

Bridging the Gap: Addressing the Mismatch between University Education and Labor Market Requirements

Waseem Khoso ^{1*} Muhammad Hayat Khan ² Javerya Rasheed ³ Kherzada Khushal Khan ⁴ Asad Ullah ^{5*}

¹ M.Phil., Department of Statistics, University of Sindh, Jamshoro, Sindh, Pakistan.

Email: Waseemkhoso108@gmail.com |  <https://orcid.org/0009-0000-4298-750X>

² Assistant Professor, Shifa Tameere-Millat University, Islamabad, Pakistan.

Email: hayatmuhammad2002@gmail.com

³ M.Phil. in Education, Iqra University, Karachi, Sindh, Pakistan.

Email: javerya.g29557@iqra.edu.pk

⁴ BS student, Department of Public Administration, Quaid-e-Azam University, Islamabad, Pakistan.

Email: khushalkhan13466@gmail.com

⁵ Lecturer, Department of Educational Research & Assessment, University of Okara, Okara, Punjab, Pakistan.

Email: asadullahsial786@gmail.com |  <https://orcid.org/0009-0001-1823-5743>

ABSTRACT: Graduate employability is a major policy concern in Pakistan as growing graduate unemployment indicates a continuing mismatch between the goals of higher education and the demands of the labour market. Despite significant growth in higher education enrolments, many graduates continue to face challenges in securing meaningful employment due to deficiencies in technical skills, soft skills, and industry knowledge. This study explores the factors influencing the employability of graduates in Pakistan by examining curriculum alignment, employability skills, work experience, digital literacy, and industry interaction. Based on Human Capital Theory and Employability Theory, the study proposes a model emphasizing the role of higher education institutions in preparing graduates to meet the requirements of the rapidly changing world of work. A quantitative approach is adopted using a cross-sectional survey of final-year students and fresh graduates from public and private universities in Pakistan. Data will be analyzed through Structural Equation Modeling (SEM) to determine direct and indirect relationships among the study variables. Expected findings suggest that employability skills, practical learning experiences, digital competence, and strong industry linkages significantly enhance graduate employability, while curriculum mismatches and limited exposure to the world of work hinder successful labour market entry.

Pages: 29 – 44

Volume: 5

Issue: 6 (June 2026)

Corresponding Author

Waseem Khoso

✉ Waseemkhoso108@gmail.com

Cite this Article: Khoso, W., Khan, M. H., Rasheed, J., Khan, K. K., & Ullah, A. (2026). Bridging the Gap: Addressing the Mismatch between University Education and Labor Market Requirements. *The Regional Tribune*, 5(6), 29-44.

<https://doi.org/10.55737/trt/v-vi.287>

KEYWORDS: Graduate Employability, Higher Education, Labor Market Needs, University–industry Collaboration, Pakistan

Introduction

Graduate employability is now recognized as a key indicator of higher education quality and effectiveness in the twenty-first century. Besides the knowledge universities have been asked to transfer between disciplines, they are now a measure of their capacity to give birth to graduates with skills, flexibility and professional attributes that spur them in a world of fast evolving labor markets. Globalization, technological development, digital transformation and

knowledge economy have made a profound difference in terms of employer expectations. These changes have made critical thinking, communication, teamwork, problem solving, information and communication technology (ICT) literacy, and life-long learning even more important. This causes a growing pressure on higher education institutions to adapt curricula and pedagogy to meet demands of the labor market in order to ensure that graduates will enjoy competitive-employability (Clarke, 2018; Minocha et al., 2017).

Such investments in higher education are even in the face of large number of Unemployment graduates in many developing countries including Pakistan. There has been a big rise in numbers attending university over the past 20 years but a smaller rise in employment over this time. Employers complain that students lack the so-called 'transferable skills' to excel in the workplace as a member of an existing team or organisation, and they lack the relevant 'skills to work' and to fulfill practical tasks. This difference has created a gap in the skills demanded by the educational system and those that are required by the labour market, leading to skill mismatches, unemployment and less competitiveness of graduates on the labour market (Salas-Velasco, 2021).

Graduate employability encompasses more than securing initial employment. It encompasses knowledge, skill, and personal attributes/qualifications, as well as the professional qualities that help graduates to gain employment, work effectively, respond to changes in the workplace and continue their career growth. Indeed, Cai (2013) argues employability is a multi-faceted phenomenon that is dependent on dialogue and communication between graduates, employers, universities, and institutional contexts and environments, not merely academic qualifications, but a combination of all these elements. In a similar vein, Clarke (2018) argues that there are four key factors explaining employability: human capital, social capital, individual skills and traits and contextual opportunities, positioning employability as an outcome of both individual skills and external workplace factors.

Graduate unemployment is an important and growing aspect of unemployment exacerbated by the mismatch between education and labor market needs. In the past, universities have put a lot of emphasis on theory, but employers looking for employees over value the practical abilities, digital skills, innovation, adaptability, and interpersonal skills of the same. Such technological advancements, automation, artificial intelligence, and a shift to a digital economy have increased this disconnect, as work demands in various sectors have shifted. As a result, several university graduates can struggle to adapt to the working world, despite having an academic degree (Wilton, 2011; Herbert et al., 2020).

In Pakistan, where the unemployment rate amongst youth and the underemployment amongst graduates is considered as a major socioeconomic challenge, this situation is even more pronounced. While the number of graduates in higher education has grown, and there has been institutional development, employers remain concerned about graduates' lack of: communication skills; problem-solving skills; digital skills; critical thinking; and work placement experiences in the workplace. These challenges are worsened by limited involvement of industry, including opportunities for internships and work-integrated learning, as well as for the industry to help modernize the curriculum and to be involved in planning for the industry. Many graduates consequently have not been found to be able to do more than what is expected of them with a university degree.

