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PRC BUIITEMS

December 2025

Executive Summary

Balochistan, a Pakistani province with an estimated population of 10.5 million, is marked by high unemployment, education-job mismatches, and limited private sector jobs. Despite having a significant youth potential, the province faces systemic misalignment between human capital development and labour market needs. This study investigates the persistent challenge of educational and vocational skills mismatch in the province. To address this gap, the study pursues the following objectives that are interlinked

- (i) To quantify the extent of educational mismatch and its association with unemployment using nationally representative Labour Force Survey (LFS) data;
- (ii) To assess vocational (skills) mismatch through primary survey data among those who have obtained Technical Education and Vocational Training of different duration across different field; and
- (iii) To explore primary contributing factors towards the present skill/educational mismatch in the labour market via qualitative analysis of open-ended responses.

These objectives respond directly to the research questions concerning the scale of mismatch, its labour market effects, and systemic barriers to effective education–employment alignment.

To quantify the relationship between educational mismatch and unemployment, the study employs the Realized Match Approach (RMA) with LFS microdata ($n \approx 15,918$). Education–occupation mismatch was classified into over-education, under-education, and matched categories, and logistic regression was applied to estimate their effects on unemployment. Similarly, to address the problem of skill mismatch among vocational trainees, a primary survey of Technical Education & Vocational Training Authority (TEVTA) alumni was conducted, using direct self-assessment to capture perceived skills-job match and skill utilization. Logistic regression tested the relationship between mismatch categories and job attainment after training. Finally thematic and narrative analysis was employed to explore the factors that may contribute towards the education/skills mismatch and its related labour market outcome by utilizing the participants' lived experiences and systemic challenges.

The results of Educational Mismatch and Unemployment analysis show that 34.7% of workers were over-educated, 17% under-educated, and 48.3% were well-matched. Over-educated dominates among the youth (47.8% of 15 to 24-year-old) and women (42.6% vs 19.4% for men). Logistic regression confirms that over-educated individuals face significantly higher odds of unemployment ($p < 0.001$). Ordered logistic regression also reveals that over-education prolongs unemployment duration, indicating not only wasted human capital but also lengthier job searches. Conversely, vocational/technical training reduces unemployment risk (3.2% vs 6.5% without training).

The results obtained for the analysis of Vocational Skills Mismatch show that 27% of vocational trainees were over-skilled, while 14% identified themselves as under-skilled. Logistic regression demonstrates that being over-skilled reduces the likelihood of post-training employment by over 80%. Results also showed that women were more likely to be under-skilled, while men more often reported skill underutilization. Part-time workers faced disproportionate mismatch, especially under-skilling (28%). These results highlight several issues, including inefficiencies in training design, weak job linkages, and gender disparities.

Finally, the narrative analysis based on the open-ended responses from the survey participants revealed systemic barriers, outdated curricula, lack of industry participation, inadequate career guidance, limited practical training, and gender-specific mobility constraints. Respondents also pointed out regional disparities along with opportunities clustered in urban centres like Quetta while peripheral districts remain underserved. Many

emphasized that training often builds “credentials” rather than employable skills, reinforcing mismatch rather than reducing it.

1. INTRODUCTION

Balochistan, Pakistan’s largest province by area with a population of about 10.5 million, is less developed as compared to other provinces. The education and employment sectors in the province are face with persistent and systemic challenges, especially in aligning human capital with labour market needs. According to the 2023 Census, the population of Balochistan grew from 12.3 million in 2017 to about 14.9 million in 2023 (Pakistan Bureau of Statistics, 2023). At present, about 60 per cent of the population falls under the age of 30, which is both a challenge and an opportunity at the same time. The youth is always a source of economic growth if given the opportunities. However, if their potential is not utilized effectively and timely, it can lead to increased unemployment, poverty as well as social unrest. The ratio of higher unemployment and underemployment in Balochistan, as shown in Labour Force Survey (2021), is well above the national average, due to which the youth and women are affected disproportionately. Currently, the unemployment and literacy rates in Balochistan are 9.13 per cent and 42.01 per cent respectively, which is lowest in the country. Only 38.6 per cent of the people are part of the labour force, thus the issue of higher unemployment and underemployment is one of the pressing one.

According to a survey conducted by Pakistan Bureau of Statistics in collaboration with International Labour Organization (ILO), the youth labour force participation rate in Balochistan is around 40.4 per cent (Pakistan Labour Force Survey), which is again the lowest among all provinces. One of the growing concerns for the youth is the Not in Education, Employment, or Training (NEET) rate that is staggering at 41.8%. A significant proportion of the youth is not involved in education, employment, or skill development initiatives. District-level comparison shows the situation is exacerbated in districts like Sherani, where the NEET rate is 67.6%, followed by Lasbela at 55.5% and Killa Abdullah at 54.9%. High levels of unemployment have been observed in these areas, notably Sherani (22.1%), Gwadar (22%), Dera Bugti (21.8%), Awaran (20.9%), and Washuk (20.2%). Some districts show significantly lower unemployment and NEET rates, attributable to enhanced access to education and skills training. Chaghi exhibits the lowest unemployment rate at 0.4%, followed by Nushki at 1.3% and Pishin at 1.7%. The NEET rates in these areas are comparatively lower, with Chaghi at 15.8%, Nushki at 12.2%, and Pishin at 10.6%. This indicates that regions with greater access to vocational training and employment opportunities demonstrate a better capacity to integrate young individuals into productive roles, whereas regions deficient in these resources experience elevated rates of NEET and unemployment.

The data on skills development in Balochistan shows that despite the efforts by national and provincial governments to expand education and vocational training, considerable challenges and regional inequalities persist. The province has lowest TVET enrolments as compared to other provinces (National vocational & Technical Training commission, 2022). Coupled with lack of strong industrial sector, this further leads to scarcity of opportunities for the youth to gain essential practical skills necessary for workforce entry (Najam & Bari, 2017; Bashir et al. 2024).

1.1 Problem Statement

A significant disconnect exists between the skills taught and the labour market demand in the province. Despite the expansion of technical and vocational education and training (TVET) under institutions such as B-TEVTA, evidence suggests that training programs often fail to translate into stable employment or improved earnings (Ahmed, Abbas & Afzal, 2023). This mismatch in education and skills has become a key factor in rising unemployment, especially among the educated youth.

Achakzai (2023) reported that around 67% of job-seeking youths cited inadequate technical/vocational skills as a primary reason for the lack of job opportunities. At the same time, TVET graduates continue to face low employability and earnings, which reflects a disconnect between training content and actual labour-market requirements (Altaf & Shabir, 2024; World Bank, 2023). Gender disparities further complicate outcomes with women facing mobility, security, and access issues to TVET institutes (Khan & Ali, 2024). This context suggests that mismatches in Balochistan are not only because of individual capability gaps but also due to outdated curricula, weak employer engagement, and lack of proper policy implementation (Ahmed et al. 2023).

This study aims to discuss that the youth in Balochistan, even after completing formal education or vocational training, remain mismatched in the labour market, which might lead to high unemployment, underemployment, lower incomes, and loss of human capital potential. It further provides a systemic analysis on the relationship between educational and vocational dimensions of job market, without which the policy responses remain fragmented and ineffective.

Several international studies argued that education and skills mismatch can lead to more unemployment and lower job satisfaction (Quintini, 2011; McGuinness, 2006). Nevertheless, in Pakistan, little research exists at the provincial level and Balochistan has not been studied much with this angle.

This study examines the impact of educational and skills mismatches on unemployment in Balochistan. To address this problem, it works on various paths. First, it uses data from the Labour Force Survey of Pakistan to identify the current state of job-education mismatch and whether it has any significant effect on labour market outcomes, such as unemployment. For this purpose, this study has utilized globally recognized methods to measure mismatch, such as Realized Match and Statistical methods. The study will create new mismatch variables like Over-education, Required-education, and Under-education. It will then test how these relate to unemployment.

Second, this study investigates the existence of a skill mismatch and its potential impact on unemployment. Owing to lack of relevant information in the nationally representative LFS for Pakistan, this study obtains primary data through a self-administered survey and a subjective method, based on the respondents' self-reported assessment of the match between their skills and the job's required tasks.

Third, the study also presents qualitative analysis to highlight the perspective of the participants about their challenges and opportunities in the labour market.

1.2 Objectives

The study employs a mixed method approach to quantify the prevalence of educational and vocational mismatch in Balochistan, utilizing microdata from the Labour Force Survey (LFS). It further evaluates the vocational skills' mismatch among trainees of Balochistan Technical Education and Vocational Training Authority (B-TEVTA) using a structured self-assessment approach. This study not only examines the factors that contribute to the persistence of mismatches through qualitative narrative analysis but also provides evidence-based recommendations for aligning technical and vocational education and training (TVET) with labour-market needs in the light of international best practices.

1.3 Research Questions

1. What is the extent of educational mismatch in Balochistan, and how is it related to unemployment rates?
2. To what degree do vocational trainees experience skill mismatch, and how do these mismatches influence their labour market outcomes.
3. What institutional and socio-economic factors contribute to persistent mismatch in the province's labour market?
4. How can TVET and educational systems in Balochistan be further improved to reduce prevailing mismatch and enhance employability?

The study is meant to assist individuals, who formulate policy, training organizations like B-TEVTA, and educational institutions. By turning actual data into practical guidance, it helps these groups bridge the gap between training and employment and provide young people with better job opportunities. The study not only points out policy implications, but also adds to the body of information on the links between education and job market. It also gives clear, region-specific suggestions for creating jobs and promoting balanced growth in Balochistan, which is the most deprived region of Pakistan.

2. LITERATURE REVIEW

This section presents a detailed overview of existing literature in the areas of education and skills mismatch.

2.1 Educational and Skills Mismatch

The concept of educational mismatch received substantial attention in labour economics, particularly in examining the discrepancies between individuals' educational attainment and the education levels required for the jobs. It was typically categorized into three forms: over-education (when individuals possessed higher education than required), under-education (when their education was less than required), and required education (when there was an exact match). These categorizations served as a foundation for analysing labour market inefficiencies and individual employment outcomes (Verdugo & Verdugo 1989; Hartog 2000).

2.2 Mismatch and Labour Market Outcomes

Educational and skills mismatches refer to a situation where workers' education or skills do not align with job requirements. The educational/skills mismatch has drawn significant attention from policymakers due to its impact on both individual careers and overall economic performance (Burke et al., 2020; Draissi, Rong, & Suliman, 2023). In many countries, both over-education (having more qualifications than a job requires) and under-education (lacking the qualifications a job demands) are widespread problems. Recent studies highlight significant concerns about over-educated and under-educated workers in Morocco and Georgia (Draissi et al. 2023; Badurashvili, 2019).

A key cause of these mismatches is that education systems often respond too slowly to changing labour market needs. By the time new graduates enter the workforce, their skills may not fit market demand, leaving many struggling to find relevant employment opportunities (Lopes et al., 2023). Reform efforts have, therefore, emphasised more responsive vocational education and training, including curricula shaped by employer input and greater use of internships and workplace-based learning to impart practical skills (Lopes et al., 2023). Despite such efforts, a clear gap remains between the high-tech skill requirements of modern industries and the qualifications of much of the existing workforce, indicating that education–labour market alignment is still lacking.

A large body of literature documents the negative consequences of skills mismatch. When education exceeds their job requirements, it often leads to underemployment and job dissatisfaction. For instance, one study found that mismatches arise when workers' schooling levels do not meet job needs, frequently resulting in frustration and lower job contentment (McGuinness, 2006). Over-educated employees also tend to have fewer stable careers and earn lower wages, especially in labour markets that are rigid or inflexible in adjusting job structures (Quintini, 2011). In an OECD cross-country analysis, Aroob and Shah (2019) reported that overqualified workers face a higher risk of unemployment compared to peers whose education matches their jobs. Likewise, Montt (2015) observed that skill mismatch can drag down productivity and increase the likelihood of job loss during economic downturns, as mismatched workers are often the first to be let go. These findings reinforce a common theme: mismatches make workers more vulnerable in the labour market.

