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Pathways to graduates' employability: analysis of labor market outcomes in Ethiopian higher education and vocational training institutions

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The employability of graduates is of great importance in educational institutions, the government, and industries, and is a growing interest among scholars and researchers, as graduates are expected to hold a strategic importance in nation-building. This study examined graduates' employability at ISCED levels 5 and 6 by collecting primary data from 561 graduates using multistage cluster sampling. Methodologically, it is a cross-sectional survey study using PLS-SEM and PLS-MGA as the statistical and analytical frameworks. The analysis was run with the trial version of SMART-PLS 4. The analysis assessed both measurement and structural models. Bootstrapping method with 5,000 samples and 95% was used to assess the SEM structural model. The findings indicate that graduates' employability is multifaceted, context-dependent, and heavily influenced by educational, institutional, and structural factors. More specifically, the results of PLS-SEM revealed that the relationship between program relevance and graduates' employability was found to be statistically significant. Whereas teaching practices and institutional environment appeared to show a non-significant association with graduates' employability. The study implies that educational inputs and processes are less likely to affect the employability of graduates at ISCED levels 5 and 6. Innovation partially mediates the relationship between program relevance and graduates' perceived employability. Similarly, the mediating role of innovation in the relationship between institutional environment and graduates' employability was found to be statistically significant, such that innovation fully mediates the relationship between the two variables. However, there is no statistical evidence that innovation mediates the relationship between teaching practice and the development of employability skills. The level of teaching practices has not impacted innovation in a way that enables graduates to develop employable outcomes in the market. The PLS-MGA result also reported that there is no significant statistical difference in the employability of graduates from the two levels and sectors of the education system. It can be concluded that there are no statistically significant differences in the educational and institutional dimensions in determining graduates' employability. It indicates that possessing higher educational qualifications doesn't automatically relate to higher employability. The findings could provide solid theoretical, policy, and practical implications for both sides of the labor market. As for the academic institutions, they are propelled to pay due attention to designing a demand-driven curriculum, implementing teaching practices supported by innovative mechanisms, and focusing on skill-oriented academic programs that satisfy the labor market requirements of industries, considering the triple

helix model, which proposes the cruciality of strong partnership and linkage among academic institutions, industries, and the government. A joint Endeavor of curriculum design, staff exchange, and internship programs is also instrumental in enhancing the employability skills of graduates for specific levels of education. This study will make several contributions to the body of knowledge on labor markets by addressing theoretical and practical gaps.

KEYWORDS

employability, Ethiopia, graduates, higher education, ISCED, PLS-SEM, TVET

1 Introduction

In the era of digital transformation and a dynamic labor market, the effectiveness of education systems is measured by their graduates developing the required competencies and skills needed in the labor market. This idea is largely recognized by the human capital theory (Becker, 1964; Mincer, 1974), which underscores the role of education in enhancing growth and productivity through knowledge and skills acquisition. Drawing on the concept of human capital theory, contemporary economic theories, such as the endogenous growth model, also emphasize that education plays a vital role in promoting innovative practices, technological adoption, and knowledge transfer in pursuit of long-run economic growth (Lucas, 1988; Romer, 1986). These assumptions are supported by empirical evidence, which emphasizes the centrality of skill-proficient graduates and addressing issues related to skill mismatch in the labor market. On the other hand, there are persistent theoretical debates and strong arguments in the literature about employability. For signaling theory, education doesn't necessarily bring about direct growth and productivity enhancements; it is rather a signal for potential ability to be competent in the labor market (Spence, 1973). In complementing this perspective, the job-matching theory highlighted that mismatches between education and labor market requirements significantly reduce employability and productivity (Jovanovic, 1979). Hence, employability extends beyond the mere acquisition of certain qualifications; rather, it is the competencies, graduates' personal qualities and motivations, and professional dispositions that enable graduates to access, retain, and advance in the labor market (Hanushek et al., 2017; Yorke, 2006). Pianda et al. (2025) explained the concept of employability as a complex and dynamic construct shaped by a range of constituents, from institutional to psychological factors. Similarly, Tomlinson (2017) described that relevant skills for graduates' employability can be shaped and developed through the cumulative effect of variables such as institutional facilities, administrative support systems, and infrastructure. Moreover, several institutional and personal factors include the quality level of instruction, curriculum, institutional environments, innovative cultures and practices, and the extent to which students are motivated (Jackson and Bridgstock, 2021; Tran and Dempsey, 2017). They all agreed that both perceived employability and actual labor market outcomes are highly affected by one or more of these variables in one way or another.

The employability of graduates of Technical and Vocational Education and Training institutions and Higher Education institutions (classified as ISCED level 5 and 6) has tremendous

significance for national development efforts (MoE, 2021). According to UNESCO (2012), the international standard classification of education (ISCED) levels 5 and 6 represent the post-secondary non-tertiary and bachelor studies of higher education, respectively, which, in the context of Ethiopia, denote students in technical and vocational education and training (TVET) and higher education undergraduate program students.

At the global level, many studies have been conducted on the correlates and determinants of employability. Although the studies provided a solid conceptual understanding of the subject matter, many were limited to developed economies, leaving the realities of developing nations, such as sub-Saharan countries, behind (Mgaiwa, 2021). Another notable line of discourse in the existing literature concerns the use of single and multiple predictors. Most studies were conducted with single or a few predictors, whereas a few adopted a multilevel approach across multiple dimensions, including educational processes, institutional factors, personal factors, and even external factors, within a single analytical framework. In addition, the existing literature mainly focuses on objective employment outcomes with a negligible number of studies emphasizing perceived employability in which graduates assess themselves about their competitiveness in the labour market, which has a strong prediction on graduates' labour market trajectories (Fugate et al., 2004; Rothwell and Arnold, 2007). Moreover, a few of them employed complex and robust analytical methods to examine relationships between various determinants and graduates' employability. Lastly, while most theories and models offer proliferating conceptual bases for linking educational inputs, processes, and outputs to employability, their application in cross-sectoral settings (TVET vs. HE) remains underdeveloped. Hence, the theories and empirical studies to date haven't captured the clear demarcation of differences in employability skills between the two levels of education.

There have been some studies conducted in the Ethiopian context to date. Despite significant strides toward the massification of higher, technical, and vocational education in Ethiopia, the issue of graduates' employability remains a major concern among scholars and policymakers. A significant number of graduates lack the necessary competence required in the labor market, which adversely affects their employment prospects. Guárdia et al. (2021), Melesse (2023), and Demissie et al. (2021) found that graduates lack the necessary technical, practical, and soft skills required in the labor market. This mismatch is primarily associated with educational processes, specifically curricula, which are criticized for being overly theoretical and loosely aligned with industry needs. It is also heavily criticized for insufficient collaboration among stakeholders, including

educational institutions, industry, and the government (Taferé and Camfield, 2020; World Bank, 2020; Woya, 2019).

Another Study by Shimeket and Oumer (2022) reported that, although policies and strategies exist to enhance graduate employability, education systems lack coordination with employers in the labor market. Most existing studies in the Ethiopian context have been narrow in scope and used simple analytical procedures, thereby oversimplifying the complex relationships between predictors and graduates' employability. They lack the necessary methodological rigor, which could affect the generalizability and robustness of their findings within the academic and scientific community. Furthermore, although previous studies have predominantly examined the direct relationships between educational and institutional environments and graduates' employability, little attention has been paid to the indirect relationships operating through innovation within educational institutions. Therefore, this study examines the indirect relationships among attributes of higher education and vocational training institutions by including these mechanisms as mediating constructs, thereby enabling the study to move beyond direct relationships. It helps to develop a deeper understanding of the indirect mechanisms underlying graduates' employability through innovative practices, which previous studies have underexplored.