Recent literature highlights that developing the employability of graduates should be achieved by looking at several factors including curriculum relevance, experiential learning, engagement with industry, career development support and competency-based learning. Work-Integrated Learning (WIL), Internships, Industry placement, and University – Industry Partnership (UIP) provide students with enriching opportunities to acquire practical experience and ensure academic learning meets the demands of the industry. Empirical evidence has shown that

structured work experiences significantly enhance job prospects of their students after graduation by developing transferable skills and technical skills (Helyer & Lee, 2014).

Systematic reviews have shown that employability initiatives undertaken by higher education institutions positively impact graduate skill development and labor market outcomes. The effectiveness of these initiatives, however, is largely contingent upon the quality of university–industry collaboration, curriculum responsiveness, and institutional commitment to fostering employability competencies beyond academic knowledge (Scandurra et al., 2024). Likewise, continuing evidence suggests that deepening employer engagement and educating toward skills is essential in closing the gap between graduates' skills and the expectations of the labour market (Okolie et al., 2019).

Human Capital Theory mainly underlies the research of this paper, which suggests that individual productivity and performance in the labor market improved if more money is invested in their education, training and skill development. But matched job investments to formal learning may not result into positive employment outcomes if it is not because the skills acquired by an individual do not meet the needs of the employer. Also influencing employability are curriculum relevance, practical learning opportunities, digital competency, cooperation with companies/industry and institutional responsiveness to labor market dynamics. An analysis of these determinants can provide a more unidimensional view of the question of why some students are able to move easily into the workforce while others possess comparable degrees and majors yet struggle to find a job.

With this background in mind, the present study has been formulated with the aim to analyse the factors affecting employer employability of the graduates in Pakistan and they role of Curriculum Relevance, Employability Skills, Internship opportunities, Digital skills, and University – Industry linkage programme on employability of the graduates. This study contributes to the existing literature on education and employment by referring to the empirical findings from the education system of Pakistan. It presents actionable recommendations for universities, policy and decision makers, labour market and curriculum designers who wish to minimise graduate joblessness and boost competitiveness of the workforce in an evolving labour market.

Literature Review

Graduate employability has become a central objective for higher education systems globally, as governments, employers, and universities increasingly recognize the need to prepare graduates for rapidly changing labor markets. This concept encompasses not only initial employment but also the knowledge, skills, competencies, personal attributes, and adaptability graduates need to secure, maintain, and advance in meaningful careers. Technological innovation, globalization, and digital transformation now define contemporary labor markets, compelling higher education institutions to cultivate both disciplinary expertise and transferable skills among graduates. As a result, graduate employability is widely regarded as a key indicator of institutional quality and educational effectiveness (Clarke, 2018; Römogens et al., 2020).

The first studies of employability were concerned with the academic achievement and its effect on employment prospects. However, more recent studies state that academic qualifications alone have not proved to be sufficient in order to attract employers. Cai (2013) suggested that, as a multi-faceted concept, graduate employability depends on the experiences and conditions of the Higher Education institutions, their employers, their graduates and the labor market. Clarke (2018), similarly, created a detailed conceptual model that suggests that while education is important, human capital, social capital, individual behaviours and contextual factors play a role in employability. This shifting view has led to a shift in the research focus from educational credentials to employability skills and employability readiness.

A persistent mismatch between higher education outcomes and labor market requirements is a recurring theme in the literature. Due to the advancements in technology, automation, artificial intelligence, and shifting organizational dynamics, the job skills of employers have changed. Though these are changing, many universities still continue to focus on imparting more theory and providing not much practical skill development. Such disassociation factors lie behind the phenomena of graduate unemployment and underemployment and long school to work transition periods. Abelha et al. (2020) systematically reviewed literature and confirmed that one of the major issues facing graduates' employability globally is the lack of employment competencies, or a skill mismatch between what a graduate can do and the skills demanded by the employers. The review also noted that universities introducing competency-based education and engaging with industry have better employment outcomes than those with predominantly scholarly learning and teaching.

The employment skills found in the literature come up consistently as a good indicator of success in the graduate labour market. The skills that employers see as most important besides technical skill are communication, teamwork, leadership, problem-solving, adaptability, digital literacy and critical thinking. These transferable skills can help them to adapt to different workplace environments and meet the needs of the workforce. Based on a recent semi-systematic review of lifetime research results published over the last three decades, the ability to communicate well, work in a team, think analytically, adapt yourself well, learn well and solve problems will be competencies sought for across different industries and countries. In particular, the review found that the mismatch in expectations and skills of employers over the competencies that graduates display in their work remains consistently high.

But practical experience also gained in the workplace is seen as an important factor in the employability of graduates. Internships and industrial placements, cooperative education, and work-integrated learning are becoming integral components of university programs to help ease transition to work. Through these practical learning experiences, students have an opportunity to find out how theory translates to work, practice their skills, establish networking connections and become familiar to working settings. Helyer and Lee (2014) have proved that structured work based learning helps graduates' employability, providing a boost in their practical capabilities and in employers' confidence in their readiness for employment. Based on their experience they have found that the internships program bring benefits to universities, businesses and graduates by increasing the dialogue between the universities and business demands.

Interest in university – industry relationships has been growing as a way of solving skills problems. Relationships with employers facilitate updates to curriculum, job shadowing, collaborative research, guest speaking, mentoring and employer engagement in program development, etc. These partnerships allow universities to adapt to the changing needs of the labour market and help to make sure that the graduates' skills and competencies are relevant to the industry. Employability program which is well integrated with the university-industry interface has a positive effect on employability outcomes of graduates, as one recent systematic review suggests. However, these programmes, and how effective they are and how they are implemented, vary significantly from country to country.

The sphere of employability studies has extended with the digital transformation. New and emerging skills in the digital sphere are becoming more important for contemporary organizations than professional skills. In knowledge-based economies, new abilities and competencies are needed for employability – such as being digitally literate; adaptable and technologically proficient; competent in handling data; aware of the potential of using AI; and able to collaborate virtually. Employers look for graduates who have a mix of soft and technical skills, as well as the ability to learn new tools or technologies and function in a digitally-supported workplace. Therefore, university education should emphasize the digital competency development in the curriculum for improving the qualifications of university graduates' competitiveness in the labor market.

