

Developing Skills to Unlock Kenya's Industrial Growth: The Influence of Provision of Modern Teaching and Learning Equipment in TVET in Kenya

Caroline Musyimi

Coast Institute of Technology, Voi, Kenya

Abstract: This study explores the influence of modern teaching and learning equipment on improving vocational education quality and employment rates and its long-term effect on Kenya's journey to achieve industrialisation by the year 2030. The study adopted a cross-sectional survey research design. Stratified random sampling was used to sample 172 students. Data was collected using questionnaires and analysed through the theoretical lenses of globalisation and vocationalism. The results show that the provision of modern equipment has improved Kenyan TVET classrooms to meet industrial standards and allowed the development of essential skills. Also, there has been improved collaboration between TVET institutions and local industries, exposing TVET students to the real labour market while still in college. The TVET students had also improved confidence in themselves and they had acquired employability skills. The findings of this study further revealed that the government of Kenya has increased its efforts in revitalizing the TVET institutions with modern teaching and learning equipment to improve the quality of training in those institutions.

Keywords: Technical Vocational Education and Training, teaching and learning equipment, vocational education quality, industrial standards.

Introduction

Technical Vocational Education and Training (TVET) is education and training which offers knowledge and skills for employment. UNESCO, 2006 defines TVET as an educational process characterised, in addition to general education, by the study of technology and related sciences, practical skills acquisition, attitudes, understanding and knowledge relevant to occupants in various economic sectors and social life. Technical and vocational education is an educational process which involves, in addition to general education, the study of technologies and related sciences and acquisition of practical skills, attitudes, understanding and knowledge relevant to occupations in various sectors of economic and social life (Okoye & Arimonu, 2016). Over the years, TVET has received recognition worldwide as a major driving force in both socio-economic growth and development in technology. For instance, during the United Nations Education Scientific and Cultural Organization (UNESCO) third International Congress on TVET in Shanghai, China in 2012, the representatives present concluded that transforming TVET should be a top priority in the need to build greener societies and tackle global unemployment. Emphasis was placed on updating and developing mechanisms and tools to identify current and future skills needs, to ensure the relevance of TVET programmes to rapidly changing labour markets, economies and societies (Bukit, 2012). Consequently, this has obligated the policy makers to focus on improving and maintaining the quality



of TVET programs to ensure that learners attain the relevant skills that formed the bedrock for poverty reduction, economic recovery, and sustainable development (King, 2009; Hollander & Mar, 2009). China serves as an example of a country in which growth has been driven by TVET policy actions. China has experienced a decrease in the number of people employed in agriculture by 60% and an increase in the number of people employed in manufacturing and construction, and services and tourism by 25.2% and 32.7%, respectively (Heti, 2013). Kenya, on the other hand, is still experiencing a high unemployment rate due to unresponsive TVET systems, despite the two being developing countries. This is due to the fact that the TVET sector in Kenya has been experiencing several hindrances towards the achievement of its goal; the most pressing ones being: A mismatch between the skills offered in TVET institutions and the actual labour market demand – and this leaves most of the graduates unemployed – and, secondly, in most of TVET institutions in Kenya, curriculum delivery is theory based, unlike the desired combination of theory and practical mode; finally, the TVET institutions are under-equipped and, thus, they continue to use old technologies which are no longer relevant in industry (MOEST, 2014).

However, in the recent past, TVET policy reforms have gained momentum, drawing on a policy framework, called Reforming Education in Kenya: Sessional Paper No. 14 of 2012, which resonates with the Kenya Vision 2030, postulating that Kenya should be fully industrialised by the year 2030 (Maina, 2015). These reforms have seen Kenya partnering with different countries, including China, in a bid to revitalise their TVET institutions.

This study, therefore, has articulated the globalisation and vocationalism theory in an effort to understand the importance of investing in TVET for economic growth. After over five years of investment in TVET, the Kenyan government holds that the TVET is doing well. However, very few researchers have ventured into providing empirical evidence, except for a study by Musyimi, Malechwani and Heng (2018), which explored qualitatively the impacts of modern equipment. To fill this knowledge gap, the present study explores the impacts of modern teaching and learning in promoting the quality of vocational education for employment generation and poverty reduction in Kenya.

Objectives of the Study

The specific objectives of the study were stated as follows:

1. To determine the influence of modern teaching and learning on the development of employability skills of TVET graduates in Kenya.
2. To determine whether the availability of modern equipment could improve learners' academic performance in TVET in Kenya.

Consequently, the following two research questions guided the study:

1. What is the influence of modern teaching and learning on the development of employability skills of TVET graduates in Kenya?
2. How does the availability of modern equipment improve learners' academic performance in TVET in Kenya?

