Enhancing Green Learning and Training in TVET Institutions through Digital Libraries in Nyeri County, Kenya

Rose Muthoni Mukundi & Wanjiru Njuki
The Nyeri National Polytechnic, Kenya

Abstract

TVET institutions all over the world and Kenya in particular have experienced low uptake of their courses for a very long time since the youth consider them secondary to university degrees. These institutions need to transform and revitalize themselves for acceptability by youth as a preference for post-secondary education. Green skills are an integral part of vocational competence and are key to sustainable development. Green learning and training in TVET through Competency Based Education and Training (CBET) would attract the attention of the majority youth towards adopting green skills geared to self-sustainability hence contributing towards sustainable development. However, sustainable development is not a fixed concept; rather it is a culturally-directed search for a dynamic balance in the relationships between social, economic and natural systems, a balance that seeks to promote equity between countries, races, social classes and genders. The objective of the study was to establish how the digital libraries were enhancing green learning and training in TVET institutions in contribution towards sustainable development. The study employed explorative and descriptive research methodologies and adopted purposive sampling. The target population included all TVET institutions in Nyeri County, Kenya. Data collection and data analysis tools were used for data process and presentation. The findings of the study were that digital libraries have contributed in enhancing green learning and training in TVET institutions through CBET for sustainable development. The conclusions were that digital libraries had a role to play towards enhancing green learning and training, there were several factors affecting implementation of digital libraries, and digital library implementation had positive effect on green learning and training in TVET institutions. In view of this, implementation of green CBET courses mainly targeting the youth by TVET institutions would go a long way in supporting green economy. The study recommended that TVET institutions should put in mechanism for implementing digital libraries for green learning and training.
Key words: *Green learning and training, digital libraries, greening curriculum*

Introduction

International experience demonstrates that technical and vocational training providers could play a significant leadership role in meeting the social and economic needs of greening the economy. These could include integrating green concepts and processes into curricula to prepare workers for new, changed, or emerging jobs in greening economies. The process of greening could be stimulated if current practices in curriculum development, links with industry, and patterns of

training trainers be explored in order to provide targeted support for policy formulation and practice development in greening (Pavlova, 2018).

TVET institutions in Kenya have experienced low uptake of their courses for a very long time since the youth consider them secondary to university degrees. These institutions need to transform and revitalize themselves for acceptability by youth as a preference for post-secondary education. The government of Kenya has encouraged a paradigm shift and has developed the National TVET Policy Framework (The TVET Act, 2013), which aims to strengthen the relevance and quality of TVET to respond to the needs of the labour market. (GoK, June 2015).

During the World Youth Skills Day 2016 in Bonn, the following three priority areas related to TVET courses uptake were highlighted: (i) enhancing institutional capacities to promote employment intensive growth; (ii) enhancing youth skills and competencies for employability, entrepreneurship and business creation; and (iii) promoting job creation and enterprise development through public-private and private-private partnerships (UNEVOC, 2016). These steps were echoed by the Cabinet Secretary Ministry of Education (MoE) during the launch of the Equity Group Foundation "Wings to Fly Programme for TVET placement in January 2017. (Matiang'i, 2017).

In view of this, TVET institutions need to capture the attention of the majority youth through "online interactivity". Most youth are not attracted to reading traditional books and are always on the move accessing everything anywhere. Introduction of new, green and interesting CBET courses supported by digital libraries would attract more youth. By adapting green TVET practices and processes, institutions would also enhance youth employability, ability to take up entrepreneurship and reduce unemployment. Green TVET prepares people for green jobs with adequate wages, safe working conditions, and ensures workers' rights contributing to preservation of environment, improving human well-being and social equity (UNESCO, 2012).

This study was conducted in three selected TVET institutions in Nyeri County, representing 44 public TVET institutions within the Ministry of Education's Directorate of TVET, a number that is set to sharply rise given the ongoing construction and establishment of 60 new Technical Training Institutions (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). The government is working towards increasing enrolment in TVET to over 250,000 students by 2024 (GoK, June 2015)

Should TVET institutions adopt the new way of thinking in relation to sustainability, it requires greening of CBET curriculum by integrating systemic solutions not just to the economic and environmental challenges but also the interdependent health, social and political challenges (Louw, 2013).

