Financial Preparedness for the Implementation of CBET Curriculum in Public Technical Institutions in Mt. Kenya East Region, Kenya

Caroline Kananu Ringeera [1*], Flora Gacheri Ngeera [1], Sabina Murithi [1]

1 Kenya Methodist University P.O Box 267, 60200, Meru, Kenya

**Correspondence email: mugunakarol@gmail.com*

Abstract

The implementation of Competency-Based Education and Training (CBET) in public Technical and Vocational Education and Training (TVET) institutions is vital for aligning curricula with industry-required skills. Despite government funding, there is no structured financial support for execution of CBET. This study evaluated the adequacy of funding and infrastructure in preparation for CBET curriculum implementation. An exploratory research design grounded on mixed-method approach was espoused. The study targeted a population of 70,591 respondents, including 21 principals, 21 Board of Governors chairpersons, 1,263 trainers, and 69,158 trainees, drawn from Technical and Vocational Colleges, Technical Training Institutes, and National Polytechnics. Purposive sampling technique was used to select 19 principals, 19 Board of Governors chairpersons, and 19 class representatives, while proportionate sampling was employed in selecting 154 trainers from 19 TVET institutions with functional Building and Civil Engineering departments. Data were collected via questionnaires, interviews, and document analysis. Validity of the research instruments was ascertained for reliability. Quantitative data were analyzed descriptively (mean, standard deviation) and inferentially (correlation), while qualitative data underwent thematic analysis. Data was presented in tables and themes, and findings revealed inadequate CBET funding. The study concluded that inadequate funding of CBET significantly affects its implementation. The study recommends that the Ministry of Education establishes timely capitation disbursement mechanisms to address budgetary shortfalls, and set standardized minimum funding benchmarks for successful CBET implementation.

Keywords: *Competency-Based Education, financial allocation, TVET institutions, curriculum, implementation, industry collaboration*

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1.0 Introduction

Competency-Based Education and Training (CBET) is an approach to education and training that emphasis the development of specific competencies or skills to fit the employers' demands, rather than mere accumulation of knowledge (Kenya Institute of Curriculum Development (KICD), 2018). The CBET approach entails breaking down the course requirements into specific sets of competencies that trainees are expected to master to be declared competent (Mutungi & Muriuki, 2021). The implementation of curriculum refers to the actual execution or carrying out of the education plan or program (MOE, 2018). This involves putting into practice the designed curriculum, including training materials, methods, and assessments to ensure that trainees receive the intended training experiences. The desired outcome for any curriculum is successful transfer and/or development of knowledge, skills and attitudes (KICD, 2018).

The aim of CBET curriculum is to align skills and competencies needed with the job market and industry requirements. This would provide graduates with hands-on experience and practical skills, enhancing their employability (Mutungi & Muriuki, 2021; Adams, 2019). Globally, the use of Competence-Based Education and Training (CBET) is not a new idea. In Korea, Joo (2018) posits that Competency-Based Education (CBE) is preferred over traditional models as it enhances employees' acquisition of post-secondary degrees and diplomas, thereby addressing the skills gap in the labour market.

In 1998, South Africa became the first country in Africa to successfully adopt the CBET strategy, aiming to solve the severe shortage of experts, including engineers, technicians, and artisans (Simon et al., 2020). However, Rwanda encountered a number of difficulties in the implementation of CBET, including lack of parental support, huge class sizes, a deficiency of training and educational resources, and a shortage of trained instructors which are common in many Sub-Saharan African nations (Sifuna, 2020). In Kenya, the government through the ministry of education usually finance the TVETs. However, the financing of TVETs has been systematically been insufficient, hence affecting the preparedness TVETs to develop human capital. Notably, the development of human capital through promotion of TVET must be prioritized if Kenya is to meet its goals for social development and economic progress. If a national curriculum does not generate sufficient skills that support the macroeconomic and social goals of the economy, such as income, growth, and equity, it may be deemed irrelevant. This reality provides the thrust for this study.

