



## Original Article

## Analyzing the Alignment between University Curriculum and Job Market Requirements in Pakistan: Challenges and Opportunities

<sup>1</sup>Nilofar Pervez, <sup>2</sup>Waqas Mahmood, <sup>3</sup>Muzammila Akram & <sup>4</sup>Mohammad Waqas

<sup>1</sup> Visiting Lecture, Govt. Sadiq College Women University Bahawalpur, Pakistan,

Email: [nilofarpervez98@gmail.com](mailto:nilofarpervez98@gmail.com)

<sup>2</sup>Assistant Prof. Department of Educational Training, The Islamia University of Bahawalpur, Pakistan,

Email: [waqas.mahmood@iub.edu.pk](mailto:waqas.mahmood@iub.edu.pk)

<sup>3</sup>Associate Professor, Department of Educational Training, The Islamia University of Bahawalpur, Pakistan,

Email: [muzammila.akram@iub.edu.pk](mailto:muzammila.akram@iub.edu.pk)

<sup>4</sup>PhD scholar, Department of Educational Training, The Islamia University of Bahawalpur, Pakistan,

Email: [mohammadwaqas33@gmail.com](mailto:mohammadwaqas33@gmail.com)

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\*Corresponding Author:

Waqas Mahmood

[waqas.mahmood@iub.edu.pk](mailto:waqas.mahmood@iub.edu.pk)

### ABSTRACT

The preparation of university graduates to meet the practice demands remains a fundamental variable that can improve employability and stimulate economic development. The misalignment between the academic programs and the labor market in Pakistan has implications for graduates, employers, and policymakers. This paper aims to discover the gaps between the courses offered by universities and the demand in the labor market in the context of Pakistan, and the ways of their elimination. Using a combination of quantitative and qualitative data, the study considers curricular content, employer requirements, and sentiments of students, graduates, and educators. Consequently, the study highlights a skills mismatch between the university education output and the market demand in technical, managerial, and interpersonal competencies. Some of the major impediments mentioned in the study include insufficient opportunities to gain practical experience, the courses taught might be old, and there exists limited interaction between academia and the industry. Moreover, the study indicates that more perennial problems, including lack of adequate funding, organizational and political barriers, and weak curriculum policies, shape curriculum reforms' challenges. At the same time, the study also highlights some of the more encouraging avenues for achieving these gaps. More specifically, partnerships between universities and industries, curriculum development with the inputs from industry, and incorporating work experience-based teaching methodologies such as internships, and skill-based training programs can be seen as solutions to the problems identified. Moreover, the brought-in policies complied with the International benchmark and encouraged the governments to education reform can enhance the institutes' preparedness for the labor market needs. This paper provides some sound advice for policymakers, academic leaders, and others responsible for improving university education so that they can respond to the market effectively. The results emphasize the need for curriculum annual review, new career guidance service, and colleges' and employers' collaboration. To solve these problems and build up opportunities to enhance the graduate employment rate and unemployment rate, Pakistan can experience sustainable economic development.

## Introduction

Higher education has a great responsibility of preparing the learners to meet the challenges arising from the increased job competition. In Pakistan, the need for professional and technical human capital has surged highly due to factors such as globalization, technology, and the change in the economy. Finally, the poor quality of the fit between the university curricula and market demands continues to be a burning issue (Mahmood, Ismail, & Omar, 2024). Systemic consistencies in learning include while universities and colleges are in the process of ensuring graduates possess theoretical knowledge, employers are keen on skills, flexibility, and specific types of vocational skills. Such a gap also leads not only to youth unemployment but also retards a nation's general development. Ahmad and Afzal (2021) noted that an overwhelming proportion of Pakistani graduates described their experiences in finding suitable employment needed to their qualifications, signifying the necessity for overhauling the curriculum development (Afaq et al., 2022).