Research across different economies further confirms how mismatches impair job quality and efficiency. Kucel and Vilalta-Bufí (2013) argue that educational mismatches create significant inefficiencies in the labour market, particularly in countries with weak career guidance systems that fail to channel graduates into appropriate fields. A comprehensive review by Groot et al., (2000) found that over-education is associated with lower wages and a higher probability of employees switching jobs. This implies that when workers cannot fully utilize their qualifications, they may seek new positions more frequently in search of better fit. Specific country studies mirror these patterns: in Spain, for example, over-qualified workers reported greater job dissatisfaction and were more likely to change occupations (Budra & Moro-Egido, 2008). In the UK, Clark and Oswald (1996) similarly found that employees in jobs below their education level had significantly lower job satisfaction than well-matched workers. Such

outcomes are not only detrimental to individual well-being but also signal a waste of skills in the economy.

Notably, the adverse effects of skills mismatch can be even more pronounced in developing economies. In countries with smaller formal job markets and limited high-skill industries, educated workers often cannot find roles that match their qualifications. For instance, studies on Pakistan's labour market revealed that the supply of graduates far exceeds the economy's capacity to absorb them (Nasir, 2005; Aslam et al., 2011). The result is a large cohort of young degree-holders who end up either unemployed or working in jobs well below their education level. Farooq (2009) confirms that over-education is prevalent in urban Pakistan – a considerable number of university graduates were found employed in clerical and sales positions that typically require much less schooling. This scenario leads to widespread underemployment and talent waste. In fact, international data indicate that in many low- and middle-income countries, between roughly 20% and 60% of workers are in jobs that do not match their education. Such high rates of mismatch in developing regions contribute to brain drain, where skilled individuals either leave or disengage, further hampering economic development.

Given these challenges, it is no surprise that policymakers and researchers have become highly concerned about skills mismatch in recent decades. Multiple comparative studies have investigated the scale and variation of mismatches across regions and industries. For example, Guo et al. (2022) find that certain southern and eastern European countries – including Greece, Italy, Spain, and Poland – suffer particularly high skill shortages, meaning employers struggle to find workers with the right qualifications. In contrast, many wealthier northern European regions face fewer shortages and sometimes even surpluses of skilled labour. Such imbalances have important economic implications. When employers cannot fill specialised jobs due to skill shortages, productivity suffers; conversely, when workers are overqualified for available jobs, the excess education does not translate into higher productivity. Esposito and Scicchitano (2022) note that persistent mismatches, whether shortages or surpluses, tend to depress wages, increase underemployment, and lower overall productivity. Over time, these distortions can act as a drag on economic growth by preventing the workforce's full potential from being realized. The concern is that if a large segment of workers is stuck in jobs below their capacity (or if jobs stay vacant for lack of qualified applicants), the economy operates below its optimal output.

One particularly well-documented outcome of education-job mismatch is the wage penalty faced by over-educated or over-skilled workers. Traditional human capital theory would suggest that more education leads to higher earnings, but the reality of mismatch challenges this assumption. Empirical evidence shows that workers who hold qualifications beyond what their job requires often earn significantly less than peers with similar education in roles that fully utilize their credentials. In other words, a college graduate in a low-skilled job may be paid less (and feel less satisfied) than someone with the same degree in a graduate-level position. Recent research quantifying this effect across Europe found a clear earnings penalty for over-educated employees, and it was especially severe for individuals who were both over-educated *and* under-utilising their skills on the job. This combination of surplus education and underused ability had the most detrimental impact on wages. Such findings underscore how critical proper matching is: excess schooling alone doesn't guarantee better pay or productivity if the job doesn't require it. Moreover, mismatched workers' lower job satisfaction (as noted earlier) can further reduce their motivation and performance. Ultimately, the prevalence of over- and under-education in the workforce poses a dual challenge – it undermines expected returns to education for individuals and wastes human capital from the perspective of society. The growing literature consistently indicates that skill and educational mismatches in the labour market are a serious concern with multifaceted repercussions, from Europe's advanced economies to developing countries like Pakistan. Studies have shown that when workers' education and skills are out of sync with their jobs, the consequences include higher unemployment risks, lower earnings, reduced job satisfaction, and lost productivity (McGuinness, 2006; Quintini, 2011; Montt, 2015; Clark & Oswald, 1996; Cultrera et al. 2022).

2.3 The Case of Balochistan

In Balochistan, multiple studies declare skill mismatches and educational gaps the major barriers in the way of employment. Ahmed and Gul (2023), found that the technical and vocational education system in Balochistan was outdated, lacked industry linkages, and failed to equip students with market-relevant skills. Their findings emphasized that many programs were offered without assessing the economic needs of the province.

A report released by the National Vocational and Technical Training Commission (2021) stated that the industrial base of the province is weak, labour market coordination is poor, and employer engagement in curriculum development is negligible. These factors contributed to a gap between the graduating youth and available jobs. It also noted that the youth unemployment was highest in districts like Quetta, Gwadar, and Khuzdar despite an improved literacy rate. A UNICEF (2021) report about Balochistan, highlights that the lack of structured career pathways contributed to the mismatch. Students often entered fields without knowing job prospects, which resulted in high rates of dropout or joblessness.

Khan and Ali (2024) find that a majority of unemployed youth has neither job specific skills, nor they have information about employment opportunities. Employers in sectors like construction, transport, and services have repeatedly reported the unavailability of trained workers.

3. METHODOLOGY

3.1. Education-job Mismatch

This section provides data description and details of estimation procedure used to empirically address the first Research Question: What is the incidence of educational mismatch among the workforce in Balochistan, and how is it related to unemployment rates? We use the LFS 2021 microdata for this section.

3.1.1 Data and Sample

The most recent LFS microdata for Balochistan was acquired from the Pakistan Bureau of Statistics. The LFS is a national survey that includes all working-age individuals. The survey sample included data from 15,918 individuals. This dataset contains information regarding employment status, occupation, education, and fundamental demographics across all districts of Balochistan. Key variables were generated or reclassified as outlined below: Unemployment is characterized by the active pursuit of employment (binary outcome for regression), while a dummy variable for technical training indicates whether an individual has undergone formal technical or vocational training, as sourced from the Labour Force Survey in Pakistan. Although details on training type/duration are limited, these dummy captures formal skill acquisition to some extent.

3.1.2 Educational Mismatch Measurement: Realized Match Approach (RMA)

The analysis adopts the Realized Match Approach (RMA) to classify individuals into over-educated, under-educated, or adequately matched categories based on their occupation and educational attainment. The RMA compares an individual's years of schooling with the modal (or mean) years of education of all workers in the same 1-digit ISCO-08 occupational category:

- **Over-educated:** Years of schooling > mode years in occupation.
- **Under-educated:** Years of schooling < mode years in occupation.
- **Matched:** Years of schooling = mode years in occupation.

ISCED-level coding is used to standardize education variable for the analysis, allowing for comparability across respondents.

Following Verdugo & Verdugo, (1989), Modal year is calculated only among employed individuals to determine occupational mismatch according to ORU specification (Under, Required and Over education).

Table 3.1: Mapping of the ISCO major groups to skill levels and ISCED levels of education	
ISCO major groups	ISCED groups
1 = Managers, senior officials and legislators 2 = Professionals 3 = Technicians and associate professionals	6 = Second stage of tertiary education (leading to an advanced research qualification) 5 = First stage of tertiary education, 1st degree (short and medium duration)
4 = Clerks 5 = Services and sales workers 6 = Skilled agricultural and fishery workers 7 = Craft and related trade workers 8 = Plant and machinery operators and assemblers	4 = Post-secondary, non-tertiary education 3 = Upper secondary level of education 2 = Lower secondary level of education
9 = Elementary occupations	1 = Primary education or less

Additionally, we introduce a dummy variable for vocational or technical training (derived from Section 4 of the LFS questionnaire). This binary variable equal 1 for individuals who report receiving any form of formal technical or vocational training, and 0 otherwise. Although we cannot access detailed records from provincial TVET agencies, this dummy enables us to include a basic measure of formal skill acquisition in the model. This combined classification allows us to construct individual-level indicators for educational mismatch and estimate their effects on unemployment.

3.1.3 Econometric Model

To assess the relationship between mismatch and unemployment status (binary dependent variable), a binary logistic regression model is used.

Model Specification:

$$\text{Unemployment}_i = \beta_0 + \beta_1 \text{educational mismatch}_i + \beta_2 X_i + \epsilon_i$$

Where: Unemployment: 1 if unemployed, 0 if employed, educational mismatch: Dummies from RMA classification, X: Vector of control variables (gender, age, education level, urban/rural location, marital status, region, industry) and ϵ : Error term. Marginal effects will be calculated to interpret the impact of mismatch on the probability of being unemployed.

3.2. Vocational Skills Mismatch

This section provides detailed assessment of second research question: To what degree do vocational trainees experience skill mismatch, and how do these mismatches influence their labour market outcomes.

3.2.1 Methodology

3.2.1.1 Data and Sample

Since the LFS lacks exact data on vocational skills and their utilization, the analysis in this chapter relies on primary data. We conducted a survey targeting alumni of Balochistan's Technical Education and Vocational Training Authority (B-TEVTA) programmes. A structured questionnaire was administered and a total of 343 respondents (male and female), who completed vocational training courses in various trades across Balochistan, provided their responses by completing the survey. After data cleaning for completeness and exclusion of those who reported self-employment (43) and unemployed but not looking for job (08), a final sample of n=292 responses is used for final analysis. The survey captured demographic information (age, gender, education), training history (field, year of completion), current employment status (employed full-time, part-time, self-employed, unemployed), and income. Crucially, it included self-assessment items on skill-job match and skill utilization, enabling a subjective skill mismatch measure (Research Question 2).

3.2.2 Measuring Skill Mismatch

We operationalized vocational skills mismatch through direct self-assessment questions. Trainees were asked to evaluate: (a) whether their current job (or job search) matches the skills acquired in training (with responses: "over-skilled", "fully matched", "under skilled") and (b) to what extent they feel their skills are utilized in their current labour market situation (if employed) or generally put to use (if unemployed). For the latter, respondents rated their skill utilization as "Well-utilized", "Partly utilized", or "Underutilized/not utilized". This approach captures subjective mismatch, i.e. the individual's perception of over-skilling or skill under-use. While we relied on subjective method because lack of available details in the LFS, Pakistan, the existing literature has shown that compared to "objective" mismatch (comparing person's skills to job requirements via tests or external criteria) subjective mismatch strongly reflect the outcomes such as job satisfaction, even when objective mismatch measures might not flag (Bischof, 2021, 2024).

3.2.3 Econometric Model

To assess the impact of (vocational) skill mismatch employment outcome a binary logistic regression model is used. For robust estimates we have used the on post-training employment outcomes to determine how the skill mismatch effects the probability of being employed after attaining the vocational training.

Model Specification:

$$\text{PostTrainEmployment}_i = \beta_0 + \beta_1 \text{skill mismatch}_i + \beta_2 X_i + \epsilon_i$$

Where: $\text{PostTrainEmployment}_i = 1$ if participant got a job after completing training, 0 otherwise, vocational skill mismatch (over skilled, under skilled): are dummy variables capturing subjective (vocational) skill mismatch relative to the reference category of well-matched skill, X: Vector of control variables and ϵ : Error term.

3.3 Qualitative Analysis

This section presents the details of qualitative analysis performed to address the third and fourth research questions respectively:

What institutional and socio-economic factors contribute to persistent mismatch in the province's labour market?

How can TVET and educational systems in Balochistan be further improved to reduce prevailing mismatch and enhance employability?

3.3.1 Analytical Approach for Qualitative Analysis

This qualitative analysis employs a thematic analysis framework combined with elements of narrative analysis. The data consist of open-ended survey responses in Urdu, which were first translated to English to facilitate coding. Using the six-phase approach of Braun and Clarke (2006) – from familiarization and initial coding to theme development and refinement – recurring patterns in the text were identified and categorized into themes and subthemes. This reflexive thematic analysis allows us to capture broad patterns across respondents' answers (Braun & Clarke, 2006). At the same time, a narrative lens was applied to understand how individuals construct their personal stories of unemployment or job mismatch. Rather than fragmenting the data entirely into discrete codes, the analysis considered the sequence and combination of reasons each respondent described, preserving aspects of their narrative context (Riessman, 2008).

