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STRATEGIES FOR ALIGNING INSTITUTIONAL ENGINEERING TECHNICAL VOCATIONAL EDUCATION AND TRAINING PRACTICES WITH INDUSTRY SKILLS REQUIREMENTS IN KENYA

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ABSTRACT

This study examined strategies for aligning institutional engineering Technical Vocational Education and Training practices with industry skills requirements in Kenya. The work environment all over the world is experiencing rapid transformations which have brought about unprecedented and significant changes in labour dynamics all over the world. The human capital theory was used for its explanatory value in assessing the critical role of TVET in moving society to the level of a knowledge economy. Literature review marked a conceptual gap in the study requiring broader collaborative arrangements between the technical institutions and the industry. A descriptive survey using both qualitative and quantitative methods was used to provide an in-depth understanding of TVET training. The study utilized 489 participants comprising 339 trainers, 3 Directors of TVET, KAM and LIWA, 24 representatives of industries working with TVET, 64 TVET engineering trainees and 59 TVET engineering trainees who had graduated. The Study mainly utilized questionnaires, interview guide and Focus Group Discussions. For the purpose of triangulation, a document analysis and direct observation were used. The research instruments were piloted to increase and assess their appropriateness, isolate any logistical challenges and evaluate whether the research procedure was workable. All the completed research instruments were scored manually and the collected data organized systematically. The online google questionnaires were analysed and presented in statistical form. The findings of the study presented a summary of strategies for aligning the training practices in engineering courses in TVET institutions with industry skills requirements. The researcher then synthesized the salient findings of the study to tease out and prioritize policies recommendations for matching TVET training with the requirements of the world of work.

Key Words: *Aligning skills with industry requirements, TVET Training practices, Engineering, Skills Gaps*

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INTRODUCTION

The work environment all over the world is experiencing a rapid transformation. The major ones are globalization and technological advancements catalysed by the Fourth Industrial Revolution (4IR) (Schwab, 2016). These transformations have brought about unprecedented and significant changes in labour dynamics all over the world. It is these kinds of disruptions that call upon educators to reflect seriously on the kind of skills that are offered in our TVET training institutions and the relevance of this training to the future of work.

However, there are concerns that TVET training is not producing skills that are commensurate with the requirements of the world of work which leads to youth unemployment. One of the factors accounting for this high unemployment is skills-sets that are discordant with the requirements of the industry. Sectors that have a huge capacity for employment have not been explored (Odero, et al., 2021; Sikenyi, 2017; Awiti & Scott, 2016). Presently, skills demands in the world of work are in a state of flux due to advancing technologies, environmental challenges and their mitigation and demographic shifts. The decreasing shelf life of existing skillsets requires the development of responsive, higher quality and accessible TVET systems (O'Brennan, et al., 2014).

Skills mismatch is an encompassing concept that denotes different kinds of discrepancies between the skills rendered in training institutions and those required in the world of work. This major gap in skills has been acknowledged by both policymakers and researchers. The World Bank has identified the major skills gap including but not limited to hands-on technical skills; knowledge of the job; ICT skills; foundational skills; soft skills and higher-level cognitive skills (McGuinness, Pouliakas, & Redmond, 2018).

At the global level, there is evidence that the research problem that was addressed in this study has also been articulated explicitly. Many youths globally are without a job or disengaged from the labour market. From recent ILO statistics (2019), approximately 64 million young people are without employment globally. Paradoxically, millions of jobs remain unfilled. This inconsistency in skills begs for a reconsideration of the part being played by general education and TVET in particular towards linking training and work (Bandura & Grainger, 2019).

In Africa, TVET suffers from obsolete and insufficient training equipment and tools. The region has also suffered from a declining quality of the training offered since most of the trainers lack the necessary industrial and technical capability and a lack of linkage between the educational institutions and the industry. There are limited mechanisms or structured arrangements for involving the industry players in the TVET planning process (Marope et al., 2015). Moreover, evidence shows that TVET engineering courses in South Africa should be repositioned to articulate the relationship between training and the labour market in full realization of the state of extensive unemployment among the youth (Sibiya and Nyembezi, 2018).

In the Kenyan context, TVET has a history of negative perception dating back to the colonial days. The Phelps/Stokes commission of 1924 introduced the Devonshire white paper that advocated for education along racial lines thus setting aside technical education for the Africans so that they could mainly perform the manual work for the settlers (Sifuna, 1990; Bogonko, 1992; Otiende et al., 1992). The system had a semblance of 'Negro' education in the USA that tended to relegate the Africans to a source of cheap, skilled labour for the whites (King, 1971). The negative perception towards TVET emerged since technical education was set aside for blacks and therefore linked it to manual work as opposed to academic work. This attitude has been persistent since the stakeholders still see it as inferior quality education that only becomes an option for those failing to acquire a university grade (Simiyu, 2009). This colonial bias entrenched the perception that technical education is an inferior second-rate pathway leading to low social recognition and hindering its development. Recent on-going developments in TVET in Kenya involve the revival and expansion in terms of creating new TVET institutions to ensure there is at least one institution per constituency in the county.

Further, the extent of the study problem is reflected in an Industry Needs Assessment conducted by KAM in November 2017. The report covered 50% of industries in six regions of Central, Nairobi and Machakos, Nakuru, Eldoret, Kisumu and Mombasa. It revealed that the gap between skills needed by industry and what TVET teaches remains a challenge that has partly contributed to the rising unemployment rates in the country. The report further elevates the need to focus specifically on engineering courses in affirming that nearly all companies visited required machine operators, who can handle machines currently used in the respective industries.

Therefore, this study focused on strategies for aligning institutional engineering Technical Vocational Education and Training practices with industry skills requirements in Kenya.

Statement of the Problem

There is a renewed interest in engineering courses in TVET in Kenya. Statistics from 2019/2020 placement results by KUCCPS show that a total of 58,851 students had been placed to train in TVET institutions. Out of these, engineering attracted the highest students at 15,326 representing 26% compared to sciences 11,115 (19%), Technology 5,220 (9%), Mathematics 3,538 (6%) and Agriculture 2,170 (4%) among others. In order to attain Vision 2030 target of increasing manufacturing from 10.3% to 15%, it is important to expand the Technical and Engineering pathway from an average of 0.05% to 15%. So there is an indication of eminent interest in engineering courses.

In spite of the above depiction of increased interest in TVET engineering courses and the indicated mismatch, there is no evidence to show major efforts to address gaps in the training practices. This study views the skills mismatch as a paradox given the high level of youth unemployment. Furthermore, the mismatch has implications even for self-employment given that the youth need requisite skills to start their own enterprises. Furthermore, studies also show that TVET graduates lack hand-on-skills in their areas of specialization, digital skills, innovativeness and entrepreneurial skills. In addition, given that many countries have limited job opportunities, TVET graduates need skills in innovation, creativity and entrepreneurship so as to generate jobs.