Statement of the Problem

In an ideal scenario, effective implementation of the Competency-Based Education and Training curriculum in public technical institutions requires adequate budgetary allocation, to support its practical orientation, outcome-based nature, and demand for modern infrastructure and instructional materials. The implementation process should be industry-driven, with active involvement of stakeholders in developing occupational standards, guided by qualification-awarding bodies and

regulators. Financial preparedness is, therefore, a critical enabler in realizing a trainee-centered and industry-responsive curriculum that equips graduates with employable skills.

However, in reality, many public technical institutions in the Mt. Kenya East Region face significant financial constraints that impede CBET implementation. Despite increased focus on CBET following the recommendations of the Presidential Working Party on Education Reforms (2024), there remains no dedicated policy framework to fund its execution. While government funding exists for TVET institutions, it is often inadequate and unspecific to CBET needs. Most institutions rely on internally generated funds, which are largely consumed by infrastructure and operational costs, leaving minimal support for CBET-specific requirements.

The persistent rise in youth unemployment, despite increased TVET enrolment, underscores the disconnect between training and industry expectations. This situation raises concerns about the financial readiness of institutions to deliver the CBET curriculum effectively. Previous studies have not sufficiently examined how financial allocation influences preparedness for CBET implementation in this region, thereby creating a critical knowledge gap. This study addresses this gap by testing the hypothesis that government budgetary allocations for TVET does not significantly affect preparedness for CBET curriculum implementation.

Literature Review

Fiscal support is indeed a critical factor that assists public technical institutions in effectively implementing CBET programs. The study was based on Systems theory which was advanced by Ludwig von Bertalanffy in the 1940s and 1950s. The four basic parts of the systems model are input, output, process, and feedback. According to this idea, the funding is the input that help the trainee to go through the training and skill-building process in order to produce results. The output in this context is competency in skills required by the industry. The feedback is the response from the consumers and stakeholders, such as the industry, the employers and the parents.

"The paper concluded that funding significantly impacts CBET curriculum implementation in Mt. Kenya East TVET institutions"

Public-Private Partnerships (PPP) and collaborations are important components in financing TVETs in many developing countries, given the current budgetary and resource constraints in various governments. In Malaysia, officials from different ministries as well as education administrators make judgments about TVET projects and implementation of CBET based on methods that restrict the roles that industry play in

promoting TVET activities (Chan & Fong, 2018). According to Kamuhabwa's (2019) study, TVET graduates lack skills as a result of ineffective training strategies, inadequate facilities and equipment, and ineffective educational policies. The industry and TVET institutions in Kenya do not have a strong connection (Gachunga et al., 2020). In order to make the abilities that the trainees acquire more applicable to the sector, the CBET approach requires that TVET institutions cooperate with industries in their training (Kumar, 2020).

2.0 Materials and Methods

The study was conducted in Mt. Kenya East Region, Kenya, which reported high number of unemployed TVET graduates. The study targeted a population of 70,591 from 21 public TVET institutions, comprising of 21 principals, 21 Board of Management Chairpersons, 128 Heads of Departments, 1,263 trainers, and 69,158 trainees. The study used a stratified sampling technique for all of the public technical institutions which were categorized into: Technical and Vocational Colleges (TVC), Technical Training Institutes (TTI), and National Polytechnics (NP). The study further used purposive sampling to select principals, BOM chairpersons and trainees, while proportionate sampling technique was utilized on trainers from the 19 sampled TVET institutions with functional Building and Civil Engineering. The study sample comprised 19 principals, 19 Board of Management Chairpersons, 19 class representatives and 154 trainers. Data was collected through questionnaires, interviews, and document analysis. The researcher conducted a pilot test in Nairobi Technical Training Institute given its functional Building and Civil Engineering Department, and shares similar characteristics with the public technical institutions in the Mt. Kenya East Region, to test the validity and reliability of the research instruments. Quantitative data were analysed descriptively (mean, standard deviation) and inferentially (correlation), while qualitative data underwent thematic analysis. Results were presented in table and themes. Ethical clearance was obtained from ethical committee and later sought for research permit from NACOSTI. Anonymity was observed while participants filled the consent form to participate in the study. The study ensured confidentiality and integrity throughout the process.