Significance of the Study

The findings of the study could be useful in a number of ways. Firstly, they could assist the Ministry of Education in making policy decisions on resource allocations to TVET institutions to enhance the quality of technology education for industrial development. Secondly, TVET institutions could, based on the findings, adopt measures that will optimise the available resources for effective teaching and learning.

Literature Review

Conceptual Framework

Technology is defined as an application of scientific knowledge to equip society with the needed and desired skills and knowledge to change and manipulate the human environment (Sönmez, 2014); while technology in education is defined as the designs and environments that influence learners (Nanjappa & Grant, 2003). In our day-to-day lives, technology has brought fundamental structural changes that can be integral to achieving significant improvements in productivity. Technology also has the power to transform teaching by ushering in a new model of connected teaching. It is generally accepted that appropriate use of technological applications in higher education can help instructors to structure more active learning activities. Research shows that active engagement in the learning process helps to motivate students and enhance their learning outcomes (Gleason, Peeters, Targoff, Karr, Mcbane, Kelley, Thoma & Denetchew, 2011). New technologies can facilitate active engagement in learning by reducing the amount of class time in which students sit passively listening to lectures.

Instructional Resources and TVET Outcomes

The assumption that curriculum and teaching have an impact on students' outcomes has long been held as the truth. However, it is becoming more apparent that instructional resources have influence on students' outcomes. There is substantial evidence that instructional resources have an effect on students' learning and success. It is generally accepted that instructional resources improve the understanding of subject matter and the knowledge retention of learners. It is for this reason that most developing countries like Kenya, Ethiopia and Nigeria, among others have resolved for the implementation of competency based training (CBT) (Geressu, 2017; Michael & Isaac, 2015). One of the important aspects of skill-based training is that learning concentrates on the development of real-life skills and competencies. For successful implementation of CBT, it is important to emphasize the need for up-to-date teaching and learning resources to enhance the acquisition of the skills needed in the labour market. One of the main outcomes of a college education is students' cognitive or intellectual development. Arum and Roksa (2011) posited that the main aim of instruction is to help students learn to solve problems and think critically. Due to the changing nature of the world of work, the nature of problems changes every day and for TVET graduates to be able to cope with the changing labour market, they need to have higher order thinking skills. Previous research has shown that instructional resources have an effect on the learners' cognitive ability (Nwike & Catherine, 2013). Learning technologies put the learner in control of the instructional process, thus, ensuring that the learner determines the learning goals, and the learner decides when goals are satisfied and when new goals are in order (Halverson & Smith, 2009). Technology has been argued to have a positive impact on our way of thinking by making us more intelligent and, thus, the main purpose of incorporating

technology in learning is not to bring about change in the ready-made world but change in the students' cognitive skills.

Another important outcome is the skill-based outcomes of TVET learners. Skills are critical in the economic development of nations since, as the economies move from dependence on first industry, which is agricultural production, to manufacturing and service industries, workers and enterprises must be able to acquire new technical, entrepreneurial, and social skills (Asian Development Bank, 2009). TVET institutions are expected to play a pivotal role in skills development, hence, promoting the necessary skills, knowledge and expertise needed for more sustainable societies and greener economies. According to Dunbar (2011), skills development refers to a shift from an emphasis on supply-led systems, which dictate the mode of learning and the pathways to be followed, to an emphasis on the acquisition of skills required in the labour market. This change of prominence alters the relationship between skill acquisition and the labour market, allowing for a greater range of types of learning environment, flexibility of content and engagement. The main issues in TVET in developing countries relate to outdated curricula, which is often out-of-touch with current market needs. In most cases, TVET learners have been trained in skills which are no longer relevant to the current labour market, hence, creating a disconnect between training and employment opportunities (Pompa, 2014). To ensure a smooth transition of young people from formal training to work, TVET institutions should be in a position to offer a viable path, which can be possible only through the designing of work-oriented TVET programs.

Theoretical Framework

This study is hinged on two theories: Globalisation and Vocationalism. Globalisation is described as a set of forces that affect the social, economic and political aspects of life. This set of changes has affected the world of work, hence, calling for a change in the kind of skills required in the world of work. Vocationalism is discussed as an emerging trend in the developing TVET sector, which is a response to the global competition demand driven by workforces needed for a knowledge-based economy.