Coding Process: Initial open coding was conducted on the translated texts to mark salient concepts (e.g. "lack of experience," "few jobs available," "update curriculum"). Many of these codes corresponded to categories anticipated from the literature (e.g. skill deficits, structural job shortages) as well as new nuances (e.g. "regional issues – jobs in other cities"). Codes were then grouped into candidate themes reflecting *why* respondents felt mismatched and *how* they believe employment outcomes could improve. A constant comparison ensured that themes accurately represented the range of responses. To enhance reliability, overlapping codes were discussed and definitions refined (e.g. distinguishing "lack of practical skills" from "lack of soft skills" even though both are individual skill gaps). The final themes were derived inductively from the data but informed by prior research on skill mismatch and the youth employment to ensure coherence and coverage. Throughout, we remained attentive to narrative structures – for instance, whether respondents framed their situation in terms of personal shortcomings or external barriers – to integrate a narrative analysis perspective. This hybrid approach is justified because it captures both the common themes across many participants and the individual storylines that illustrate how different factors interact in a single person's experience (Freeman, 2017; Riessman, 2008). The results are organized by thematic content, with direct quotations (in both original Urdu and English translation) provided as evidence. Pseudonyms or respondent IDs are not used; quotes are presented to exemplify each theme.

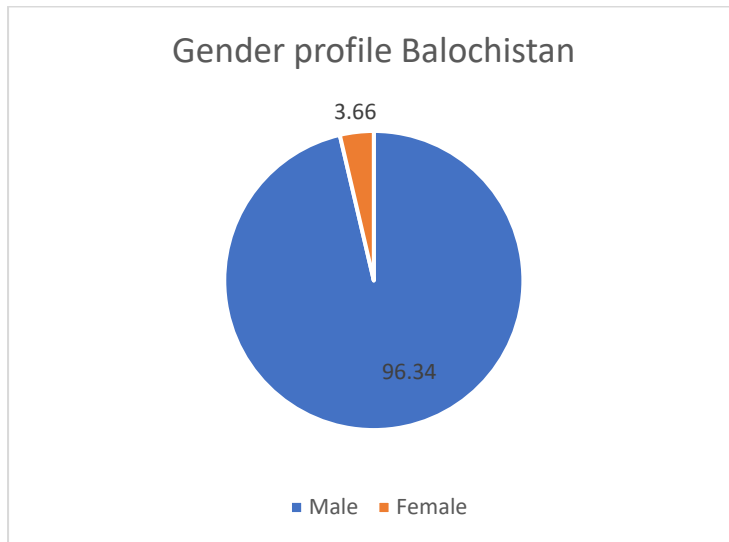
4. EDUCATION-SKILLS MISMATCH

This section provides detailed analysis of job-education mismatch in Balochistan using microdata collected from Pakistan Labour Force Survey (2020-2021).

4.2 Descriptive analyses

This section presents the key characteristics of selected sample. Figure 4.1 shows that the LFS sample for Balochistan is overwhelmingly male: 15336 men (96.3 %) versus only 582 women (3.7 %).

Figure 4.1 Labour Profile by Gender



Educational attainment (Figure 4.2) in the labour force is skewed towards low levels: roughly two-thirds of respondents have five or fewer years of education, while only about 13 % have completed 12 or more years. This illustrates the Balochistan's limited human-capital base and explains why many jobs remain low-skilled. The overall unemployment rate (Figure 4.3) in the LFS sample is 6.3 %, close to the national average.

Figure 4.2: Years of Education

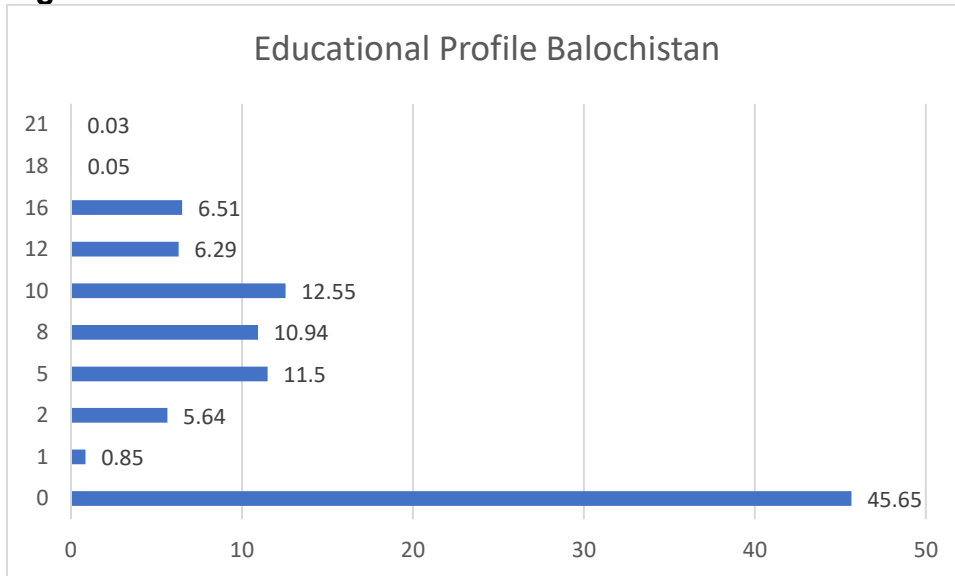
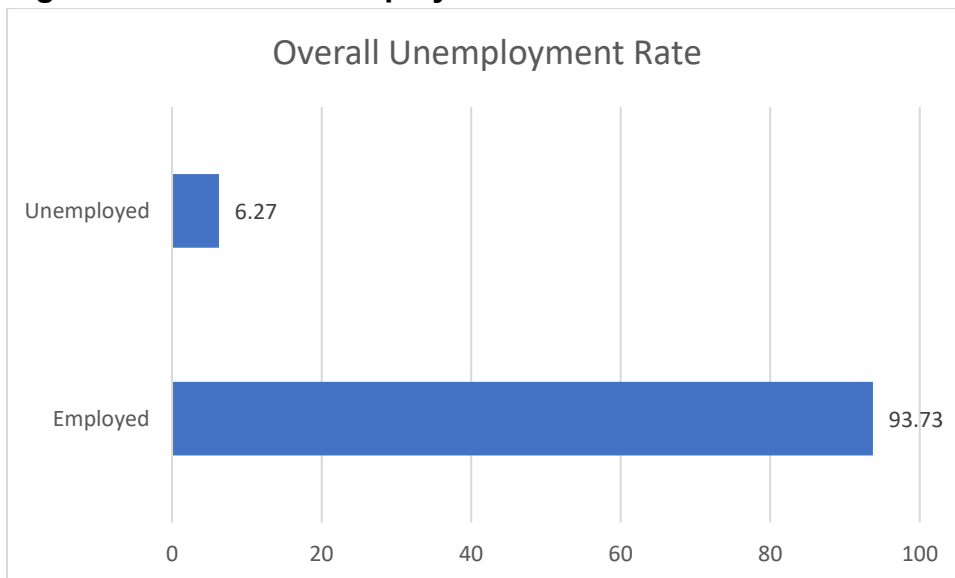


Figure 4.3: Overall Unemployment Rate



According to national statistics, women in Balochistan face a high unemployment rate (Table 4.1). This is also evident from the data of our selected sample. According to recent statistics, the male unemployment rate is 5.8 % whereas the female unemployment rate is 17.9%. Keeping in view the socio-demographic structure of Balochistan, the high unemployment rate among women not only stems from job scarcity but also from the fact that women have to take up the issue of occupational gender segregation (Khan et al., 2023).

Table 4.1: Unemployment by Gender (ILO Definition)

Gender	Employed (0)	Unemployed (1)	Labour-Force (n)	Rate (%)
Male	14442	894	15336	5.83
Female	478	104	582	17.87

Total	14920	998	15918	6.27
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The unemployment rate across age groups (Table 4.2) shows that the youth is the main sufferer. Respondents aged 15–24 have an unemployment rate of 17.7 %, which is more than double the provincial average and vastly higher than the rates for older age groups (1.4 % for 35–49-year-olds & 1.8 % for 50–65-year-olds). The decline in unemployment rate after the age of 24 indicates that it takes time for young people to find their footing in the labour market. International evidence also supports the argument by confirming that new entrants are more likely to be unemployed or stuck in transitional jobs, which declines as they gain market experience.

Table 4.2: Unemployment Rate by Age Group

Age Group	Employed (n)	Unemployed (n)	Labour-force (n)	Rate (%)
15–24	2718	586	3304	17.7
25–34	4352	293	4645	6.3
35–49	5560	77	5637	1.4
50–65	2290	42	2332	1.8
Total	14920	998	15918	6.3

Furthermore, a descriptive analysis shows that the relationship between education and unemployment is non-linear trend (Table 4.3). The unemployment statistics by years of education shows that, those with only primary education (0–5 years) have relatively low unemployment rates (i.e. around 5 %), which suggests that even minimal education is sufficient for many low-skill jobs. Unemployment rises among those with 10–12 years of schooling (8–11 %) and remains elevated for those with 16 years (10.3 %) or more. The highest rate can be witnessed among the tiny group having 18 years of education (postgraduation), wherein the underpayment rate is 16.7 %. This pattern indicates that job creation has not been keeping pace with educational expansion, thus middle and high school graduates are competing for a limited number of skilled jobs.

Table 4.3: Unemployment Rate by Years of Schooling

Years Edu	Employed (n)	Unemployed (n)	Labour-force (n)	Rate (%)
0	6873	393	7266	5.4
1	133	2	135	1.5
2	855	42	897	4.7
5	1761	69	1830	3.8
8	1628	113	1741	6.5
10	1841	157	1998	7.9
12	889	113	1002	11.3
16	930	107	1037	10.3
18	6	2	8	25.0
21	4	0	4	0.0
Total	14920	998	15918	6.3

Moreover, Vocational and technical training is associated with markedly lower unemployment (Table 4.4): those having any kind of technical. Vocational training has a 3.2 % unemployment rate, half that of those who have no training (6.5 %). This finding suggests that even short duration of training can improve employability.

Table 4.4: Unemployment by Vocational/Technical Training

Tech Training	Employed (n)	Unemployed (n)	Labour-force (n)	Rate (%)
No	14062	970	15032	6.5
Yes	858	28	886	3.2
Total	14920	998	15918	6.3

Unemployment is chronically higher in Balochistan cities (Table 4.5). Consequent upon the high rate of rural to urban migration, it is significantly higher in Urban areas where joblessness rate is 8.9 % whereas in rural areas, it is 5.7 %. It shows that urban centres experience significantly higher unemployment than rural areas. Quetta faces acute labour-market pressures where the jobseekers' influx coupled with limited industrial growth, creates an oversupply of labour. Rural workers, by contrast, may absorb themselves in agriculture even when under-employed.

Table 4.5: Unemployment by Region

Region	Employed (n)	Unemployed (n)	Labour-force (n)	Rate (%)
Rural	12 176	729	12 905	5.65
Urban	2 744	269	3 013	8.93
Total	14 920	998	15 918	6.27

4.2 Incidence of Educational Mismatch

The study provides a substantial evidence of education–occupation mismatch in Balochistan's labour market (Table 4.6). Using the RMA classification, about 34.7% of workers are over-educated as for as their their current jobs are concerned, around 17.0% are under-educated, and 48.3% are in jobs that are well-matched to their education (Table 3.8). In other words, just over half of the workforce has an educational level that does not align with the requirements of their occupation. This mismatch (over 51% combined) is high, even when compared to the national figures. For instance, a recent national study found that around 45% of male and 40% of female workers experience an education–job mismatch (Khan et al. 2022). Similarly, Hassan (2024) found over 45% face the problem of overeducation in the country.

In Balochistan, over-education predominates, thus this pattern reflects the scarcity of high-skill jobs relative to the pool of educated workers in the province. The high over-education rate suggests a large number of educated individuals are working in roles below their qualification level, implying an underutilization of human capital and potential productivity losses. At the same time, the under-education segment (17%) indicates that many jobs are staffed by people with less education than typically required, which can also hinder productivity and innovation.