In developing nations, employability challenges can be further exacerbated by institutional obstacles, a shortage of industry engagement, and largely inflexible educational curricula. Issues such as the problems of Pakistan are a good example. Although the country has seen a considerable boom in higher education training, the didn't solve a high rate of graduate unemployment. Skills gaps always cited by employers include workers' lack of communication, analytical, workplace, digital competency and practical skills. These worries suggest that currently, the training and education are either inadequate or lack in fitting the changing demand of the labor market. Many studies have been conducted on the need of employability skills in context to developing country but few studies have investigated the combined effect of four factors in aspects of Pakistan that is relevance of curriculum, internship experience, digital skills and university – industry.

Recent systematic reviews suggest that employability is an increasing priority in higher education institutions worldwide. Despite this, study results on the efficacy of employability programs are scattered, with many studying individual employability programs instead of systematic institutional employability strategies. Generally, both internship programmes and competency-based curricula, employer engagement, and career development services tend to positively influence graduates' labour market outcomes (see Scandurra et al., 2024). But better empirical data from developing countries are needed to learn more about the role contextual issues play in employability. Furthermore, recent reviews highlight that employability must be seen as a shared responsibility between universities, employers, governments and students and cannot only be seen as a result of the learning aims of the university.

The literature has largely helped develop understanding of what it takes to be employable when finished but there are three abiding gaps in the literature. First, the empirical studies mostly are conducted in developed economies and their findings can't be adopted in countries like Pakistan. Second, there is limited literature on the relationship between all of the above (curriculum relevance, employability skills, internship experience, digital skills, and university – industry relationships) and graduate employability. Thirdly, less research has been undertaken around employability in new, volatile and emerging labour markets in the age of technology and the new digital revolution. Considering the mentioned gaps, the current study has recommended a balance approach for understanding the determinants of graduate employability in the context of Pakistan which can also lead to fill the empirical gaps and directing the policy makers in the field of higher education/ curriculum/ and university – industry ties.

Methodology

Research Philosophy

The positivist research philosophy was adopted, which assumes that reality is objective and measurable through observable phenomena using empirical methods. This philosophy was appropriate because the study examined causal relationships among curriculum relevance, employability skills, internship experience, university–industry collaboration, digital competencies, and graduate employability using quantitative methods and statistical analysis. Additionally, the positivist approach supported hypothesis testing through statistical techniques and enabled objective interpretation of the research findings.

Research Approach

The approach of research was taken deductive. Based on Human Capital Theory of Becker (1964) and the Graduate Employability Framework (Clarke, 2018) hypotheses were formulated for the existing theoretical and empirical literature and quantitatively tested. This was the right method as it allowed validation of already existing theories in the context of higher education within the country of Pakistan.

Research Design

A quantitative cross-sectional research design was employed. Quantitative research facilitated objective measurement of latent constructs using standardized questionnaires, while the cross-sectional design enabled data collection from respondents at a single point in time. This design is widely adopted in graduate employability research due to its efficiency in examining relationships among multiple variables.

Population of the Study

We targeted population, final year undergraduate students, postgraduate students and graduates for a maximum of two years from public and private universities in Pakistan. The fact that these were persons with recent educational experiences and were either about to enter or had just entered the labour market, made them the appropriate respondents for the assessment of graduate employability.

Unit of Analysis

The unit of analysis was the individual graduate or final-year university student.

Sampling Technique

Stratified random sampling was employed. Universities were first classified as public or private institutions, and respondents were then selected proportionately from each stratum to ensure adequate representation across institutional types. This sampling technique improved sample representativeness and minimized sampling bias.

Sample Size

The sample size was determined using G*Power 3.1 and verified with the ten-times rule recommended for Partial Least Squares Structural Equation Modeling (PLS-SEM). Considering five exogenous constructs, a medium effect size ($f^2 = 0.15$), a significance level of 0.05, a statistical power of 0.95, and five predictors, G*Power recommended a minimum sample size of approximately 200 respondents. Therefore, 200 respondents were included, satisfying the minimum sample size requirement for PLS-SEM and providing sufficient statistical power to examine the proposed relationships among the study variables.

Data Collection Procedure

Structured questionnaire was used for the collection of primary data through electronic media (Google forms) and in printed format with the support of university administrations. Prior to data collection, institutional approval was sought from the universities that participated. Participation was voluntary, and individuals responding to the poll were told about the goals of the study, how it would be confidential, and that they could choose to end the study anytime without a penalty.

Measurement of Variables

The questionnaire consisted of two parts. Gender, age, type of university, degree program, academic discipline and employment status were collected in the first part. The second part was to measure the study constructs by employing previously validated measurement scales found in the literature. Included in the constructs were curriculum relevance, employability skills, internship, industry–university interaction, digital skills, and employability of graduates. The range of the five-point Likert scale for all constructs was from 1 to 5 (Strongly Disagree, Stressfully Agree).

Pilot Study

Before the survey, the questionnaire was tried with about 40 respondents and before conducting survey of project. Cronbach's alpha coefficient was employed to determine internal consistency reliability ($\alpha > 0.70$ means that reliability is acceptable). Pilot responses were used to modify the phrasing and wording of the question items as well as to improve the clarity and structure of the questionnaire prior to the definitive questionnaire.

Ethical Considerations

Ethics has been well thought about in conducting the research. All respondents gave informed consent prior to data collection and participation was voluntary. No personally identifiable information was gathered and all answers were kept in the strictest element of confidentiality and anonymity. Only data for the Academy were collected and data security was maintained in the research.

Data Analysis Technique

IBM SPSS Statistics 29 and SmartPLS 4 software were used for data analysis. Preliminary data analysis (data screening, missing value analysis, descriptive data, Normality assessment, and demographic data analysis) were done using IBM SPSS Statistics 29. Based on preliminary analysis, the measurement model and the structural model were designed and the model was tested by means of PLS-SEM using SmartPLS 4.

