



The Mediating Role of Soft Skills in the Link Between Innovative Training Approaches and Graduate Employability: A Structural Equation Model from Tanzania

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Abstract

This study investigates the mediating role of soft skills in the relationship between innovative training approaches (ITA) and graduate employability (GE) in Tanzanian higher learning institutions (HLIs). Using survey data from 366 graduates, the study employed structural equation modeling (SmartPLS) to test a mediation framework linking ITA, soft skills, and GE. The findings reveal that ITA significantly enhance the development of soft skills, which in turn improve employability outcomes. Moreover, soft skills were found to play a critical mediating role, as ITA did not directly influence graduate employability unless their impact was transmitted through the development of soft skills. The direct effect of soft skills on employability was substantial ($\beta = 0.42$, $Q^2 = 0.32$), suggesting that graduates with stronger soft skills are more likely to be employable. This study contributes to the literature by highlighting the importance of integrating innovative training approaches and by empirically examining the mediating role of soft skills within the Tanzanian context.

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Introduction

In Africa, particularly in Sub-Saharan Africa, employers consistently report a significant gap between the skills graduates possess and those demanded in the labour market. This gap is especially evident in essential soft skills such as teamwork, problem-solving, communication, and adaptability. Literature indicates that many graduates in Tanzania lack core soft skills (Kinyondo & Shija, 2024). These concerns stem from the global shift in hiring practices, where graduate employability is prioritized over academic grades. As a result, higher learning institutions (HLIs) face increased

pressure to demonstrate how their programs and training approaches equip graduates with employability skills (OECD, 2025).

In Tanzania, sector strategies have explicitly focused on enhancing the quality and relevance of training and learning. For instance, the Education Sector Development Plan 2025/26–2029/30 emphasizes reforms in training and learning aimed at improving employability, aligning education with labor market demands, and strengthening tutor development and learning environments (MOEST, 2025). Despite various initiatives and policy reforms aimed at improving training approaches in Tanzania, there is no evidence directly linking these approaches to employability outcomes through measurable skills acquired by graduates (Mgaiwa, 2021).

Innovative training approaches have been increasingly promoted as a means of bridging the gap between higher education and the evolving needs of the labor market. One notable example is competency-based education (CBE), which emphasizes demonstrable learning outcomes by aligning curriculum content, assessment methods, and student progression with clearly defined competencies. Key design features of CBE include explicit learning outcomes, criterion-referenced assessments, and flexible pacing, allowing learners to advance upon mastery rather than time spent in class (Pichette & Watkins, 2019). The implication here is that if apprenticeships enhance graduate employability when mentoring is included, this suggests that the focus should be on the quality of field placements rather than merely extending their duration.

This study, therefore, contributes to the existing body of knowledge by deepening our understanding of how soft skills act as a mediating mechanism between training approaches and graduate employability outcomes. By empirically investigating this relationship, it addresses gaps in prior research, which has often assumed a direct link between training approaches and employability outcomes without considering the role of soft skills.

Theoretical framework

The study draws on Human Capital Theory (Becker, 1964), which suggests that education programs and training initiatives enhance individual employability and productivity by equipping learners with knowledge, skills, and competencies that increase their value in the labor market. In higher learning institutions, industry training approaches (ITAs) such as Competency-Based Training (CBT), apprenticeships, and studio-based work are regarded as investments in human capital, yielding

outcomes in the form of graduates' employability. However, while these programs often emphasize technical and job-specific skills, employers increasingly seek a broader set of competencies, particularly soft skills. These include the ability to adapt, collaborate, manage teamwork, communicate effectively, and navigate dynamic work environments. Consequently, there is a growing need to align training programs with both technical proficiency and essential interpersonal skills to better prepare graduates for the labor market (Succi & Canovi, 2020). These developments have led to a perspective emphasizing soft skills, suggesting that the pathway from training to graduate employability is often indirect, with soft skills playing a crucial intermediary role between learning and the labor market (Nguyen, 2021). Another widely recognized framework is Kolb's Experiential Learning Theory (Kolb, 1984), which posits that training approaches in higher education are designed to encourage students to actively engage with their environment and apply knowledge in real or simulated work settings (Kolb & Kolb, 2013). Experiencing practical applications of concepts learned in the classroom enhances both cognitive and interpersonal development. In particular, it fosters critical soft skills such as problem-solving, adaptability, teamwork, and communication—skills that are widely regarded as essential for graduates' employability (Kyndsgol & Mabin, 2022).