Problem Statement

To realize the growth and development of green economy development in our country, technical skills are indispensable. To contribute towards enhancement of these skills, the government has rolled out a master plan to improve access to TVET programmes which includes building one institution in every constituency. The uptake of TVET courses by the youth has been wanting since they regard them second to university degrees. With the emergence of less costly gadgets/devices that can access internet, the youth can learn on the move. They can be able to download and use any information they required; hence they can use media like YouTube to learn green skills. It is therefore paramount for institutional libraries to devise ways to improve the access to green learning and training materials in support of the ever increasing numbers of the youth population. To enhance green learning and training in these institutions, consideration to improve some of the key areas like the libraries would be vital. The introduction of green CBET curriculum would be greatly enhanced through digital libraries. In view of this, the researchers were out to establish how the digital libraries were enhancing green learning and training in TVET institutions in contribution towards sustainable development.

Purpose and Objectives of the Study

The main purpose of the study was to establish how the digital libraries were enhancing green learning and training in TVET institutions in contribution towards sustainable development.

Specific Objectives

1. To assess the role played by digital libraries towards enhancing green learning and training in Technical Vocational & Training Institutions.
2. To identify factors affecting implementation of digital libraries in Technical Vocational & Training Institutions.
3. To evaluate the extent to which digital library implementation had affected green learning and training in TVET institutions.

Justification

In carrying out this study on the contribution of digital library, the researchers aimed at assessing the TVET institutions in order to establish their capacity to

support acquisitions of green skills and knowledge. The TVET institutions implementing digital library would be able to acquire wide range of information resources at minimal costs. The diversification of skills delivery through the internet would also enhance better collaboration through online flexible and blended courses that are integrated with green skills. Informing and sensitizing stakeholders and other library managers the importance of enhancing digital libraries in TVET institutions for support of green skills for greener economy. The research findings would serve as reference information upon which future decisions on green economic development could be based.

Literature Review

Most youth are not attracted to reading traditional books and are always on the move accessing information from the internet anywhere anytime. Enhancing digital libraries in TVET institutions could change the way the youth learn and may influence their perception if there was an introduction of new, green and interesting CBET curriculum. According to UNESCO, Education for Sustainable Development (ESD) and Green TVET are like Siamese twins. The two include education for enhancing problem-solving skills in everyday situations (life skills education), sustainable consumption, lifestyles, and entrepreneurial learning. (UNESCO, 2012) Attainment of sustainability extends beyond just informing and educating. According to Bradley (2012), it cuts across all the pillars by empowering communities through knowledge and the ability to access information for themselves. The green CBET curriculum would ensure production of competent and skilled human resource needed to drive the country towards green economy. As economies strive for stable development and increased industrialization, the adoption of a green economy and green TVET-systems must be based on the principle of "growing cleaner without growing slower" (Baumgarten, 2016)

Education is the key to development while TVET is the master key which opens doors to poverty eradication, raising standards of living, bringing greater justice, equity and fairness in the various societies. Sustainable development is a culturally-directed search for a dynamic balance in the relationships between social, economic and natural systems, seeking to promote equity between countries, races, social classes and genders bringing together the interdependence of people and the environment requiring that no single development or environmental objective be pursued to the detriment of others (Munjanganja, 2010). The equilibrium for social, economic and environmental sustainability brings about self-sustainability.

Library automation has helped to provide easy access to collections through the use of computerized library catalogue such as On-line Public Access Catalog (OPAC). Many digital libraries provide access to other multi-media content like audio and

video and cam also retain a defined community of users, focused collections, long-term availability, and the possibility of selecting, organizing, preserving and sharing resources (Mishra, 2016). Digital libraries would come in handy in the transformation of green skills into their digital format ensuring increased interest by the youth.

Sustainable development goal 4 "Quality Education" and, goal 9 "Industry, Innovation and Infrastructure" require that TVET institutions offer quality education for self-sustainability and engage industries in development of competency based curriculum embracing innovation, green skills and the right infrastructure. Kenya Vision 2030 through its Medium Term Plan 3 (MTP3) envisages achievement of these goals. Digital libraries involve the philosophies of library science, computer science, and networked information systems which are part of collections in TVET institutions. To enhance green learning and training in TVET institutions digital libraries therefore need to be fully fledged. This would entail putting in place digital library system and digital management systems.

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 three institutions namely; The Nyeri National Polytechnic (NNP), Mathenge TTI and Mukurwe-ini TTI for enhancing digital libraries in support of TVET for green learning and training. Descriptive research approach was developed to ensure the data would be applicable to the Kenyan situation, and could be used in a predictive way.