Given these contexts, this study aims to address theoretical, methodological, and empirical gaps by examining how the predictor variables examined interact to influence employability among graduates of TVET and higher education institutions in Ethiopia. Moreover, this research provides further insight into the extent to which educational processes, institutional environments, and personal attributes contribute to the production of competent, well-equipped graduates. Generally, the study's implications are to validate theories in the context of developing economies, to formulate policy and institutional strategies, to design curricula, and to provide additional guidance for sustainable human capital development endeavors that meet labor market requirements. In response to the identified research problems, the study aims to address the following basic questions.

2 Literature review and hypotheses development

2.1 Theoretical framework

Employability refers to graduates' competence in securing employment, navigating the labor market, and making a meaningful contribution to a nation's economy, drawing on a combination of academic and personal traits (Yorke and Knight, 2004). Theoretically, it is a multidimensional concept that has a complex nature, which isn't conceived as a mere result of education. It is rather a function of multifaceted, interrelated variables that encompass personal competence, environmental factors, educational processes, and career development skills (Holmes, 2013; Pool and Sewell, 2007). Employability is not a monolithic concept that can be studied using a defined variable. It is rather dynamic and multifaceted in nature that scholars have studied it from different perspectives using various models.

Some researchers argue that employability stems from individual-level factors, such as personal traits, professional qualities, and social adaptability; others contend that it is shaped by institutional factors, including teaching quality and internship practices (Zhang et al., 2022). In pursuit of this, researchers employ different perspectives and generate research findings. Different models and theories consider various determinants in their analyses of graduates' employability.

Stemming from these multifaceted perspectives, this study is therefore based on multiple theoretical frameworks. It is primarily grounded in the assumptions of human capital theory, which posits that education promotes productivity by developing knowledge and skills relevant to the economy (Becker, 1964; Mincer, 1974). Considering the multidimensional and complex nature of the concept and the limited explanatory power of a single theory, additional frameworks are also included to properly capture the relationships of the study. These include: the CIPO model of the general system theory by Bertalanffy (1968) and the Triple Helix model by Etzkowitz and Leydesdorff (2000). The CIPO model assumes that educational establishments can be conceived as a set of integrated and interrelated components and provides a structural lens to the relationships among contextual factors, inputs, throughputs, and educational outputs. Moreover, the Triple Helix model highlights the role of university–industry linkages in fostering innovation, which is conceptualized in this study as a key mediating mechanism. These theoretical perspectives together give a comprehensive foundation in comprehending how educational variables convert into labor market outcomes through the mediating role of innovation.

2.2 Program relevance

Program relevance is conceptualized as the extent to which the training curriculum addresses the needs of both trainees and employers. From a human capital perspective, it refers to the appropriateness of a training program and alignment with labor market demands to develop and acquire job-relevant competencies. The triple helix model by Etzkowitz and Leydesdorff (2000) emphasizes the importance of alignment between academic institutions and industry to ensure that academic programs are relevant and responsive to societal demand. They further highlighted the importance of dynamic relationships among training institutions, the state, and industries to enhance innovative practices. This model particularly promotes a strong linkage between academia and industry through internships, joint curricular development, and guest lectures, thereby enhancing graduates' employability. Moreover, the technology organization environment framework developed by Tornatzky and Fleischer (1990) also supports the inclusion of employers' expectations in curriculum design to maintain the training program's relevance within the academic institution and thereby improve graduates' employability. Empirical evidence also supports the degree to which academic programs are aligned with labor market requirements determines graduates' employability. Ramos et al. (2025) indicate that graduates' employability is shaped by how well students are equipped with the necessary competencies needed

in the market during the dynamic labor market situations. Moreover, a systematic literature review by Vlachopoulos and Tsitiridou (2026) concluded that employability is a multifaceted function mainly determined by educational experiences and the market demands. A study by Zhang et al. (2022) examining university-related factors and students' employability in China found that the combined effects of course instruction, club activities, and internship programs significantly affected employability. They further strengthened that students with a better grade average and an elongated internship participation period were perceived as more likely to have a stronger sense of employability. Tumpa et al. (2023) also analyzed how to enhance the employability of project management graduates through innovations in group assessment. They found that implementing diverse group tasks improves work readiness and skills among project management graduates.

Many studies also underscore the importance of university-industry linkage to enhance academic training/program relevance to the needs of the labor market, with reference to updating training curriculum with emerging technologies and intensifying skill-oriented training programs so that the employability skills of graduates will be increased (Chakravarty et al., 2018; Schultheiss and Backes-Gellner, 2022). On the other hand, despite the growing number of graduates from educational institutions, the unemployment rate is rising, and studies have found that these problems are intertwined with the education system, attributable to curricular and training gaps (Monteiro et al., 2024; Sabri et al., 2025). Similarly, a study conducted in Nigeria with a focus group discussion approach by Otache (2021) discussed that unemployability is rooted in collaboration gaps between higher education institutions and industries in designing a more relevant curriculum. Therefore, based on the theoretical empirical evidence, the following hypothesis is proposed.

H1: Program relevance has a significant direct association with graduates' employability.

Moreover, program relevance also plays a significant role in promoting innovation, which in turn enables graduates to develop market-oriented competencies. Education programs that tend to incorporate entrepreneurial perspectives and practical learning significantly enhance the innovative capabilities of their graduates, which thereby affect their employment prospects (Scandurra et al., 2023; Vlachopoulos and Tsitiridou, 2026). Another study by Huang et al. (2025) also emphasized the importance of aligning academic programs with industry needs and real-world problems to promote students' creative and problem-solving skills, which are essential in workplaces. When academic programs are closely related to industry needs and labor market requirements, conducive learning experiences to develop key components of innovation like creativity, experimentation, and application of knowledge will be created (Fossatti et al., 2023). Based on the above arguments, program relevance can positively predict innovation among graduating students, which, as a result, H2 is proposed accordingly.

H2: Program relevance has a direct relationship with innovation.

2.3 Teaching practices

One of the most significant determinants of graduates' employability is the quality of teaching practices of academic institutions. It is central to the development of graduates' key competencies for employability. The context-input-process-output (CIPO) model of general systems theory underscores the importance of inputs, such as resources (e.g., qualified teachers and students), and processes, such as teaching, in producing better outcomes, including graduates' employment, particularly in educational settings (Scheerens, 1990). According to this model, teaching practice is a key function that transforms input into intended outputs, such as the acquisition of required competencies for employment. Similarly, the input-environment-output model developed by Astin (1993) stipulates the basis to conceptualize the centrality of teaching practices in determining educational outcomes. Furthermore, understanding, skills, efficacy-beliefs, and metacognition, also known as the USEM model, conceive teaching as a fundamental function of the educational process that helps to master subject area knowledge and generic skills, which in turn foster employability competencies (Yorke and Knight, 2004). Similarly, recent empirical studies show the importance of teaching practices in enhancing and promoting both innovation and employability outcomes. Zúñiga et al. (2025) indicate that a competence-based teaching approach positively impacted students to develop and acquire skills that reinforce both innovation and employability in the context of higher education. Healy (2023) also highlighted the crucial role of structured pedagogical approaches in improving graduates' employability perspectives. On a similar vein, the central role of teaching in developing graduates to develop innovative skills is explored in the literature. For example, studies by Kosedá et al. (2024), Tian and He (2024), and Jackson et al. (2022) all underscore the importance of teaching practices in promoting innovative skills crucial to improving employability. Hence, based on these premises, hypotheses 3 and 4 were put forward as follows.

