

# Capabilities of TVET Trainers' Regarding the Implementation of Real-Life Project-Based Learning for Competence Development in Uganda.

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## **Abstract:**

Real-Life Project-based learning (RLPBL) has long been used especially in developing countries. Various results of RLPBL related studies have also been found to be effective and have a positive impact on trainees. The purpose of this study sought to determine the capabilities of TVET Trainers regarding the implementation of real-life project-based learning for competence development of technical and vocational education and training (TVET) trainees in Uganda. The study aimed at finding out an ideal TVET Trainer abilities for implementing competence based education & training (CBET) in Uganda. The study adopted the descriptive survey design with a mixed methods approach. The sample size of 488 study participants included TVET trainers, heads of institutions and Ministry of Education & Sports officials and trainees. Qualitative sampling and simple random sampling techniques were employed, data collection was carried out using questionnaires, interview schedule, observation checklist, Focus Group Discussion guide. The data were presented in form of tables employing the use of frequency distribution and percentages and the data was analysed using descriptive statistics with statistical package for social sciences (SPSS). The study revealed that a successful implementation of real-life project based learning, trainers should have adequate ability to perform skilful activities to a satisfactory standard, adequate use of materials, tools, and abstract concepts, ability to adapt RLPBL strategies to suit individual learners, proper choice of assessment procedures, ability to organize an active learning environment, demonstrate a range of behaviour management strategies for trainees, ability to develop suitable tasks that respond to the needs of trainees, industry, and society and lastly the TVET trainer's capability of having a practical expertise and practice. In conclusion, a TVET Trainer capabilities include routine expertise, resourcefulness, craftsmanship, functional literacies, business like attitude and wider skills. It was recommended that the trainers adopt back to industry program.

**Key words:** Real-Life Project-Based Learning, Competence Development, TVET trainer capabilities.

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## **I. Background:**

### **1.1. Introduction**

This paper focused on determining the capabilities of TVET Trainers regarding the implementation of real-life project-based learning for competence development of technical and vocational education and training (TVET) trainees in Uganda. This paper is including, Competence-Based Education and Training in Uganda, Real-life Project based learning in Uganda and Skilling Uganda Strategy. The scope of the Study, literature review, methodology, results and discussion and recommendations are mentioned

### **1.2. Competence-Based Education and Training in Uganda.**

In 2016, Uganda through National Curriculum Development Centre (NCDC) introduced Competency-Based Education and Training (CBET) curriculum for Business, Technical and Vocational Education and Training (BTNET) sub-sector. The new curriculum introduced Competence-Based Assessment (CBA) being implemented by a new examination body known as Uganda Business and Technical Examinations Board (UBTEB) which opened doors in 2011. In competence-based education (CBE) assessment, student progress is measured on the basis of demonstrated competences (Barman & Konwar, 2011; Biemans, et al., 2009). Real-life project-based learning on the other hand was introduced as one of the approaches used to implement Competency-Based Education and Training (CBET). It is intended to enhance TVET graduate's capabilities for decent employment and entrepreneurship.

### **1.3. Real-life Project based learning in Uganda**

Real-life project-based learning is an active learning by doing and it is also known as a multifaceted approach to training in which trainees come up with real-world tangible products assessed by experts while working individually or in small collaborative groups. Real-life projects involve problem identification, solution identification, project planning and designing, project implementation and presentation (UBTEB, 2021).

The growing challenge of youth unemployment and underemployment is one of the main socio-economic development concerns of most African governments including Uganda. Without job-related abilities, youth and adults cannot benefit from the employment opportunities that offer a decent income ( African Union, 2018).

In Germany, Otero (2019) researched about the current trends mapping study that aimed at increasing the knowledge on innovations in TVET among the international community and share different experiences, recommended that TVET institutions should implement learner centered pedagogies and methods such as project-based learning with the aim of enhancing student engagement and ensuring that activities help to solve real-life problems in the local community (UNESCO-UNEVOC, 2019).

Accordingly, real-life project-based learning, can also be applicable to primary, secondary and tertiary education curriculum. It's a solution for the ordinary, conventional trainer centered teaching methods that so many learners are disgusted about. Real-life Project-based learning model may be the means to engage learners, who may have otherwise become disengaged from the classroom learning environment (Beres, 2011).

One of the advantages of real-life project-based learning is that it is more effective than traditional teaching methods.