Objective of the Study

The study sought to generate appropriate strategies for aligning the training practices in engineering courses in TVET institutions with industry skills requirements in Kenya.

Significance of the Study

The study anticipated that the Ministry of Education and private sector players may find this study instrumental in generating appropriate strategies for aligning the training practices in engineering courses in TVET institutions with industry skills requirements in Kenya. Additionally, the researcher hoped that the outcomes of this study may participate in building up knowledge in institutional Technical Vocational Education and Training practices in engineering courses and implications for alignment with industry skills requirements in Kenya.

In pursuit of this, the study was optimistic that the findings would generate awareness among the various players in TVET education on training practices in the engineering courses in technical training institutions and implications on meeting industry skills requirements in Kenya.

Theoretical Framework

Aligning industry skills requirements emphasizes the need for institutional engineering TVET practices to be in line with the labour market demands. Therefore, the research examined the appropriate strategies for aligning the training practices in engineering courses in Technical Vocational Education and Training Institutions with industry skills requirements in Kenya.

The study based its theoretical explanations on the Human Capital theory. The theory has its foundation from the works of early scholars like Adam Smith (1960s), Schultz (1961) and Becker (1993). The main tenet of the theory looks at training as an investment. Training as an investment, therefore, means preparing trainees for a particular job in the industry based on the requirements; ensuring sufficient provision of skilled labour for specific skill domains; and that the trainees secure gainful employment relevant to their area of specialization (Galbraith, et al., 1975).

The human capital theory is a useful tool for evaluating the link between the systems of education which are the inputs and the accruing social-economic payoffs which are the outputs (Netcoh, 2016). Although the human capital theory is a classical one, it still has explanatory value in assessing the critical role of TVET in moving society to the level of a knowledge economy. Its contemporary perspectives enable us to assess TVET education from a social-economic angle. This theory is still relevant because it looks at how technical education should match the world of work. As argued by Mahoney and Kor (2015), the skills and competencies possessed by the workforce constitute the main capital in a knowledge economy. It is these skills and competencies that act as the buoyancy for building the economy.

Conceptual Framework

The study recognizes that the TVET Act 2013 provides the policy framework. The Act focuses on reinforcing the relevance and quality of TVET training to ensure it is responding to the requirements of the labour market. The study recognizes that the training environment has a role towards guaranteeing quality training.

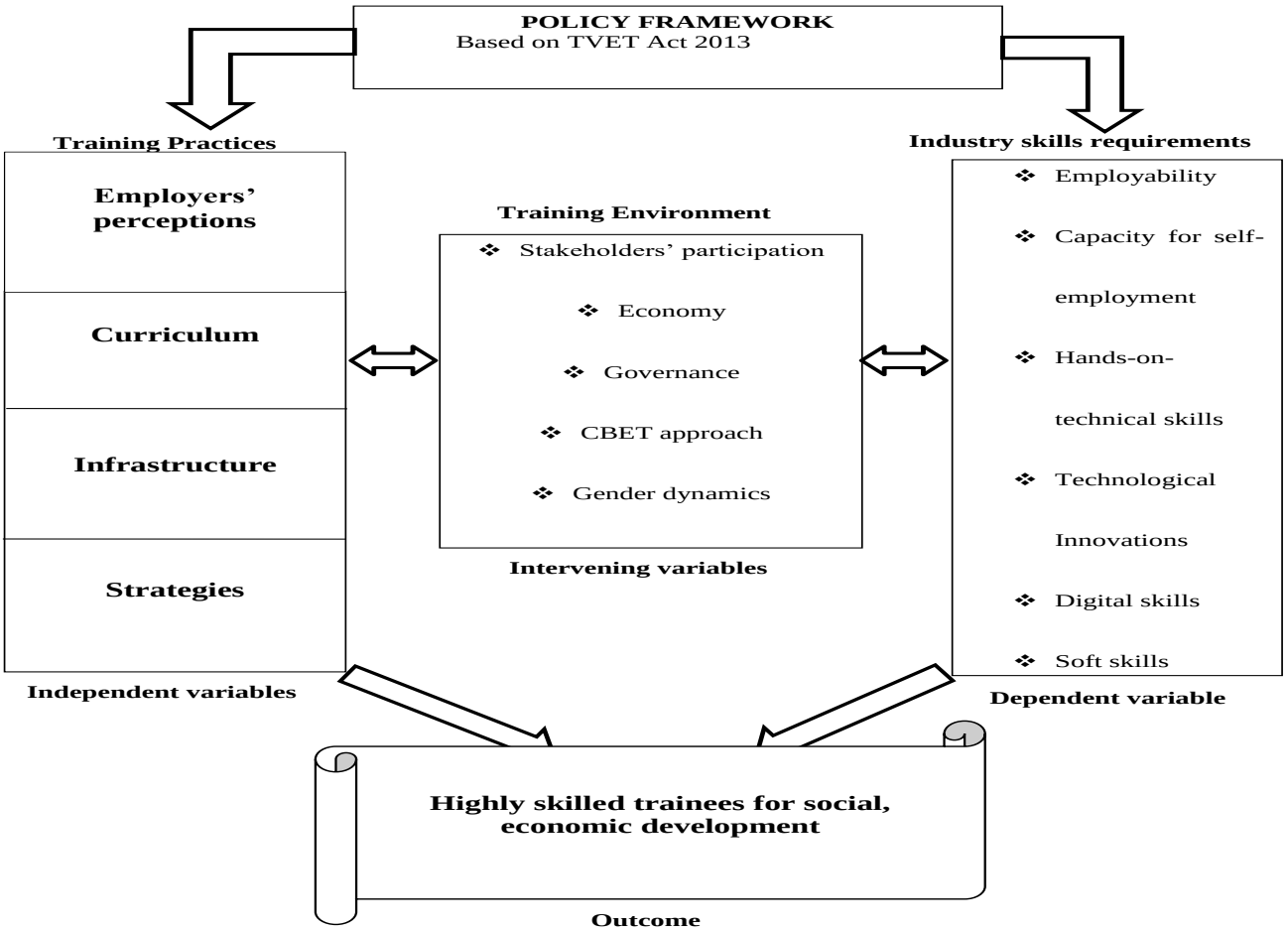

Figure 1: Training practices and implications for alignment with industry skill requirements

REVIEW OF RELATED LITERATURE

Appropriate strategies for aligning the training practices in engineering courses in TVET institutions with industry skills requirements in Kenya

According to a 2013 report by UNESCO, TVET is at a vantage position to address skills mismatch and empower the youth to find decent jobs or become self-employed. The report, however, notes that TVET institutions need to undergo major transformations in the wake of rapid technological change and globalization. These changes embody the strategies that this study sought to recommend for TVET.