H3: The quality of teaching practice has a direct predictive association with graduates' employability.

H4: The quality of teaching practice innovation positively predicts innovation.

2.4 Institutional environment

As noted, the CIPO model explicitly posits that institutional factors, such as resources, facilities, and infrastructure, are important determinants of organizational output. In academic institutions, the availability of adequate academic inputs and other facilities significantly contributes to the expected level of competence graduates are expected to acquire. Additionally, for this study, ecological systems theory, developed by

Bronfenbrenner (1979), can be used to examine how the institutional environment shapes employability skills, as it posits that educational outcomes, including employability, can be influenced by multiple environments ranging from micro to macro levels. Several empirical studies have examined graduates' employability. A qualitative study of five African countries by Iwara (2025) examined the importance of contextual factors related to institutional-environment support systems in enhancing graduates' employability skills development in rural Africa. In the context of the UAE, Shomotova and Ibrahim (2024) also highlighted the role of institutional infrastructure and facilities on students' perceived employability. They found that integrating physical and digital infrastructure into the learning environment positively influenced students' employability. Institutional environment, such as resources and facilities, support system, and organizational structure, also significantly influences innovative capacities in the context of educational establishments (Campbell and Wood, 2026; Chapel et al., 2023). Hence, it is evident that innovation is institutionally context sensitive and heavily dependent on the type and size of the organization. Therefore, the following hypotheses were formulated accordingly.

H5: Institutional environment is positively associated with graduates' employability.

H6: Institutional environment has a direct relationship with innovation.

2.4 Innovation

The notion that innovation, as an institutional practice and educational outcome, is linked to the development of employability skills is conceptualized across various theories and models. According to human capital theory, students' skills, such as problem-solving and creativity, enhance institutional productivity, which in turn promotes their employability (Becker, 1993). It further underscores that innovative practices lead students to engage with, face, and overcome real-world challenges, thereby developing employability skills relevant to the labor market. The endogenous growth model (EGM) also assumes that growth is primarily driven by endogenous factors, such as investment in human capital and innovation, which, in turn, generate knowledge spillover (Lucas, 1988; Romer, 1986). According to this model, innovation is assumed to be the main driver of economic productivity. In the context of education, the application of innovative practices entails integrating technology, introducing new teaching methods, revising curricula, and developing problem-solving skills, thereby enhancing graduates' competence. Hence, the EGM fully supports the use of innovative practices as a determinant of graduates' employability.

Empirical studies indicate that students' engagement in innovative practices are positively associated with employability skills. Zhang et al. (2022) and Li et al. (2022), in their study on college students' employability based on university-related factors, and the impact of innovation and social adaptability on graduates' employability, respectively reported that students with

higher innovative capacity have better employability than those with lower innovative capabilities and motivation. Innovation enhances employability among graduates, thereby helping them develop confidence and self-awareness (Li et al., 2022). Another study reported that innovative practices among higher education institutions have a direct positive association with reducing unemployment (Mian et al., 2022). In more quantifiable terms, they found that a 1-unit increase in students' innovative capabilities reduces their unemployment prospects by 0.52 percentage points. The study further investigated the mediating role of innovation in the relationship between e-education programs and reductions in unemployment. The program is shown to have a statistically positive indirect association with employability, accounting for approximately 0.24 percent, which reflects the mediating role of innovation. Therefore, one can infer that students from more innovative settings tend to develop better motivation, which, in turn, leads to greater skill development and employability than those exposed to less innovative institutional environments. Generally, empirical studies mainly focus on the assessment of relationships independently. The direct relationships between educational factors and employability, and innovation, and employability separately in most cases. The mediating role of innovation in connecting these two sets of relationships into a unified framework is barely explored. Besides its direct relationship with graduates' employability, innovation may serve as a mediator that links educational variables with labor market outcomes. Hence, this study proposed the following hypotheses.

H7: Innovation has a direct relationship with graduates' employability.

H8: Innovation mediates the relationship between program relevance and graduates' employability.

H9: Innovation mediates the relationship between teaching practices and graduates' employability.

H10: Innovation mediates the relationship between institutional environment and graduates' employability.

H11: There is a significant difference between higher education and TVET (ISCED levels 5 and 6) in graduates' employability.

2.5 Conceptual framework

Figure 1 summarizes the conceptual framework of the study, which shows the hypothesized relationships of the variables treated in the study. It shows how the independent variables related to higher education and TVET (Level 5 and Level 6 acc. to ISCED) influence graduates' employability through a mediator variable, innovation.

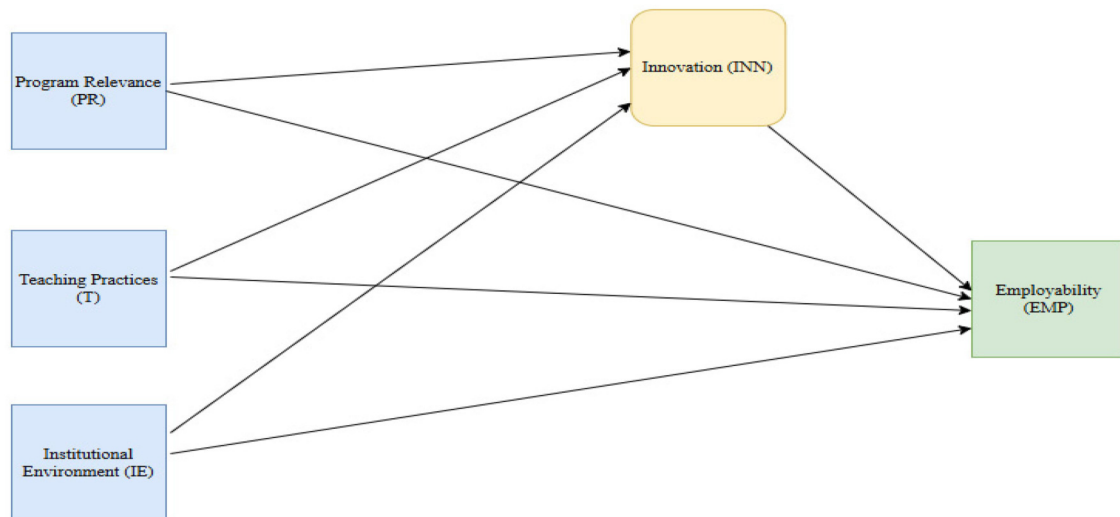


FIGURE 1
Conceptual model of the study.

3 Methodology

This study is part of the broader research project on the education-development nexus in Ethiopia, focusing on employment issues of graduates of different educational institutions. It is based on primary data collected from 561 research participants in ISCED 6 and ISCED 5, using a multi-stage cluster sampling technique with stratification to ensure representativeness. Institutions were clustered into two major categories: higher education institutions and technical and vocational education and training. Higher learning institutions were further grouped based on their specialization as research, applied, and comprehensive universities. Technical and vocational training institutions were clustered based on their geographic location. The target population of the study consists of graduates of these institutions in the year 2024 from levels 5 and 6, according to ISCED (UNESCO, 2012). Clustered sampling is a relevant technique for targeting dispersed yet naturally organized entities, such as institutions (Cochran, 1977). Following the selection of institutions, bands, and training streams were considered using a stratified sampling technique, and finally, respondents were drawn from each band and training stream using a random sampling technique. The sample size was determined using Cochran (1977) using the following formula.

$$n = \frac{Z^2 pq}{e^2}$$

Where n is the minimum sample size for a statistically meaningful study, z is the critical value, p is the estimated proportion of the study variable, which accounts to 70%, q is $1-p$, and e is the margin of error.