However, Project-based learning has its challenges; according to Lui (2019) in the study about Barriers of Project-Based Learning in Teaching and Learning of Technical and Vocational Education and Training, it was identified that the lack of knowledge, skills and enterprise experience of trainers in managing projects is a major issue. Furthermore, Project design, lack of integration from multiple levels and being disconnected from reality, absence of established rubric for assessing student skills and trainers' role adaptation not being conscious of having a different role in RLPBL setting affect project-based learning negatively.

In the Ugandan TVET context, Project-based learning (PBL) is commonly known as Real-life project. It is a reform initiative to transform the TVET sub sector and deliver TVET competence-based programs to varied needs of human development. This is fully in line with Sustainable Development Goals 4 and 8 of the United Nations 2030 Agenda for Sustainable Development, which sees TVET as a mechanism to substantially increaseAccording to National Curriculum Development Centre (2020) Real-Life Project work execution and assessment involves a combination of subjects' knowledge, process, skills and transferable abilities. Trainees must apply classroom knowledge and skills proactively in a real-life context for an extended period. Each trainee is required to do a project outside the classroom time. At the end of every year, a trainee should have a visible real-life project on the ground to be authenticated by UBTEB.

Project-based vocational skills' training is comprehensive and focuses on productivity. The training reflects a situation of real world of work with projects and assignments simulating the workplace atmosphere. The trainees are assessed on a day-to-day basis; their weekly progress is also monitored by trainers and their learning level is individually evaluated at the end of the training.

A project constitutes a number of tasks and is assigned to trainees by TVET trainers based on the curriculum of the study or needs of the community at the beginning of the training period or course (UBTEB, 2014). The trainees are assigned tasks or projects within or outside the training institution which may be conducted individually.

Literature research on this topic shows that Project-Based Learning (PBL) is seen indistinctively as andragogic approach, an active style of learning, a type of inquiry-based learning and a method. Stephanie Bell defines RLPBL as "a student-driven, trainer-facilitated approach to learning because learners pursue knowledge by asking questions that have attracted their natural curiosity, it leads to the creation of an artifact (model, design, device, computer program, arts, etc.) by means of completing a variety of tasks (Bell, 2010).

On the other hand, RLPBL is considered to be a particular type of activity-based learning where the context of learning is provided through authentic questions and problems within real-world practices (Al-Balushi, 2014).

### **1.4. Skilling Uganda Strategy**

Ugandan Government through the Ministry of Education and Sports approved the most substantial legal instrument guiding the policy formulation and reforms for TVET education sub sector known as the BTVET Act, 2008. According to this act the objective of BTVET is to provide relevant and quality knowledge, values and skills for purposes of academic progression and employment in the labour market to the larger number of persons in an affordable way, and to improve the productivity capabilities of the individuals and enhance employability (GoU, 2008).

In the same effort, the Ugandan TVET sub sector made a paradigm shift through a strategic plan titled “Skilling Uganda” 2012-2022 which symbolizes a paradigm shift for skills development in Uganda. The objective of the strategic plan was to transform TVET system from an educational sub-sector into a comprehensive system of skills development for employment, enhanced productivity and growth. The main purpose was to create employable skills and competencies relevant in the labour market instead of educational certificates. It was meant to embrace all Ugandans in need of skills, not only primary and secondary school leavers. (GoU, 2012).

Based on the foreseen reforms, National Curriculum Development Centre (NCDC) reviewed the curricula for Uganda community polytechnics and schools, Technical, Vocational and Farm Institutes and Uganda Technical Colleges. In effort to produce skilled workforce that meet current and future labor demands, Competency Based Education and Training (CBET) a mode of training where the emphasis is placed on the acquisition of competencies was introduced in Uganda in 2016. The most important approach in this revised curriculum was the emphasis of real-life project-based learning because it's meant to enhance skills for employability, productivity, and entrepreneurship in order to tackle youth unemployment, already significantly high in Uganda (NDP 11, 2016).

### **1.5. Problem**

The increasing number of poorly trained, unskilled, unemployed and under-employed TVET graduates every day becomes a threat not only to the TVET sub sector but also to the stability of countries in their development process. It is estimated that almost 100 million young men and women in Africa are unemployed or in low-paid jobs (UNESCO, 2012).