Target Population
The target population included all the lecturers, library staff and students from each of the three institutions - The Nyeri National Polytechnic (NNP), Mathenge TTI and Mukurwe-ini TTI in Nyeri County.

Table 1
Target Population

S No.	Institute	Lecturers	Library Staff	Students	Total
1	NNP	170	6	2500	2676
2	Mathenge TTI	70	2	700	772
3	Mukurue-ini TTI	27	0	550	577
Total					4025

Sample and Sampling Techniques

The researchers selected a convenient sample of all the TVET institutions in Nyeri County. Random sampling was done and approximately 30% of the total target population was sampled which amounted to a total of 82 lecturers, 4 library staff and 1205 students.

Table 2

Sample per Institution

Category	NNP	Mathenge TTI	Mukurue-ini TTI	Total
lecturer	54	20	8	82
Student	746	208	165	1119
Library Staff	2	2	0	4
Total	**802**	**230**	**173**	**1205**

Research Instruments

The researchers used questionnaires that were self-administered to the respondents, and each question/item was formulated to convey to the respondent the idea or group of ideas required by the research objectives.

Validity and Reliability of the Instrument

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; if the respondents interpret each item in the intended way; and if the items had 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.

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.

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 digital libraries were enhancing green learning

and training in TVET institutions. The discussions provide a basis for generalization of results specifically to TVET institutions in Kenya.

Role Played by Digital Libraries in Enhancing Green Learning and Training
In regard to the role played by digital libraries in enhancing green learning and training, respondents gave responses on the extent of agreement with the given statements. 66.5% of the respondents agreed with the statements, 30.0% disagreed while 3.5% were not sure. Therefore, the results indicated that digital libraries played a great in enhancing green learning and training.
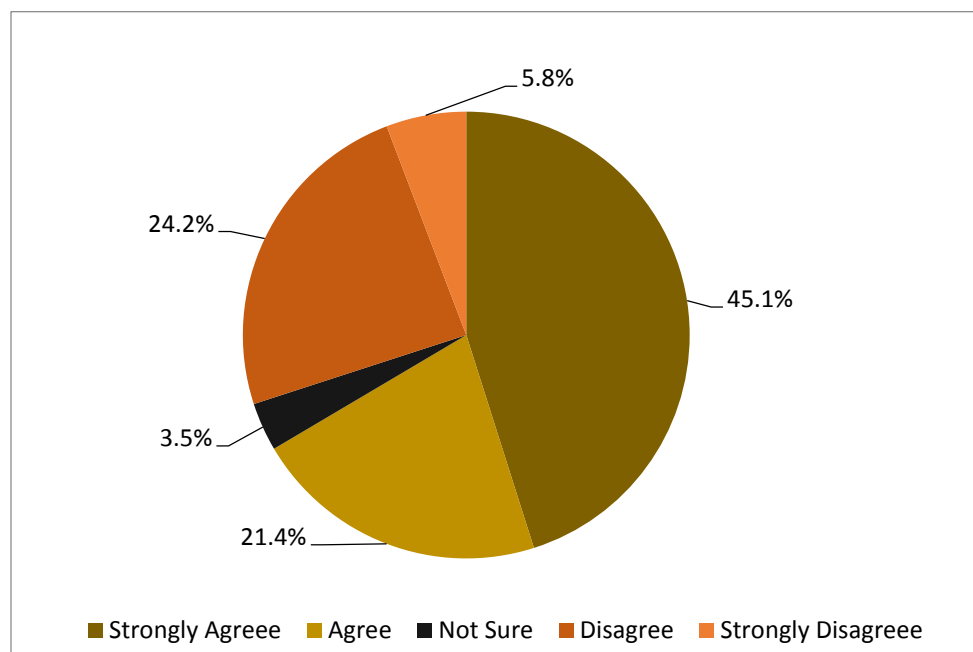

Figure 1: *Contribution by Digital Libraries Enhance Green Learning and Training*