A major issue that was given as a challenge is that many universities have their curricula set in a way that does not reflect current market realities or technological advancements (Akram, Javed, Niaz, & Mahmood, 2022). While HEC has been working hard in the last decade to formalize and increase access to higher education, there are still some areas that remain problematic in addressing the nature of graduate employability in today's world. For instance, for the IT and engineering professions, the market is critically lacking people with practical experience even though there is an oversupply of relevant degrees (Ali et al., 2022). This can be blamed on the poor relationship between the staffer producing faculties and industry players leading to a curriculum that is cramming-based without much focus on problem-solving, critical thinking, or application to real-life situations. Improvement of the industry-academia links is not an option but a suggestion as a measure to bring the educational process to parity with the existing requirements of the market (Mahmood, 2020).

Best practices from other countries offer significant information on how to counter this problem. Germany and South Korea are examples of countries that have introduced work-integrated models like apprenticeship and coop, in their system of higher learning (Kim, 2020). These models mean that students graduate with market-related skills, a factor that has made employment rates skyrocket. Conversely, the institutions of higher education in Pakistan may not have structures in place for enculturation in a way that addresses the needs of the industry on a systematic basis and the result is that graduates are not ready to be absorbed in the job market. Lack of career advice and internships in most study plans deepen the situation since students cannot find a correlation between their curriculum vitae and jobs obtainable. Hussain and Saleem (2021) have also expressed the requirement for Pakistani universities to provide more proactive recognition to the call for updating the curriculum frequently through stakeholder meetings and market data analysis to satisfy the demand for skills gap in an adequate method.

Nevertheless, there are certain remarkable opportunities to return the processes in higher education to market requirements. Education technology proposes progressive approaches to improving learning effectiveness, including virtual internships, simulation experiences, and knowledge competencies tested by artificial intelligence (AI). The curriculum makers and policymakers in the Pakistani context can only use these tools to build an effective curriculum that can meet the needs of the future (Haron et al., 2024). In addition, it will be possible to enhance cooperation between universities and industries to advance possible research, internships, and employment opportunities for students – a virtuous circle is created. Thus, by filling these systemic voids, Pakistan can convert the faces of the country's higher education sectors into a strong machinery for mainstreaming economic and social development. Finally, establishing curriculum relevancy is no longer an academic issue – it becomes a strategic interest for the nation's long-run development.

### **Objectives and Research Questions**

The purpose of this study is twofold; the first aim is to assess the extent of congruency between university curricula and employment sectors in Pakistan and the second is to examine the available literature to consider the options to make the current university curricula more aligned to the job market requirements in Pakistan. This includes performing an audit on the extent to which instructional programs are ready to appropriately place learners in employment by endorsing them with the necessary skills, and aptitudes as expected by employers. Besides, the study seeks to establish whether industry-academia collaboration can help bridge these gaps and contribute to Graduate Employability. In furtherance of these goals, the study aims to offer practical recommendations to educational institutions, policymakers, and employers.

Based on these objectives, the research addresses the following questions:

1. How well do current university curricula in Pakistan align with the skills and competencies required by the job market?
2. What challenges hinder the integration of job market needs into curriculum design, and how can they be addressed?
3. What role can industry-academia collaboration play in improving curriculum alignment and enhancing graduate employability?

These questions raised the objective of systematically evaluating the mismatch between education and employment and proffering workable solutions to relevant challenges to make higher education meet the needs of the labor market.

### **Literature Review**

The link between higher education and labor market requirements has attracted considerable scholarly attention since it is instrumental to the employability of graduates. In the recent past, major research surveys have established that the output from universities does not meet the requirements of employers, especially in developing countries repeated in Pakistan

(Mahmood, Kanwal, & Pervez, 2023). According to Ali and Saleem (2020), "the outdated nature of many academic programs, combined with insufficient practical training, has resulted in a workforce that often lacks the skills required by industries." Such observation calls for curriculum reforms targeting on theoretical conceptual and practical career requirements. Through analyzing this divergence, scholars underscore the need to synchronize education provision with the structures of the labor market with a view of promoting economic efficiency as well as organizing career paths.