Consequently, the quality of the workforce remains low and often inadequate. Uganda is not different, NDP111 (2020) highlights that human capital development remains a major concern with estimated 13 million skills gap in key Sectors of Agriculture, Manufacturing, Construction, Oil and Gas and Tourism.

While the labour force growth rate is estimated at 4.7 percent per annum in 2012/13 and a projected job gap of 13 million Ugandan people between the formal labour market size and the total employable labour force. (NDP11, 2016). In the study about the employers' perception of the employability of TVET graduates in Uganda, it was established that much as the graduates possessed some basic skills, ICT skills and interpersonal skills required for work, it was also established that most employers negatively perceived some areas about TVET graduates (Kintu al et, 2019). The areas included, product finishing, decision making and reasoning; regarding self-esteem, sociability, integrity and honesty, materials selection, estimation of quantities and facilities management, understanding of systems, monitoring and improving of systems designs; and issues of application of technologies (Kintu, 2019). Secondly, there is lack of quality and standards in the conduct of real-life projects, continuous assessment and inadequate private sector involvement (Belgian Development Agency, 2018).

This study explored the critical area of how real-life project-based learning is implemented for competence development of trainees in TVET Institutions of Uganda.

### **1.6. Scope of the Study**

The study was conducted between February, 2022 to July, 2022 and it was limited to only TVET institutions in Uganda.

## **II. Literature Review**

Several studies have been conducted about project-based learning for competence development of TVET trainees. In USA, (Kwietniewski, 2017) did a Literature review about Project-Based Learning at the State University of New York College at Buffalo. She observed that real-world application of projects in training allowed learners to improve their competencies and supplement their preparation for lives after school. They also learned how to collaborate, make connections and manage themselves. In the background note for (UNESCO-UNEVOC, 2014), Bill Lucas in his research to find which learning and teaching methods worked best in TVET, he suggested the approaches created by David Perkins that seemed thoroughly grounded in the literature and accessible (Perkins, 2009).

According to Mehmet and Mikail (2015) meta-analysis conducted in Turkey to identify the effects of project-based learning approach to the academic achievements of the learners in science classes it was found that project-based learning was more effective than the traditional teaching methods. The core significant potential and important objective of real-life project-based learning approach was the advancement of innovativeness and productive thinking. Projects were designed and implemented by the learners themselves with guidance from trainers, this strengthens ownership of the project, integrating cognitive and metacognitive domains at individual level and their contextual desires at the institutional level (Sharipova&Wesseler, 2018). In Uganda, Wenani (2019) took an action research study with the aim to improve the performance of the Real-Life Project module in building and construction trainees at Amero Technical Institute. The findings confirmed that teaching and learning in groups yielded better performance and motivation of learners and therefore could improve the quality of TVET graduates. However, it was further found out that TVET Trainers were not taking much attention to real-life project based learning approach which jeopardises the impact of the module to the learners. Bender (2012) established that implementing real-life project-based learning involves a dramatic departure from traditional modes of training thus, a trainer used to that style of teaching would undergo some degree of awareness of difference between their past teaching practices and the novel approach of real-life project-based learning. There is literature available to support educators who are interested in implementing project-based learning including resources that guide trainers in constructing units and assessing learners (Markham, et al., 2003; Stanley, 2012). A recent review of RLPBL in UK Higher Education in engineering found that authentic content was a key element in implementing real-life project based learning (Graham, 2010). Furthermore, the problem must usually be complex and open-ended in order to allow a range of possible solutions and responses (Kahn & O'Rourke, 2004). Examples from the literature range from technical questions, such as how to speed up motion recognition software (Otake et al., 2009), to those requiring a combination of scientific and social investigations such as a pre-feasibility study for a multi-purpose leisure trail on a disused railway (Nation, 2006), to social issues, such how to help adult learners returning to education (Green, 1998). Furthermore, on the question of who determines the problem (teacher, student or external partner) varies widely across the cases described in the literature. However, (Danford,2006; Bell 2010) claim that a key feature of real-life project is that learners have some choice of topic as well as the nature and the extent of the content in the project although adding that the majority of projects are initially identified by the lead staff member and developed further by learners. They also insist that the learners' choice of a topic should be based on questions that have piqued their natural curiosity, as a central approach since it fosters their motivation. However, several cases in the literature rely solely on teacher-defined questions. The differentiation between the extent of teacher versus student control of the project forms an essential part of Kolmos's (1996) categorization of project types which includes: (a) the assignment project, significant input and control from trainers who choose problems and topics closely related to the academic subject. (b) the subject project is where learners can choose their methods for investigating their choice of a range of pre-selected problems and (c) the problem project: where the problem determines the choice of disciplines and methods (Kolmos, 1996 Pg 143). Kolmos explains that each is right for various stages of study, providing different skills and learning outcomes. But for Blumenfeld et al. (1991) found that what matters is not who decides the question but that the outcomes must not be predetermined so that genuine ownership of the process and exploration may take place. There is also little consensus in the literature on whether the problem needs to be actual or may be simulated. For Morgan (1983) it may be either, but the learners must have some say over the design of their project. As suggested by Moehr (2004) above, some projects involve partnerships with external clients and deliver actual professional outputs which can be used by these external actors. Examples include international market research carried out by business learners at Helia University in Finland for corporate partners (Danford, 2006) and feasibility studies for sustainable waste treatment facilities undertaken by learners from Melbourne University for a new-build campus in Vietnam (Meehan & Thomas, 2006) and here, clearly, student choice was limited.