The value of each is given below:

$$p = 0.7$$

$$q = 1 - 0.7 = 0.3$$

$$e = 0.05.$$

$$z = 1.96, \text{ at } 5\% \text{ level of significance}$$

Hence,

$$n = \frac{1.96^2 [0.7 \times 0.3]}{0.05^2} = 323$$

Therefore, the minimum number of research participants needed is less than 323 samples. For this study, a total of 613 questionnaires were distributed, and a total of 561 (about 91%) research participants responded and filled out the survey questionnaire. The study involved several explanatory variables and a mediating variable used to disclose the predictive relationships between education and labor market outcomes, proxied by graduates' employability. Methodologically, it is a cross-sectional survey study that uses PLS-SEM and PLS-MGA as the statistical and analytical frameworks. Therefore, this empirical study presents the findings of the PLS-SEM analysis conducted using the trial version of SMARTPLS 4. The PLS-SEM applied a reflective model. The analysis included assessments of validity, reliability, indicator relevance, and collinearity diagnostics.

Partial least squares structural equation modelling (PLS-SEM) involves two major steps, assessment of measurement and structural models (Hair et al., 2019). The first analysis was conducted to assess outer loading, internal consistency using Cronbach's alpha, composite reliability, and convergent validity using the average variance extracted (AVE) and outer loadings. Moreover, multicollinearity diagnostics were conducted to assess the degree of intercorrelation among predictors using the variance inflation factor (VIF). The second was the analysis of the structural model used to assess the hypothesized causal relationships among the latent variables. It primarily consists of basic structural model estimates from path analysis, including the indirect and total predictive relationships between education and employability, which help assess the presence of mediating relationships and their strength.

Furthermore, PLS-MGA, a technique used to assess differences between two groups, was employed to test whether structural path coefficients differed significantly between the two subgroups in the study (ISCED 6 vs. ISCED 5). To briefly

discuss the results and interpretation, a graphical representation of the structural model is presented together with tables. The model consists of 5 latent variables and 24 indicators.

4 Variables and measurements

As shown in Table 1, the study included five latent variables and 24 indicators, all measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This scale is common in the social sciences and behavioral research and, most importantly, is considered appropriate for PLS-SEM analysis, as it involves ordinal data measured on a Likert scale (Dawes, 2008; Hair et al., 2021). The latent variables were modelled as reflective measurement models, in which proxy indicators were conceived as manifestations of constructs and assessed based on indicators' reliability, internal consistency, and convergent validity (Hair et al., 2021).

5 Results

5.1 Assessment of measurement model

5.1.1 Model reliability and validity

Table 2 presents the outer loading of the model, indicating that the indicators reliably measure their respective construct variables. As clearly indicated in the table, most of the outer loadings exceed the recommended threshold of 0.7. Only a few indicators between 0.6 and 0.7, which is also acceptable in explanatory research (Hair et al., 2016, 2022). Therefore, this confirms that the indicators are reasonably reliable to measure the construct variables.

Table 3 shows the internal consistency and convergent validity of the measurement of the PLS-SEM calculated using various approaches. The indicator loading of each latent variable was calculated. A composite reliability of greater than the threshold 0.7 and an average variance extracted (AVE) greater than 0.5 for convergent validity generally ensures model internal consistency and validity. Nevertheless, indicators that load as low as 0.4 could also be considered unless they significantly affect other reliability measures such as the average extracted variance (Hair et al., 2016; 2022). Given the reliability index and convergent validity of PR ($\alpha=.824$; $\rho_a=0.828$; $\rho_c=0.872$; $AVE=.532$), T ($\alpha=.844$; $\rho_a=0.849$; $\rho_c=0.889$; $AVE=.616$), IE ($\alpha=.739$; $\rho_a=0.738$; $\rho_c=0.836$; $AVE=.561$), INN ($\alpha=.784$; $\rho_a=0.785$; $\rho_c=0.861$; $AVE=.607$), and EMP ($\alpha=.787$; $\rho_a=0.790$; $\rho_c=0.855$; $AVE=.542$), it is possible to infer that the PLS-SEM model has achieved recommended level of reliability as can be seen from Table 2 and Figure 2.

Table 4 presents the results of the Heterotrait-Monotrait Ratio (HTMT) analysis, which further supports the discriminant validity of the constructs. The ratio ranged from 0.58 (between teaching practice and innovation) to 0.88 (employability and program relevance), which shows almost all variables fall below the commonly accepted threshold, 0.9 (Henseler et al., 2014), which indicates that the variables are empirically distinct.

5.1.2 Variance explained (model explanation power)

Table 5 presents the total variance explained by the predictors and mediators for each variable. A total of 60.7 percent (also see Figure 2) of the variance in the outcome variable ($R^2=0.607$)

TABLE 2 Outer loading.

Construct	Indicator	Outer loadings
Employability	EM_1 < - EM	0.675
	EM_2 < - EM	0.786
	EM_3 < - EM	0.811
	EM_4 < - EM	0.711
	EM_5 < - EM	0.688
Institutional Environment	IE_1 < - IE	0.715
	IE_2 < - IE	0.777
	IE_3 < - IE	0.785
	IE_4 < - IE	0.717
Innovation	IN_1 < - INN	0.749
	IN_2 < - INN	0.789
	IN_3 < - INN	0.793
	IN_4 < - INN	0.784
Program Relevance	PR_1 < - PR	0.708
	PR_2 < - PR	0.746
	PR_3 < - PR	0.752
	PR_4 < - PR	0.722
	PR_5 < - PR	0.774
	PR_6 < - PR	0.669
Teaching Practices	T1 < - T	0.738
	T2 < - T	0.778
	T3 < - T	0.786
	T4 < - T	0.833
	T5 < - T	0.786

TABLE 1 Variables and measurements.

No	Latent Variable	No of indicators	Measurement model	Variable type
1	Teaching Practice (T)	5	Reflective	Predictor
2	Program Relevance (PR)	6	Reflective	Predictor
3	Institutional Environment (IE)	4	Reflective	Predictor
4	Innovation (INN)	4	Reflective	Mediator
5	Employability (EMP)	5	Reflective	Outcome

TABLE 3 Model internal consistency and convergent validity.

Construct	Cronbach's α	rho_a	rho_c	Average variance extracted (AVE)
EMP	0.787	0.790	0.855	0.542
IE	0.739	0.738	0.836	0.561
INN	0.784	0.785	0.861	0.607
PR	0.824	0.828	0.872	0.532
T	0.844	0.849	0.889	0.616

PR, program relevance; T, teaching; IE, institutional environment; INN, innovation; EMP, employability.