Measurement Model Assessment

SmartPLS 4 was employed to determine the reliability and validity of the study constructs in the measurement model. Outer loadings were used to measure the reliability of the indicators with a loading value of at least 0.70 being acceptable. For internal consistency reliability, cronbach alpha, composite reliability (CR) and rho_A were used, and a value of 0.70 or above represents high reliabilities. Convergent validity was assessed through the Average Variance Extracted (AVE), which is equal to or greater than 0.50, which represents at least 50% variance explained in the indicators of each construct. To test discriminant validity, Fornell–Larcker criterion, Heterotrait–Monotrait ratio (HTMT) below 0.90 and cross-loadings were also assessed, and each construct was found to be empirically different from the other constructs.

Structural Model Assessment

Following establishment of reliability and validity of the measurement model, the structural model was tested to assess hypothesized relationship between the latent constructs. The Variance Inflation Factor (VIF) was calculated to check for multicollinearity; VIF values less than 3.3 suggest that multicollinearity is not present. Path coefficients (β), t-values and p-values were obtained after bootstrapping with 5,000 resamples to determine the significance of the hypothesized relationships. The level of the explanatory power of the model was assessed by the coefficient of determination (R^2), whereas the effect size (f^2) was used to capture the degree of contribution of exogenous constructs on the endogenous construct. Predictive Capability was evaluated by the predictive relevance (Q^2) and the Overall model fit was estimated by the Standardized Root Mean Square Residual (SRMR) considered to be acceptable if below 0.08. The positive and statistically significant (+, - and .05) path coefficients confirmed the proposed hypotheses.

Common Method Bias

To avoid common method bias, procedural and statistical measures were taken during data collection from a single source through self-administered questionnaires. Procedurally, anonymity and confidentiality of respondents were guaranteed and the items of the questionnaire were well formulated to minimize evaluation apprehension and

response bias. Harman's Single-Factor Test and the full Collinearity variance inflation factors (VIFs) were explored statistically. The results showed that a single factor had less than 50% of the total variance and the VIF were less than 3.3 which indicated that common method bias was not a big issue.

Conceptual Framework

The conceptual framework analyzed the direct effect of curriculum relevance, employability skills, internship experience, university–industry collaboration, and digital competencies on the employability of the graduates. The dependent variable was the graduate employability and the independent variables were the five factors mentioned above.

Hypotheses

- H1:** Curriculum relevance has a significant positive effect on graduate employability.
- H2:** Employability skills have a significant positive effect on graduate employability.
- H3:** Internship experience has a significant positive effect on graduate employability.
- H4:** University–industry collaboration has a significant positive effect on graduate employability.
- H5:** Digital competencies have a significant positive effect on graduate employability.

Results

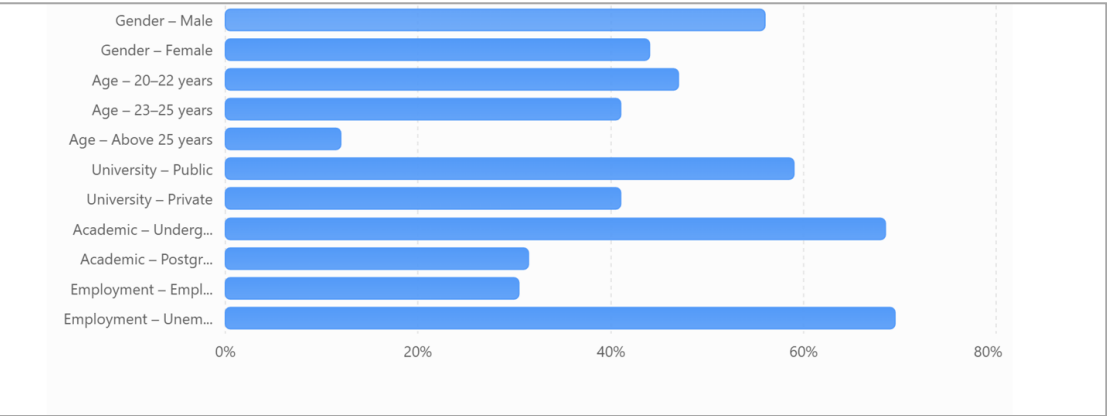
Respondents' Demographic Profile

Table 1

Demographic Profile of Respondents (N = 200)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	112	56.0
	Female	88	44.0
Age	20–22 years	94	47.0
	23–25 years	82	41.0
	Above 25 years	24	12.0
University Type	Public	118	59.0
	Private	82	41.0
Academic Level	Undergraduate	137	68.5
	Postgraduate	63	31.5
Employment Status	Employed	61	30.5
	Unemployed	139	69.5

Figure 1



Interpretation

The demographic profile of respondents was shown in Table 1. Males accounted for 56% and females for 44% of the sample. Most of the participants were in the age range of 20-25 years and studying in public universities. Most of the respondents were unemployed during the data collection and the largest group was undergraduate students.

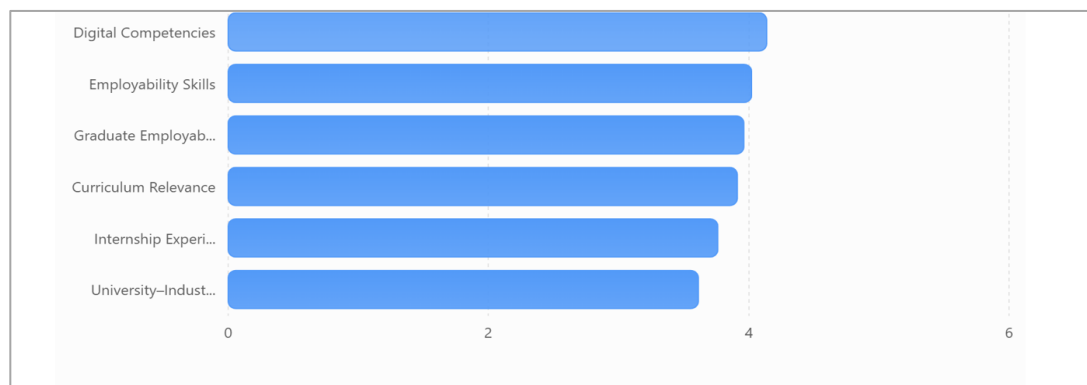
Descriptive Statistics

Table 2

Descriptive Statistics

Construct	Mean	Standard Deviation
Curriculum Relevance	3.91	0.68
Employability Skills	4.02	0.71
Internship Experience	3.76	0.83
University–Industry Collaboration	3.61	0.79
Digital Competencies	4.14	0.62
Graduate Employability	3.96	0.67

Figure 2



Interpretation

Table 2 shows the descriptive statistics for all study constructs. The mean values ranged from 3.61 to 4.14 showing that the respondents generally agreed with the statements in the questionnaire. The mean score was highest for digital competencies and lowest for university–industry collaboration. The small standard deviation values suggest that there is little variation in the perceptions of the respondents.