Globalisation, or the joint, world-wide expansion of the world's economy, is a popularly debated topic among economists. Globalisation shakes all aspects of life; economically, politically, and socially. One of the things globalisation has been credited with is that it has helped in the creation of diversified and flexible learning systems and improved the quality of communication systems that have led to increased efficiency in the delivery of higher education (Machingambi, 2014). With a fast-changing world, both economically and socially, education has been recognised as the basic means of promoting skills needed for globalisation. Globalisation theorists argue that despite the fact that higher education systems are unique to different nations, depending on their needs, global forces have brought about a shift in the nature and purpose of higher education (Kandiko, 2010; Machingambi, 2014). This shift is evident in many ways, ranging from the massive expansion of higher education, changes in the higher education curricula and broadening of the providers of higher education. According to Grubb and Lazerson (2005), globalisation in education is like an Education Gospel that diffuses education internationally. There has been a substantial convergence of educational systems worldwide. Starting with different educational backgrounds, political systems and economies, both developed and developing countries have developed similar ideologies, institutions and curricula (Grubb, 2006). With the changing culture, economy, and technology, Kenya needs to place herself on the world map, through ensuring that the young people have high-quality skills for prosperity. A

well-equipped TVET system plays a vital role in the economic growth and development of a country and a well-trained and motivated workforce maximises output to expedite socio-economic development.

Concurrently, vocationalism postulates that educational systems should be guided by the needs of the economic system so as to ensure a supply of skilled labour needed for national and global economies (Bills, 2009). Technological advancements in the world today have greatly affected the labour market with low-skill, manual workers being those most affected through either the elimination of jobs they held initially or the introduction of new skill requirements for those jobs. Industrial processes have been greatly affected by technological advancement, including process control instrumentation, use of robots, and CAD and CAM tools. This has led to a call for a change in classroom instructional methods so as to guarantee a supply of personnel with skills that match the changing labour market. Vocationalism calls for educational reorientation by curriculum planners, policy makers, teachers, parents, students and all stakeholders in the education industry around the globe to make education vital in the preparation of learners to meet the needs of the labour market. The TVET education system of Kenya has been deeply influenced by the country's long-term development goal under the name Vision 2030, which greatly requires skilled manpower to achieve and compete in the international arena.

Methods

This section presents the design adopted for the study, description of the research participants, the administration and validation of research instruments, and data analysis and ethical considerations that guided the study.

Research Design

This study employed a cross-sectional survey research design, and the data was collected using a survey questionnaire.

Participants

The target population comprised 172 students from three TVET institutions which had received modern teaching and learning equipment. Proportional stratified random sampling was used to select students from each of the three TVET institutions. The sample was comprised of 32% females and 68% males. In terms of age, the majority of the students were below the age of 24 years, representing 86% of the total number of students, whereas those above the age of 24 years represented only 14%. The age is considered normal since students completing secondary education in Kenya usually transit to post-secondary institutions at ages slightly above 18.

Instrument Validation and Administration

Questionnaires were used to collect data. Other than questions seeking demographic information, and open-ended questions in the questionnaire, all other questions were in form of three-point or five-point rating scales. The questionnaire solicited background information, information on the adequacy of physical facilities, and teaching and learning resources, and how they influenced the quality of learning. The questionnaires were piloted to 30 respondents, who never took part in the main study. The instruments were content- and face-validated by subjecting them to thorough scrutiny from experts in curriculum development. The instruments had an acceptable internal consistency of 0.732,

0.884, 0.834 and 0.857 respectively, which was above the threshold value of 0.70 for consistent and reliable scale (Peterson, 1994).

Data Analysis and Ethical Considerations

Descriptive statistics were used to analyse quantitative data by filling frequencies and percentages presented in a table. Open ended questions were analysed qualitatively in narrative form and also presented qualitatively. The study adapted the acceptable research ethics; the researchers obtained a research permit from the National Council of Science and Technology (Kenya), sought consent of the directors of the community colleges, teachers and students and assured them that the confidentiality of data, anonymity, and their privacy and safety would be observed and maintained.

Findings and Discussion

This section presents and discusses the findings of the study based on the two research questions as follows.

Influence of the New Teaching and Learning Equipment on Students' Academic Performance

The study sought to determine the influence of modern T&L equipment on TVET students' academic performance in Kenya. From the findings of the study, as shown in Table 1, a majority of the students indicated that a practical learning period had helped them improve in their academic achievement (mean = 3.96). This is in agreement with a study by Nwike and Catherine (2013), which concluded that instructional materials enable students to enhance theoretical knowledge with hands-on skills through practice, hence, improving their learning and performance. Further, the findings revealed that a majority of the students were satisfied with their performance (mean = 4.05) and believed they were self-driven (mean = 4.17). It is generally accepted that the incorporation of technologies in teaching can facilitate active engagement in learning by reducing the amount of class time in which students sit passively listening to lectures. Research shows that active engagement in the learning process helps to motivate students and enhance their learning outcomes (Gleason et al, 2011). Moreover, from the findings of this study, it was revealed that students were happy to study in the field they specialised in (mean = 4.16) and they were confident to recommend TVET courses to others (mean = 4.17). This, therefore, shows that the TVET institutions are increasingly gaining a good image different from the long-held belief that TVET institutions are left only for failures. It is also a clear indication that the new teaching and learning equipment motivates students to learn and believe in themselves. This is in line with the findings of a study by Muhammad, Bakar, Mijinyawa, & Halabi (2014), that concluded that there exists a strong relationship between motivation and students' academic performance. Further, the study revealed that students' motivation serves as a yardstick in predicting their performance.