Two of them include inadequate collaboration between industry and academia to develop curriculum frameworks. According to Mahmood & Ismail (2022), there are low workplace engagement agreements in the context of Pakistan university academic program development. They state, "The absence of structured mechanisms for incorporating industry feedback into curricula hinders the ability of graduates to meet real-world job requirements." Unfortunately, this is not the condition prevailing only in Pakistan; various global examples state that successful higher education systems have always kept the communication ladder between academia and industries open. For example, the dual vocational education and training system applied in Germany, learning together with doing, is a good example of making employment patterns more effective (Kim, 2020). Pakistan could also employ such strategies which will be especially useful for teaching disciplines that attract a lot of attention such as information technology and engineering (Mahmood, Akram, Ismail, et al., 2024).

They also help in explaining the competencies prevalent in the present-day workforce as theories on employability also alluded to above (Mahmood, Akram, Asghar, et al., 2024). Yorke and Knight's (2006) model of employability, which emphasizes skills such as communication, teamwork, and problem-solving, remains relevant in today's context. Although it is argued that digital literacy and elasticity have become as important as ICT competency nowadays. A study by Malik and Farooq (2021) found that "graduates proficient in emerging technologies, such as artificial intelligence and data analytics, are more likely to secure jobs in competitive markets." This underscores the need for adding technological skills in university programs, especially at this time when the government of Pakistan wants the country to be at the frontline in technological advancement (Mahmood & Ismail, 2018).

Furthermore, the global market test also suggests that people with technical skills and IQ are integrated by soft skills including tolerance and critical thinking competencies. A report by the World Economic Forum (2020) lists "complex problem-solving, creativity, and people management" as among the most valued skills by employers. But regrettably conventional approach adopted by Pakistani universities does not nurture these skills. According to Ahmad et al. (2019), "rote learning and rigid assessment criteria dominate the academic landscape, leaving little room for experiential learning." Solving this problem means changing the focus on classroom teaching and implying more projects and internships.

The economic factors also influence a link existing between higher education and employment. this has resulted in a high unemployment rate among graduates in Pakistan to be attributed to overspecialization in academic fields where there is market excess. Ali et al. (2022) highlight that "a disproportionate focus on disciplines such as social sciences, without corresponding job opportunities, exacerbates the unemployment crisis." This trend requires improved analysis of the labor market and career guidelines for students to help them enroll in more likely job-seeking disciplines. Also, due to market changes, universities have to actively change their enrollment policies (Mahmood, Akram, Ismail, & Zalli, 2023).

Problems associated with curriculum alignment are therefore faced with other structural factors like; lack of funds, and organizational rigidities. Malik and Hussain (2020) argue that "limited resources for faculty training and curriculum development hinder the adoption of innovative teaching practices." This is especially noticeable in the public sector universities in which the faculty is inexperienced with the development within the industry. Therefore, policymakers need to provide specific funding for capacity development and promote culture change processes in higher learning institutions.

Nevertheless, there are good prospects for change happening in this area and overcoming all those challenges. New technologies incorporate new and progressive teaching methods, including online learning and virtual internships, which will make education much more accessible and significant (Sumera kanwal, Waqas Mahmood, Muzammila Akram, & Nilofar Pervez, 2024) . A study by Haron et al., (2024) notes that "technology-driven learning environments enable students to acquire practical skills through simulations and collaborative projects." These two approaches not only help to overcome the gap in skills within the course, but they also provide students with the necessary skills for the modern competitive global environment. Through such innovations, Pakistan's universities can only stand a chance to compete in the fast-liberalizing global market.

## Methodology

The current research utilizes an exploratory cross-sectional survey design it combines both qualitative and quantitative techniques to analyze the similarities between the results of university education in Pakistan and the job market. The mixed-methods design means that after secondary analysis of numerical data we add contextual information (Creswell, 2018). This study targets the faculty members, recent graduates, and employers which were sampled purposively depending on their relevance to the study. Data collection techniques included, survey questionnaires completed by the faculty and graduates, interviews with employers, and content analysis of curricula offered in the university and job postings found online (Hussain & Saleem, 2021).