Table 4.6: Overall Educational Mismatch in Balochistan

	Freq.	Per cent	Cum.
Over-educated	5529	34.73	34.73
Under-educated	2709	17.02	51.75
Matched	7680	48.25	100.00
Total	15918	100.00	

Figure 4.4 to 63.6 reflects the geographical distribution of educational mismatch across the province. However, there is no uniformity in mismatch issue, as there exists geographic clustering. For instance, out of all over-educated workers in the province, a disproportionate share comes from a few districts: Kalat and Khuzdar alone account for about 13.4% of

Balochistan’s over-educated workers (i.e. 6.2% and 7.2% respectively). Quetta, the provincial capital, adds another 4.7%. These three locales together make up nearly 18% of all over-educated individuals (Figure 4.5). Such concentration reflects local dynamics. Quetta attracts many educated jobseekers (including migrants from other districts) who often end up in roles below their qualification. It is a common phenomenon where educated workers flock to cities but suitable white-collar jobs don’t keep pace with them. Meanwhile, intermediate cities like Kalat and Khuzdar have colleges producing graduates, but their local economies remain small and undiversified, thus they are unable to absorb higher-educated youth, resulting in credential spillover into lower-skilled jobs. Conversely, the under-education pattern shows that even the more developed districts have many workers employed above their education level. Notably, Quetta has about 7.5% of all under-educated workers in the province that is the single largest share. The coexistence of high over-education and notable under-education in Quetta points to a dual challenge: a surplus of graduates unable to find graduate-level jobs, and an abundance of low-skilled work for which even those with minimal education compete. Matched cases are also led by Quetta (9.7%), with other pockets like Killa Abdullah (7.0%) showing better alignment.

Figure 4.4: Geographic Distribution of Over-Education

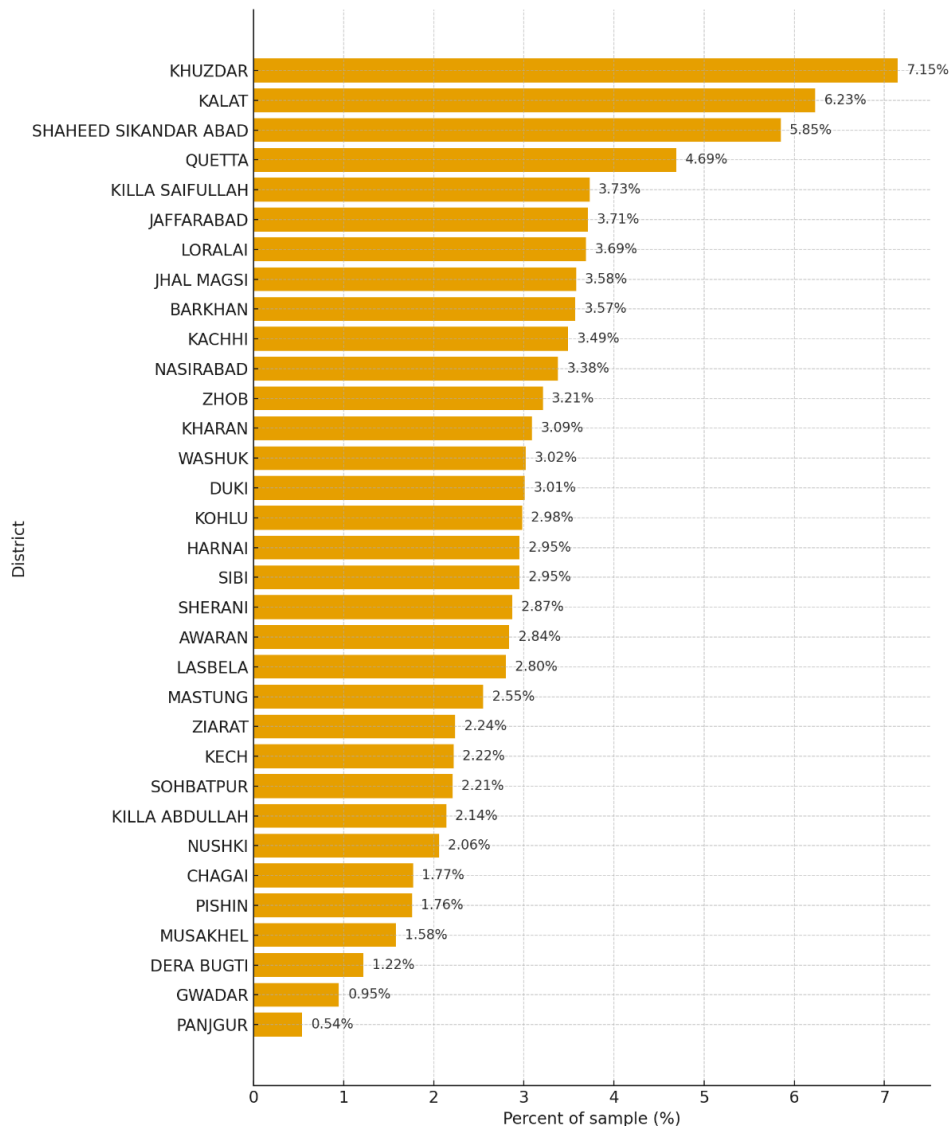


Figure 4.5: Geographic Distribution of Under-Education

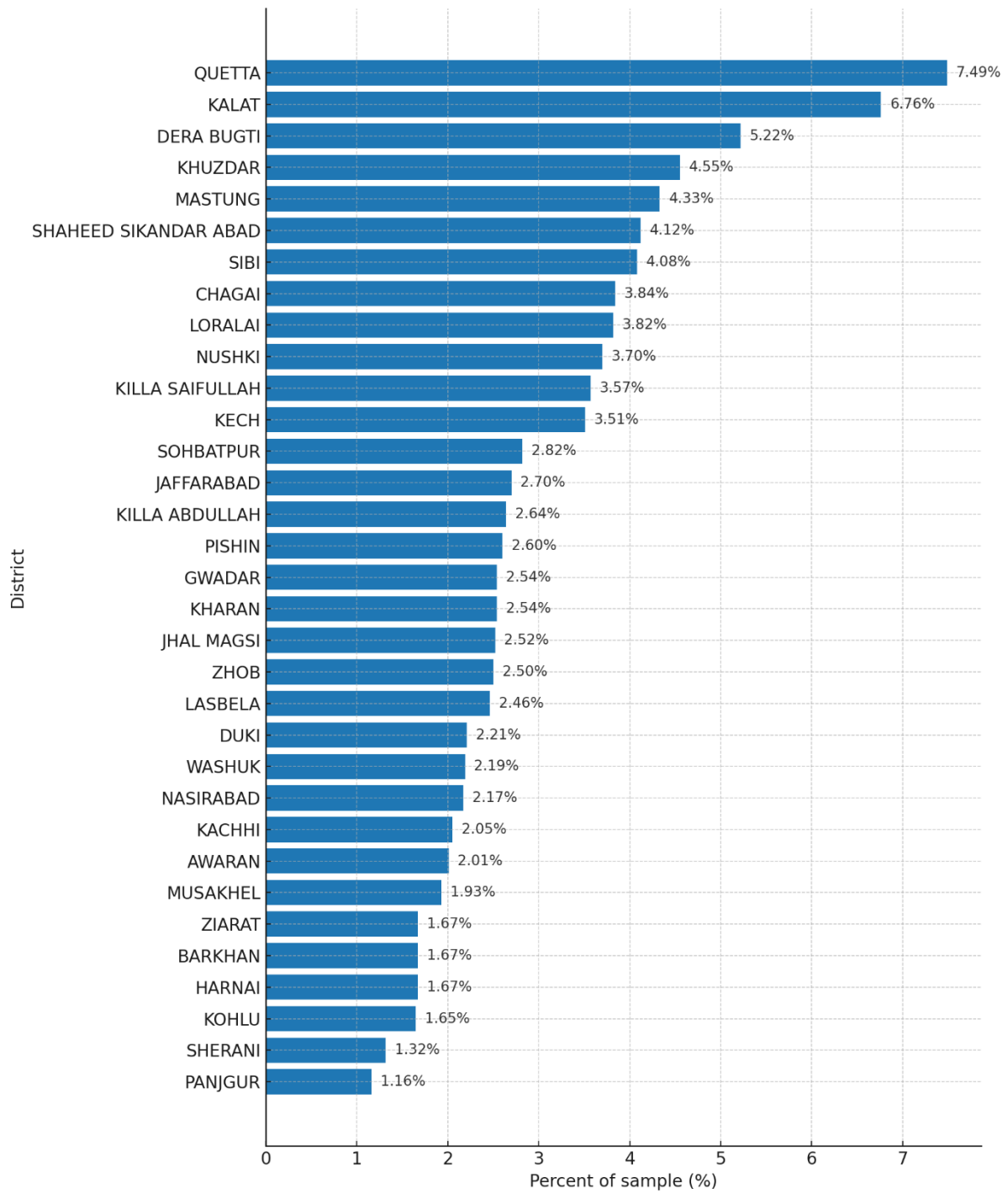
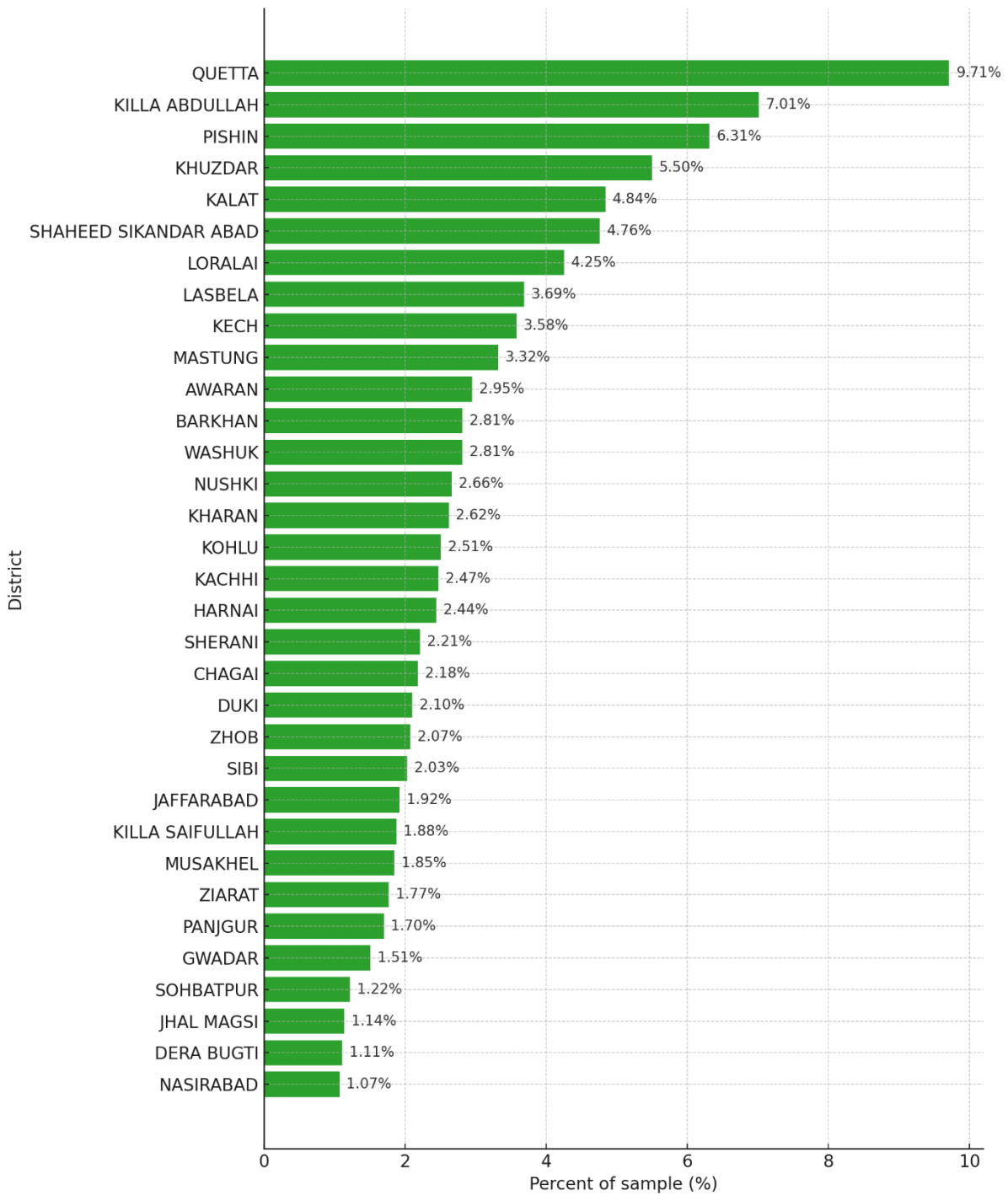


Figure 4.6: Geographic Distribution of Matched Education



Further analysis shows that the education-job mismatch is heavily age-dependent (Table 4.7), highlighting the challenges faced by the youth. We find that younger workers (15–24 years) have the highest over-education rate; nearly 48% of employed youth are in those jobs that require less education than they possess, and this rate steadily declines with age, down to about 16% for workers aged 50–65. In parallel, the proportion of well-matched workers rises with age (from roughly 47% in the youngest group to 76% in the oldest group). Under-education is low (4–5%) among the youth but increases to 8% in older workers. These patterns suggest that mismatch is largely a “young worker” problem, echoing difficult school-to-work transitions and a temporary “queue effect” until labour demand catches up (Dolton & Vignoles, 2000).