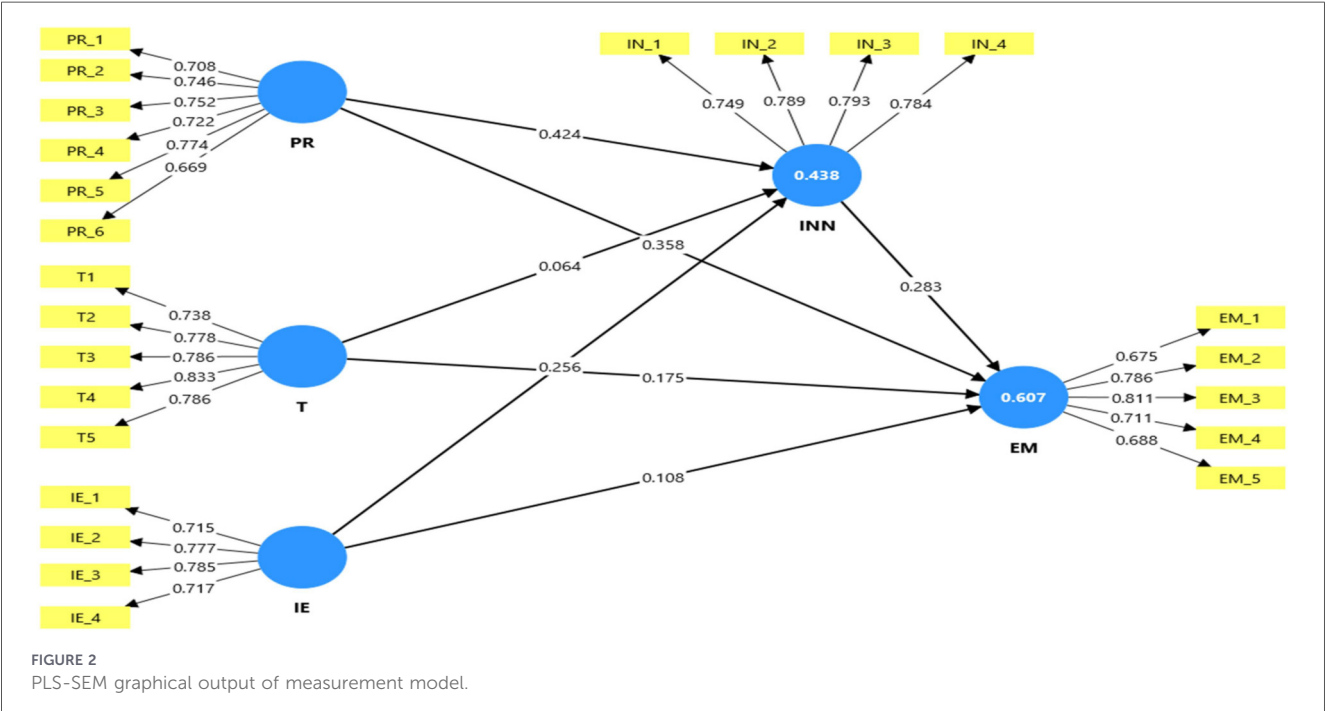


TABLE 4 Heterotrait-monotrait (HTMT) ratio.

Construct	EM	IE	INN	PR	T
EM					
IE	0.77				
INN	0.83	0.73			
PR	0.88	0.80	0.77		
T	0.73	0.72	0.58	0.75	

was explained by the predictor variables. According to [Hair et al. \(2021\)](#), R^2 values greater than 0.75 are substantial, between 0.50 and 0.75 have moderate explanatory power, and 0.25 to 0.50 are weak for PLS-SEM. The study variables also predict innovation by 43.8 percent.

5.1.3 Multicollinearity assessment

To ensure that predictor variables have unique predictive significance for the outcome variable, it is always necessary to assess multicollinearity in the model. This step is usually considered

TABLE 5 R-square.

Construct	R-square	R-square adjusted
EM	0.607	0.605
INN	0.438	0.435

significant and required in hypothesis testing, as it addresses spurious findings arising from correlations among the independent variables. According to [Ringle et al. \(2023\)](#), the variance inflation factor (VIF) is a recommended technique for addressing collinearity, with predictor variables typically kept below 5. Based on his suggestion, no significant collinearity concerns were observed in the PLS-SEM model of this study, as presented in [Table 6](#).

5.2 Assessment of the structural model of the PLS-SEM

The main purpose of assessing a structural model is to evaluate the hypothesized relationships among the latent variables, specifically between the predictors and the outcome

variables. It primarily consists of basic structural model estimates direct and indirect relationships of the predictor variables and the mediator on the outcome variable, which help assess the presence and strength of mediating relationships. The assessment of the structural model was conducted using PLS-SEM bootstrapping with 5,000 samples and a 95% precision level.

5.2.1 Path analysis

The results presented in the table below (Table 7) and Figure 3 show the predictive relationships of the predictors, the mediator and response variables, and the mediating role of the operating variable (innovation) on the outcome variable.

The analysis ($\beta = 0.344$, $t = 3.301$, $p < .05$) revealed that the relationship between institutional environment and innovation is statistically significant, which supports H6. The result may mean that a one standard deviation in institutional facilities is associated with a 0.34 standard deviation increase in innovation. As evidenced in the analysis, the coefficient estimates ($\beta = 0.566$, $t = 5.616$, $p < .05$) disclosed that program/training relevance has a strong and statistically significant positive association with innovative practices, which supports H2. Similarly, the path coefficient measures of ($\beta = -0.090$,

$t = 1.009$, $p > .05$) indicate that there was no statistically significant evidence that teaching practice has a direct relationship with innovative practices. Therefore, H4 is not supported. This implies that the effort exerted in improving the teaching process is not significantly contributing to innovative practices among graduates of academic institutions in the context of the study area.

Similarly, the path analysis presented the relationship between the predictor variables, namely, institutional environment, program relevance, and teaching practices, on the response variable, employability. The coefficient ($\beta = 0.478$, $t = 4.568$, $p < .05$) presents the direct relationship between program relevance and graduates' employability. The result depicts that there is a positive and statistically significant direct relationship between program relevance and graduates' employability, which supports H1. The result further can be understood that every attempt made to make the training program and curriculum relevant may result in improving graduates' employability. On the other hand, the coefficients ($\beta = 0.029$, $t = 0.292$, $p > .05$) and ($\beta = 0.145$, $t = 1.816$, $p > .05$) indicate that there is no statistically strong evidence that institutional environment and teaching practices, respectively, have a direct predictive relationships with graduates' employability, which further explains graduates' employability in the context of developing economies is heavily determined by other factors such as personal, social and economic factors despite its theoretical support that teaching practices and institutional infrastructure shape employment opportunities.

Moreover, the path coefficient estimates the association between innovative practices and graduates' employability. As indicated in the analysis table, ($\beta = 0.350$, $t = 4.890$, $p < .05$) shows the existence of strong statistical support that innovative practices have a positive association with graduates' employability, which supports H7. This, therefore, implies that innovation and graduates' employability have a positive direct relationship.

5.2.2 Indirect relationships

Table 8 portrays the indirect relationships between the explanatory variable and the response variable through the mediator variable, innovation. More specifically, the result ($\beta = 0.198$, $t = 3.615$, $p < .05$) supported that Program/training relevance has a statistically significant positive association

TABLE 6 Collinearity analysis of the model.

Indicator	VIF	Indicator	VIF
EM_1	1.304	PR_1	1.648
EM_2	1.687	PR_2	1.831
EM_3	1.869	PR_3	1.707
EM_4	1.473	PR_4	1.554
EM_5	1.368	PR_5	1.730
IE_1	1.322	PR_6	1.455
IE_2	1.607	T1	1.599
IE_3	1.615	T2	1.718
IE_4	1.272	T3	1.846
IN_1	1.435	T4	2.018
IN_2	1.598	T5	1.722
IN_3	1.658		
IN_4	1.532		

TABLE 7 Path coefficients.

Hypothesis	Path	$\beta(O)$	M	SE	T-statistics	P-values	Test-result
H5	IE → EM	0.029	0.029	0.101	0.292	0.770	Not supported
H6	IE → INN	0.344	0.347	0.104	3.301	0.001*	Supported
H7	INN → EM	0.350	0.351	0.071	4.890	0.000*	Supported
H1	PR → EM	0.478	0.481	0.105	4.568	0.000*	Supported
H2	PR → INN	0.566	0.569	0.101	5.616	0.000*	Supported
H3	T → EM	0.145	0.141	0.080	1.816	0.069	Not supported
H4	T → INN	-0.090	-0.094	0.089	1.009	0.313	Not supported

*denotes statistical significance at 0.05 level.