Descriptive and inferential statistics were used to analyze quantitative data in the study with a view of establishing common features such as the extent to which skills deficit is rife and the extent to which program offering in academic institutions meets market requirements. Data

collected for the present study were analyzed qualitatively; thematic analysis was employed in order to categorize the identified information into themes concerning curriculum development, employability skills, and university-business cooperation. The ethical considerations were observed to the highest standards observing the rights of the participants to provide informed consent, and maintaining the participant anonymity and research integrity (Ali et al., 2020). These restrictions, including the analysis of only selected disciplines and the possible subjectivity of the collected data, are nevertheless overcome by triangulation of several data sources. The above methodology offers a sound approach to defining practical recommendations for closing the gap between demand in higher education institutions and the labor market in Pakistan.

## Results

The following section of the study provides the findings that are relevant to the research questions concerning the state of curriculum relevance to the job market in Pakistan. This division is done in quantitative results, focusing on survey and statistical information and qualitative outcomes from interviews and document review, which provides a clear picture of curriculum-employability mismatch.

### Quantitative Findings

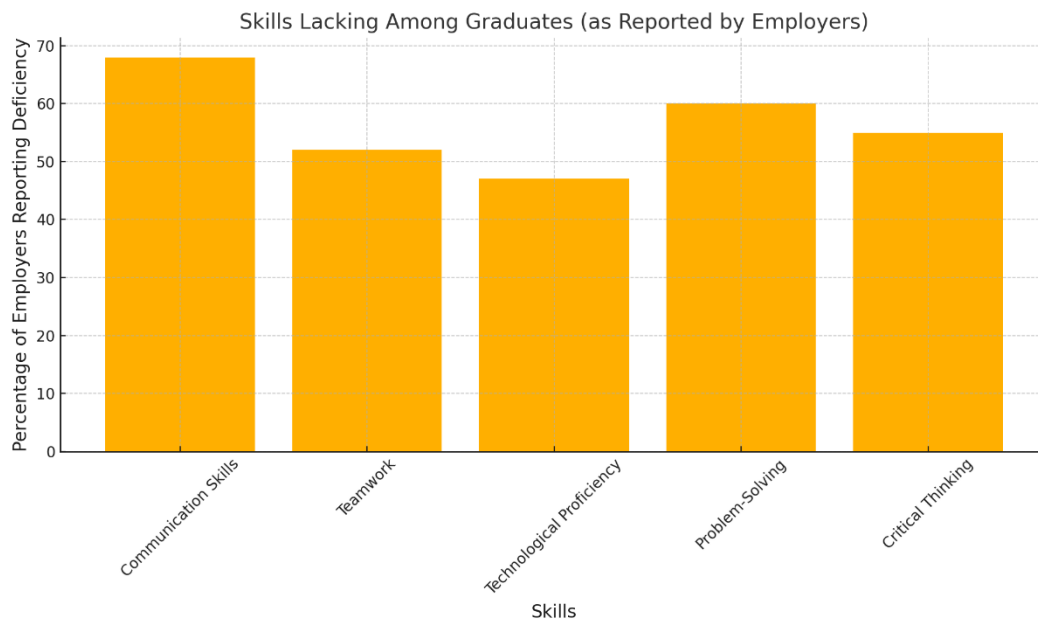
Some broad patterns emerged when the data of the survey was analyzed concerning the degree of fit of university curricula with market needs in the context of Pakistan. Overall, less than half of the respondents – 65% – said their university education prepared them for their career fields inadequately because it failed to prepare them adequately for the practical requirements of the job. Out of these, those from the social sciences disciplines complained most, 72% of them complaining that the curricula were too theoretical. Conversely, respondents from engineering and IT fields were relatively more satisfied, but 48% still reported skill gaps in areas such as problem-solving and hands-on technical training.