This study defines Innovative Training Approaches (ITA) as comprising three main training strategies: Competence-Based Training (CBT), Apprenticeship, and Studio Work. Soft skills are conceptualized as mediating the relationship between these training approaches and graduates' employability skills. The underlying rationale is that ITA not only develop learners' technical competencies but also cultivate the non-technical capabilities that employers value in a competitive labor market. Consequently, the proposed model adopts Partial Least Squares Structural Equation Modeling (PLS-SEM) as the analytical approach, which enables simultaneous examination of the mediating effects of soft skills on the relationship between ITA and employability outcomes.

Figure 1 illustrates the hypothesized mediation of soft skills, innovative training approaches, and graduate employability.

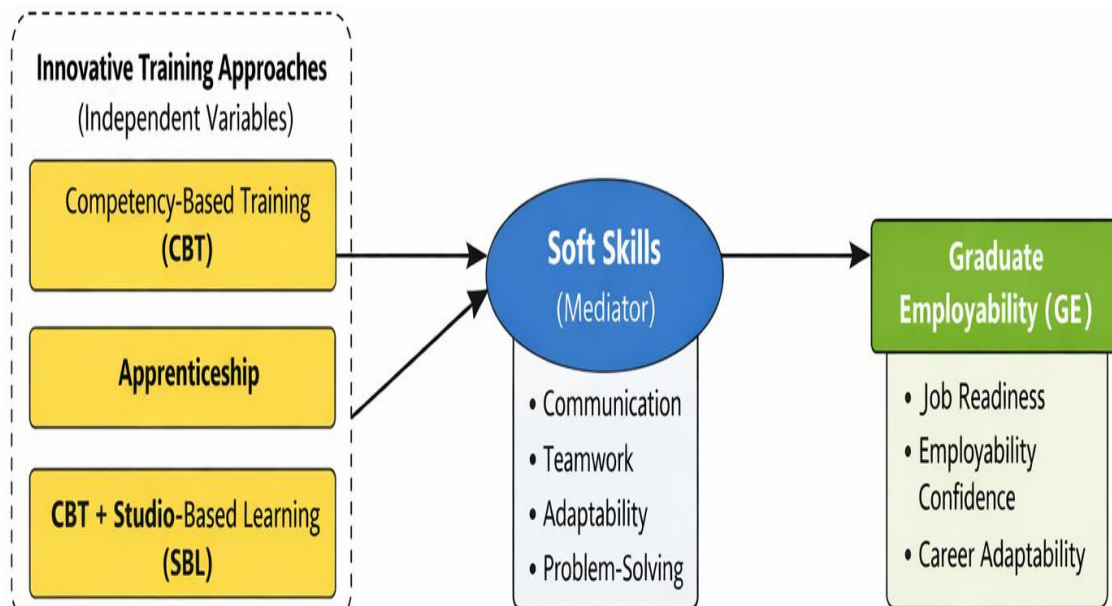


Figure 1: Hypothetical mediation framework on innovative training approach and graduate employability

Material and Methods

Research design and participants

This study employed a cross-sectional survey design to investigate the influence of innovative training approaches (ITA) on graduate employability (GE), with soft skills (SS) examined as a mediating factor in Tanzanian higher education institutions. A quantitative, mechanism-focused approach was used to test a pre-registered mediation model through Partial Least Squares Structural Equation Modeling (PLS-SEM). This method enables the estimation of complex relationships among latent constructs and is particularly suited for studies with smaller sample sizes and non-normal data distributions, which are common in field research (Hair, et al, 2022).

The target population comprised 7,376 graduates from three higher learning institutions in Tanzania, representing both vocational and professional programs. Using simple random sampling, 366 respondents. This sample size was considered sufficient for PLS-SEM analysis, in line with the 10-times rule and established guidelines for mediation models. The inclusion of the identified institutions

provides a holistic perspective on how diverse educational models, ranging from academic to technical, contribute to the development of employable graduates in Tanzania's competitive job market.