Factors Affecting Implementation of Digital Learning in TVET Institutions
The respondents agreed that 71.0% of the stated factors affected implementation of digital libraries in Technical Vocational & Training Institution, 25.1% disagreed while 4.9% were not sure. The results indicated that the respondents were in agreement that implementation of digital libraries in TVET was greatly affected by several factors.
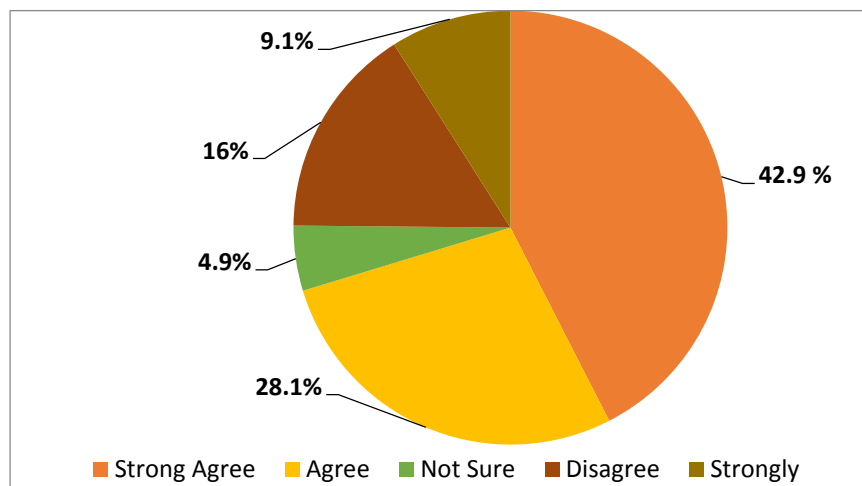
Figure 2: *Role Factors Affecting Implementing Digital Libraries in TVET*

Implementation of Digital Libraries Impact Green Learning and Training

As to whether digital library implementation had affected green learning and training in TVET institutions, 72.0% of the respondents agreed that implemented digital libraries had a great impact on green skills while 24.5% disagreed. The results were that the evaluated factors enhanced implementation of digital libraries.
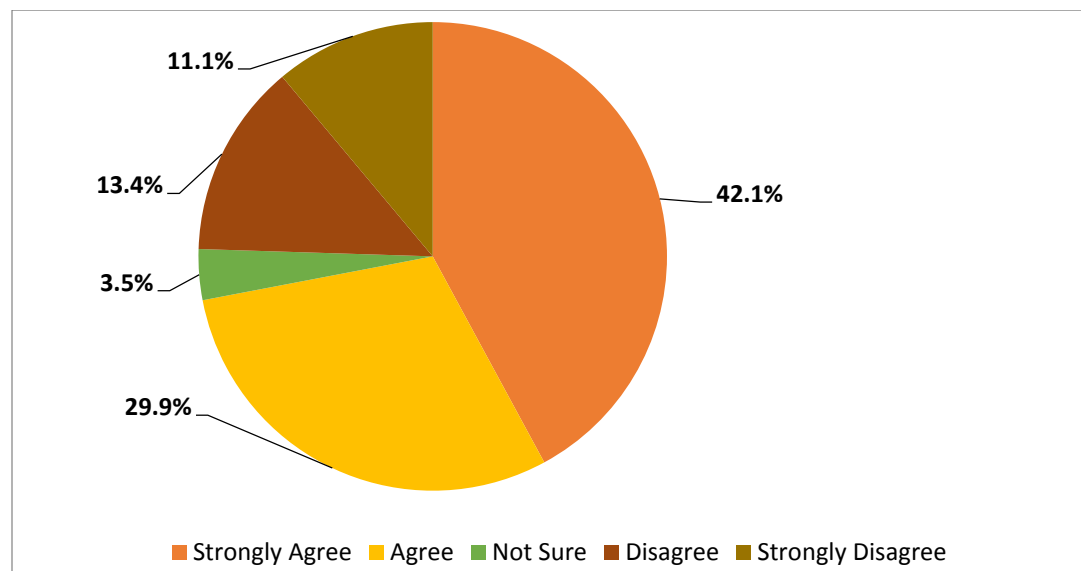

Figure 3: *Impact of Digital Libraries on Implementation of Green Learning and Training*

The first objective assessed the role played by digital libraries towards enhancing green learning and training in TVET. The findings were that digital libraries played a great role in enhancing green learning and training. The second objective identified factors affecting implementation of digital libraries in TVET. The researchers established that there were various factors affecting implementation of digital libraries. Some of the factors were capacity to accommodate more computers, hot spots (WiFi), availability of green skills digital materials and collaborations.

The third objective sought to evaluate the extent to which digital library implementation affected green learning and training in TVET. The researchers found that the available digital library computers, access to digital materials and internet access had played a great role in expanding knowledge base on green skills and independence of the digital library section, availability of WiFi has encouraged usage of own devices.