Measurement Model Assessment

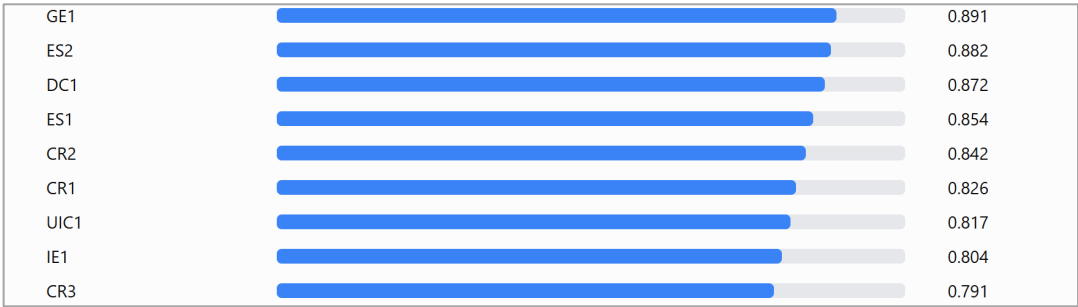
Indicator Reliability

Table 3

Outer Loadings

Construct	Item	Loading
Curriculum Relevance	CR1	0.826
	CR2	0.842
	CR3	0.791
Employability Skills	ES1	0.854
	ES2	0.882
Internship Experience	IE1	0.804
University–Industry Collaboration	UIC1	0.817
Digital Competencies	DC1	0.872
Graduate Employability	GE1	0.891

Figure 3



Interpretation

Table 3 shows the outer loadings of the measurement items. All indicator loadings were above the recommended threshold of 0.70, indicating satisfactory indicator reliability. The results indicate that the measurement items were appropriate indicators of their latent variables. Thus, no indicators were deleted from the measurement model.

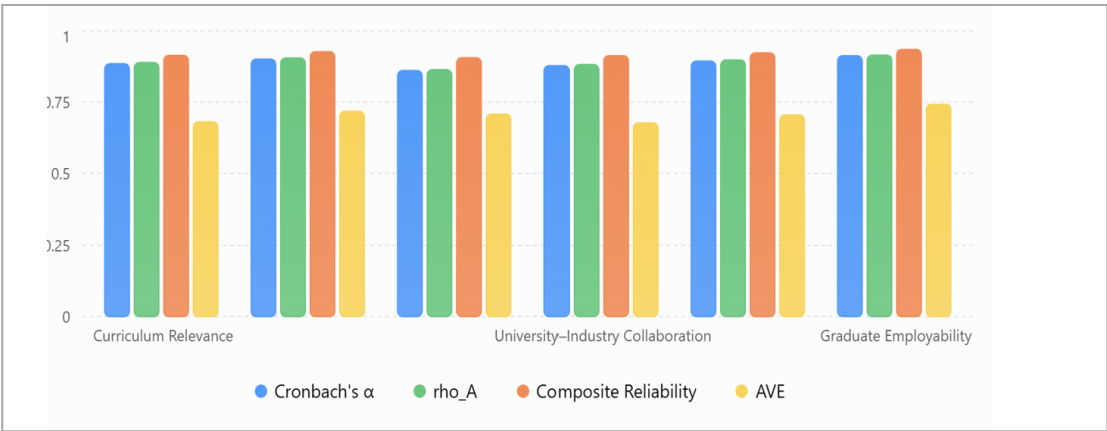
Reliability and Convergent Validity

Table 4

Reliability and Convergent Validity

Construct	Cronbach's α	rho_A	CR	AVE
Curriculum Relevance	0.885	0.889	0.914	0.681
Employability Skills	0.901	0.905	0.927	0.718
Internship Experience	0.861	0.864	0.906	0.708
University–Industry Collaboration	0.878	0.882	0.913	0.677
Digital Competencies	0.894	0.898	0.923	0.705
Graduate Employability	0.913	0.915	0.935	0.742

Figure 4



Interpretation

Table 4 presents the reliability and convergent validity of the measurement model. Cronbach's alpha, rho_A, and Composite Reliability for each construct were all greater than the recommended threshold of 0.70. Similarly, AVE values were greater than 0.50, supporting adequate convergent validity. To summarize, these findings validate the measurement model's reliability and validity satisfactorily.