### **III. Material and Methods**

This paper adopted the descriptive survey design with a mixed methods approach. The term "mixed methods" denotes to an emergent methodology of research that advances the systematic integration, or "mixing," of quantitative and qualitative data within a single investigation or sustained program of inquiry.

The main reason for selecting this methodology was that such integration allows a more complete and synergistic utilization of data than do separate quantitative and qualitative data collection and analysis (Creswell et al, 2011). The purpose of this design was to investigate in detail how project-based learning was being implemented to achieve its goal of competence development of TVET trainees in Uganda.

Creswell (2014) claims that mixed methods research combines or integrate both quantitative and qualitative research and data in a study. Affirmatively, Koller and Sinitsa (2009) confirm that applying a mix of various methods enables researchers to draw a more holistic representation of the subject under study.

The target population for this study was made up of 20 Ministry of Education & Sports officials, Examining body, National curriculum development and Principals of the Training institutions, 36 Heads of Department (HoD) of TVET Institutions. Out of this population about 10% were female. This is because the enrollment of female in TVET institutions is still low. The researchers expediently administered up the 36 questionnaires to HoD respondents and made sure that they were all properly filled and returned. The interviews were also conducted to 20 heads of institutions & MoES officials. The data collected was analysed using Statistical Package for Social Scientists (SPSS) version 16.0

#### IV. Result and Discussion

##### 4.1. Real Life Project Based Learning (RLPBL) Trainers 'Capabilities for Competence development of TVET Trainees in Uganda

##### 4.1.1. Routine Expertise

**Table 1: Routine Expertise**

Routine Expertise	Fully Agree	Agree	Disagree	Fully Disagree	Total Agreements
Adequate ability to perform skilful activities to a satisfactory standard	22 (61.1%)	14 (38.9%)	-	-	36 (100%)
Adequately use of materials, tools, and abstract concepts	24 (66.7%)	12 (33.3%)	-	-	36 (100%)
Ability to adapt RLPBL strategies to suit individual learners	20 (55.6%)	16 (44.4%)	-	-	36 (100%)
Proper choice of assessment procedures	22 (61.1%)	14 (38.9%)	-	-	36 (100%)
Ability to organize a proper learning environment	21 (58.3%)	15 (41.7%)	-	-	36 (100%)
Demonstrate a range of behaviour management strategies for trainees	19 (52.8%)	17 (47.2%)	-	-	36 (100%)
Ability to develop suitable tasks that respond to the needs of trainees, industry, and society	20 (55.6%)	16 (44.4%)	-	-	36 (100%)
Acquiring practical expertise requires time and practice.	18 (50.0%)	18 (50.0%)	-	-	36 (100%)
<b>Average Responses</b>	<b>20.75 (57.65%)</b>	<b>15.25 (42.35%)</b>	-	-	<b>36 (100%)</b>

From the Table 1, it was revealed that the capabilities as TVET trainers include adequate ability to perform skilful activities to a satisfactory standard, adequate use of materials, tools, and abstract concepts, ability to adapt RLPBL strategies to suit individual learners, proper choice of assessment procedures, ability to organize a proper learning environment, demonstrate a range of behaviour management strategies for trainees, ability to develop suitable tasks that respond to the needs of trainees, industry, and society and lastly the TVET trainer's capability of acquiring practical expertise requires time and practice. The study participants were all 36 (100%) in total agreement with these capabilities. The findings are in line with those of Educaid.be (2016).