3.0 Results and Discussion

Response Rate

An overall response rate of 84.6%, with 94.8%.response rate by TVET trainers, 100% for principals, and 84.2% for BOM chairpersons was noted. The high response rate suggested that the data collection was effective and yielded a solid foundation for analysis.

The reliability of data in this study was assessed using Cronbach's Alpha coefficient. A Cronbach's Alpha of 0.838 on trainer's data. A Cronbach's Alpha value of 0.70 or higher is considered acceptable for social science research, with values above 0.90 indicating excellent internal consistency.

Demographic Characteristics of Respondents

The demographic data from various respondents, including trainers, principals, Board of Management (BoG) chairpersons,

and class representatives (trainees) across 21 public TVET institutions in the Mt. Kenya East Region, was analyzed. Results indicated that 1`majority of the trainers, 63 (43.2%) below 30 years of age, suggesting a predominantly youthful teaching workforce. In terms of gender, 88(60.3%) of the trainers were male, while females were 58 (39.7%). The teaching experience of trainers confirms a predominantly early- to mid-career workforce. When asked about their level of involvement in curriculum development or review, the majority of trainers 68 (46.6%) reported a moderate extent of involvement, with 135 (92.5%) trainers indicated that they had prior exposure to CBET, and only 11 (7.5%) reporting no prior exposure to CBET.

The demographic data of TVET principals indicated a fairly balanced representation: out of the 16 Principals interviewed, 8 were female and 8 were male. Regarding tenure, majority of the TVET principals had 1-6 years of experience, while the majority of BOM chairpersons had served for relatively shorter durations of time, mostly 2 to 3 years. The demographic profiles of TVET trainees indicated that majority, 6 were enrolled in Civil Engineering, Plumbing (5), Building Technology (4), Masonry (3), Land Survey (1), and Quantity Survey (1). In terms of qualification levels, most of the respondents were at Level 6 (10 trainees), followed by Level 5 (5 trainees) and Level 4 (4 trainees).

Financial Allocation in Preparedness for CBET Curriculum Implementation in public TVETs in Mt. Kenya East Region

The study employed a five-point Likert scale to assess respondents' perceptions regarding the availability of funds to support implementation ofr Competency-Based Education and Training (CBET) curriculum in public technical institutions. The scale ranged from Strongly Agree (5) to Strongly Disagree (1), with an additional option (0) for responses deemed not applicable. The aggregated results of this analysis are presented in Table 1 below;

Table 1

Trainer's Responses on Financial Allocation in Preparedness of Curriculum Implementation on CBET

	Statements on Availability of Financial Allocation (n = 146)	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
a)	The institution has an approved Strategic Plan which has included aspects of CBET implementation	1(0.7%)	2(1.4%)	35(24.0%)	54(37.0%)	54(37.0%)	4.08	0.851
b)	The institution has an approved annual budget to support implementation of CBET programs	2(1.4%)	14(9.6%)	63(43.2%)	48(32.9%)	19(13.0%)	3.47	0.888
c)	The institution has distinct departmental budget for CBET programs	9(6.2%)	11(7.5%)	57(39.0%)	54(37.1%)	15(10.3%)	3.38	0.984
d)	Training materials and tools are adequately funded	7(4.8%)	17(11.6%)	60(41.1%)	46(31.5%)	16(11.0%)	3.32	0.982

e)	Workshops and practical sessions are well-supported financially	4(2.7%)	18(12.3%)	63(43.2%)	46(31.5%)	15(10.3%)	3.34	0.921
f)	This institution has a departmental budget for staff to advance in their careers in CBET	15(10.3%)	18(12.3%)	57(39.0%)	42(28.8%)	14(9.6%)	3.15	1.091
g)	The institution has budget for regular workshops for the trainers and technical staff	10(6.8%)	16(11.0%)	56(38.4%)	48(32.9%)	16(11.0%)	3.30	1.033
h)	The institution solicit funding from IGAs, Partners, government, and donors for CBET implementation.	14(9.6%)	24(16.4%)	56(38.4%)	36(24.7%)	16(11.0%)	3.11	1.109