Table 1: Population and sample size by training institute

No	Study Location	Population	Sample Size
1	Institution one	5,502	272
2	Institution two	1,464	74
3	Institution three	350	20
	TOTAL	7,376	366

Source: Field Data, 2025

Table 2: Sample distribution by training approach

Institution Attended	ITA Used	Student Exposure (n=366)
TICD	Apprenticeship, CBT	92 (25.1%)
IRDP	CBT and Studio Work	209 (57.1%)
VETA	Apprenticeship and CBT	65 (17.8%)

Source: Field Data, 2025

Data Collection

Data were collected using a structured questionnaire administered via KoboTool, an online data collection platform widely used in educational and development research. The platform also enabled real-time data validation, reducing the likelihood of data entry errors (Harvey, 2018). All constructs in this study were assessed using validated scales adapted from previous research, with respondents indicating their agreement on five-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree). Innovative Training Approaches (ITA) were operationalized using three sub-constructs. Competency-Based Training (CBT) was assessed through five items adapted from Mgaiwa (2021) and Marijani et al. (2023), focusing on the alignment between curriculum, assessment methods, and observable competencies. Apprenticeship (A) was assessed using four items that measured work-integrated learning experiences, based on Ngonda et al. (2024).

Studio-Based Learning (SBL) was measured with four items evaluating collaborative problem-solving and applied learning activities, adapted from Saimon et al. (2023). Soft skills (SS) modeled were assessed with five items capturing communication, teamwork, adaptability, problem-solving, and professionalism (Canovi, 2020; Dacre & Sewell, 2017). Graduate employability (GE), the outcome variable in this study, was measured with five items designed to capture students' perceived job readiness, confidence in their employability, and career adaptability (Tushar & Sooraksa, 2023)

Data analysis

Data analysis involved screening the dataset for completeness and removing inconsistent responses. Reliability was assessed using Cronbach's alpha and composite reliability, while convergent and discriminant validity were evaluated following standard PLS-SEM procedures (Fauzi, 2022). The analysis was conducted using SmartPLS software, and bootstrapping was employed to test the significance of both direct and indirect effects. Path coefficients, t-values, and confidence intervals were reported to determine whether soft skills significantly mediated the relationship between innovative training and employability (Changalima & Elias, 2024).

PLS-SEM was suitable for this study because it performs well without requiring assumptions about data distribution and is effective in handling complex models with multiple constructs and relationships (Sarstedt et al., 2020). Mediation analysis was conducted to examine the process underlying the relationship between training and employability, specifically to determine whether soft skills mediate the effect of ITA on graduates' employability. SEM is particularly advantageous for mediation studies, as it enables the simultaneous estimation of direct, indirect, and total effects within a single analytical framework (Gunzler, et al 2013). This approach sheds light on the ways ITA enhances employability, particularly by emphasizing the importance of soft skills for graduates.

Results and Discussion

The study sample consisted of 366 graduates from three higher learning institutions. Most respondents (83.1%) were aged between 18 and 25 years, while 14.8% were aged 25–30 years, and 2.2% were aged 30–35 years. Female participants made up 53.8% of the sample, and males accounted for 46.2%. In terms of program duration, the majority of respondents were enrolled in three-year programs (56.8%), followed by two-year programs (34.4%) and one-year programs (8.7%).

Table 3: Characteristics of Respondents (N = 366)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	169	46.2
	Female	197	53.8
Age Group	18–25 years	304	83.1
	25–30 years	54	14.8
	30–35 years	8	2.2
Program Duration	One-year program	32	8.7
	Two-year program	126	34.4
	Three-year program	208	56.8

Source: Field Data 2025

Measurement Model Assessment

Before testing the structural relationships, the measurement model was evaluated for reliability and validity. All constructs demonstrated satisfactory internal consistency, with Cronbach's alpha (α) and composite reliability (CR) exceeding 0.70. Convergent validity was established, as Average Variance Extracted (AVE) values ranged from 0.55 to 0.67, above the recommended 0.50 threshold. Discriminant validity was assessed using the Heterotrait–Monotrait ratio (HTMT), with all values below 0.85, indicating that the constructs were distinct (Henseler et al., 2015).

Structural Model Assessment

The structural model was estimated using PLS-SEM with 5,000 bootstrap resamples. Predictive relevance was assessed through Q^2 , while predictive accuracy was determined using RMSE values from PLS Predict, with results compared to those of a linear model benchmark.