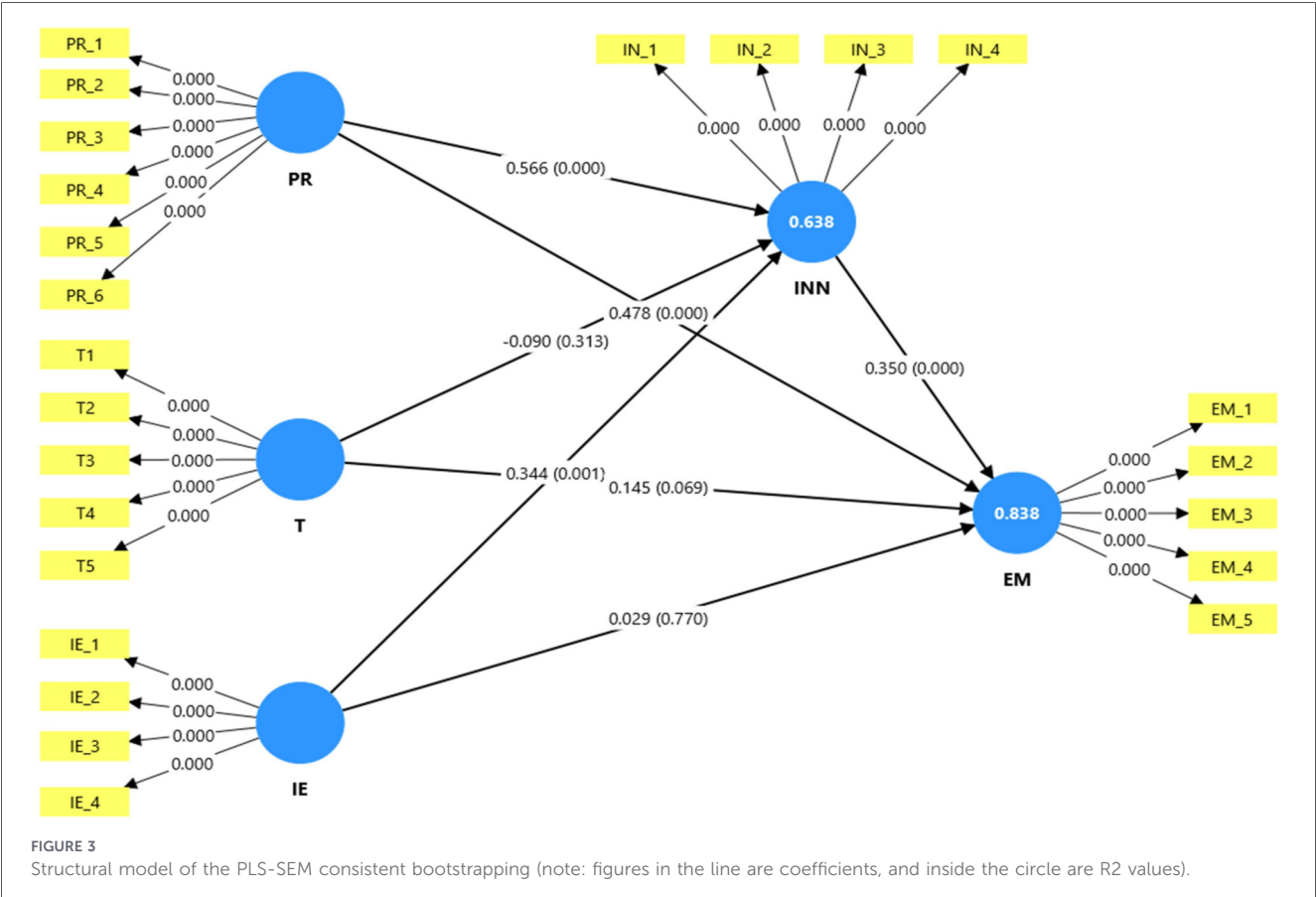


TABLE 8 Indirect relationships.

Hypothesis	Var. Relations	$\beta(O)$	M	SE	T-statistics	P-values	Test result
H8	PR -> INN -> EM	0.198	0.200	0.055	3.615	0.000*	Supported
H9	T -> INN -> EM	-0.031	-0.033	0.033	0.960	0.337	Not supported
H10	IE -> INN -> EM	0.120	0.122	0.046	2.615	0.009*	Supported

*denotes statistical significance at 0.05 level.

with graduates' employability, which revealed that innovation *partially mediates* the relationship between program relevance and employability. Therefore, *H8* is supported.

Another important indirect relationship is between teaching practices (T) and graduates' employability (EMP) through the mediator. The statistical values ($\beta = -0.031$, $t = 0.960$, $p > .05$) show how teaching practice is linked to graduates' employability through the mediator variable, innovation. It proved that teaching practice has no statistically significant indirect relationship with employability, which confirms that innovation doesn't mediate the relationships between independent and dependent variables. Hence, there is no statistical evidence to conclude that teaching practice is linked with graduates' employability through innovative practices. Hence, *H9* is not supported.

The study also sought to investigate the indirect relationship between the institutional environment and the response variable through the mediator variable. The statistical values ($\beta = 0.120$,

$t = 2.615$, $p < .05$) present that institutional environment has a statistically significant indirect relationship with graduates' employment through innovative practices. Therefore, innovative practices *fully mediated* the relationship between institutional environments and graduates' employability. Therefore, *H10* is supported.

In general, innovation partially mediates the relationship between program/training relevance and graduates' employability, fully mediates the relationship between institutional environment and graduates' employability, and doesn't mediate the relationship between teaching practices and graduates' employability.

4.2.3.1. Total effects

Table 9 presents the combined relationships between the independent variables and the dependent variable, graduates' employability, aggregating the direct and indirect relationships discussed in Tables 7, 8. The statistical values ($\beta = 0.150$,

TABLE 9 Total effects.

Var. Relations	$\beta(O)$	M	SE	T-statistics	P-values
IE -> EM	0.150	0.151	0.097	1.540	0.1240
IE -> INN	0.344	0.347	0.104	3.301	0.001*
INN -> EM	0.350	0.351	0.071	4.890	0.000*
PR -> EM	0.676	0.680	0.090	7.540	0.000*
PR -> INN	0.566	0.569	0.101	5.616	0.000*
T -> EM	0.113	0.108	0.084	1.349	0.177
T -> INN	-0.090	-0.094	0.089	1.009	0.313

*denotes statistical significance at 0.05 level.

$t = 1.540$, $p > .05$) and ($\beta = 0.344$, $t = 3.301$, $p < .05$) indicate the overall relationship between institutional environment and graduates' employability and institutional environment and innovation, respectively. The results indicate that while there is a statistically significant relationship between institutional environment and innovation, the relationship between institutional environment and graduates' employability remains statistically insignificant, indicating that its influence on the response variable only passes through the mediator, innovation. This doesn't necessarily imply that the institutional environment has nothing to do with employability. It suggests that a conducive environment for learning primarily enhances the employability of graduates through strengthening students' innovative capacity, as its influence on the response variable was transferred through the mediator.

The influence of program relevance on graduates' employability and innovation was positive and statistically significant ($\beta = 0.676$, $t = 7.540$, $p < .05$; $\beta = 0.566$, $t = 5.616$, $p < .05$), which depicts that program relevance has a positive and statistically significant association in explaining employability both directly and indirectly through innovation. The statistical analysis ($\beta = 0.350$, $t = 4.890$, $p < .05$) also presents the positive relationship between innovation and graduates' employability, which suggests a unit standard deviation in innovative practices leads to a 0.35 change in graduates' employability.