Table 4.7: Education-job Mismatch by Age Group

Age Group	Over-educated (%)	Under-educated (%)	Matched (%)	n
15–24	47.8%	4.6%	47.6%	13 223
25–34	28.1%	7.7%	64.2%	10 247
35–49	23.5%	9.8%	66.7%	10 584
50–65	16.1%	8.2%	75.7%	5 457

Statistics related to mismatch by gender (Table: 4.8) show a prominent gender disparity in educational mismatch. Among female workers, only 44% are in jobs that match their education, versus about 80% of male workers, i.e. 56% of women experience some mismatch compared to 20% of men. Female mismatch takes both forms: 42.6% of employed women are over-educated (more than double men's 19.4%), and 13.4% of women are under-educated (vs. 0.4% for men). This dual mismatch highlights how gender-specific constraints impede optimal matching in Balochistan (Ahmed et al., 2023; Khan & Ali, 2024).

Table 4.8: Education-job Mismatch by Gender

Gender	Over-educated (%)	Under-educated (%)	Matched (%)
Male	19.4%	0.4%	80.2%
Female	42.6%	13.4%	44.0%

3.3 Relationship between Educational Mismatch and Unemployment

After establishing the evidence of educational mismatch across gender, age and different geographical location, the logistic regression is used to determine the relationship between educational mismatch and unemployment. Since the evidence of over-education is more pronounced in Balochistan, the regression analysis incorporates overeducation in the model while leaving the remaining specification of mismatch.

The regression results showed that, holding other factors constant, an individual classified as over-educated has significantly higher odds of being unemployed than an otherwise similar well-matched individual. The estimated coefficient on the over-education dummy is positive and highly significant ($p < 0.001$). In terms of marginal effects, over-educated workers are predicted to have a much higher probability of unemployment, suggesting that having more education than one's job requires is a risk factor for joblessness. Additionally, the analysis of educational mismatch on unemployment duration for those who are unemployed and reported their job search duration (Table 4.9) shows that, being overeducated significantly increases the job search duration, while vocational/technical training have no significant influence of job search duration the findings confirm that educational mismatch not only waste human capital capabilities it also increases the job search duration.

This result presented in Table 4.9 and Table 4.10 aligns with certain labour market realities: over-educated workers often accept jobs out of desperation, but remain unsatisfied and keep searching for better matches, thus experiencing more frequent or longer spells of unemployment (either voluntarily as they quit mismatched jobs or involuntarily if employers view them as flight risks or "overqualified"). these findings are consistent with the observation by McGuinness (2006) that over-education can coincide with higher job turnover and unemployment as workers attempt to correct their mismatch. It also mirrors evidence from Pakistan's national labour market. Studies such as Humala (2013) and Šahin et al., 2010–

2013 also found supporting evidence on the statistically significant effect on educational mismatch on unemployment. However, the results are in contrast to Flórez & Gómez, (2024) who, in a recent study, found statistically insignificant effect of mismatch on unemployment in Cambodia.

The control variable of education level confirms that with a rise in education per year, the probability of unemployment declines, however, there exists difference of the magnitude of the coefficients of each year of education. Being female is associated with higher unemployment probability (consistent with the earlier descriptive finding of women’s high unemployment) – a result of gender barriers and limited female-oriented jobs. Urban residence was associated with higher unemployment relative to rural areas, hinting at congested urban labour markets (Quetta’s educated unemployed pool) versus rural subsistence absorption. These findings echo national trends where educated urban youth have the highest joblessness (Khan et al., 2022). Importantly, the results also show that individuals who reported having any technical/vocational training were significantly less likely to be unemployed than those with no training. In the sample, the unemployment rate for those with formal technical training was about 3.2%, compared to 6.5% for those without. The regression analysis presented in this section underscores the protective effect of skills training in a low-skill economy like Balochistan. Even though vocational trainees might also face mismatch (as shown in Chapter 5 of this study), having practical skills seems to improve one’s immediate employability, perhaps by enabling self-employment or making one eligible for trades jobs that general-education graduates cannot take.

Table 4.9: Logistic Regression (Overeducation and Unemployment)

Number of jobs = 15,918 Wald $\chi^2(15) = 1009.96$ Prob > $\chi^2 = 0.0000$ Penalized log likelihood = -2835.7435					
Variable	Coef.	St.Err.	z-value	p-value	Sig
Overeducation	6.878	1.417	4.850	0.000	***
years_edu					
1	-7.775	1.561	-4.980	0.000	***
2	-6.822	1.427	-4.780	0.000	***
5	-7.015	1.423	-4.930	0.000	***
8	-6.384	1.421	-4.490	0.000	***
10	-5.811	1.419	-4.100	0.000	***
12	-5.773	1.421	-4.060	0.000	***
16	-5.109	1.419	-3.600	0.000	***
18	-4.365	1.657	-2.640	0.008	**
21	-6.519	2.124	-3.070	0.002	***
tech_dummy	-1.165	0.202	-5.760	0.000	***
age_group					
25–34	-1.174	0.080	-14.640	0.000	***

35–49	-2.680	0.126	-21.290	0.000	***
50–65	-2.237	0.164	-13.620	0.000	***
gender					
Female	1.247	0.133	9.340	0.000	***
_cons	-1.716	0.065	-26.490	0.000	***

Table: 4.10: Ordered Logistic Regression (Unemployment Duration and Mismatch)

unemployment duration	Coef.	St.Err.	t-value	p-value	[95% Conf	Sig
overedu_dummy	.275	.118	2.34	.019	.045	**
tech_dummy	-.058	.385	-0.15	.879	-.813	
Age : (base 15-24)	0	
25-34	.028	.13	0.21	.832	-.228	
35-49	-.389	.214	-1.82	.069	-.81	*
50-65	-.116	.313	-0.37	.71	-.73	
Gender: (base Male)						
Female	.012	.197	0.06	.951	-.375	
cut1	-.994	.109	.b	.b	-	
					1.207	
cut2	.124	.103	.b	.b	-.078	
cut3	.528	.105	.b	.b	.322	
cut4	.974	.109	.b	.b	.76	
Mean dependent var	2.963			SD		
				dependent		
				var		
Pseudo r-squared	0.003			Number		
				of		
				obs		
Chi-square	10.500			Prob > chi2		
Akaike crit. (AIC)	3028.773			Bayesian crit.		
				(BIC)		

5. Analysis of Vocational Skills Mismatch

This section provides detailed analysis of vocational (skills) mismatch in Balochistan using self-assessment methods.

5.1 Descriptive analysis

Figure 5.1 gives a gender breakdown of the survey sample wherein a majority of respondents (56.5%) are male, 43.2% are female, i.e. 165 vs 126 individuals; total n = 292. This gender imbalance is notable given the context of Balochistan's labour force. Gender composition of the sample reflects the generally low female labour force participation in the province, where cultural norms and barriers often limit women's involvement in formal employment.

Figure 5.1. Gender Representation

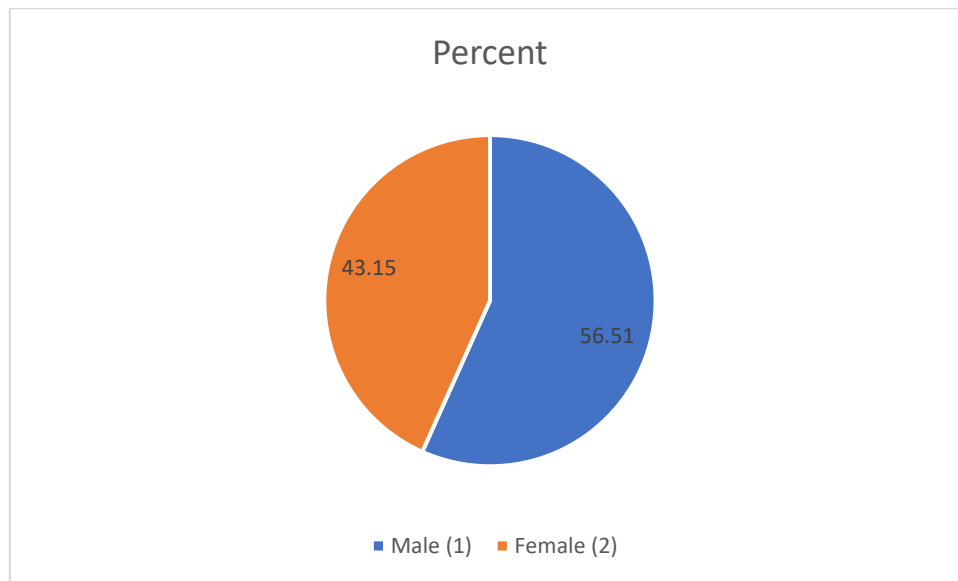
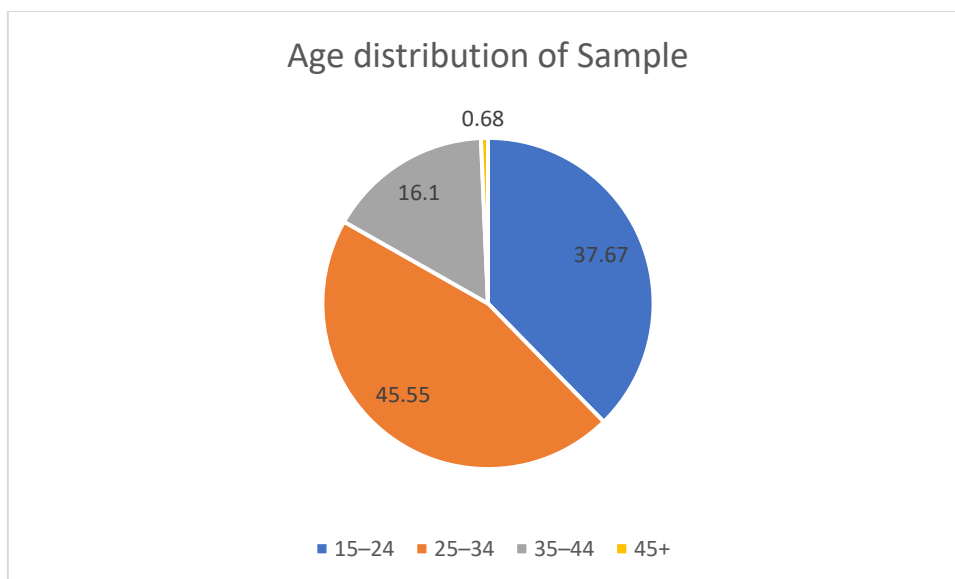


Figure 5.2 presents the age structure of the sample, which is overwhelmingly young: ~83% of respondents are between 15–34 years, and virtually none are above the age of 45 (~0.7%, n=2). The largest cohorts are the 15–24 group (37.7%) and 25–34 group (45.2%). The province has a very young population, with roughly 60% under 30 (Pakistan Census 2023). It also means our findings primarily reflect early-career dynamics. Younger workers in their late teens and twenties are typically in the school-to-work transition or in their first jobs, where mismatches tend to be more common.