A comprehensive survey conducted in Philippine on skills mismatch makes several recommendations. In order to produce highly skilled workers that would balance the supply and demand for competent personnel, there would still be the need for upgrading of the curriculum in TVET to be responsive to needs of various industries; for companies to provide up-skilling/multi-skilling programs to their employees to meet the skills requirements of technological innovations adopted by the companies; to encourage industry-academia linkages and collaboration; as well as to increase public spending for and strengthen technical/vocational education in the economy were the most recommended courses of action to ease the problem of lack of qualified personnel or existing talent mismatch observed to support emerging industries (Asia Pacific Economic Cooperation, 2012:22).

Another jurisdiction to compare with is the Latin America and Caribbean (LAC) region where the study notes that to advance youth employability, governments across the region have developed national and/or regional qualifications frameworks and promoted competency-based approaches and work-based training. Measures have also been put in place to raise TVET quality through the training of trainers and external evaluation (UNESCO-UNEVOC, 2015:27).

A study on expanding TVET education in Kenya notes that companies face severe difficulties in recruiting workers with an appropriate mix of applicable skills and knowledge. However, the government seems to be getting it all wrong by simply tripling the capacity of existing tertiary educational programmes and the number of institutions. This is likely to lead to situations where trainees cannot find suitable employment, are underemployed and their education skills are not properly utilized for the economy's benefit. The introduction of new programs must be linked to new labour market opportunities and shifting demand in the private sector (Blom, 2016).

Further, according to the 2018 World Economic Forum Report, 30 percent of the Kenyan workforce have inadequate skills, a position that adversely impacts on labour productivity. Furthermore, the report indicates that 3 out of 10 Kenyans lack the required skills, thereby reducing productivity and increasing the cost of doing business in the country. This report points to a clear indication that there is a need for an industry-led skills policy that will ensure that human skills development connects effectively to labour market needs. Accordingly, the study sought to interrogate the policy position regarding skills development in Kenya.

Literature review shows that the link between TVET and the industry as presently constituted is narrowed down to the representation of industry in the governing bodies of technical institutions and students going for internship, attachment and academic trips in the industries. This relationship marks a conceptual gap in the studies since the collaboration should have a broader meaning and go beyond that to include industry involvement in formulating curricula for the training institutions in line with specific needs. This type of collaboration is what is envisioned in the TVET Act of 2013, Part V — Organization of Training Institutions 29(k) which gives the councils established authority for "approving collaboration or association with other institutions and industries in and outside Kenya subject to prior approval by the Board." Further in Part VIII —The Technical and Vocational Education and Training Curriculum Development, Assessment and Certification Council- clause 38 (c) states that "Every institution shall in accordance with the provisions of this Act, establish and promote appropriate collaborative arrangements with national and international

agencies on standards and quality assurance." Consequently, the collaboration expected between the technical institutions and the industry is lacking.

A survey carried out in Armenia, Georgia, FYR Macedonia, and Ukraine on the skills gap, underscores the need for reforms in TVET education. Underlying these reforms is a continued need for more and better information on the availability of skills, the skills needed in labour markets, and the reward to skills. More efforts to measure skills in consistent and comparable ways to facilitate benchmarking and provide timely input to labour market and skills policies are needed (World Bank, 2015). The situation is even grimmer for the informal sector where potential trainees as well as training institutions, do not have accurate information on the kind of skills required by the informal sector. Therefore, while the trainees lack the necessary information to help them pursue the right skills, the training institutions lack the necessary information to adapt their programmes to meet the skills gaps (Adams, et al., 2013: 108). These surveys presuppose a feedback system whereby TVET institutions are getting information from the industry on the skills in demand so as to inform their training practices.

However, a study by Palmer (2017: 30) marks a significant knowledge gap in recommending appropriate strategies to the address skills gap. The study notes that common policy at the macro level to orientate skills policies to better match market 'demand' is to call for greater private sector representation on TVET governance and coordination entities (e.g., TVET Councils, national training authorities). However, such private sector participation tends to be of representatives of the formal private sector. Greater representation of those working in the informal economy is needed; perhaps one way to do this is via intermediaries like informal trade associations. The role of the informal economy in addressing skills gap is not given its due mileage yet most of the TVET trainees end up in the informal sector. It was, therefore, important for the study to examine the level of involvement of the informal sector in TVET education.

The studies above have adduced several recommendations towards linking TVET training practices with the requirements of the industry. The study endeavoured to bring together a synthesis of a number of these plausible recommendations towards advancing the way forward and in propounding the main premise of the study.

METHODOLOGY

The study employed a descriptive survey design utilizing both qualitative and quantitative approaches towards understanding strategies for aligning institutional engineering Technical Vocational Education and Training practices with industry skills requirements in Kenya**.** The design was adopted because it provides an in-depth understanding of the situation as it is in our TVET institutions. The study focused on TVET institutions in Kenya. TVET institutions are middle level colleges under the Ministry of Education, State Department for Technical, Vocational Education and Training.

The study focused on Central Kenya region which was covered in the Industry Needs Assessment conducted by KAM in November 2017 and which provided a good foundation for understanding the skills gaps in this study. The region covers a wide geographical area cutting across eight counties: Meru, Tharaka, Embu, Kirinyaga, Murang'a, Nyeri, Nyandarua and parts of Laikipia.

The researcher used Google online questionnaires for the trainers in selected TVET institutions to collect both qualitative and quantitative data. An interview schedule was utilized for the TVET Director, Central Region, Director of Kenya Association of Manufacturers (KAM) and the Director of Linking Industry With Academia (LIWA). There was also a questionnaire for representatives of industries working with TVET institutions and focus group discussions with the TVET engineering students who had graduated as well as selected third year TVET engineering trainees. For the purposes of triangulation**,** a document analysis for the purposes of triangulation and structured observations were undertaken to gather data. The research instruments were

piloted to increase and assess their appropriateness, isolate any logistical challenges that could arise in the process of data collection and evaluate whether the research procedure was workable.

All the completed research instruments were scored manually and the collected data organized systematically. However, for the online google questionnaire, data was analysed as soon as the respondent clicked the submit button. The programme has an inbuilt data analysis system that automatically provides the analysis of the uploaded information in statistical form.

FINDINGS

General and Demographic Information

A summary of the survey respondents and the response rate of the instruments is presented in table 1 below:

Table 1: A summary of the survey respondents and the response rate of the instruments

Sampled Group	Instrument	Number of Respondents	Participated	Response Rate
Trainers	Questionnaire	373	339	91%
Representatives of industry	Questionnaire	24	24	100%
Director KAM	Interview	1	1	100%
Director LIWA	Interview	1	1	100%
Director TVET	Interview	1	1	100%
Trainees	Focus Group Discussion	64	64	100%
Trainees who Graduated	Focus Group Discussion	64	59	92%

Strategies for matching the training practices in engineering courses in TVET institutions with industry skills requirements in Kenya

To arrive at strategies for matching the training in engineering courses in technical training institutions with industry skills requirements in Kenya, the researcher summarized the recommendation by the trainer respondents and refined them with expert opinions from the selected representatives of industries working with TVET institutions, directors of TVET, KAM and LIWA because of their relevance as argued earlier in the study. Secondly, the researcher considered the suggestions made by the trainees and those trainees who have graduated on the challenges encountered in acquiring requisite skills, their attempts to surmount the obstacles and their estimations on how to improve TVET training. The proposed strategies were weighed against the recommendations of other studies for functionality and policy underpinnings.