##### 4.1.2 Resourcefulness

**Table 2: Resourcefulness**

Resourcefulness	Fully Agree	Agree	Disagree	Fully Disagree	Total Agreements
Ability to apply technical skills to troubleshoot and solve problems in projects	18 (50.0%)	18 (50.0%)	-	-	36 (100%)
Ability to apply knowledge and skills that is applicable to new and unfamiliar contexts	23 (63.9%)	13 (36.1%)	-	-	36 (100%)
Able to apply knowledge in a range of situations which do not closely replicate those already encountered in training	23 (63.9%)	13 (36.1%)	-	-	36 (100%)

Ability to organize work processes	21 (58.3%)	15 (41.7%)	-	-	36 (100%)
Ability to adapt to rapid changes in technology	21 (58.3%)	15 (41.7%)	-	-	36 (100%)
Initiate and participate in innovations and creativity	17 (47.2%)	19 (52.8%)	-	-	36 (100%)
<b>Average Responses</b>	<b>20.5 (56.9%)</b>	<b>15.5 (43.1%)</b>	-	-	<b>36 (100%)</b>

From the Table 2 above, all 36 (100%) of the study participants who freely consented to take part in this study agreed that the resourcefulness TVET trainers' capability entails ability to apply technical skills to troubleshoot and solve problems in projects, ability to apply knowledge and skills that is applicable to new and unfamiliar contexts, ability to apply knowledge in a range of situations which do not closely replicate those already encountered in training, ability to organize work processes, ability to adapt to rapid changes in technology and initiate and participate in innovations and creativity. The findings are in line with those of Educaid.be (2016).

#### 4.1.3 Craftsmanship

**Table 3: Craftsmanship**

Craftsmanship	Fully Agree	Agree	Disagree	Fully Disagree	Total Agreements
Have the pleasure, pride and patience involved in doing a good job	19 (52.8%)	17 (47.2%)	-	-	36 (100%)
Like working with their hands most of the time	21 (58.3%)	15 (41.7%)	-	-	36 (100%)
Identify, work and partner with industry for teaching purposes	23 (63.9%)	13 (36.1%)	-	-	36 (100%)
Ability to analyze labour market requirements	24 (66.7%)	12 (33.3%)	-	-	36 (100%)
Ability to pass on the 'tricks' of the trade	26 (72.2%)	10 (27.8%)	-	-	36 (100%)
<b>Average Responses</b>	<b>22.6 (62.8%)</b>	<b>13.4 (37.2%)</b>	-	-	<b>36 (100%)</b>

From the Table 3, all the study participants 36 (100%) who consented to take part in this study were in total agreement with the above elements highlighted above as the major contributors to craftsmanship and these included the TVET trainers' capability to; have the pleasure, pride and patience involved in doing a good job, like working with their hands most of the time, identify, work and partner with industry for teaching purposes, analyze labour market requirements and to pass on the 'tricks' of the trade. The findings are in line with those of Educaid.be (2016).

#### 4.1.4 Functional Literacies

**Table 4: Functional Literacies**

Functional Literacies	Fully Agree	Agree	Disagree	Fully Disagree	Total Agreements
Ability to utilize ICT, numeracy, and literacy to facilitate teaching and learning	25 (69.4%)	11 (30.6%)	-	-	36 (100%)
Engage in live debates today about how best to teach tomorrow	20 (55.6%)	16 (44.4%)	-	-	36 (100%)
Possess higher order thinking (HOT) skills	23 (63.9%)	13 (36.1%)	-	-	36 (100%)
<b>Average Responses</b>	<b>22.7 (63.0%)</b>	<b>13.3 (37.0%)</b>	-	-	<b>36 (100%)</b>

From the Table 4 above, all 36 (100%) the respondents who consented to participate in the study were in total agreement that the above highlighted factors contribute the TVET trainers' capability of functional literacies. These include TVET trainers' capability to utilize ICT, numeracy, and literacy to facilitate teaching and learning, to engage in live debates today about how best to teach tomorrow and to possess higher order thinking. The findings are in line with those of Educaid.be (2016).