Table 3: Structural model Path Coefficients, t-values, p-values, and Predictive Metrics

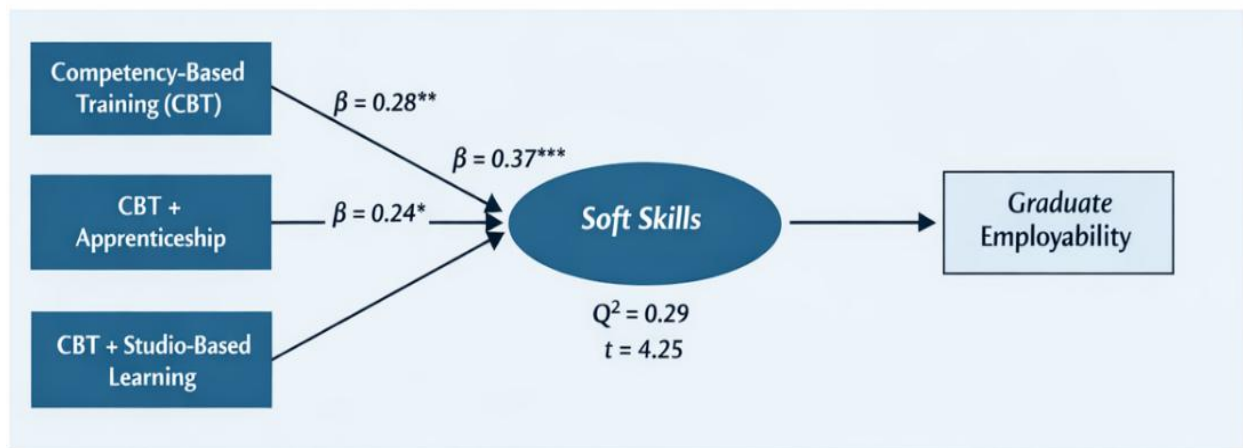
Path	β	t-value	p-value	Q^2_{predict}	RMSE (PLS)	RMSE (LM)	Interpretation
CBT \rightarrow SS \rightarrow GE	0.28	3.12	0.002	0.21	0.345	0.412	Moderate mediated effect; better predictive accuracy than LM
CBT + A \rightarrow SS \rightarrow GE	0.37	4.25	<0.001	0.29	0.298	0.401	Strongest mediated effect; highest predictive relevance
CBT + SBL \rightarrow SS \rightarrow GE	0.24	2.45	0.014	0.18	0.362	0.395	Weakest mediated effect among the three paths
SS \rightarrow GE (Mediator only)	0.42	5.31	<0.001	0.32	0.275	0.352	Very strong direct effect of soft skills on employability

Source: Field Data 2025

All Q^2 values were positive, indicating moderate to strong predictive relevance. RMSE values for the PLS model were consistently lower than the linear model benchmarks, suggesting superior predictive performance. The highest predictive relevance was observed for the CBT + Apprenticeship pathway ($Q^2 = 0.29$, $RMSE = 0.298$). This emphasizes the practical importance of work-integrated learning in enhancing employability through soft skills

Structural Model Path Diagram

Figure 2 presents the structural model, illustrating standardized path coefficients, t-values, and significance levels for all direct and mediated paths. The diagram highlights the strongest mediation via CBT + Apprenticeship and the substantial direct effect of soft skills on employability.



$^{**}p < .01$, $^{***}p < .001$, $^*p < .05$

Figure 2: Structural Model of soft skills as a Mediator between Innovative Training Approaches and Graduates Employability

Direct and Indirect Effects

The indirect effect of CBT on employability through soft skills was $\beta = 0.28$ ($t = 3.12$, $p = 0.002$). This means that competency-based training contributes to employability primarily through transferable skills development. The CBT + Apprenticeship pathway produced the strongest mediated effect ($\beta = 0.37$, $t = 4.25$, $p < 0.001$; $Q^2 = 0.29$), while CBT + SBL showed a weaker mediated effect ($\beta = 0.24$, $t = 2.45$, $p = 0.014$; $Q^2 = 0.18$). The direct effect of soft skills on employability was substantial ($\beta = 0.42$, $t = 5.31$, $p < 0.001$; $Q^2 = 0.32$), confirming their central role as a mediator.