The recommendations by the trainer respondents on how to improve TVET training were summarized in table 2 below:

Table 2: Recommendations by the trainer respondents on improving TVET training

Recommendation by the trainer respondents	Frequency of responses	Percentage
Re-branding TVET pathway by creating a link from basic education to TVET	112	33.04 %
Adoption of Collaborative Training Model	75	22.12 %
Policy formulation to plug in SMEs in collaborative training	47	13.86 %
Policy on Niche courses for TVET	36	10.62 %
Policy Framework for Systematic professional development of TVET Trainers	30	8.85 %
Policy on Enhancing Management of TVET institutions	28	8.26 %
Others: increased government funding, restructuring of ministry of education, community involvement, devolution of TVET, reconstitution of entry criterion, qualifications of trainers etc.	11	3.24 %

These responses and their implications were discussed below.

Re-branding TVET pathway by creating a link from basic education to TVET

The trainer respondents were asked to give recommendations on how TVET training for engineering courses could be improved. The most frequent response as indicated was 33.04% (112 respondents) dealing with negative perception towards TVET education in general. Indeed, as noted earlier in the study (Sifuna, 1990; Bogonko, 1992; Otiende et al., 1992), the negative perception is an age-old problem in TVET and it persists to date.

The views from trainees' voices in the focus group discussions reveal that negative perception towards TVET training was still rampant:

> *There is low opinion towards technical education as 'kazi ya mikono' (meaning manual labour)*
>
> *(*Male voice in the focus group discussion for Sample Institution*)*
>
> *We need to explain a lot that we are not failures.*
>
> *(*Female voice in the focus group discussion for Sample Institution*)*
>
> *Even our own parents have doubts about technical education.*
>
> *(*Female voice in the focus group discussion for Sample Institution)
>
> *What I found here was very surprising because out there I came with low expectations. People have no idea that we learn a lot here*.
>
> (Male voice in the focus group discussion for Sample Institution*)*

The trainee voices bring out the negative perception towards TVET training. Technical education was still perceived to be for failures who do not make it to the university and a commensurate low opinion towards manual labour. These negative perceptions have repercussions for the acquisition of skills for employability. The selected representatives of industries working with TVET institutions associated the negative perception with lack of soft skills:

> *We should try and bring back 'dignity' in TVET education because for the longest time it has been the last option, a place for failures. The mindset that people doing white-collar are better than those doing blue-collar jobs is not right because they are both able to fend for themselves. It may be that that is where the problem of soft skills comes in because the TVET students feel like they cannot compete with university students.*
>
> (Male representative of industries working with TVET)

The selected representative of industries working with TVET institutions revealed that the negative perceptions also affect the trainees thus lowering their personal determination to acquire skills and be as good as those they are rated against. The respondents indicated that many stakeholders were ignorant about TVET and were only familiar with university education. The respondents went further to make recommendations on enhancing positive perception through creating a link from basic to tertiary education:

> *One of the possible causes of negative perception towards TVET is the lack of link from basic education to technical education at the tertiary level. This link will be addressed in the new CBC curriculum: Introducing technical education early and linking basic and tertiary education- one can move directly from electrical engineering in high school to electrical in TVET.*
>
> (Male TVET Director*)*

There is a need to resocialize the students by introducing technical education early in the education system. That way there is a link between primary school and high school. University education is overrated in this country.

(Male LIWA Director)

The directors opine that a link between basic education and technical education would not only create awareness but also validate the TVET pathway in the eyes of the public. The trainee voices in the focus group discussion indicated that the TVET pathway was not well known by many people. They indicated that university appears to be the only known pathway after basic education.

You did not make it to the university?

(Male voice in the focus group discussion for Sampled TVET Institution)

Work hard there so that you can later go to the university.

(Female voice in the focus group discussion for Sampled TVET Institution)

What happened, I thought your grades were good enough for the university?

(Female voice in the focus group discussion for Sampled TVET Institution)

Don't worry, even if you did not make it to the university, technical education is also good.

(Male voice in the focus group discussion for Sampled TVET Institution)

The above discussion painted an imbibed perception that university education was the only pathway after basic education. This systemic misunderstanding, undermining and undervaluing of TVET training diminished its ability to produce skilled technical workers due to low rating and prestige.

Empirical studies in Cambodia note that TVET will have limited effectiveness in promoting youth employment as long as TVET is seen by parents and students as a 'final choice' or 'second choice' option. The current optimism about TVET against youth unemployment has raised the status of TVET, but if substantial measures are taken towards improving quality, the negative image of TVET will be reversed in the long run (Ly, B.,2018). Similar studies in Egypt, Jordan and Lebanon indicate a vicious cycle of the negative image, low quality and low self-esteem related to TVET advocating for awareness campaigns (Billett, 2018).

Directors and trainers recommended the introduction of vocational disciplines earlier in basic education in order to facilitate a seamless pathway from basic to tertiary education. Further, it would help to pacify the mindset among stakeholders that TVET was a valid pathway rather than the last result alternative. In addition, the Directors recommended engaging industry as significant players in TVET in order to raise the profile of TVET, gain more visibility in innovations meant to solve societal problems and more engagement with the local community. The trainers opined that the presence of TVET institutions should be felt more in society through solving their problems to raise the profile.

Adoption of Collaborative Training Model

The respondents from the TVET trainers on recommendations on how TVET training for engineering courses could be improved indicated 22.12% (75 respondents) vouching for collaborative training. The respondents may not have necessarily mentioned the word collaborative training but they used their own language to indicate the same. They used words like linkages, working together, consultations etc. They felt that collaborative training was a more comprehensive approach to training the skills of the 21st century. Collaboration is the organization of joint efforts among actors to achieve a shared goal. The LIWA director aptly defined it as: *"training with the industry rather than training for the industry".* Collaborative training was not one of the three models of TVET cited in the review of related literature: the private market-led

industry model; the state-regulated bureaucratic model; and the dual system model. It is an adaptive innovative model drawn from a conglomeration of the three.