4.1.5 Business-like attitudes are essential

Table 5: Business-like attitudes are essential

Business-like attitudes are essential	Fully Agree	Agree	Disagree	Fully Disagree	Total Agreements
Ability to engage industry in setting up occupational standards	22 (61.1%)	14 (38.9%)	-	-	36 (100%)
Have behaviours such as punctuality, orderliness, willingness to put in extra time and effort,	19 (52.8%)	17 (47.2%)	-	-	36 (100%)
Ability to connect trainees for industrial training opportunities	20 (55.6%)	16 (44.4%)	-	-	36 (100%)
Possess marketing and customer care skills	24 (66.7%)	12 (33.3%)	-	-	36 (100%)
Ability to engage industry in setting up occupational standards	24 (66.7%)	12 (33.3%)	-	-	36 (100%)
<b>Average Responses</b>	<b>21.8 (60.6%)</b>	<b>14.2 (39.4%)</b>	-	-	<b>36 (100%)</b>

From the Table 5 above, all 36 (100%) the respondents who consented to participate in the study were in total agreement that the above highlighted factors contribute the TVET trainers' capability of Business-like attitudes are essential. These included TVET trainers' capability to engage industry in setting up occupational standards, have behaviours such as punctuality, orderliness, willingness to put in extra time and effort, to connect trainees for industrial training opportunities, to possess marketing and customer care skills, to engage industry in setting up occupational standards. The findings are in line with those of Educaid.be (2016).

4.1.6 Wider Skills

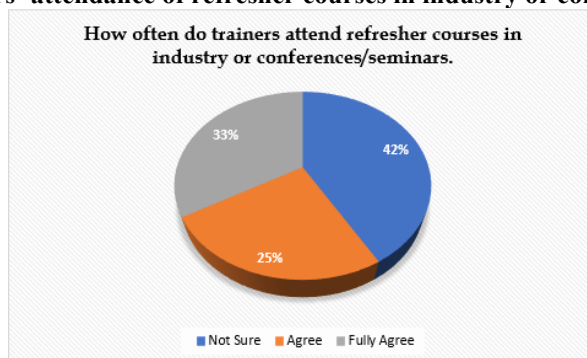
Table 6: Wider Skills

Wider Skills	Fully Agree	Agree	Disagree	Fully Disagree	Total Agreements
Have good negotiating skills	21 (58.3%)	15 (41.7%)	-	-	36 (100%)
Have good problem-solving, team-working, resilience, and entrepreneurialism skills	18 (50%)	17 (47.2%)	-	-	35 (97.2%)
Ability to manage projects	17 (47.2%)	19 (52.8%)	-	-	36 (100%)
<b>Average Responses</b>	<b>18.7 (51.8%)</b>	<b>17 (47.2%)</b>	-	-	<b>36 (100%)</b>

From the Table 6 above, almost 35 (99%) the respondents who consented to participate in the study were in total agreement that the above highlighted factors contribute the TVET trainers' capability of wider skills. These included having good negotiating skills, having good problem-solving, team-working, resilience, and entrepreneurialism skills and ability to manage projects. The findings are in line with those of Educaid.be, 2016.

4.2. Trainers' attendance of refresher courses in industry or conferences/seminars (How often)

Figure 1: Trainers' attendance of refresher courses in industry or conferences/seminars



From the Figure 4.2 above, Majority 21 (58.3%) of the study participants who consented to participate in the study revealed that they often attend refresher courses, and these trainings attended include seminars,

conferences, and workshops in the industry. The findings are in line with a study conducted by Eline (2019) about the reasons for attendance-work based training continue to work.

## V. Conclusion

In conclusion, the study revealed that the capabilities of TVET Trainers in the implementation of real-life project-based learning for competence development of TVET trainees in Uganda included the ability to perform skilful activities to a satisfactory standard, resourcefulness, Craftsmanship, functional literacies. Business-like attitudes and wider skills.

## VI. Recommendations

It was recommended that TVET institutional managers urgently adapt process-based management model, retool trainers especially by attaching them to industry, recruit practical trainers with atleast 5 years of proven industry experience, plan for continuous professional development of all TVET staff but also establish quality assurance officers such as internal assessors and verifiers to oversee portfolio of evidence at all levels of TVET training in order to manage the quality of delivery.

### 7.0 Acknowledgements

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### 8.0 Competing Interests

The authors have declared that there are no competing interests exist in the study

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