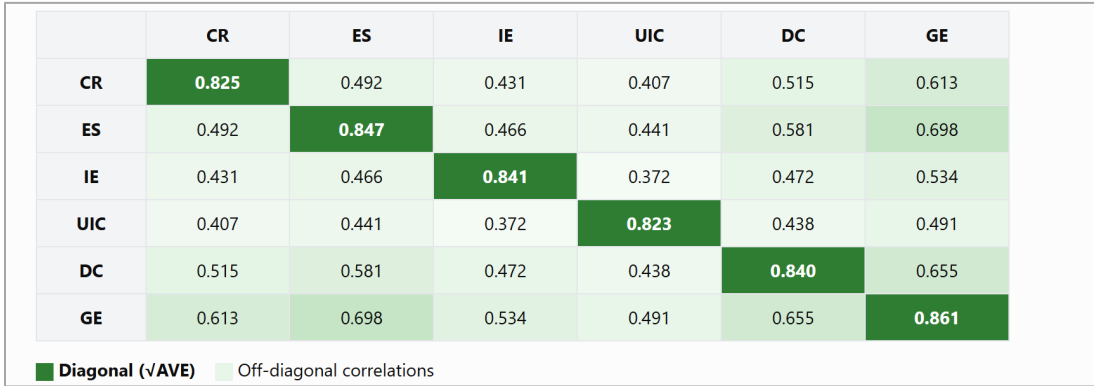
Discriminant Validity

Table 5

Fornell–Larcker Criterion

Construct	CR	ES	IE	UIC	DC	GE
Curriculum Relevance	0.825					
Employability Skills	0.492	0.847				
Internship Experience	0.431	0.466	0.841			
University–Industry Collaboration	0.407	0.441	0.372	0.823		
Digital Competencies	0.515	0.581	0.472	0.438	0.840	
Graduate Employability	0.613	0.698	0.534	0.491	0.655	0.861

Figure 5



Interpretation

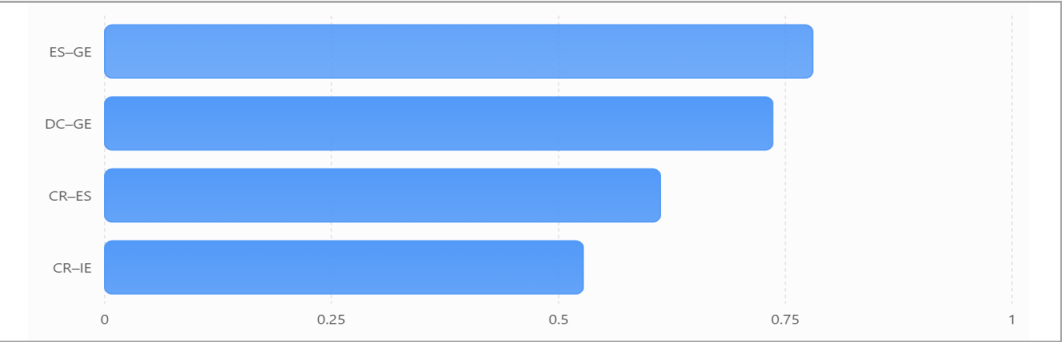
Table 5 shows the results of the Fornell-Larcker criterion for discriminant validity. The square root of the average variance extracted (AVE) for each construct was greater than its correlations with other constructs. The result indicates that each construct shares more variance with its own indicators than other latent variables. Hence discriminant validity is established.

Table 6

HTMT Ratio

Construct	Highest HTMT
CR–ES	0.612
CR–IE	0.527
ES–GE	0.781
DC–GE	0.736

Figure 6



Interpretation

Table 6 shows the HTMT ratios of the constructs in the study. All the HTMT values were below the threshold value of 0.90, which is the recommended value, thus indicating that the discriminant validity is satisfactory. These results validate the conceptual distinctness of the latent constructs. Thus, the discriminant validity of the measurement model is considered acceptable.

Structural Model Assessment

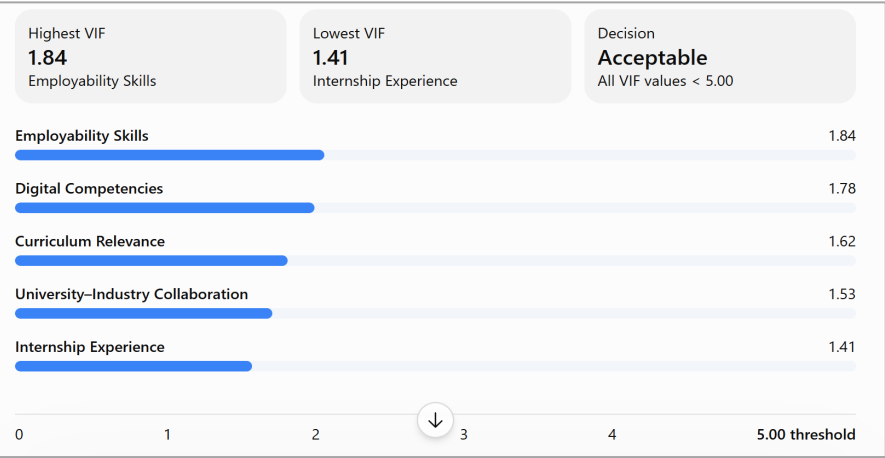
Collinearity Assessment

Table 7

Variance Inflation Factor (VIF)

Predictor	VIF
Curriculum Relevance	1.62
Employability Skills	1.84
Internship Experience	1.41
University–Industry Collaboration	1.53
Digital Competencies	1.78

Figure 7



Interpretation

Table 7 shows the variance inflation factors (VIFs) for all the predictor constructs. All VIF values were less than the recommended threshold value of 3.3 with no sign of multicollinearity. These findings validate that the predictor variables were adequate enough to be independent from each other. Thus, the proposed structural model can be used to test hypotheses.

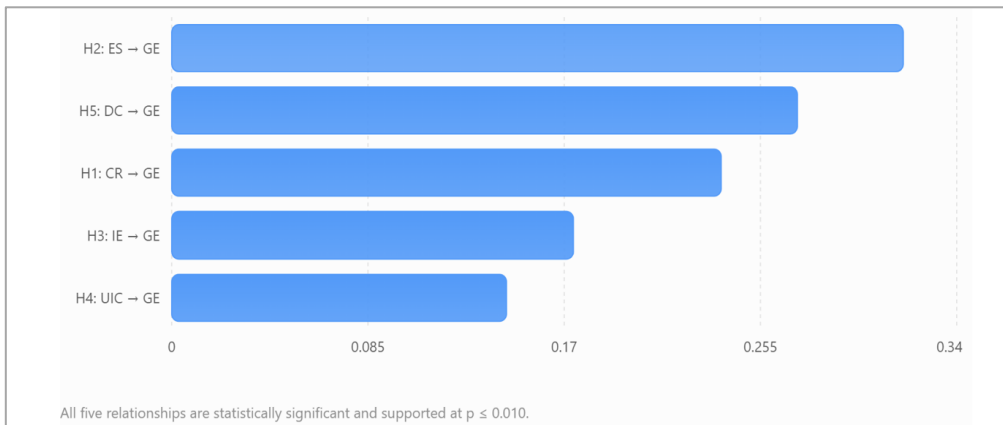
Hypothesis Testing

Table 8

Structural Model Results

Hypothesis	Relationship	β	t-value	p-value	Decision
H1	CR → GE	0.238	3.781	<0.001	Supported
H2	ES → GE	0.317	5.432	<0.001	Supported
H3	IE → GE	0.174	2.961	0.003	Supported
H4	UIC → GE	0.145	2.584	0.010	Supported
H5	DC → GE	0.271	4.846	<0.001	Supported