> *When talking about adapting the model, it means that we cannot import directly. We can only borrow elements from it. When borrowing these elements, we look at the context of our landscape as far as industries are concerned. With that kind of model, how do we then design something similar that would work for our context?*
>
> *Collaboration is a very successful model because when the industry works together with the institutions, they contribute to curriculum development and designing the assessment model. When it comes to the implementation of training, do not train for the industry but rather train with the industry. When it comes to skills forecasting, predicting what skills are needed in this country for the next two to three years cannot be done by the training institutions alone, the industry has to get involved.*
>
> (Male LIWA Director)

The findings from the LIWA director were an indication that collaboration between TVET institutions and the industry would provide a solution to the mismatch in skills. The researcher infers that the industry and the training institution would begin their cooperation at the identification of occupation standards or the curriculum. Then the trainees would be rotating in blocks between the training institution and the collaborating industry. The trainee not only learn technical competencies but also social and soft skills useful for the world of work. Regarding the challenge of inadequate and obsolete training equipment in TVET institutions, the LIWA Director notes that the TVET system could keep pace with technological advancements by using technology that was readily available in the industry. He presented a strong thesis for collaboration:

> *This is not an easy problem to solve because even if the training institutions purchase up-to-date equipment right now the technology in the industry is also changing very fast meaning that you will buy new equipment today and in a couple of years that technology has changed. Each industry is using a different kind of technology. Hence the only solution is for the industry to work together with the institutions.*
>
> (Male TVET Director)

According to the LIWA Director then, TVET institutions would keep up with the fast pace of changing technology through collaboration. In addition, the challenge of expensive equipment that TVET institutions cannot afford would be resolved. When TVET institutions collaborate with the industry, they would benefit from modern technology thereby bridging the gap.

As indicated earlier, the study found out an example of good practice in the area of training equipment for engineering courses in the Sampled TVET Institution C. Through observation and document analysis, the study noted that due to the breakdown of training equipment for training dairy technology, the institution had sought partnership with a local dairy company for the trainees to get hands-on training in handling the equipment. The study revealed that there was a collaboration that allowed the trainees to interact with the dairy technology in the industry. This strategy had facilitated the acquisition of practical skills in spite of the challenge of the breakdown of training equipment in TVET institution. The research cited this as an innovative approach to overcoming the challenge of inadequate training facilities for engineering programmes in TVET.

The respondents also noted that collaborative training would sort out the problem of lack of industrial experience and exposure for trainers as well as bridge the gap in training infrastructure. Thirdly and quite importantly, collaborative training would help achieve the target of partnership in the examination process that was envisaged by TVET CDACC. Trainers noted that the current examination system is heavily modeled on

basic education. Collaborative training would help in the streamlining of the examination process to eliminate existing duplication of KNEC, CDAAC, NITA and other government departments and private institutions. With the help of the industry, TVET would harmonize entry requirements, course duration, progression criteria as well as examination and certification.

In furtherance to the collaborative training model, the study found out that TVET institutions had the capacity to provide opportunities within by creating income-generating activities related to their areas of training.

> *TVET institutions should begin by consuming their own services. A lot of repair and maintenance work could be done by trainees cutting on costs and providing trainers and trainees with opportunity for hands-on experience. The procurement regulations have room for institutions to do so. Furthermore, TVET policy does encourage institutions to create incubation centres that work as both income-generating activities and as training opportunities. For example, Mechanical engineering should provide opportunities for welding, fabrication and machine operations. Automotive engineering departments should establish automobile garages or car care centres that are open to the public.*
>
> (Male TVET Director)
>
> *There should be a policy requiring TVET institutions to start Income Generating Activities along their line of trade skills. It is here that the trainees get an opportunity to practice their trade while giving the institution a new revenue stream. It is also possible for TVET institutions to partner with industry to carry out basic routine work like cutting metal, welding and threading. I witnessed this happening at the Kigali Integrated Polytechnic Regional College in Rwanda. A lot of metalwork is happening in the institution and the finer finishing happening in the industry. There are numerous opportunities if the institutions have the capacity to do so and this helps them further their core business of training.*
>
> (Male LIWA Director)

The above proposal by the two directors connects the Income Generating Activities (IGAs) to the curriculum. The LIWA Director proposed that TVET institutions should also be encouraged to initiate IGAs and short customer-tailored courses. While the students are taking part in the activities along their trade areas, they will obtain corresponding hands-on skills. Similarly, a summary of recommendations by trainers on how to improve TVET training suggests that IGAs are furtherance to the core business of TVET institutions. Moreover, the activities need not be in competition with the industry since there are opportunities for partnerships and collaboration. What seems to be lacking in the Kenyan context is a regulatory framework. The regulatory framework is meant to create a win-win situation for all players. They recommend that the government provides incentives for industries to partner with TVET institutions. Such incentives would include tax concessions.

Income Generating Activities have been successfully realized in TVET institutions in other jurisdictions. The government of Vietnam has a policy that expects TVET institutions to initiate Income Generating Projects. Besides being a source of revenue to fund training, IGAs are seen as an avenue for providing both trainers and trainees with improved practical training opportunities (Vietnamese-German Development Cooperation, 2007). Even in Nigeria, the government policy for each TVET institution is to establish a Production Unit. There are two main objectives for these units: provide trainees with practical hands-on experience and generate funds for the institutions. There is a regulatory body to monitor the management of the resources generated from the Unit (UNESCO-UNEVOC, 2017).

The findings of this study firmly recommended the institutionalization of the Collaborative Training Programme in TVET. Collaborative training holds the key to many challenges cited in this study including a curriculum that is not in tandem with the requirements of the industry, training infrastructure that is

inadequate, obsolete and not in line with technological advancements of our time. Collaborative training would also facilitate industrial exposure and experience for trainers as well trainees. The study recognizes that to do so, the country requires the full participation of the industry. The government ought to facilitate the formulation of a collaborative framework by providing incentives for a conducive environment for industrial growth and development.

Therefore, through collaborative training, the industry is well-positioned to directly provide technical support to the TVET institutions through mentorship, attachments, internships and employment opportunities, curriculum development, implementation and credentialing, guest lecturers and advisory board roles. The industry is also in a position to place its workforce in TVET institutions for professional development courses. This would be a win-win arrangement for both TVET and the industry.

Policy formulation to plug in SMEs in collaborative training

The respondents at 13.86% (47 respondents) recommended collaboration with SMEs to bridge the gap in lack of enough industries to cooperate with. In recommending the collaborative training model discussed above, there would be the challenge of having enough industries for the TVET institutions to pair with. Trainers noted that *sometimes the trainees have a challenge getting places for attachment since there aren't enough places in the companies*. The study found out that the Kenyan context does not provide enough national and multinational firms for institutions to give their trainees adequate industrial experience. The Kenyan economy is not highly industrialized. It is within this context that the study called for leveraging the nexus between SMEs and TVET.