Another important variable included in the model is the relationship between teaching practices and graduates' employability. The coefficient ($\beta = 0.113$, $t = 1.249$, $p > .05$) and ($\beta = -0.090$, $t = 1.009$, $p > .05$) indicate that the practice of teaching quality applied in the education systems doesn't bring a meaningful and statistically significant influence on graduates' employability and innovative practices, respectively. This suggests that the teaching practices might be loosely attributed to the labor market requirements, characterized by a theory-dominated, rather than a practical, weak alignment with real professional activities, which limit its effectiveness on graduates' employability.

5.2.3 PLS-MGA (multi-group analysis)

PLS-MGA is a technique in structural equation modelling that compares structural model coefficients, usually path coefficients, between groups. In the current study, PLS-MGA is used to

TABLE 10 PLS-MGA of path coefficients.

Hypothesis	Path	Path Coefficients-diff (Level 6-level 5)	p-value	Test result
H11	PR -> INN	-0.073	0.426	Not supported
	T -> INN	0.056	0.569	
	IE -> INN	0.030	0.754	
	INN -> EMP	-0.082	0.282	

PR, program relevance; T, teaching; IE, institutional environment; INN, innovation; EMP, employability.

compare the path coefficients between higher education and technical and vocational education (TVET) in the study site. Table 10 indicates the difference in path coefficients between the two levels of the education system (ISCED levels 5 and 6). If the p -value falls below $p < 0.05$, which shows level 6 is less than level 5, and if the p -value falls between 0.05 and 0.95, it indicates there is no significant difference between the two levels of education system, and if p is greater than 0.95, it indicates that level 6 has a better coefficient over level 5. Given these premises, the path coefficients in the PLS-MGA analysis revealed no statistically significant differences between the two levels of education in predicting employability, which further suggests that the practices and situations of the variables included in the study are largely comparable in determining graduates' employability.

6 Discussion

The study was set out to examine whether education (particularly higher education and vocational education and training) influences the extent of graduates' employability and whether this relationship is mediated by innovation. It mainly discusses the results of the overall influence of the predictors and the mediator (educational inputs, processes, and

institutional capacity) on the employability of level 5 and level 6 graduates.

The results of the study found that *academic program relevance* has a direct and statistically significant relationship with graduates' employability. In addition, program relevance was found to significantly influence innovative practices among graduates, implying that a relevant academic program tends to help graduates develop a sense of *innovative culture*, which enables them to acquire employability skills. Besides, innovation exerts a significant positive influence on graduates' employability, which suggests its role in shaping students to develop the necessary competencies for the labor market requirements. Most importantly, program relevance is indirectly associated with graduates' employability, emphasizing the existence of a *mediating role of innovation in the relationship between the two*. Innovation, therefore, has a *partial mediation role* in determining the relationship between program relevance and graduates' employability. Given both direct and indirect significant relationships, the overall relationship of program relevance is found to be statistically significant and indicates the existence of a partial mediation role of innovation on graduates' employability. The findings could have significant theoretical and practical implications for both sides of the labor market. As for the academic institutions, they are propelled to pay due attention to designing a demand-driven curriculum of a certain academic program and focusing on skill-oriented academic programs that satisfy the labor market requirements of industries, considering the triple helix model, which proposes the cruciality of strong partnership and linkage among academic institutions, industries, and the government. A joint Endeavor of curriculum design, staff exchange, and internship programs is instrumental in enhancing the employability skills of graduates for the specific levels of education considered in this study (Tumpa et al., 2023; Zhang et al., 2022). Many more studies, for example, Schultheiss and Backes-Gellner (2022) and Chakravarty et al. (2018), underscore the importance of collaboration among the triple stakeholders to make sure that academic programs are relevant to the societal and market needs, integrate emerging technologies, and consider the dynamism of the global labor market to ensure graduates acquire all the necessary competence. In support of the current study's findings, a study conducted in sub-Saharan Africa found that employability is enhanced through collaboration among stakeholders, and unemployment is rooted in collaboration gaps between educational institutions and industry (Otahe, 2021). Besides, other study findings have focused on the problems entangled with the education system, attributed to gaps in curriculum and training (Monteiro et al., 2024; Sabri et al., 2025), while the huge influx of graduates is expected to adversely affect the labor market.

Another important finding of the current study is the role of teaching quality practices in determining the employability of graduates at levels 5 and 6. Contrary to the general expectations, the findings revealed that *teaching practice has no a significant direct, indirect, or total relationship with graduates' employability, suggesting that the level of quality of teaching plays a less significant role in helping graduates develop the required employability skills and competencies necessary in the labor market*. From a theoretical perspective, it contradicts the

assumptions of endogenous growth theory and human capital, which both surmise that investment in education and accumulation of knowledge and skill improve productivity and labor market outcomes, which in turn lead to long-term economic growth (Becker, 1964; Lucas, 1988; Romer, 1986). It is also against the central idea of the general system theory of Bertalanffy (1968), which assumes educational outcomes are the result of interrelated input, throughput, and output factors like the teaching process, among others. It also contradicts the findings of recent empirical studies that emphasize the importance of the teaching and learning process in enhancing employability skills among graduates (Çağlar et al., 2026; Jackson, 2014). Moreover, other studies also highlighted the significance of teaching quality as a critical component in developing employability skills. The quality of teaching plays an indispensable role in helping students acquire competencies (Zhang et al., 2022, 2025). They further noted that graduates with better academic achievement scores and longer internship programs tend to have more employable skills. The contradiction against the assumptions of the theory and empirical studies may suggest that the relationship between the two variables is highly *context sensitive and contingent upon structural issues, institutional facilities, and infrastructures*, which limit the quality of teaching to provide students with a meaningful experience necessary to develop employable competencies. While acknowledging the solid theoretical foundations, this finding revealed that any teaching practice that doesn't consider the quality and practicality doesn't simply translate into positive labor market outcomes. To ensure its effectiveness in enhancing graduates' employability, effective teaching practices that focus on practicality, quality, and consideration of contextual factors should be in place to respond to the labor market requirements. From a theoretical point of view, the study contributes to existing literature by underscoring that the role of teaching practice in shaping the effectiveness of labor market outcomes is conditional and dependent on many contextual and institutional factors.

As for the institutional environment, the current study found that the direct relationship is statistically insignificant, implying that *institutional factors such as facilities, infrastructure, and support systems are less likely to exert an influence on employability*. However, the indirect relationship between institutional environment and graduates' employability was positive through innovation, which highlights that *innovation plays a full mediation role in the relationship between institutional factors and graduates' employability*. Despite the significant indirect association, the total influence of institutional environment is not statistically significant. Therefore, the influence of institutionally related factors on graduates' employability depends on their ability to predict the mediating variable, innovation. Studies conducted to date have underscored the importance of the institutional context in enhancing graduates' employability. A qualitative study of five African countries by Iwara (2025) discussed the importance of contextual factors related to institutional support systems in enhancing graduates' employability skills development in rural Africa. In the context of the UAE, Shomotova and Ibrahim (2024) also highlighted the role of institutional infrastructure and facilities on students' perceived employability. They found

that including physical and digital infrastructure in the learning environment positively influenced students' employability. Even though the direct relationship between institutional environment and employability is statistically insignificant, this doesn't necessarily imply that its role in employability outcomes is always negligible. It indicates that *its role is rather indirect through innovation*, as shown in the results section.