The available digital library resources are units in terms of E-materials, connectivity, partly skilled library staff and limited ICT infrastructure. The digital library materials were found to be moderately available, there were strategies laid down and the effect of these strategies was found to be relatively affecting the enhancement of digital library for the implementation of green learning and training.

Conclusion

With the availability of several free digital library software packages at the recent time, the creation and sharing of information through the digital library collections has become an attractive and feasible proposition for library and information professionals around the world (Ubogu, 2013). According to the findings, the moderately available digital library materials are servicing the current TVET capacity though they do not meet the digital library requirements for green learning and training.

For the TVET institutions to effectively mount competency based courses that are required to drive the economy towards green skills for sustainable development, enhancement and utilization of digital libraries is a key factor to creating self-sustainability by the majority youth. Green skills entail new capabilities required in industry, agriculture and manufacturing which would form a basis for a green curriculum. Green learning and training would only happen where green curriculum has been developed or integrated with the traditional set of skills. Implementation of green CBET courses mainly targeting the youth by TVET

institutions would go a long way in supporting green economy henceforth sustainable development. Transfer of green skills for the youth who would be the main drivers if the country is to achieve sustainability and sustainable development would be greatly enhanced through digital libraries.

Recommendations

TVET institutions should endeavor to produce knowledgeable, skilled, innovative and responsible manpower in industry, agriculture and manufacturing to meet the demands of the green economy through integration of green skills in CBET. This will help Kenya to work towards realization of its vision 2030 that seeks to transform the country into a newly industrialized middle income country providing high quality of life to all. The MTP3 indicates that TVET reform policy framework for the sector is in place and TVET is focusing on providing CBET courses that meet the needs of the workplace as well as self-employment. The TVET institutions should hasten the process of greening the curricula.

Availability of free digital Library software packages would assist TVET institutions to incorporate green skills in their digital libraries by transforming the content into digital format. Hence TVET institutions should take advantage of the freely available software.

Digital libraries are key sources of information and learning materials that are essential for green learning and training. But in most learning environments, there is missing information and materials that integrate theory and reality, and missing skills and competencies that are needed in meeting the requirements of green jobs and demands of the green economy. In view of this, the TVET institutions in conjunction with industry should enhance digital libraries to bridge the gap towards acquisition of green skills. More resources should be channeled towards enhancement of digital libraries with a view of attracting the youth as they access everything anywhere.

References

Baumgarten, K. (2016). Re-thinking greening TVET for traditional industries in Asia - the integration of a less-skilled labour force into green supply chains. *Online Journal for Technical and Vocational Education and training in Asia.* Issue 6:1-17.

Bradley, F. (2012). *How libraries contribute to sustainable development & the SDGs.* IFLA.

GoK. (2015). *Support to technical vocational education and training for relevant skills development-phase ii.* Nairobi: African Development Fund.

Louw, W. (2013). Green curriculum: Sustainable learning at a higher education institution. *The International Review of Research in Open and Distance Learning. University of South Africa (Unisa)*, Vol 14.

Makori, E. (2016). Digital technology acceptance in transformation of university libraries and higher education institutions in Kenya. *Library Philosophy and Practice (e-journal)*, 1379.

Matiang'i, D. F. (2017, January 31). Investing in vocational training of youth key to national progress. *Commentaries*. Nairobi, Kenya: Daily Nation.

Mishra, R. K. (2016). Digital libraries: Definitions, issues, and challenges. *Innovare Journal of Education*, ISSN - 2347-5528.

Munjanganja, L. E. (2010). *Integrating sustainable development in technical and vocational education and training.* Bonn, Germany: UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training.

Pavlova, M. (2018). A holistic approach to greening TVET: A case study and analysis of Bac Thang Long Economic Technical College practices in Viet Nam. *Technical and Vocational Education and Training: Issues, Concerns*, 99-117.

Ubogu, F. (2013). *A policy framework for the digital library.* Johannesburg: South African Digitisation Initiative (SADI) Workshop,.

UNESCO. (2012). *Promoting skills for sustainable development. ED/PSD/ESD/2012/PI/4.* UNESCO/UNEVOC.

UNEVOC. (2016). *Promoting youth skills for work and entrepreneurship in Eastern Africa.* Bonn: UNEVOC Bulletin.