In Kenya, SMEs accounted for 83.6 percent of the new jobs created in 2018 (Kenya National Bureau of Statistics). Therefore, micro and small enterprises have the capacity to provide reliable work experience and eventually employment to the TVET trainees. An informal Sector Skills and Occupations Survey (KNBS, 2020), shows that majority of the players in the informal sector at 78.8% had not attended any TVET training with only 21.2% having had TVET training. The researcher feels that this scenario presents an opportunity for TVET institutions to collaborate with SMEs. The collaboration would be a win-win situation in that while TVET trainees and trainers have an opportunity for hands-on practice, the SMEs would benefit from the theoretical knowledge that is useful for practice. The interview with the directors confirmed that:

> *One of the areas where TVET would benefit SMEs is recognition of prior learning. The Kenya National Qualifications Authority (KNQA) has already validated recognition of prior learning framework creating validation mechanism and addressing certification of various training levels. A lot of artisans are practicing competently but lacking certification which lowers their prestige and remuneration.*
>
> (Male TVET Director)
>
> *The majority of the industries are SMEs. Next to our TVET institutions, there are automotive workshops and since they are also running an automotive course, every week Monday, Tuesday and Wednesday, the students are training in school while on Thursday and Friday, there is mandatory training in the garage. That way they are learning theory while at the same time being exposed to hands-on in their skill area. The government must come up with incentives for the SMEs since they will always ask, 'what is in it for us'. There will be a mutual benefit for both the TVET institution and the SME. The industry may not have the benefit of the theory that the trainees have as the SMEs provide TVET trainees with the practical component that they do not have. See, it is a win-win situation.*
>
> (Male LIWA Director)

The two directors viewed collaboration between SMEs and TVET institutions as a win-win situation. The informal sector in Kenya suffers from a lack of opportunities for formal training, up-skilling and certification. The SMEs would benefit from the theoretical aspects of TVET training, up-skilling as well as certification while the TVET institutions get the opportunity for hands-on practice in the industry. What seems to be lacking then is the policy guideline.

The KAM Director notes that *KAM recognizes the role of SMEs and has set up a Manufacturing SME Hub in order to grow the sector and provide impetus to develop full potential.* According to the 2016 National MSME survey, the SMEs in Kenya have engaged about 14.9 million workers. However, the Directors opined that SMEs lack a technically competent workforce for innovation that meets international standards. Collaboration with TVET would be mutually beneficial in that SMEs would build their capacity and competence while TVET trainees find attachment, apprenticeship, internship and eventually employment.

Based on the observations of the study, the researcher noted that TVET should also focus on skills for self-employment since most of the graduates mainly end up there after training. Therefore, the institutions should ensure that the training is sufficient for the entire spectrum of the labour market right from Jua Kali (informal sector) to multinationals. The diploma in engineering course should be suitable for all the levels in the labour market. According to the World Bank, the informal sector in Kenya, that is the Jua Kali sector, accounts for about 90 percent of the total nonagricultural employment (Bennell, 2022).

The model could be benchmarked in Sri Lanka where TVET has leveraged the National Policy Framework for SME Development. In Sri Lanka, the government acknowledges that SMEs are the pillar of the economy and accounts for 75% of the total number of enterprises, and provides 45% of total employment in the country. In sub-Saharan Africa, informal TVET accounts for 80-85% of skills training. The informal sector trains by observation on-the-job training leaving the trainees with applicable skills but no theoretical knowledge. That way, they have produced street craftspeople in mechanics, household appliance repairs, electricians, plumbers (Igwe, et al., 2018). TVET involvement would plug in these gaps in theory and certification for the informal sector trainees, therefore, win-win for TVET and SMEs.

The study, therefore, proposes policy formulation that plugs in SMEs in collaborative training. This collaboration is supported by an ILO global survey that provided evidence that 7 out of 10 workers are self-employed or in small businesses, a finding that has important implications for employability policies across the globe (ILO Database, 2019).

Policy on Niche courses for TVET

The TVET trainer respondents at 10.62 % (36), as shown in the results, proposed that TVET institutions should be given some autonomy regarding the choice of the curriculum such that they could choose some courses that suit their locality. TVET institutions should be encouraged to specialize by offering niche programmes in their areas of strength. This specialization would enable the institutions to leverage available resources in terms of trainers and training infrastructure. Secondly, institutions would enhance their relevance and visibility by specializing in programmes that respond to the needs of their locality.

According to the TVET Director, each of these environments presents the TVET institutions with an opportunity to develop skills and appropriate technology to match the needs of the immediate environment. The director insisted that:

> *TVET institutions are encouraged to specialize by offering niche programmes in their areas of strength. This specialization will empower the institutions to leverage available resources including trainers, available equipment and community resources.*
>
> (Male TVET Director)

In this context, the niche is a connotation of specialization in a given trade skills area. The suggestion is for TVET institutions to position themselves strategically for courses that are suitable to their individual contexts. That way, TVET institutions would provide market-driven courses. A niche is a specific area of specialization which has its own particular requirements, products and target customers.

> *Each TVET institution is within unique social-economic ecosystems and the immediate skills demands are equally unique. There are TVET institutions within farming environments for value addition technology, dry and semi-arid areas could specialize in solar installation technology and air-conditioning and refrigeration technology, fishing communities to develop appropriate technology, pastoral communities where hide skin are available for leather making could focus on leather manufacturing and meat processing technology, marine technologies for the coastal region, mineral-rich areas for extractive engineering, opportunities for recycling and manufacturing hubs for technological advancements in urban centres.*
>
> (Female KAM Director)
>
> *TVET is about providing solutions whether to individuals or society. Therefore, how should a TVET institution give back to the society where it is situated? For instance, for a TVET institution situated around Kericho where the main economic activity is tea farming, what value is the institution giving to tea farming? Therefore, it is easier to establish a center of excellence around tea-related activities. Where we know that the TVET institution in Kericho is working closely with providing solutions around tea farming maybe by training farmers on the modern way of farming, training tea pluckers on mechanization, training soft skills required by tea farmers, training managers for tea factories. Therefore, it is about providing solutions for where I am operating.*
>
> (Male LIWA Director)

The findings from the directors were that each TVET institution could be a Centre of Excellence in a niche course. Niche courses present TVET institutions with an opportunity to develop skills and appropriate technology to match the needs of the immediate environment, solve problems and create employment.

Additionally, the LIWA director noted that *the curriculum should consider the context within which the institution operates. For example, some of the informal sector skills may not necessarily need the highly academic concepts but mainly hands-on competence.* He noted that without this realization, the training environment could be difficult for some trainees who may not easily conceptualize the highly elitist and academic curriculum. He, therefore, recommended a flexible and dynamic curriculum that also factors recognition of prior learning. He noted that 30% of the workers in the informal sector have skills that had not been recognized which led to their alienation from the wider economy. Incorporation into the curriculum would be a pathway from unemployment through training to employment and self-employment.

The findings pronounce themselves to customization of courses focusing on the specific skills required by the immediate environment within which TVET institutions are located. This niching of TVET courses would facilitate skills match by meeting specific skill needs and opening up opportunities for employment.