The current study has also dealt with innovation as an influencing variable to employability and its mediating role in the relationship between program relevance, teaching practice, institutional environment, and perceived employability of graduates. In terms of direct relationships, the study revealed that innovation positively enhances employability, providing further evidence for existing empirical studies. In line with this finding, studies by Zhang et al. (2022), Wang et al. (2022), and Li et al. (2022) found that students' engagement in innovative practices during their studies positively impacted their employability skills. They further noted that students with higher innovative capacity are more employable than those with lower innovative capacity. Innovation boosts employability among graduates, helping students develop confidence (Li et al., 2022). Moreover, Pianda et al. (2025) revealed that the development of 21st-century competencies such as critical thinking, problem-solving skills, adaptability, and creativity significantly explains the enhancement of graduates' employability among vocational students.

From the indirect perspective, in the present study, innovation positively mediates the relationships between program relevance and employability, and between the institutional environment and employability, but not the relationship between teaching quality and employability practices. Therefore, innovation does mediate the relationship between teaching quality and employability, according to this study's findings. In other words, the finding doesn't mean innovation by itself has no positive influence on employability. It implies that the level of teaching practices has not influenced innovation in a way that can influence and enhance employability skills development among graduates. However, the previous study concluded that innovation successfully mediates the relationship between educational processes and unemployment reduction, exerting not only a direct positive influence but also a positive mediating role.

The results of PLS-MGA also revealed that there was no strong statistical evidence that there exists significant variation in the employability of level 5 and level 6 graduates, which challenges the simplistic assumptions of the traditional human capital theory that achieving a higher level of education necessarily translates into better labor market outcomes and better earnings (Becker, 1964). The fact that achieving a higher level of education yields better opportunities in the global market, in the context of developing countries like Ethiopia, where labor market outcomes and access to opportunities are determined and moderated by various structural, socio-demographic, and institutional factors, non-significant variation between higher education and vocational training institutions among graduates may not be a big surprise. The presence of skill mismatches and the market's absorption capacity are also constraints that, among other factors, help explain the lack of difference between the two levels. The result also indicates that graduates' employability is not determined by higher

levels of education; rather, it is shaped by the interplay of institutional and context-specific labor market conditions.

7 Conclusion

This study empirically analyzed labor market outcomes, proxied by employability among higher education and vocational training graduates. It specifically investigated the relationships among program relevance, teaching practices, institutional environment, and innovation on graduates' perceived employability. Grounded in scientific literature, the current study proposed and tested hypotheses based on primary data collected from 561 graduating classes of ISCED levels 5 and 6 students in Ethiopia. The study employed a PLS-SEM technique of analytical procedure.

The overall results of PLS-SEM revealed that program relevance has a positive and statistically significant relationship with graduates' employability. Whereas teaching practices and institutional environment appeared to show weaker and non-significant associations with employability. The study implies that educational facilities and processes are less likely to predict the employability of graduates. Innovation partially mediates the relationship between program relevance and graduates' employability. It also fully mediates the relationship between institutional environment and graduates' employability. However, innovation does not mediate the relationship between teaching practice and graduates' employability. The level of teaching practice is not positively associated with innovation in a way that enables graduates to develop employable competencies in the labor market. Therefore, teaching practices should integrate experiential and work-based learning pedagogical models to foster student motivation and expose them to problem-solving environments to meet the labor market requirements.

The study also analyzed whether there exist differences in the employability of graduates from the two levels and sectors of the education system. It can be concluded that there are no statistically significant differences in the educational and institutional dimensions in determining graduates' employability. It indicates that possessing higher educational qualifications doesn't automatically relate to higher employability. The fact that there is no statistical difference between the two levels shows that employability is not determined by the level of education; rather, by the competence of graduates acquired over the years of their studies, which challenges the linear assumptions of human capital theory. In practice, it shows that policy and institutional endeavors should work on the alignment of skill and industry demands by fostering experiential learning opportunities at both levels.

In a nutshell, the study concludes that collaborative curriculum development, enhanced teaching and innovative practices, and strengthened institutional facilities and infrastructure are instrumental in enhancing graduates' employability in Ethiopia. The findings have practical and policy implications, indicating that institutions need to focus on building a coherent, interdependent system to align educational inputs, processes, and outputs with labor market outcomes. This study will make several contributions to the existing body of literature in labor markets by addressing theoretical and practical gaps both at the global and local contexts. It is also assumed to provide insights for researchers interested in

conducting further investigations using similar measurements. It also helps policymakers, practitioners, and other stakeholders in addressing the issue of graduate employability.

8 Limitations

Although the findings of the current study are informative, they are subject to numerous limitations arising from several factors. Initially, the estimation was based on cross-sectional data collected from research participants, which may not be able to establish causal relationships between education and labor market outcomes. Yet the results can be used to test theoretically grounded hypotheses and predictive relationships. Future research could focus on longitudinal or experimental designs to better establish causal relationships. In addition, the study didn't conduct a formal common method bias assessment. However, some remedies, like anonymity, were applied to mitigate the problem. Moreover, the multicollinearity assessment result showed that the VIF values were below the acceptable threshold, which suggests that CMB might not be a major concern. Secondly, although indicators can serve as proxies for variables, self-reported data may lack sufficient quality, posing a challenge. Moreover, it would have been worthwhile to include a range of educational and economic variables. Thirdly, the specified model and its estimation technique, design, and the data may not fully capture the causal relationships between the explanatory and response variables under study. It only reported predictive relationships. The fourth limitation concerns generalizability, which is constrained by contextual factors specific to Ethiopia. The results primarily reflect the Ethiopian context and may not be generalized to other regions or to developing countries, except for nations facing similar systemic, structural, and institutional challenges. Therefore, readers of this study should consider these limitations when interpreting the findings. The authors highly recommend further research using a wide range of data and advanced analytical techniques.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Berhanu Mekonnen Yimer, Dilla University. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The author(s) declared that generative AI was not used in the creation of this manuscript.

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Appendix

Survey Questionnaire filled by graduating students

1. Program Relevance

		1	2	3	4	5
1	The academic programs are adequately aligned with industry needs					
2	The program is offering practical skills to help students succeed in their future careers					
3	Academic programs are adaptable to changes in the labor market					
4	Academic programs embrace the required professional profiles					
5	The institution frequently collaborates with industries to make sure that academic programs address industry demands					
6	Regular revision of the program based on employment demands on the labor market					

2. Teaching practices

		1	2	3	4	5
1	The academic staff of my institution possesses the required competence					
2	Teachers effectively communicate complex concepts in a way that is easy to understand					
3	The institution meets the standard for meaningful interaction between teachers and students					
4	The teaching methods used promote critical thinking so that students will be able to develop problem-solving skills					
5	Classroom activities are designed to take into account the diverse learning styles of students					

3. Institutional Environment

		1	2	3	4	5
1	The classroom facilities provide a conducive environment for effective learning					
2	Technological infrastructure supports the educational needs of students					
3	Library resources adequately support the academic needs of students					
4	The campus is designed to be accessible for individuals with different abilities					

4. Innovative Practices

		1	2	3	4	5
1	There are sufficient opportunities for innovation\creative activities in my institution					
2	The institution allocates adequate money for innovation\creative activities					
3	The institution collaborates with other national and international organizations to support innovation\creative activities					
4	The institution equips me with the necessary skills to contribute to innovative projects in my field of study					

5. Employability

		1	2	3	4	5
1	Graduates' academic qualifications and industry requirements match each other					
2	My academic program equips me with practical skills helpful to apply in the real world of work					
3	My academic program prepared me for entrepreneurship to employment					
4	Support provided by your institution in enhancing your employment opportunities were sufficient					
5	I got sufficient career support and training from the institution, aiming at employment opportunities					