The descriptive statistics in Table 1 reveal trends regarding financial preparedness for Competency-Based Education and Training (CBET) implementation. A majority of trainers (74%) agreed or strongly agreed that the institution has an approved Strategic Plan incorporating CBET (M = 4.08, SD = 0.851), indicating high consensus with relatively low variability. However, only 45.9% agreed/strongly agreed that the institution has an approved annual CBET budget (M = 3.47, SD = 0.888), while 43.2% remained neutral, suggesting uncertainty in budgetary commitment.

Regarding departmental budgets, 47.4% agreed/strongly agreed on distinct CBET allocations (M = 3.38, SD = 0.984) reflecting ambiguity in fund decentralization. Training materials and workshop support received moderate agreement, while career advancement budgets had the lowest agreement index (38.4%; M = 3.15, SD = 1.091), signaling inadequate staff development investment. The high agreement on Strategic Plan inclusion (Statement a) contrasts with weaker budgetary execution (Statements b–h), suggesting a policy-practice gap. While strategic intent exists, operational funding remains inconsistent, echoing Mutungi & Muriuki (2021) findings on Kenya's TVET underfunding.

During interviews, principals were asked to explain how their institutions fund the implementation of the CBET curriculum. Their qualitative responses highlighted three main themes. The most common was a heavy reliance on government funding, including capitation grants, scholarships, HELB loans, and bursaries. However, delayed disbursements posed a significant challenge, which supports Woodard (2018) findings on budget delays in East African TVET institutions. When questioned about strategic financial management for sustainable CBET implementation, Boards of Management described a coherent framework linking planning with operational action. This linkage of planning and operations reveals a sophisticated financial management approach where each reinforces the other. Balanced budgeting offers structure, but boards complement it with partnerships and IGAs. This aligns with UNESCO's (2016) view that successful TVET systems blend

sound financial management with entrepreneurial initiatives.

Extent of CBET Curriculum Implementation in Public TVETs in Mt. Kenya East Region

Table 2

Trainers' responses on the extent of CBET curriculum implementation in public TVET institutions

S/N	Statements (n = 146)	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
a)	CBET has been formally adopted and implemented in all relevant programs	6(4.1%)	6(4.1%)	65(44.5%)	47(32.2%)	22(15.1%)	3.50	0.941
b)	Workplace simulations are included in training programs	3(2.1%)	6(4.1%)	10(6.8%)	59(40.4%)	68(46.6%)	4.25	0.908
c)	Workplace attachments are included in training programs	2(1.4%)	11(7.5%)	40(27.4%)	64(43.8%)	29(19.9%)	3.73	0.912
d)	Industry stakeholders are involved in the development, review of the curriculum and CBET delivery.	3(2.1%)	5(3.4%)	48(32.9%)	70(47.9%)	20(13.7%)	3.68	0.830
e)	Competency-based assessments are being regularly conducted	3(2.1%)	22(15.1%)	42(28.8%)	54(37.0%)	25(17.1%)	3.52	1.012
f)	Trainees are aware of how CBET links to future job roles and expectations	3(2.1%)	1(0.7%)	20(13.7%)	66(45.2%)	56(38.4%)	4.17	0.842
g)	The CBET approach has improved trainee employability	2(1.4%)	5(3.4%)	24(16.4%)	45(30.8%)	70(47.9%)	4.21	0.932
h)	Assessment results guide improvement of training delivery	4(2.7%)	4(2.7%)	24(16.4%)	49(33.6%)	65(44.5%)	4.14	0.975
i)	There is collaboration with industry in delivering CBET	5(3.4%)	4(2.7%)	24(16.4%)	65(44.5%)	48(32.9%)	4.01	0.958
j)	Feedback from trainees informs CBET content improvement	4(2.7%)	10(6.8%)	38(26.0%)	72(49.3%)	22(15.1%)	3.67	0.911