Studies concur that it was important to consider the individual needs of each TVET institution in crafting programmes that match the industry. A survey on the G20 countries noted a policy to set aside specific time and space in the TVET curriculum to address local needs. There were efforts to cover both national skills competencies while creating room for coverage of the most relevant local skills requirements. For example, in Italy, a framework curriculum was developed nationally but provides a 20% "school autonomy quota" that provides flexibility for tailor-made customized TVET programmes to reflect specific local needs in the curriculum. With the right level of flexibility, training institutions can more effectively partner with local employers, employer associations, sector organizations, local government authorities and regional

development boards to enhance the relevance and quality of TVET programmes (OECD, 2016). A model example is given in the State of Victoria in Australia where TVET institutions have specialized and excelled in dairy technology through the introduction of new technologies, value addition, tighter product specifications and thus meeting high levels of customer expectations (Australian Government, 2010). Similar specializations are achieved in the country by pooling institutional resources towards a common motif instead of spreading resources thin to fit in all courses. Similarly, FAO (2018) acknowledges that TVET systems can respond through greater integration of new technologies. Technology will be a key factor in finding ways of producing more food, in a manner that is more profitable to farmers, while also having a less detrimental impact on the natural environment.

The foregoing discussion indicated that at the policy level, the TVET institutions should be provided with carte du jour of programmes within which they can exercise some latitude and customize as per the demands of the local needs of the industry in consultation with the regulating body TVETA. Since the TVET institutions are open to all students across the country through central placement by KUCCPS there is no fear of balkanization, instead, there would be specialization in the given areas and students in the country know where to go for a given programme.

The researcher acknowledges niching of the curriculum to match idiosyncratic circumstances of each TVET institution as a viable strategy for matching the training practices in engineering courses in TVET institutions with industry skills requirements. Ideally, each TVET institution is within unique social-economic ecosystems and the immediate skills demand should leverage on the mainstay activity of the local community. Each institution will thus drive innovation by being adaptable. There are TVET institutions within farming environments for value addition technology; dry and semi-arid areas could specialize in solar installation technology and air-conditioning and refrigeration technology; fishing communities to develop appropriate technology, pastoral communities where hide skin are available could focus on leather manufacturing and meat processing technology; marine technologies for the coastal region; mineral-rich areas for extractive engineering; while urban areas have opportunities for recycling and manufacturing hubs for technological advancements. Such undertakings would be advantageous in threefold: relevance of the TVET institution in solving problems; accruing benefits to the local community and opportunities to augment employment for the TVET trainees.

Policy Framework for Systematic professional development of TVET Trainers

In recommending improvement to TVET training, the trainers at 8.85% (30 respondents), as presented in the results, called for compulsory industry training of trainers. The need to pay attention to the professional development of TVET trainers comes in the backdrop of continuous neglect as reflected by the LIWA Director:

> *There is a major challenge when it comes to trainers because for the longest time the TVET sector has been neglected which means that no attention was given to the trainers. According to many trainers, since they completed their studies there has been no retraining on the technical aspect of specialization. Moreover, the TVET trainers are not in touch with industrial practice because of the nature of their work and partly because their employer has not given guidance on the same.*
>
> (Male LIWA Director)

The opinions of the director pointed to a challenge of TVET trainers' deficiency in industrial practice that has lasted many years. The trainers confirmed the same and provided possible solutions. In response to what they thought could be done to improve the TVET training and enhance employability of trainees, TVET trainers gave recommendations regarding their professional development:

After leaving the Teachers Service Commission to the Public Service Commission, trainers should be better focused on technical education.

There is a need for a scheme of service.

Retrain the trainers on competency-based curriculum and preparation of assessment tools.

Trainers should get opportunities for industry training.

Technical trainers have been working towards the target of making trainees pass the KNEC examinations. The orientation should be towards skills development.

(TVET Trainers recommendations)

The trainers raised issues regarding trainers' competence among other suggestions. They called for a scheme of service for TVET trainers, a framework for professional development, mandatory registration with a professional body and programmed training in the industry. The study thus took note of the recommendation for a policy on industrial attachment for trainers. As noted earlier, 68% of the trainers indicated that they were willing to participate in industrial attachment. However, they indicated that there was neither a policy nor opportunities.

On their part, the industry players indicated a willingness to support the same:

For many years now, the industry has accommodated TVET trainees for attachment and internship and there is no reason why they would be reluctant to accommodate the trainers. It is important for TVET trainers to be in touch with the developments in the industry. What is needed is policy engagement between the government and the industry.

(Female representative of industries working with TVET)

The trainers expressed their deficiency in industrial practice while the industry players indicated a willingness to provide opportunities for industrial training. Therefore, the gap lies in policy formulation by the government through TVETA, the regulating body. Through the document analysis, the researcher perused through TVET Standard-CBET Trainers Qualification Framework (TVETS 03-1:2019 ICS 03.180) where TVETA is mandated to ensure that TVET trainers are globally competitive and that they continually renew and update their skills. The authority is also in the process of implementing Continuous Professional Development (CPD). However, the policy framework, standards and guidelines is work in progress (TVETA, 2021).

Studies concur that there was a lack of a systematic professional development scheme for TVET trainers to upgrade their skills and competencies in other jurisdictions too. In Ethiopia, the professional development of TVET trainers is a critical component in guaranteeing quality training and enhancing trainees' employability. However, the report reveals that in spite of the policy that makes industrial experience mandatory for TVET trainers, there was no implementation framework and thus most of the TVET trainers lack industry experience (The Federal TVET Agency of Ethiopia, 2019).

Policy on Enhancing Management of TVET institutions

When enunciating the challenges they encountered in making engineering trainees more marketable and suggestions on what they thought should be done to improve the situation, the trainers pointed out issues that point directly at the very nature of institutional management. The trainer respondents at 8.26% (28 respondents) suggested improvement in the quality of institutional management. The suggestions pointed out that management of TVET institutions had been revealed to be another missing link in skills match and enhancing youth employment. Among the recommendations made by TVET trainers was the rationalization of management of TVET institutions. Further, some of the challenges cited by trainees in the group discussions pointed to lethargy in management.

Some of their recommendations regarding TVET management include: Ensuring that the managers of TVET institutions match the position and the demands of the positions; Management of TVET should be appropriately considered to avoid promoting managers from high school who do not understand technical education; The leadership of TVET institution should be given to more suitable candidates especially for those with technical know-how so that the potential of the institution is exploited fully; Improve the management of technical education in Kenya, presently it is managed just like any other system of education and this is not helpful since TVET is skill-based and not just academic work. The researcher recognized these sentiments from TVET trainers as urging for management that is suited for skills development that are in line with the requirements of the workplace.

Secondly, when asked whether available training equipment was being used for day-to-day training in their respective TVET institutions, trainers responded at strongly disagree at 13.65% (46) against 7.12% (24) strongly agree while disagree at 41.84% (141) against 37.39% (126) agree. This means that about 55.49% (188) do not think that available resources are being utilized optimally. The findings on the underutilization of donor-funded equipment also indicated lack of good transition. Institutional management capacity was also critical in guaranteeing transition and the sustainability of donor-funded programmes. The donor projects have specific timelines and closure. Therefore, it is important to ensure that the institution strives for sustainability beyond the donor period. The researcher feels that this was an indictment on management for not demonstrating innovation and creativity in the utilization of resources. This behooves the quality of management that this study recommended.