Figure 5.2. Age Distribution of Respondents



The mean years of education (Table 5.1) is ≈ 14.0 (SD ≈ 2.23 ; min 0, max 18), which corresponds to completion of higher secondary schooling. 31.2% of the sample have 12 years of education, 36.6% have 14 years, and 22.6% have 16 years. In total, about 90% of respondents have at least 12 years of education, indicating a moderately better educated sample.

Table 5.1: Educational Attainment (Years of Schooling)

Years of Schooling	Frequency (n)	Per cent	Cumulative %
0	2	0.68	0.68
8	2	0.68	1.37
10	1	0.34	1.71
12	92	31.51	33.2
14	107	36.64	69.8
16	67	22.95	92.8
18	21	7.19	100.0
Total	292	100.00	100.00

Training is concentrated in IT/Computer basics (31.9%) and Graphic design (18.2%), with a sizable “Others” group (Table 5.2). This digital-leaning portfolio should be tested against local demand and employer input to mitigate the job-skill mismatch.

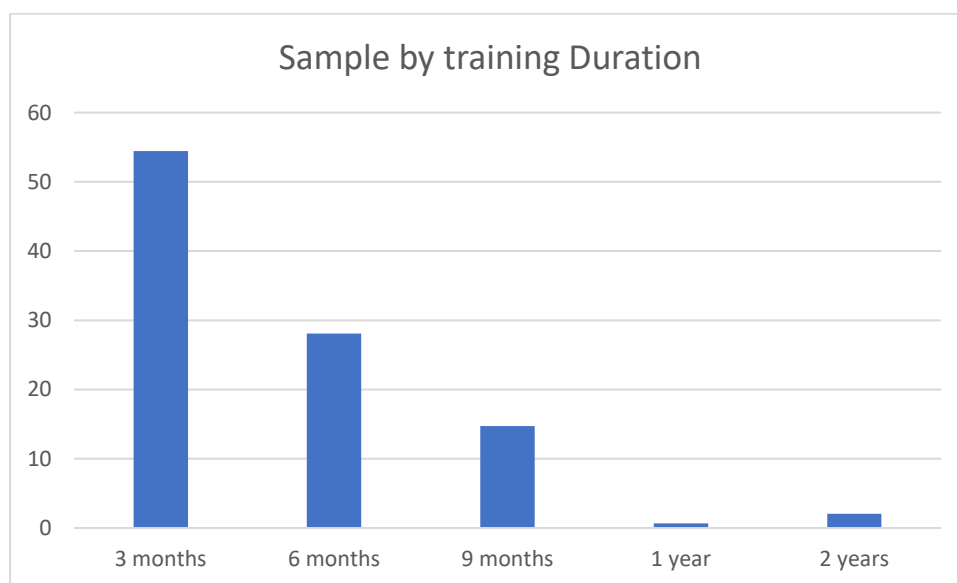
Table 5.2. Vocational Training by Trait

Field	N	%
IT / Computer basics	93	31.85
Graphic design	53	18.15

Others	55	18.84
Beautician / Beauty parlor work	37	12.67
Digital marketing (basic)	15	5.14
Tailoring / Dressmaking	12	4.11
Electrician work	10	3.42
Mobile phone repair	7	2.4
Home repair / maintenance	4	1.37
Carpentry (woodwork)	2	0.68
Welding / Metalwork	2	0.68

Duration of training (Figure 5.3) shows that short formats include: 3-month (54.3%), 6-month (27.8%), and 1-year (15.1%) courses. Short courses facilitate quick entry but typically require work-based learning/placement links to translate into utilization (ILO, 2019; Quintini, 2011).

Figure 5.3: Training Duration



Current employment status (Table 5.3) shows that 57.0% of the total sample reported being unemployed (actively looking for jobs); 29.6% were full-time and 13.4% were part-time employees. Despite near-universal training exposure in this sample, high joblessness signals weak demand/matching, consistent with existing evidence that training must be coupled with employer engagement to improve absorption (McGuinness, 2006).

Table 5.3: Current Employment Status (3-category)

Employment Status	Frequency (n)	Per cent
Employed full-time	85	29.11
Employed part-time	39	13.36
Unemployed (actively looking)	168	57.53

5.4 Mismatch Indicators and Skill Utilization

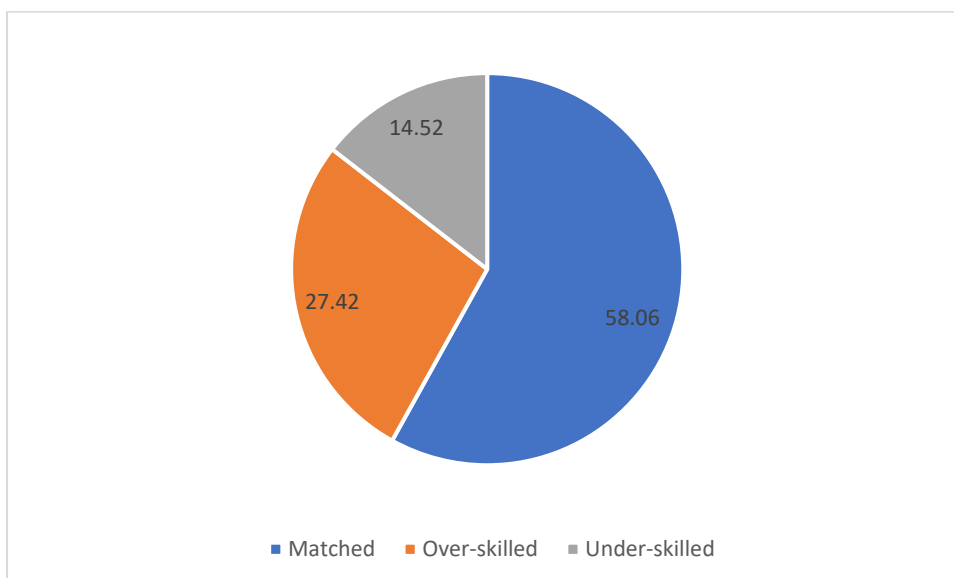
According to statistics in Table 5.4, our data reveal a similar structure: nearly half of employed respondents feel over-qualified, roughly two-fifths consider themselves adequately qualified, and only a small number of individuals feel under-qualified (over-qualification \approx 48%, adequate qualification \approx 40%, under-qualification \approx 12%). This vertical mismatch reflects wasted educational investment and can lead to lower earnings and job dissatisfaction. Self-assessment response received from respondents show among the respondents, (15/125). These results are aligned with the statistics obtained from the LFS Pakistan in the previous section, which shows high prevalence of overeducation compared to under-education and adequately educated individuals. This is also in line with the national level evidence (Hassan, 2024) and evidence from across the globe, such as (Quintini, 2011).

Table 5.4. Self-Assessed Job–Education Match

Education-Job Match	Frequency (n)	Per cent	Cumulative %
Adequately qualified	52	41.12	41.94
Over-qualified	60	48.39	90.32
Under-qualified	12	9.68	100

Figure 5.4 shows that a majority respondents (58.1%) are in jobs where their training matches the required skills, indicating effective use of vocational education. However, 27.4% are over-skilled, suggesting that their competencies exceed job requirements and that part of their training investment is underutilized. A smaller group (14.5%) is under-skilled, highlighting gaps where training is insufficient for job demands. These findings are aligned with earlier studies (Hartog, 2000; McGuinness, 2006) which show that both over- and under-skilling represent forms of mismatch with negative implications for productivity and labour market efficiency.

Figure 5.4: Job–Training Match



Responding to skill utilization question (Table 5.5), around 52 % of the respondents feel their skills are being fully used given their current job market circumstance; the remainder report some degree of under-use. This implies that almost half of these trained or educated youths

are in roles that do not allow them to apply their skill obtained in the form of technical/vocational training.

Table 5.5. Self-Reported Skills Utilization in Current Job/Activity

Skill–Job Utilization	Frequency (n)	Per cent	Cumulative %
Partly utilized	34	27.42	27.42
Under-utilized	25	20.16	47.58
Well-utilized	65	52.42	100.0

The distribution of self-reported preparedness is generally positive. Nearly four out of five respondents (82%) rated themselves as at least somewhat prepared following vocational training, with one-third (32%) describing themselves as very well prepared. In contrast, about one in five respondents (20.2%) indicated that their training left them either not at all prepared or prepared very little. These findings reflect the gap between perceived preparedness and actual job matches, underscores a key distinction drawn in the literature between skill acquisition and skill utilization. Workers may feel well trained yet still face underutilization because suitable jobs are scarce or because employers undervalue their credentials.

Table 5.6: Perceived Preparedness from Training

Preparedness	Frequency (n)	Per cent	Cumulative %
Very little	9	7.26	7.26
Not at all prepared	16	12.90	20.16
Somewhat prepared	30	24.19	44.35
Well prepared	40	23.39	67.74
Very well prepared	29	32.26	100.0

5.6 Mismatch by Gender and Age

In the employed subsample, around 58% of respondents were adequately matched (Table 5.7), 27% over-skilled, and 15% under-skilled. Female workers were somewhat more likely to be under-skilled (17.4%) compared to their male counterparts (12.8%), while male workers were more likely to be over-skilled (30.8% vs. 21.7%). These patterns suggest that women may face greater training deficiencies relative to job demands, whereas men experience greater underutilization of acquired vocational skills.

Table 5.7: Skills Utilization by Gender (Male vs. Female)

ORU category	Female	Male	Total
Matched	60.9%	56.4%	58.1%
Over-skilled	21.7%	30.8%	27.4%
Under-skilled	17.4%	12.8%	14.5%
Total	37.1%	62.9%	100%

Age-disaggregated results (Table 5.8) show that around 58% of respondents across all groups were in jobs adequately matched with their vocational training. Over-skilling was particularly common among middle-aged workers (36% in the 35–44 cohort) and relatively high among the youth (31% in the 15–24 group). By contrast, the 25–34 group reported the highest incidence of under-skilling (19%), suggesting that early-career workers may face gaps in training relative to job demands. Older workers (within the bracket of 45+) in this small sample showed no over- or under-skilling, but this result is based on only two cases and should not be generalized. Overall, the findings suggest that skill mismatch manifests differently across the life course: Young and middle-aged respondents face more skill underutilization, whereas younger adults in their mid-20s to early 30s are somewhat more likely to experience under-skilling.”

Table 5.8. Skills Utilization by Age Group

ORU Skill Mismatch	15–24	25–34	35–44	45+	Total
Matched	15 (57.7%)	36 (61.0%)	19 (57.6%)	2 (50.0%)	72 (58.1%)
Over-skilled	8 (30.8%)	14 (23.7%)	12 (36.4%)	0 (0.0%)	34 (27.4%)
Under-skilled	3 (11.5%)	11 (18.6%)	2 (6.1%)	0 (0.0%)	18 (14.5%)
Total	26 (100%)	59 (100%)	33 (100%)	2 (100%)	124 (100%)

Table 5.9 reports skill mismatch across employment types. Among full-time employees, nearly two-thirds (63.5%) were adequately matched compared to less than half (46.2%) of part-time workers. Under-skilling was far more prevalent among part-time workers (28.2%) than full-time (8.2%), while over-skilling affected both groups at comparable rates (about one-quarter). A chi-square test confirmed a statistically significant association between employment status and mismatch ($\chi^2(2) = 8.80, p = 0.012$), with a moderate effect size (Cramér’s $V = 0.27$). These results suggest that part-time workers face vulnerability to under-skilling, while full-time employment is more likely to ensure adequate training–job alignment.” The pattern observed here is consistent with international evidence. Several studies have found that “part-time workers are more likely to be mismatched, which is driven by a higher rate of over-skilling among these workers”. Occupational choices in part-time work are often limited, raising the probability of over-skilling, and transitions from full-time to part-time employment can entail occupational downgrading.