Discussion

From the perspective of Human Capital Theory, the strong impact of competency-based training (CBT) and apprenticeships indicates that apprenticeships effectively translate classroom-acquired knowledge into practical skills that are highly valued in the labor market (Becker, 1964). Consistent with Kolb's Experiential Learning Theory, apprenticeships engage graduates in concrete experience, reflection, conceptualization, and active experimentation, strengthening soft skills development (Kolb, 1984).

In contrast, while studio-based learning is pedagogically valuable, it may not fully replicate authentic workplace experiences. This limitation likely explains the weaker mediation observed, which stems from factors such as limited industry exposure, scarce resources, and a predominant focus on technical rather than interpersonal skills in many Tanzanian institutions. Overall, the results suggest that soft skills are the main mechanism through which innovative training approaches enhance graduate employability.

The findings are consistent with prior research highlighting the importance of soft skills for employability. Mwita et al. (2024) emphasize that communication, teamwork, and problem-solving are critical for graduates of Tanzanian higher learning institutions. Similarly, Mgaya et al. (2023) note that competency-based training (CBT) alone may be insufficient due to its limited focus on soft skills, underscoring the value of apprenticeship pathways. The comparison between CBT with Apprenticeship and CBT SBL highlights the critical role of experiential, work-integrated learning. While SBL effectively develops technical skills, it does not consistently enhance employability without genuine workplace exposure. These findings carry practical implications for HLI curriculum design, underscoring the need to combine competency-based instruction with structured, real-world learning experiences.

Conclusion

This study has illuminated the pivotal mediating role of soft skills in linking innovative training approaches to graduate employability within Tanzanian higher learning institutions. The PLS-SEM analysis reveals that these approaches—particularly the synergistic combination of competency-based training (CBT) and apprenticeship—enhance employability predominantly by fostering essential soft skills in authentic, real-world contexts, rather than exerting a strong direct influence. This

mediated pathway underscores that experiential, hands-on methods like apprenticeship and studio work are especially effective at bridging the gap between academic preparation and labor market demands, as they enable students to cultivate competencies such as communication, teamwork, problem-solving, adaptability, and initiative—skills repeatedly identified as critical yet deficient among Tanzanian graduates.

The findings align with and extend existing Tanzanian scholarship, which consistently highlights the employability-enhancing potential of integrated soft skills training. For instance, recent studies emphasize that graduates with stronger soft (and technical) skills exhibit significantly higher perceived employability. They also reinforce calls for curriculum reforms that prioritize these skills through practical methodologies. The strongest mediated effects from CBT-apprenticeship combinations provide empirical support for shifting away from traditional lecture-based models toward innovative, practice-oriented pedagogies that simulate workplace realities.

From a broader perspective, these results highlight a structural challenge in Tanzania's higher education system: persistent skills mismatches contribute to graduate unemployment and underemployment, despite investments in education. By demonstrating that soft skills serve as the primary mechanism for translating innovative training into better labor market outcomes, the study offers actionable insights for stakeholders. Tanzanian higher learning institutions should therefore prioritize embedding soft skills development into curricula via innovative methods such as CBT, apprenticeships, and studio-based learning, while implementing aligned assessments to measure progress. Policymakers must support this shift through revised education policies that allocate sufficient resources for infrastructure improvements, faculty training, and regular curriculum reviews—ensuring alignment with evolving labor market needs and national development goals.

Ultimately, this research contributes novel, context-specific evidence to the global employability literature by clarifying the indirect mechanisms through which training innovations drive graduate success in a developing economy like Tanzania. Addressing the soft skills gap through targeted, experiential education reforms holds substantial promise for improving graduate transitions to work, enhancing individual career prospects, and supporting broader economic productivity and youth empowerment.

For future research, longitudinal studies would strengthen causal inferences and track employability trajectories over time. Mixed-methods designs incorporating qualitative insights from graduates,

employers, and educators could enrich understanding of soft skills application in real workplaces. Comparative analyses across Tanzanian regions, institution types (public vs. private), or even neighboring countries would further reveal contextual moderators influencing training effectiveness. In summary, by centering soft skills as the key conduit for employability gains, this study advocates for a transformative reorientation of higher education in Tanzania—one that equips graduates not just with knowledge, but with the adaptable, interpersonal capabilities demanded by a dynamic labor market.

Conflict of interest

The author declares no potential conflict of interest was reported.

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Data access: All relevant data are within the paper, and its Supporting Information can be obtained in this manuscript.

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