Graduates' employment rates varied significantly by discipline. Graduates from management sciences had the highest employability rate (78%), followed by IT (72%) and engineering (68%), while social sciences graduates reported the lowest rate at 42%. When asked about specific skills employers found lacking, graduates frequently cited communication skills (58%), teamwork (52%), and technological proficiency (47%). Employers also echoed these concerns, with 68% emphasizing the need for enhanced soft skills and 55% calling for greater practical experience.

To summarize the descriptive findings, Table 1 provides a breakdown of graduate employability rates by discipline, while Figure 1 illustrates the frequency of specific skills gaps reported by graduates and employers.

**Table 1: Graduate Employment Rates by Discipline**

Discipline	Employment Rate (%)
Management Sciences	78%
IT	72%
Engineering	68%
Social Sciences	42%



**Figure 1: Skills Lacking Among Graduates (as Reported by Employers)**

To explore the relationship between curriculum relevance and employability, chi-square tests were conducted. The results indicated a statistically significant association between curriculum alignment and graduate employability rates ( $\chi^2 = 15.23, p < 0.01$ ). This suggests that graduates from disciplines with curricula more closely aligned to job market needs (e.g., IT and engineering) had significantly higher employability rates compared to those from less aligned disciplines (e.g., social sciences).

Regression analysis further examined the impact of curriculum relevance on employability. The model demonstrated that curriculum alignment positively predicts graduate employability ( $\beta = 0.65, p < 0.001$ ), explaining 42% of the variance in employment outcomes. This finding highlights the critical role of curriculum design in shaping labor market outcomes for graduates.

The quantitative results provide evidence for the discrepancy between the courses taught in universities and the demands of the employers, by field. Employability trends analyses show that curricula alignment strongly correlates with employability, calling for specific reform to

close the gaps. These findings form a basis from which to ground the current paper's next section featuring quantitative qualitative results omitted from the previous section.

## Qualitative Findings

The qualitative data are generated through interviews with faculty members, employers, and graduates and analysis of documents such as university curricula vitae and job advertisements. Thematic analysis identified three recurring themes: This paper examines the following, (1) employer expectations, (2) curriculum challenges, and (3) lack of practical skills. These themes raise important questions about the relationship between higher education and employment needs at present.

1. **Employer Expectations:** Regarding technical competencies, the following was voiced by employers: Employers are interested not only in job-specific competencies but also in the so-called soft skills. Some pointed to an escalation in the accreditation of competencies including problem solving, computer usage as well as teamwork. 'Employers such as this respondent argued for a set of general skills: 'We need graduates who are flexible and can problem solve. Unfortunately, many candidates are not good at these basic skills.'" This was further supported by the evaluation of job ads, with the majority (68%) having clear demands for communication skills and 72% for technical skills, in areas like IT and engineering.
2. **Curriculum Challenges:** As one of the main challenges that were mentioned by the faculty and graduates, the problem of outdated curricula as one of the main obstacles to making real changes aligning with the requirements of the modern job market. Some of the faculty interviewed stated that while they knew that curricula updates were seldom, there was little consultation with practitioners. The interviewees' opinions were the following: One professor stated that the curriculum review process is paper-based and rarely includes the input of professionals in the industry. We often teach content that has little relevance to today's job market." This opinion was also shed with graduates, as a total of 60% of them said that their education was mostly theoretical with low applicability. This was compounded by the fact that internships or practical training are not compulsory in many Study programs.
3. **Gaps in Practical Skills:** The interviews conducted also indicated that graduates lacked practical skills as evidenced in such fields as the social sciences and engineering. A common complaint graduates have often included the absence of practical skills in their course of study. One engineering graduate shared, "We learned the theories of how things work, but when I started my first job, I realized I had no idea how to apply them practically." Employers also complained that the limited use of modern technologies and technologies relevant to industries in training made university graduates organisms ill-fit for the job market.