Table 5.9: Skill Mismatch % by Employment Type

Skill Mismatch	Full-time	Part-time	Total
Matched	63.5%	46.2%	58.1%
Over-skilled	28.2%	25.6%	27.4%
Under-skilled	8.2%	28.2%	14.5%

Table 5.10 shows how different education–job groups experience mismatch. The under-qualified are the most disadvantaged: half of them report being under-skilled, meaning their training is insufficient relative to job requirements. Adequately qualified workers, by contrast, are more often over-skilled (35%), pointing to inefficient use of their human capital. Over-qualified workers are spread across categories, but more than 40% still face mismatch, indicating that having more education than required does not guarantee appropriate skill utilization. The results show that the under-qualified face a double penalty. Both lower formal education and inadequate vocational skills, and the adequately qualified suffer from underutilization, meaning investment in their training is not yielding full productivity gains.

Table 5.10: Skill Mismatch by Job–Education Match (share of mismatch outcomes within each education–job group)

Job–Education Match	Matched	Over-skilled	Under-skilled	Total
Adequately qualified (n=52)	57.7%	34.6%	7.7%	100%
Over-qualified (n=60)	60.0%	26.7%	13.3%	100%
Under-qualified (n=12)	50.0%	0.0%	50.0%	100%

Table 5.11 highlights which groups contribute most to each mismatch outcome. More than half of all over-skilled workers come from the adequately qualified, showing that mismatch is not confined to those with weak educational backgrounds. Similarly, one-third of the under-skilled are under-qualified, but nearly half are over-qualified, this shows that even those with higher education can lack relevant vocational competencies. The statistics presented here shows that the mismatch is not only a matter of vulnerable groups but also a systemic inefficiency, as a significant share of mismatch originates from groups who are “supposed” to be adequately or over-qualified. This reflects structural gaps between education systems and labour market needs.

Table 5.11. Skills Mismatch by Job–Education Match (distribution of education–job groups within each mismatch outcome)

Job–Education Match	Matched (n=72)	Over-skilled (n=34)	Under-skilled (n=18)	Total
Adequately qualified	41.7%	52.9%	22.2%	41.9%
Over-qualified	50.0%	47.1%	44.4%	48.4%
Under-qualified	8.3%	0.0%	33.3%	9.7%
Total	100%	100%	100%	100%

Table 4.12 shows the relationship between skill mismatch and job attainment after training. The results reveal clear disparities: among the matched group, 87.5% reported gaining employment, while a similar share of under-skilled participants (88.9%) also found jobs. In contrast, only 52.9% of over-skilled workers obtained employment, leaving nearly half unemployed after training. The chi-square test confirms that these differences are statistically significant ($\chi^2 = 17.60$, $p < 0.001$). The findings highlight two different inefficiencies in the labour market. First, over-skilling emerges as a barrier to employability. It is evident that

despite having training above job requirements, the individuals in this group face reduced hiring chances. This highlights the possibility of poor alignment between training design and available opportunities. Second, while under-skilled workers appear to integrate into the labour market, their employment is likely concentrated in low-skill occupations, which in turn raises concerns about job quality rather than job access. However, on the other hand, the matched workers represent the most efficient allocation of training, maximizing employability and utilization of vocational skills.

Table 5.12: Employment Outcomes by Skills Mismatch

ORU Skill Mismatch	No Job (%)	Got Job (%)
Matched	2.5	87.5
Over-skilled	47.1	52.9
Under-skilled	11.1%)	88.9%

Pearson $\chi^2(2) = 17.60, p < 0.001$

5.7 Relationship between Skills mismatch and Unemployment

Regression analysis is performed to determine the relationship between vocational skill mismatch and probability of finding the job after obtaining the vocational/technical education and skills.

Table 5.13 presents the result of logistic regression analysis. Overall findings are in line with the existing literature, i.e. keeping other things constant the primary variable of interest “over-skilled” is found have a statistically significant and negative relationship with unemployment.

The regression analysis confirms that skills mismatch is a decisive factor shaping employment outcomes in Balochistan. Workers classified as over-skilled were significantly less likely to secure employment after training, with their odds of job attainment reduced by more than 80% compared to those whose training matched job requirements. This finding is aligned with international evidence that overqualification undermines employability (McGuinness, 2006; Flórez & Gómez, 2024). By contrast, being under-skilled did not significantly reduce the probability of employment relative to matched workers. These findings suggest that Balochistan’s labour market can absorb less-qualified trainees, though likely into lower-quality or informal job, this pattern is also consistent with international evidence, which highlights that underutilisation of human capital skills in many developing labour markets.

Table 5.13: Logistic Regression of Job Attainment on Skills Mismatch

Dependent variable: Job after vocational/technical training (1=Yes, 0=No) N = 118 LR $\chi^2(8) = 17.83, p = 0.0226$ Pseudo R ² = 0.140					
Variable	Odds Ratio	Std. Err.	z	p-value	95% CI (Lower, Upper)
Skill mismatch					
Over-skilled	0.189	0.101	-3.13	0.002**	(0.067, 0.537)
Under-skilled	1.568	1.327	0.53	0.595	(0.299, 8.232)
Gender					
Male	1.141	0.622	0.24	0.808	(0.393, 3.320)
Age group (ref = 15–24)					
25–34	1.266	0.819	0.36	0.716	(0.356, 4.498)
35–44	1.943	1.480	0.87	0.383	(0.437, 8.648)
Years of schooling	0.982	0.093	-0.19	0.846	(0.816, 1.182)
Training duration	1.163511	.0921279	-0.17	0.862	(.818, 1.182)

6 months	1.437	0.763	0.68	0.495	(0.507, 4.069)
9 months	2.536	2.262	1.04	0.297	(0.442, 14.561)
Constant	4.263	5.626	1.10	0.272	(0.321, 56.637)

6. Qualitative Analysis of Open-Ended Responses on Skills Mismatch and Employment

The survey gathered qualitative feedback through open-ended questions about challenges in finding suitable employment and suggestions for improving training-job alignment. These responses (Part 3 of the study) are analysed thematically to uncover the important factors that contribute to mismatch (Research Question 3). Preliminary reading of these responses, along with existing studies, suggests issues like limited industry connectivity, information gaps in career guidance, and gender norms as recurrent themes (Ahmed, Abbas, & Afzal, 2023; Achakzai, 2023; Khan & Ali, 2024).

To ensure clarity, questions were phrased in simple Urdu/local language and pilot-tested with a small group of trainees to verify understanding. The combination of quantitative and qualitative data also allows cross-validation: for instance, patterns observed in statistical results can be explained or illustrated by participants' personal accounts (to be detailed in the narrative analysis).

6.2 Themes from Personal Narratives of Mismatch

6.2.1 Barriers to Obtaining a Matched Job

1. **Inadequate Practical Skills and Experience:** A majority of respondents identified gaps in hands-on skills as a primary reason for not securing jobs aligned with their trainings. Many simply stated: "lack of practical skills or experience" as a self-acknowledged shortcoming. This suggests that despite having completed vocational courses, they feel underprepared for real workplace tasks. Such sentiments validate the criticism that training programmes in the region have a strong theoretical focus and insufficient practicum or apprenticeship components. As one respondent described, "lack of practical skills or experience" was the crucial factor holding him back, indicating he left training without job ready experience. It highlights a personal narrative of skills mismatch: the youth feel they have training but lack the market relevant experience to be hired.

2. **Lack of Soft Skills:** A smaller but notable subset mentioned lacking soft skills, e.g. communication or teamwork abilities. For example, one respondent acknowledged: "lack of soft skills", which reflects the awareness that employers seek more than technical know-how. Though less frequently cited than technical skill gaps, this theme indicates that some unemployed youth recognize deficits in their personal attributes or professional demeanour that hinder their employability.

3. **Outdated or Irrelevant Training Curriculum:** Many respondents blamed the education/training system for not equipping them with marketable skills. The phrase "outdated or irrelevant curriculum" recurred in their narratives. Trainees felt their courses taught content disconnected from current industry needs – a classic training–job misalignment. "My course was outdated" was a common refrain. One individual listed "outdated or irrelevant curriculum" as a key reason for being jobless, suggesting that even with a certificate, the skills learned were obsolete. The frustration in these narratives is palpable – respondents feel they invested time in training that failed to improve their job prospects due to no fault of their own, but because the content was misaligned with the labour market.

4. **Limited Job Opportunities in Field:** A pervasive external barrier was the scarcity of jobs in respondents' trade or locality. "Lack of jobs in the field" was one of the most frequent phrases across the data. Many vocational graduates simply do not find openings for the specific skills they have. "Jobs related to my trade are very few" summarised this predicament. This structural issue – a weak labour market demand – leaves even well-trained youth without opportunities, leading to what one might call involuntary skill underutilisation. For instance, a respondent from a remote district noted that "jobs are only in other cities", meaning the jobs using his skill exist only in other cities, not locally (a regional mismatch problem). Several replies explicitly mentioned "regional issues (the desired jobs are in other cities)", underscoring

geographic disparities in employment. This reflects broader labour market conditions in Balochistan where development is uneven and rural areas offer few skilled jobs.

5. **Low Wages in Relevant Jobs:** Even when jobs do exist, some respondents argued they are not worth taking due to poor remuneration. “low salary in field jobs” was cited as a reason for being unemployed or working elsewhere. This suggests a pay mismatch – jobs in their trained field may be available but pay so little that graduates either do not apply or prefer to remain jobless/underemployed. “The jobs in my field don’t pay enough”, one wrote, implying it was more rational to wait or look for better options. This sentiment indicates that mismatch isn’t purely about skills; people may reject matched jobs if wages are unsustainably low. For policymakers, it signals that creating decent jobs (with living wages) is as important as creating job openings.

6. **Employers’ Preference for Higher Qualifications:** A significant theme on the demand side was the perceived bias of employers towards academic degrees over vocational credentials. Respondents complained that “employers prefer higher educational qualifications”. Vocational graduates felt they were passed over in favour of candidates with formal college degrees, even for roles within their competency. “Employers want a BA/BSc for jobs I am skilled enough to do” reflected frustration that skills alone were not valued. This speaks to a cultural bias in hiring: despite technical training, many workplaces in Pakistan default to formal education as a proxy for ability. This structural challenge contributes to mismatch by pushing skilled youth into either unemployment or jobs outside their field while less qualified (but academically degreed) individuals fill roles that the vocational graduates could have done.

7. **Lack of Networks or References:** Several participants noted the absence of personal connections as an employment barrier – “lack of connections/references”. In Pakistan’s context, informal networks and recommendations can significantly influence hiring. One candidly wrote that without any “reference” they couldn’t secure a good job, implicitly comparing themselves to others who find jobs through connections rather than merit. This highlights a social capital deficit as part of the narrative of mismatch. It’s not that these youth lack ability, but they lack social links to get a foothold which is a well-documented hindrance in youth employment. The prevalence of this sentiment underlines that improving youth employment isn’t only about skills or vacancies, but also about making hiring more meritocratic and accessible.

8. **Gender and Cultural Barriers:** Especially among female respondents, “gender or cultural barriers” were mentioned as reasons for not working in their trained field. One female graduate simply answered with “gender barriers”, indicating that conservative norms prevented her from pursuing jobs (for instance, families disallowing women to work far from home, or employers preferring male staff). Another alluded to safety and mobility issues. These personal narratives reflect how traditional gender roles and cultural expectations curtail women’s employment, leading to a mismatch between women’s training and their actual opportunities. Our respondents’ stories reinforce that even well qualified women often remain out of the workforce or in unrelated roles due to non-skills related barriers. The impact is a form of structural mismatch – the skills exist, jobs may exist, but societal conditions prevent a match.

Many respondents did not limit themselves to a single cause. Several enumerated multiple factors, painting a holistic picture of their plight. For example, one individual wrote: “lack of practical experience, outdated curriculum, gender/cultural barriers, and regional issues (the desired jobs are in other cities)”. In this short narrative, the respondent layers personal, institutional and structural challenges together. Such narratives illustrate how different dimensions of mismatch intersect: an individual may simultaneously suffer from limited skills due to poor training, discrimination due to gender, and a weak local job market. This multi causal storytelling by respondents indicates a keen awareness that their unemployment is not monolithic but the result of an interplay of factors. It also demonstrates the value of narrative

analysis – by preserving how respondents string these issues together, we see a fuller picture of the lived experience of mismatch rather than just isolated themes.