Additionally, the need to appraise the management of TVET institutions was given greater impetus in the opinions of the directors interviewed:

> *TVET institutions have a tendency to operate within their comfort zone by offering the same programmes year in year out without paying keen attention to the demands of the industry. They are simply driven by available equipment, buildings and trainers. The government is investing heavily in TVET and there is a need for return on investment. The government is giving capitation at thirty thousand shillings per student per year, plus hiring teachers, equipment and so on. Each TVET institution will be personally called to account. The Boards of Governors have a big mandate to deliver.*
>
> (Male TVET Director)
>
> *There are very high expectations for TVET institutions to provide the best practice in skills training, effectively dealing with skills gaps, aligning training with industry needs and engaging industry, government and corporates for a holistic skills ecosystem. This is a challenge posed to the management of TVET institutions. They must measure up to the calling.*
>
> (Female KAM Director)
>
> *We have been using a procedural kind of model that has impacted TVET institutions very negatively where someone comes from basic education and has worked very well and is promoted to a principal. When dealing with managers of TVET institutions then, they should have some kind of background in their centers of excellence. Centers of excellence refer to institutions that specialize in some kind of trade. Therefore, a center of excellence in agriculture should have a manager with some background in agriculture for it to be successful. This calls for highly skilled professionals.*
>
> (Male LIWA Director)

The opinions of the three directors showed the need for befitting management of TVET institution at both the board of management and the head of the institution. Matching the skills provided by the institutions with those of the industry requires management that is innovative. The LIWA director further noted that the

managers of TVET institutions could make a significant difference in generating income for the institution through the skills being trained and guaranteeing the relevance of these skills to the world of work today. He thus proposed that the government ought to consider competitively hiring the TVET managers including from the private sector so as to raise the bar on the management of the institutions. Indeed, from content analysis and direct observation, the researcher acknowledges that several challenges pointed out, especially on training infrastructure point at unresponsiveness and lack of innovation on the part of management.

Studies agree that the management of TVET is key in maximizing productivity and matching skills. While the government of Kenya is up-scaling its investment in TVET, there continue to be challenges that could be directly associated with the quality of leadership at the institutional level. These challenges, therefore, raise a question on the ability of the management of the TVET institutions to play their role in enhancing the competitiveness of these institutions (Gachunga, et al., 2020). In Bangladesh, 20% to 40 % of the TVET institutional revenue is generated by the entrepreneurial activities of the individual TVET institutions (Raihan, 2014).

The government must therefore take cognizance of the main trade areas of the TVET institution and align the management accordingly. The theoretical framework of this study looks at TVET training as an investment upon which returns are expected. It is, therefore, incumbent upon the Boards of Governors and the head of the institution to deliver the right skills and competencies for the employability of TVET graduates and the development of the country. The study, therefore, recommends a policy on competitively hiring TVET managers. Competitive institutional management will deliver on the requisite skills for the marketability of TVET trainees.

Summary of recommendations

The study makes a raft of recommendations pegged on the finding of the study including:

- Re-branding the TVET pathway by creating a link from basic education to TVET
- Adoption of Collaborative Training Model
- Policy formulation to plug in SMEs in collaborative training
- Policy on Niche courses for TVET
- Policy Framework for Systematic professional development of TVET Trainers
- Policy on Enhancing Management of TVET institutions

Policies in the TVET sector have worked for the Asian Tigers—Hong Kong, Singapore, South Korea, and Taiwan. The countries have invested heavily and successfully adopted policies in technical and vocational education which have resulted in the emergence of a highly skilled workforce. These countries successfully leveraged TVET to up-skill their economies, which made their workers more productive and their respective economies more innovative. It is therefore increasingly clear that skills development policies for TVET play a critical role in national development.

CONCLUSIONS AND RECOMMENDATIONS

The ultimate goal of TVET training is providing technical training that meets the quality and practical-oriented labour market requirements. However, TVET training faces the challenge of major skills gaps in engineering courses due to unsatisfactory consultations between the curriculum developers and the industry, trainers who lack the requisite industrial experience and exposure plus obsolete and underutilized training infrastructure.

The summary of strategies for aligning the training practices in engineering courses in TVET institutions with industry skills requirements include re-branding TVET pathway by creating a link from basic education to TVET, adoption of Collaborative Training Model, policy formulation to plug in SMEs in collaborative

training, policy on niche courses for TVET, the policy framework for systematic professional development of TVET Trainers and policy on enhancing management of TVET institutions.

Policy Recommendations

The researcher synthesized the salient findings of this study to tease out and prioritize policies recommendations to match TVET training with the requirements of the world of work as follows:

Collaborative Training framework

The findings of this study firmly recommend the institutionalization of the Collaborative Training Programme in TVET. These findings clearly highlighted some of the skills required in the current world of work and provides a point of reference for alignment efforts. The study recognizes that to do so, the country requires the full participation of industry. The government should provide incentives to industries for partnering with TVET institutions. Such incentives would include tax concessions. However, there may not be enough companies to take up the trainees. This gap is to be taken up by the SMEs.

Role SMEs in TVET training

The number of industries in the country is not adequate to provide attachment, internship and on job training for both university and TVET trainees. Consequently, TVET should tap into SMEs to bridge the gap.

Indigenization of TVET courses

TVET institutions should be encouraged to specialize by offering niche programmes in their areas of strength. This specialization will enable the institutions to leverage available resources in terms of trainers and training equipment. Secondly, institutions will enhance their relevance and visibility by specializing in programmes that respond to the needs of their locality. For example, TVET institutions within agricultural areas would become incubation centres for agriculture-related courses.

Establishment of income generating-activities for all TVET Institutions

TVET institutions have the capacity to provide opportunities within by creating income-generating activities related to their areas of training. TVET policy has encouraged institutions to create incubation centres that work as both income-generating activities and as training opportunities. For example, Automotive engineering departments should establish automobile garages that are open to the market providing students with opportunities for hands-on skills while mechanical engineering should provide opportunities for welding, fabrication and machine operations.

Policy on Managers of TVET institutions

The study noted the potential of TVET institutions to deliver work skills and incubation centres for innovation and technological advancement. The great potential may not be actualized with average management and therefore the need to competitively source the managers including from the private sector.

Mandatory and programmed attachment for trainers

The study established the need for TVET trainers to remain abreast with the skills and competencies in the industry through a well-programmed attachment policy. Such a policy provides for regular engagement and synergies in aligning the training practices. The policy would also bridge gaps in communication between the demand and supply sides of the skills. Industrial experience is important for TVET trainers in engineering programmes so that they remain up-to-date with the technological changes in the world of work.

Recommendations for further research

Bearing on the conclusions of this study, the research makes the following recommendations for further study:

- The potency of Small and Medium-Sized Enterprises (SMEs) in enhancing TVET trainees' employability.
- The emerging concept of CBET and its implications for skills match for TVET trainees in Kenya.

- The study could form a baseline for a full-scale study on skills gaps beyond engineering courses to encompass TVET training in general.

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