A notable finding in Table 2 is the high integration of workplace simulations, with 87.0% of trainers agreeing (M = 4.25, SD = 0.91), confirming their inclusion in programs. Similarly, trainee awareness of CBET's link to employability was strongly endorsed (83.6%, combined agreement; M = 4.17, SD = 0.84), and 78.8% agreed that CBET improved employability (M = 4.21, SD = 0.93). However, formal CBET adoption across programs received mixed responses: while 47.3% agreed (32.2% agreeing, 15.1% strongly agreeing), 44.5% were neutral, and 8.2% disagreed (M = 3.50, SD = 0.94). Industry involvement in curriculum development was moderately supported (61.6% combined agreement; M = 3.68, SD = 0.83), but 32.9% neutrality suggests inconsistent collaboration, echoing global challenges in industry-TVET partnerships (Allais, 2020). The strong support for workplace simulations and trainee employability aligns with research

emphasizing CBET's role in bridging skills gaps (OECD, 2018).

Qualitative data was gathered by asking TVET Board/Council during interviews to provide feedback on the overall progress and success of CBET implementation in TVET institutions since its introduction. The repeated emphasis on "continuous improvement" reflects the flexible nature of CBET. UNESCO's (2016) global TVET report observes that successful CBET systems require ongoing adaptation based on industry input and performance data. Trainees were also interviewed to share their experiences with CBET implementation in their departments, especially in comparison to their expectations upon enrollment. Many trainees found CBET to be "more practical and hands-on than initially expected," with others describing it as "more practical and industry-oriented." Both trainees and trainers were asked to suggest the way forward for CBET implementation in public TVET institutions in Kenya. Five themes emerged from these findings. The themes included resource availability, industry collaboration, trainer capacity development, curriculum and practical training, and governance and policy support.

The study tested the null hypothesis (H_{01}) that financial allocation does not significantly affect the preparedness for CBET curriculum implementation. The correlation results are shown in Table 5.

Table 3

Correlations analysis between financial allocation and preparedness for CBET implementation in public technical institutions

Data from Trainers		
	Y	X1
Y	Pearson Correlation	1
Sig. (2-tailed)	Sig. (2-tailed)	
N	N	146
X1	Pearson Correlation	.392**
Sig. (2-tailed)	Sig. (2-tailed)	.000
N	N	146

**. Correlation is significant at the 0.01 level (2-tailed).

The results in table 3 reveal a statistically significant moderate positive correlation between financial allocation and CBET preparedness from trainer ($r = .392$, $p < .01$) perspectives. This consistent correlation coefficient across both groups indicates that as funding increases, so does perceived preparedness for CBET implementation. These findings collectively lead us to reject the null hypothesis, concluding that funding does significantly affect CBET implementation in TVET institutions.

4.0 Conclusion

This study demonstrates that funding significantly impacts CBET curriculum implementation in Mt. Kenya East TVET institutions. The convergence of quantitative

budget analyses, qualitative stakeholder reports, and documentary evidence paints a comprehensive picture of institutions struggling to implement ambitious curriculum reforms within constrained financial ecosystems. The study ultimately concludes that addressing these financial challenges represents a necessary precondition for successful competency-based education transformation in Kenyan TVET institutions.

5.0 Recommendations

The study recommends that the Ministry of Education should implement three key actions to fast track implementation of CBET curriculum: (1) establish and enforce timely disbursement mechanisms for TVET capitation funds to address chronic budget shortfalls, (2) develop standardized minimum funding benchmarks for CBET implementation tied to specific program requirements, and (3) create partnership frameworks to facilitate sustainable industry collaborations.

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