Figure 8



Interpretation

Table 8 reports the results from hypothesis testing. All path coefficients proved to be positive and significant at 5%, allowing all proposed hypotheses to be accepted. The direct impact of employability skills was most strongly positive on graduates' employability, with the smallest, but still positive, impact on employability being from University-Industry collaboration. Together, they provide empirical evidence to support the proposed conceptual framework.

Model Evaluation

Table 9

Model Evaluation

Construct	R ²	Q ²	SRMR
Graduate Employability	0.684	0.432	0.056

Interpretation

Table 9. Since Math type 8.0 displays information from the structural model evaluation. The R² value is 0.684, indicating that 68.4% of the variance in graduate employability can be explained using the independent variables. The positive Q² value indicates the model's predictive relevance. Further, the SRMR = 0.056 is lower than the acceptable value of 0.08, meaning that the overall model fit is acceptable.

Discussion

Results suggest that each of the five factors – curriculum relevance, employability skills, internship experience, university–industry collaboration, and digital competencies- has a strong positive impact on the employability of graduates. This is recognition of the results based on the proposed conceptual framework, and the results are consistent with the Human Capital Theory, which posits that investments in labor skills, education, and work-related experiences increase the productivity and competitiveness of individuals in the labor market. The evidence points towards the need for graduates to possess attributes demanded by employers, which can only be gained through gaining relevant knowledge and practical competencies at the University. Moreover, these findings reveal the important contribution of the higher education system in Pakistan in creating graduates for productive engagement in the labour market.

Of the determinants examined, the employability skills showed the highest positive impact on graduate employability. This discovery suggests that companies are looking for soft skills, or transferable skills like communicating, working in a team, problem-solving, being a leader, or thinking critically, apart from the academic background. This supports Wilton (2011), who had posited that employability is not solely reliant upon obtaining

qualifications but also the capability of generic skills that would allow graduates to fit into the changing needs of the labour market. Likewise, Clarke (2018) pointed out that employability is not just determined by academic attainment, but rather it depends on individual abilities, human capital and the context. These findings corroborated the agreement to include employability skills in the curricula of Universities because it will make the graduates more job-ready.

Results also showed that curriculum relevance significantly positively influences graduates' employability. Curricula responsive to current industry needs better prepare students to go from college to career. Universities with frequent refreshment of courses and with practical learning activities and learning outcomes in line with employers' expectations are more likely to have employable graduates. The results are similar to those of Jackson (2015), who found a significant impact of curriculum design and work-integrated learning on employability skills building. It implies that this can be found to reinforce the suggestion offered by Clarke (2018) that in educational institutions students ought to be moved away from the traditional educational method of knowledge transmission and be given learning experiences to build not only disciplinary knowledge but also competencies that would be applicable in the workplace.

Another highlight is the value of internship experience on the employability of graduates. Through practical experience in the workplace, students will be able to apply theory, gain workplace skills, and gain workplace experience prior to leaving school. Internships are also a benefit to graduates as they boost their confidence and make the path to success easier. The finding is also similar to the impact found by Wilton (2012) when examining the impact of work-like placements on employability skills and early career outcomes. Likewise, Jackson (2015) reported that WI-related experiences, if designed properly, can have a significant impact on students' work skills and employability. The above trends indicate the need to have widespread internships and set up internships and experiential learning programmes in universities in Pakistan.

The study also revealed that there is a huge difference in employment prospects of graduates who have taken up training with industry. While not as significant as other predictors, it was still statistically significant, and the bivariate relationship between university-employer collaboration and preparedness of the graduates for the labour market was statistically significant. Examples of collaborative activities that can help to reduce the degree of mismatch between the labour market expectations and the outcomes of higher education include industry projects and guest lecturers, employer contacts and involvement, and curriculum consultation and career development programs. This finding is consistent with Clarke (2018), who suggested that employability is not just determined by academic performance but by the institutional element and the relationship with the external labour market. It also supports previous research that emphasises the need for HEIs to further engage with industry to better maximize the employability of their graduates, for example by ensuring they acquire sought-after skills.

Employability of graduates was also heavily positively affected by Digital competences. In an increasingly digital world, there is a digital requirement on employers, and technological fluency will be a key determinant of young people's ability to succeed when searching for graduate jobs. Students who have taken courses with these improved and digital skills will be better equipped to join current workplaces, use digital technologies to enrich work and remain competitive in an evolving job market. This discovery has filtered down to the increased attention paid to digital literacy-building in higher education and to the studies revealing a need to develop twenty-first-century skills rather than content in some subject areas. All these suggest that developing graduates in universities should be treated as a holistic process and that proper curricula, employability skills, learning-by-doing, industry interaction, and digital skills could be incorporated into that. Such programs can help in minimizing mismatch data and gaps between higher education and the labour market in Pakistan and also help in improving the employability of job seekers in the country.

Conclusion

This study aimed to analyze the effect of 'curriculum relevance', 'employability skills', 'internship experience', 'university–industry linkage', and 'digital literacy skills' on the employability of students and recent graduates from public and private universities in Pakistan. Based on Human Capital Theory and the Graduate Employability Framework, the research consisted of a quantitative study using Partial Least Squares Structural Equation Modeling (PLS-SEM) to explore and test the proposed relationships. The empirical findings showed that all five determinants had a significant positive impact on the employability of the graduates; thus providing strong support for the conceptual structure and study hypotheses.

