they agreed or disagreed with the requirements in terms of infrastructure and technology. 68.8% of the respondents agreed with the availed list of requirements, 30.5% disagreed while 0.7%

were not sure. The results were that the ICT infrastructure and technology were vital in enhancement of LLL and open learning. The results are as shown in Figure 4.

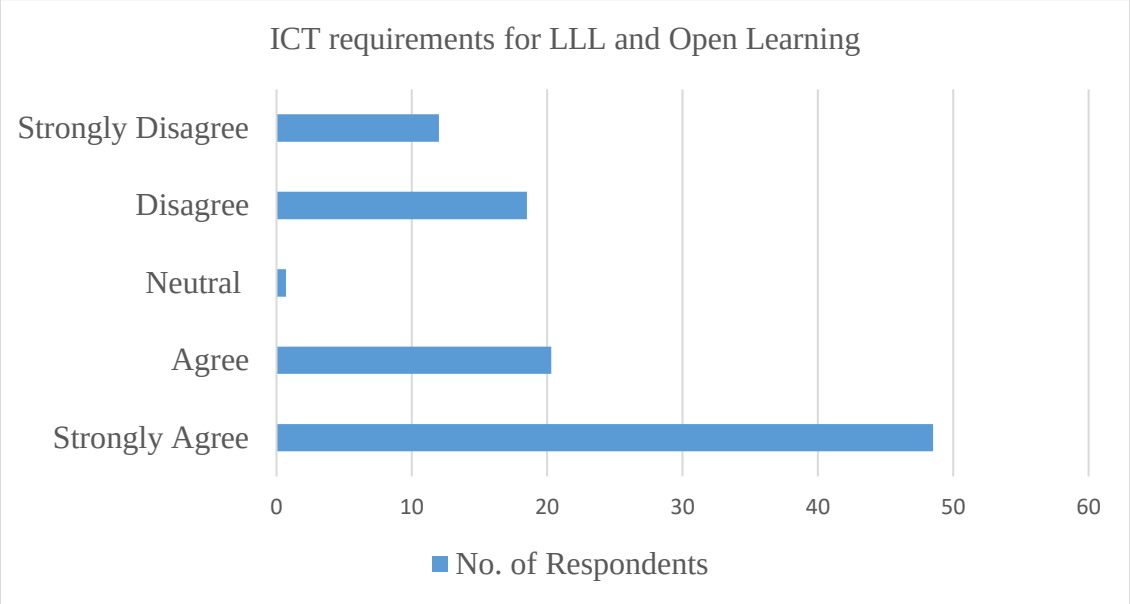

Figure 4: Infrastructure and Technology Requirements

Discussion

The objective of the study was to establish the contribution of ICT in enhancing quality and accessible lifelong learning through open learning in TVET for sustainable development. The first specific objective identified ways in which ICTs have improved quality and accessible life-long learning through open learning. The findings were that ICTs has improved accessibility of quality LLL. The researchers established that availability of ICT hardware and software infrastructure and technologies such as e-Learning, mobile computing, social media and online collaboration contributed enhancement of LLL.

The second objective sought to determine the available ICTs for the support of quality and accessible lifelong learning in TVET institutions. The findings were that various ICT infrastructure and technology were available in support of quality and accessible LLL. These included, e-mails, conferencing, streaming media, e-resources, simulations and virtual learning.

The third objective sought to establish the ICTs requirements for enhancement of lifelong and open learning in TVET institutions. The findings were that the OL and LLL systems needed to be goal oriented, user friendly, problem solving and real time operations.

5.0 CONCLUSION AND RECOMMENDATIONS

Conclusion

ICTs impact on TVET can be pointed out as expanding access, improving the quality of TVET systems, and still aiming to reach substantial improvements in social and environmental concerns, along with shifting labour market needs. In the emerging knowledge society, an educated person will be someone who is willing to consider learning as a lifelong process. Lifelong learning has a very high priority in the globe and is a compliment to the requirement for the changing technology and lifestyles. There is practically no doubt that the foundation of LLL provision is going to be the information technology and e-learning together with the emerging mobile learning technologies.

The lifelong and open learning framework examines the demand for, and the supply of, learning opportunities, as part of a connected system covering the whole lifecycle and comprising all forms of

formal and informal learning. In line with this TVET institutions needs to enhance ICTs for quality and accessible LLL. TVET institutions should have a paradigm shift from supply driven education to demand driven in order to expand access, improve quality in training and should adapt technologies like m-learning, personalization, massive open online courses (MOOCs) and social media platforms to deliver quality and accessible LLL. Contribution of ICTs in the enhancement of quality and accessible LLL and in expanding access and improving quality for provision of education in TVET institutions, LLL and open learning are paramount.

Recommendations

A lifelong and open learning perspective implies that TVET institutions need to prepare learners to engage in self-directed learning processes because this is what they will have to do in their professional and private lives outside the classroom. The central elements of lifelong learning are triadic in nature and include learning for economic, personal and social development and must be incorporated in the TVET.

Requirements for open learning are open accessibility with no specific entry requirements for a programme of study, freedom of time, pace and place. These elements can be enhanced through the use of ICTs specifically mobile computing and internet hence TVET needs to realign their education by adapting these elements in order to increase accessibility of quality OL and LLL.

Adult learners juggle between multiple responsibilities, and take ownership of their education, with the goal of improving their knowledge base, career opportunities, lifelong learning and or personal satisfaction. (Hashim, 2010). They have a self-directing personality and are oriented towards immediate application of learned knowledge. TVET institutions are therefore required to consider these characteristics as they put in place suitable open learning frameworks for enhancing accessibility of quality LLL for sustainable development.

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