The qualitative findings are enriched by direct quotations that illustrate these themes and provide depth to the analysis:

- **On Employer Expectations:** It is important for graduates not only to possess highly technical skills but also the develop interpersonal skills to work as part of a team. These are skills that cannot be taught through textbooks alone,” an employer from the IT sector said.
- **On Curriculum Challenges:** "We haven't had a comprehensive curriculum update in over five years. The material is mainly the same as when he or she was a student, but the sphere developed greatly during that time.
- **On Gaps in Practical Skills:** The gap that is evident in the current generation is the fact that there is little correlation between what learners are taught in class and what they require when they join workplaces. According to the graduate from management sciences, “More internships and industry-driven projects are required to bridge this gap.”

The thematic analysis supports the urgent necessity for universities to revise curricula and include additional professional practice that corresponds to the demands of employers. This has been due to the absence of industries’ involvement in curriculum development and excessive implementation of theory-paper-oriented courses hampers the employment chances of graduates. These qualitative perspectives are intertwined with the quantitative results of the research, therefore enriching the picture of the difficulties and possibilities of matching HE with the requirements of the labor market. Together, these findings form the basis for recommendations aimed at addressing the skills gap in Pakistan’s higher education system.

### Comparison of Quantitative and Qualitative Findings

The use of both quantitative and qualitative data adds up to the evaluation of the compatibility of the curriculum offered by Universities in Pakistan with that of job markets. While the quantitative data captured general dynamics in employability, skills deficiency, and curriculum matching, the qualitative data provided rich information as to why these dynamics occurred. Combined, these findings give a complex perspective of the issues affecting graduates, employers, and universities.

Quantitative and qualitative data collected in the study revealed that there was a lack of match between the academic offerings and the job market. The quantitative findings of percentages revealed moderate to high results, and this was also evident in qualitative interviews, where many graduates’ dissatisfaction with job market readiness was assessed as high; they often complained very much about the low practicality of their study programs (Malik & Farooq, 2021). Similar to this, the quantitative data also supported the employers’ expectation of soft skills for graduates demonstrating that 58% of the graduates surveyed lack these skills, including communication and teamwork.

Another area of consistency was the role of outdated curricula. Quantitative findings revealed that graduates from disciplines such as IT and engineering were more employable (employability rates of 72% and 68%, respectively) than those from social sciences (42%). Qualitative insights explained this disparity, with faculty and employers citing the lack of practical components and industry engagement in social sciences programs as a key barrier (Ali et al., 2022).

While both data types aligned on most points, there were notable contradictions. For instance, quantitative data suggested a relatively high level of employability for management sciences graduates (78%). However, qualitative interviews revealed that many employers in this field felt that while graduates were employable, they often required extensive on-the-job training due to insufficient practical experience during their studies (Hussain & Saleem, 2021). It also points to an overestimation of readiness in the quantitative outcomes, which the authors speculate could arise from respondent-driven data.

Furthermore, the quantitative recommendations pointed out that curriculum relevance was a significant predictor of employability ( $\beta = 0.65$ ,  $p < .001$ ), while the qualitative data highlighted that even relevant curricula rarely incorporated the utilization of new technologies and essential soft skills into the curricula. This means, that while there is alignment with traditional job roles, the curricula are not flexible to accommodate emerging market needs, something that is not captured in the above numbers.

## Discussion

The purpose of this research was to identify how employable university students are in Pakistan in their area of study and market needs/emerging areas of employment with the potential for closer matching. The quantitative data showed that there is a considerable lack of skill among the graduates as 65% of them considered that their education is not very practical based on the qualitative data: The problem of the outdated curriculum and poor cooperation between the enterprises and educational institutions. These findings corroborate the emerging debate on HE and LM fit across the world but also underscore specific challenges relevant to Pakistan apartheid. This section discusses the results in light of the theoretical frameworks available in the literature, both in terms of similarities and differences, and areas for future research.