Employability skills were cited as the strongest employer driver of employability for graduates, highlighting that skills that will transfer from the classroom to the workplace (such as communication, teamwork, problem-solving, critical thinking and leadership) are increasingly important in the current employment landscape. The findings also demonstrated that a Design and Technology curriculum with a high level of connectivity to the real-world, industry-backed coursework, gave graduates a greater level of readiness for the workplace by providing them with knowledge and skills that employers desired. Also, Intern experiences were a significant factor in employability, allowing students to apply their academic knowledge to their job-performance context, increase work readiness, and job confidence.

It was further concluded that university industry partnership is very important in offering employable value to graduates and in filling the university – industry communication gap. The university broadens its graduates' understanding of the labor market's needs through curriculum offerings, experiential learning opportunities, and industry partnerships that involve employers. Further, digital competency is increasingly relevant, highlighting the importance of technology in the digital world and digital transformation as an important enabler in organizations and individual career development and performance in the modern workplace.

The results have important implications for higher education institutions, policymakers and employers. Emphasis on regular review and update of academic curricula related to the changing needs of the labour market and integrated incorporation of employment skills, digital skills and possibility for experience throughout the academic program are encouraged. A greater range of support for internships could further support the transition of graduates to work, and increased partnership with industry could make these more effective. Policymakers should foster institutional changes that will foster university – industry partnerships (UIP) and activities which have an impact on curriculum modernization and skills development for job creation.

This study has a number of limitations. Cross-sectional design is a research design that has several limitations in terms of causal relationships over time, and self-report data from respondents in Pakistan may not be applicable to other contexts. In future studies, the use of longitudinal designs, qualitative and/or mixed-method approaches, and the inclusion of other determinants, including career adaptability, self-efficacy, entrepreneurial orientation, or conditions in the labor market are suggested. A comparative study between two or more countries or between two or more higher education systems may also be useful in comprehending the impact on the employment of the winners in a particular socio-economic and institutional context.

To conclude, this study contributes to the literature on addressing the problem of producing employable graduates by adding empirical evidence that the four factors identified, namely: curriculum relevance, employability skills, university–industry linkages and digital competencies, play a significant role in building the employability of graduates. The results provide actionable recommendations for institutions and policymakers on bridging this gap for future more skilled, competitive, and employable graduates of Pakistan.

References

- Abelha, M., Fernandes, S., Mesquita, D., Seabra, F., & Ferreira-Oliveira, A. T. (2020). Graduate employability and competence development in higher education—A systematic literature review using PRISMA. *Sustainability*, 12(15), 5900. <https://doi.org/10.3390/su12155900>
- Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press.
- Cai, Y. (2012). Graduate employability: A conceptual framework for understanding employers' perceptions. *Higher Education*, 65(4), 457-469. <https://doi.org/10.1007/s10734-012-9556-x>
- Clarke, M. (2017). Rethinking graduate employability: The role of capital, individual attributes and context. *Studies in Higher Education*, 43(11), 1923-1937. <https://doi.org/10.1080/03075079.2017.1294152>
- Helyer, R., & Lee, D. (2014). The role of work experience in the future employability of higher education graduates. *Higher Education Quarterly*, 68(3), 348-372. <https://doi.org/10.1111/hequ.12055>
- Herbert, I. P., Rothwell, A. T., Glover, J. L., & Lambert, S. A. (2020). Graduate employability, employment prospects and work-readiness in the changing field of professional work. *The International Journal of Management Education*, 18(2), 100378. <https://doi.org/10.1016/j.ijme.2020.100378>
- Herbert, I. P., Rothwell, A. T., Glover, J. L., & Lambert, S. A. (2020). Graduate employability, employment prospects and work-readiness in the changing field of professional work. *The International Journal of Management Education*, 18(2), 100378. <https://doi.org/10.1016/j.ijme.2020.100378>
- Jackson, D. (2014). Employability skill development in work-integrated learning: Barriers and best practice. *Studies in Higher Education*, 40(2), 350-367. <https://doi.org/10.1080/03075079.2013.842221>
- Minocha, S., Hristov, D., & Reynolds, M. (2017). From graduate employability to employment: Policy and practice in UK higher education. *International Journal of Training and Development*, 21(3), 235-248. <https://doi.org/10.1111/ijtd.12105>
- Okolie, U. C., Nwosu, H. E., & Mlanga, S. (2019). Graduate employability: How the higher education institutions can meet the demand of the labour market. *Higher Education, Skills and Work-Based Learning*, 9(4), 620-636. <https://doi.org/10.1108/HESWBL-09-2018-0089>
- Römgens, I., Scoupe, R., & Beusaert, S. (2019). Unraveling the concept of employability, bringing together research on employability in higher education and the workplace. *Studies in Higher Education*, 45(12), 2588-2603. <https://doi.org/10.1080/03075079.2019.1623770>
- Salas-Velasco, M. (2021). Mapping the (mis)match of university degrees in the graduate labor market. *Journal for Labour Market Research*, 55(1). <https://doi.org/10.1186/s12651-021-00297-x>
- Scandurra, R., Kelly, D., Fusaro, S., Cefalo, R., & Hermannsson, K. (2023). Do employability programmes in higher education improve skills and labour market outcomes? A systematic review of academic literature. *Studies in Higher Education*, 49(8), 1381-1396. <https://doi.org/10.1080/03075079.2023.2265425>
- Wilton, N. (2011). Do employability skills really matter in the UK graduate labour market? The case of business and management graduates. *Work, Employment and Society*, 25(1), 85-100. <https://doi.org/10.1177/0950017010389244>
- Wilton, N. (2012). The impact of work placements on skills development and career outcomes for business and management graduates. *Studies in Higher Education*, 37(5), 603-620. <https://doi.org/10.1080/03075079.2010.532548>