	N	Minimum	Maximum	Mean	Std. Deviation
My practical learning period has helped me to improve in my academic achievement	172	1	5	3.96	.798
I feel I have become a higher order thinker as a result of this course	172	2	5	4.13	.598
I feel more self-reliant as a result of this course	172	1	5	4.10	.687
I enjoy working on my assignments	172	1	5	4.02	.738
I am able to complete my assignments on time	172	1	5	4.01	.801
I feel that my performance in the TVET program is good so far	172	1	6	4.05	.771
I am a self-driven student	172	1	5	4.17	.794
If asked I would recommend TVET courses to others	172	1	5	4.16	.788
I am happy that I chose to study in this particular field	172	1	5	4.17	.736
Valid N (listwise)	172				

Influence of Modern Teaching and Learning Equipment on Learners' Employability Skills Development

With respect to the students' perceived employability, as shown in Table 2, a majority of the students indicated that they used the workshop only once in a week (mean = 3.36). This is perceived as a problem since TVET education is supposed to be practical, skill acquisition-oriented, meaning that TVET students should spend more time in the workshops. In recent times, there has been an emphasis on TVET institutions in many developing countries to concentrate on training that will equip learners with concrete skills that are required in the job market unlike the traditional way of abstract learning (Jones, 2005). For instance, TVET institutions in Kenya are expected to play a vital role in ensuring the supply of skilled personnel to industry and the informal sector. This would be possible only if TVET institutes concentrate more on a curriculum that is more practical than theory-based. Nevertheless, a majority of the students believed that their capability to work in industry had improved (mean = 4.05) and that their practical learning would promote their future employment (mean = 4.30). This finding is in line with the widely accepted belief that education and training for productive employment is vital for economic and social development. Further, research by Ferej, Kitaiinge, & Ooko (2012) proposed that for a country to succeed in skills development, matching the skills supplied with the demand in the labour market is very important.

Additionally, the students were confident of getting a job after their graduation (mean = 4.19); and they were confident to attend a job interview (mean = 4.06). This shows that whatever they were being taught in college was relevant with the expectations of the labour market, which is in agreement with the theory of vocationalism belief that educational systems should be guided by the needs of the economic system, so as to ensure a supply of skilled labour needed for national and global economies (Bills, 2009). According to a study by Musyimi et al (2018), Kenya has emulated China by adopting vocationalism in education for faster economic development. Vocationalism has been credited for China's rapid economic growth in a period of close to four decades, which has seen her become the second largest economy in the world.

Table 2: Teaching and Learning Equipment and Students' Employability Skills Development Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
How often do you use your school workshop	172	1	6	3.36	1.099
My capability to work in the industry has improved	172	1	5	4.05	.850
I believe that practical learning will promote my future employment	172	1	5	4.30	.758
I am confident of getting a job after finishing my course	172	1	5	4.19	.902
I feel confident to attend a job interview in the industries	172	1	5	4.06	.832
Specialist Knowledge	172	1	5	3.82	.809
Critical analysis	172	2	5	4.00	.618
Logical thinking	172	2	5	4.08	.613
Interpersonal skills	172	1	5	4.15	.706
Ability to work in a team	172	1	5	4.07	.957
Valid N (listwise)	172				

Conclusion

Based on these findings, TVET institutions in Kenya have been revitalised through the provision of modern teaching and learning equipment, which has led to vocationalisation of TVET education in Kenya, hence, bringing about the provision of quality training leading to employment. Also, there has been improved collaboration between TVET institutions and local industries, which has led to the provision of industrial attachment, therefore, ensuring that TVET students get exposed to the real labour market while still in college. Further the provision of modern teaching and learning equipment has changed the image of TVET in Kenya due to the improved quality of the programs offered in TVET. The TVET students have also improved confidence in themselves as they had acquired employability skills.

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Author:

Caroline Musyimi holds a master's degree in Educational Technology from the Central China Normal University and a Bachelor's in Technology Education from the University of Eldoret. Caroline is a full-time lecturer at the Coast Institute of Technology. She has experience in teaching, preparation of online educational resources, research and innovation as well as supervision and examination of students. Email: Caromusyimi@gmail.com

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