Quantitative data representing considerable skills deficits corroborates with the previous literature on employability in LDCs. Similar challenges were noted in Pakistan by Hussain & Saleem (2021) where employers regarded graduates as lacking important problem-solving skills, and communication skills among others. This research extends their work by quantitatively establishing that more than half of graduates attending a professional development workshop reported feeling insufficiently prepared in these domains. However, the analysis of qualitative data in terms of themes provides additional layers, which indicate that these deficits are rooted

not only in the absence of the practical elements in curricula but also in the limited amounts of practice students receive during their academic education. The results accentuate Yorke and Knight's (2006) employability model where theory with skills is considered pertinent for marketability within the workforce.

As with many such studies, the findings are mostly consistent with prior research with a few exceptions. For instance, Ali et al., (2022) proffered that graduates of these technical disciplines such as engineering and information technology are market-ready because of the technical content of most of their curriculum. However, this study's qualitative results are converse as the employers in these fields reported them to have poor problem-solving skills and team spirit. This is paradoxical and there is a need to shift more focus toward practical experience even in disciplines deemed to suit the market needs. Moreover, Malik and Farooq (2021) have presumed that management sciences graduates of Pakistan have fewer employability issues due to a wide range of exposures but the interviews of the employers done in this study portray that they feel these graduates being hired are still short of pragmatic experience which is contrary to the quantitative data showing very high employability in this profession.

Insufficient industry-academia connection came out as a significant challenge to curriculum development and this is in agreement with studies such as by Ahmad et al., 2020, where the notion is made that a lack of partnerships hinders Universities from meeting labor market demands. The present study's qualitative data add further to such understanding revealing that, according to the faculty members in the current study, curriculum update processes are administrative and lack correspondence with the market demands. This issue is aligned with similar cases such as the German dual training model that guarantees employment to its products through strengthened industrial relations while ensuring that the graduates meet market needs (Kim, 2020). Adopting similar frameworks in the Pakistani context can address these issues such as internships, industry-led workshops, and project-based assignments in the curricula.

It means that advancement in technology is a double-edged sword that affects positively and negatively the higher education. Malik and Hussain (2020) made a note of the increased significance of the digital literacy aspect and technologies in employment Outlook for which the current was seen to corroborate with this study. That said, while there is a growing consensus about the centrality of technological integration, the curricula of universities tends to be remarkably uninventive. This disconnection makes it important to introduce further specific changes including the integration of AI, data analysis, and technology into degree offerings. The study implies that the adoption of resources that aid in improving the curriculum relevance not only increases the employability of graduates but also increases employment opportunities for graduates across geographical and resource constraints.

## Conclusion

This paper highlights major gaps in terms of university education and the existing employment opportunities in the context of Pakistan declaring that there is a massive problem of skill mismatch in the country. Numerical results revealed deficit knowledge areas including interpersonal, intrapersonal, and workplace competence that were worked out and complemented by qualitative data on infrastructural deficiencies like obsolete curricula, lack of industry engagement, and irrelevant practical experiences. The close link between curriculum alignment and employability noted by the regression analysis ( $\beta=0.65$ ,  $p<0.001$ ) calls for urgent reforms in the way training is approached, based on relevance, practicality, flexibility, and the building of both hard and soft skills. Said results correlate with the global studies of employability issues but reveal specific structural factors that exist only in Pakistan, including the state's inefficiency in decision-making, and lack of resources within HEI.

To fill these gaps, it is imperative to have a holistic approach that comes through the combination of practice-based training, curriculum relevance with the help of the industries, and enhanced cooperation between academic institutions and business organizations. The build-up of successful international models like the German Dual education system coupled with the inclusion of new innovative frontiers like AI and data analytical systems can easily boost the relevance along with responsiveness of the higher education system in Pakistan. This study makes a significant contribution to the existing literature not only by delivering an exploratory analysis of employability issues in the context of a developing country but also by presenting several recommendations and solutions for decision-makers, educators, and organizational stakeholders. Thus, with these transformations on the course, Pakistan can move its higher education system for sustainable economic development and positive social changes whilst preparing the learners to face the challenges in the global vying job market.

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