Overall, the qualitative evidence highlights a profound education to employment disconnect. The themes echo known issues in skill mismatch literature – from skill gaps and curriculum irrelevance to demand shortages and societal barriers – but here we hear them in the voices of affected youth. The convergence of our findings with quantitative surveys lends credibility to these narratives. Each theme represents a point where the system fails the individual: inadequate training content, insufficient job creation, inequitable hiring practices, etc. In the next section, we examine respondents' own suggestions for how to fix these failures, providing insight into potential solutions from the youth perspective.

6.2.2 Respondents' Suggestions for Improving Employment Outcomes

When asked how to improve the employment prospects of vocationally trained youth, respondents provided a rich set of suggestions addressing both the supply side (education/training reforms) and the demand side (labour market interventions). Their answers were often as multifaceted as their reasons for unemployment, indicating that they see the problem – and solution – in a holistic way. We identified several key themes in their suggestions, which are aligned with many policy recommendations but gain additional credibility coming directly from those affected. Below, we organise the suggestions into supply side and demand side measures, while noting that these need to progress in tandem.

6.2.3 Supply-Side Improvements (Education and Training):

Modernize and Update Curriculum: The most frequent suggestion was to “include modern technology and updated courses” in vocational programmes. This reflects a strong desire among the youth for curricula that keep pace with industry developments (e.g. training on current tools, machines or software). Respondents are essentially calling for curriculum reform so that future trainees won't face the outdated skills problem they did. As one put it, institutes should teach “new technology that today's jobs require.” This underscores that youths are keenly aware of technological change and want their education to stay relevant.

Increase Practical Training Opportunities: The next major theme was a push for more hands on experience during and after training. Many recommended “increase opportunities for practical training (internships)”. The idea of integrating internships or extended practicums into vocational education came up repeatedly. One respondent suggested that every student “should get an internship to gain real experience”, encapsulating the consensus that on the job exposure is critical. This is essentially a call to bridge the gap between training centres and workplaces, so graduates aren't entering the job market cold. It mirrors global best practices where apprenticeships and industry placements are part of vocational training and confirms that our respondents felt the absence of such opportunities.

Soft Skills and Communication Training: Another supply side suggestion was to incorporate soft skills training into the curriculum. Respondents specifically mentioned adding modules for “soft skills (communication, teamwork)”, which is essential to improve employability. The presence of this suggestion is noteworthy: it shows that the youth recognize employability is not only about technical prowess but also about interpersonal and cognitive abilities. They want institutes to produce graduates who can interview well, communicate with employers and collaborate in teams. This reflects a maturation in understanding – possibly informed by their own job searches where soft skills might have made a difference. By directly calling for “soft skills training”, respondents are essentially asking education providers to broaden their definition of a skilled graduate.

Industry Partnerships for Demand Driven Training: A frequently proposed idea was building stronger links between vocational institutes and industry. Respondents said institutes should “provide training according to demand by partnering with industry.” They envision formal collaboration where businesses inform training content, offer apprenticeships or perhaps guarantee interviews for graduates. One respondent wrote that institutes and companies need to be “on the same page” so that training leads to jobs directly. This theme reflects frustration with the current disconnect and suggests a structural fix: involve employers in curriculum design and skills provision. If training is guided by actual labour demand, future cohorts will find it easier to secure matched jobs.

Accreditation and Recognition of Skills: Respondents also pointed out the need to elevate the recognition of vocational qualifications. They suggested efforts to “get certificates recognised at the national/international level.” This implies current vocational certificates may not be respected or understood by employers (especially those outside the province or abroad). By improving accreditation, standardising certifications or international benchmarking, graduates believe their employability would increase. Essentially, they want their diplomas to carry weight. One graduate lamented that private companies don’t know the value of their diploma, implying a recognised certification could change that. This is aligned with the broader agenda of creating national vocational qualification frameworks and improving quality assurance in vocational training. It also touches on aspirations to work abroad – if their skills certification were internationally recognised, some could find jobs overseas.

Job Placement Support: A bridging idea that emerged was to establish career support mechanisms for vocational graduates. Many called for “set up job placement centres or an online portal.” This suggests that the youth feel on their own when searching for jobs, and they want institutional help matching with employers. A placement centre could assist with job listings, career counselling or even directly liaise with local businesses to hire graduates. The suggestion of an online job portal specifically for vocational skills is essentially a plea for a targeted labour market information system to connect supply and demand. Such platforms exist in various forms elsewhere, and respondents intuitively grasp that information asymmetry is part of their problem. Implementing this would also address the issue of networks – a formal portal could compensate for those lacking personal connections by transparently linking them to opportunities.

6.2.4 Demand-Side Measures (Labour Market and Policy):

Job Creation and Regional Equity: On the demand side, the paramount suggestion was simply to create more jobs, especially beyond major cities. Respondents urged the government and private sector to “create job opportunities in different cities so that local candidates can benefit.” This reflects acute awareness of regional disparities: many are trained in smaller towns or rural districts but jobs are concentrated in urban centres. Youth emphasised that every district should have some industries or projects to employ local skilled graduates. This is essentially a development policy demand – calling for investments and incentives for businesses to operate in less developed areas, so that vocational training doesn’t lead to migration or unemployment.

Government Hiring Quotas for Vocational Graduates: A very specific policy idea frequently mentioned was allocation of job quotas in the public sector for TVET graduates. They phrased it as “set aside job quotas for vocational graduates by the government.” This suggests respondents feel that without affirmative action, they will always be edged out by general education graduates in the competition for decent jobs. Quota systems could guarantee them a foothold, especially in government departments or state-owned industries. This is a bold proposal reflecting frustration with the status quo and a belief that vocational youths deserve some preferential support given the social bias toward academic degrees.

Private Sector Incentives: Alongside quotas, respondents recognised the role of private sector and suggested inducements for companies to hire the vocationally trained youth. They proposed “give incentives to private companies to hire vocational graduates.” This could mean tax breaks, subsidies or award schemes for firms that recruit and retain TVET alumni. The underlying logic is that if hiring a skilled diploma holder is made attractive (or at least equally attractive as hiring a degree holder), companies might overcome their reluctance. Respondents are pointing to a classic demand side intervention: subsidise demand for the target group.

Support for Entrepreneurship: Several respondents also suggested facilitating self-employment as a solution. They called for “easy loans or funding to start small businesses.” This indicates an entrepreneurial impulse among some unemployed youth: if jobs are scarce, why not create their own? However, they recognise the barrier – lack of capital. By asking for accessible credit, grants or start-up funds, they believe more skilled youth could launch micro enterprises (workshops, service centres, etc.) aligned with their training. One respondent wrote that a “small loan scheme for vocational graduates” would allow them to become job creators rather than job seekers.

Enhancing Job Information and Meritocracy: Though less explicitly stated, underlying many suggestions is a plea for fair and transparent hiring. The recommended job portals and placement centres aim to reduce nepotism by making opportunities visible to all. Additionally, the cumulative message is a desire for merit-based employment – they want their skills to speak louder than their social connections or credentials. By fixing training and incentivising hiring, respondents hope employers will judge them on competency. Their narratives implicitly call for a labour market that rewards the effort they put into training.

7. Discussion and Conclusion

This study very well sets out the case of educational and skills mismatch in Balochistan's labour market while conducting a quantitative analysis of Labour Force Survey data (Part 1) and a targeted survey of vocational trainees (Part 2). In addition to exploring underlying causes and solutions. We summarize the answers to each research question as follows:

RQ1: Extent of educational mismatch and its relation to unemployment:

We found that educational mismatch is highly prevalent: about 52% of workers are in jobs incongruent with their education (with over-education more common than under-education). This rate is comparable to or higher than national estimates underscoring Balochistan's severe human capital underutilization. Crucially, over-educated individuals face significantly higher unemployment likelihood. The educated youth bulge is not being absorbed into suitable jobs, leading many to cycle through unemployment or take roles beneath their qualifications. These findings confirm prior evidence that mismatch can contribute to joblessness and wasted talent (Khan et al. 2022; Montt, 2015) and validate that even in a developing region, "over-qualification" is a real issue when the economy cannot generate enough skilled jobs. In short, Balochistan's labour market exhibits a substantial education–job gap, and this gap is linked with poorer employment outcomes.

RQ2: Degree of vocational (skills) mismatch among trainees and its impact on employment outcomes:

Among B-TEVTA graduates, we discovered a high degree of skill mismatch: roughly half of those employed are not working in their trained field, and well over half report that their skills are not fully utilized. Additionally, an alarming 57% of surveyed trainees were unemployed. This indicates that vocational training, as currently delivered, is not translating efficiently into employment. This point was also observed by Ahmed et al. (2023) for Balochistan. The vocational skill mismatch is pervasive, and it undermines the very goal of TVET (which is gainful skilled employment), resulting in lost income opportunities for the youth and wasted training investments for society.

RQ3: Institutional, informational, and socio-economic factors behind persistent mismatch:

The combined analysis, supplemented by literature, points to several important factors:

- *Structural economic factors:* Balochistan's economy is narrow, with few industries and a dominant informal sector. There is a lack of high-value sectors to absorb university graduates (hence over-education) and a shortage of formal jobs even for technically skilled workers (hence skill underutilization). As a result, educated individuals often end up either unemployed or taking informal work. Existing literature found that regions with more diversified economies tend to have better job-education matching (OECD, 2014), a diversity which Balochistan lacks outside Quetta.
- *TVET system weaknesses:* The technical education system suffers from misalignment with industry needs (Ahmed et al., 2023). Participants voice their concerns that technical and vocational training institutions operate with outdated curricula, insufficient engagement with employers, and limited job placement support. Training quality varies and often doesn't target the skills in local demand (Altaf & Shabir, 2024). As a result, even trained youth remain mismatched. The national TVET policy (2018) recognized these issues and proposed competency-based training and stronger public-private partnerships, but implementation lagged (ISSRA, 2023). Our findings of widespread horizontal mismatch and overkilling among trainees are symptomatic of these institutional gaps.
- *Information and career guidance failures:* Many youths (and their families) make educational or training decisions without accurate labour market information. This leads to oversupply in "popular" fields and undersupply in less known but needed skills. For instance,

a surge of graduates in general education or certain trades might be due to perceived prestige or lack of guidance, even if job prospects are poor. Achakzai (2023) highlighted that in Balochistan, youths often lack career counselling and networks, leading to unrealistic expectations or misinformed choices – which ultimately manifest as mismatch when reality hits.

- *Socio-cultural constraints:* Particularly for women (and to a degree for men), cultural norms limit what jobs are acceptable, which locations they can work in, and which trainings they can attend. These constraints cause a mismatch between aspiration and outcome. A woman may train as an engineer, but social barriers prevent her from working on-site, effectively wasting her qualification. Similarly, many men in rural areas may eschew certain jobs or are expected to join family businesses regardless of their training. Gender disparities we observed (high female mismatch) are rooted in these societal factors (Khan & Ali, 2024). Additionally, security concerns and tribal connections can influence hiring and posting, sometimes leading to people working in roles unrelated to their merit (anecdotal evidence from narrative responses).

In essence, mismatches persist in Balochistan due to a combination of demand-side shortages (few appropriate jobs), supply-side issues (education/training not aligned to jobs), and mediation failures (weak linkages and information flow).

RQ4: Reforms to reduce mismatch and enhance employability:

Building on the evidence, the study implies that an effective strategy must be holistic, tackling both the supply of skills and the demand for those skills, while removing barriers in between.

In conclusion, this research has demonstrated that Balochistan faces a pronounced challenge of educational and skill mismatches, which is contributing to suboptimal employment outcomes, especially for the youth and women. The province's situation exemplifies the broader problem in many developing regions: expanding education and training without corresponding economic development leads to a reservoir of underutilized talent. By systematically analyzing both macro data and micro survey evidence, we validated that mismatch is not only a theoretical concept but also a lived reality with economic consequences (lower wages, higher unemployment, wasted human capital). The study also underscored that the causes are multifaceted. Hence solutions must be comprehensive. Encouragingly, awareness of these issues is growing, and some steps are being taken (e.g. TVET reforms, donor-funded skills projects, etc.). What is needed is to accelerate and coordinate these efforts under a unified strategy to bridge the skill gap. As a pressing priority, aligning the TVET and education system with labour market needs (through curriculum reform, employer partnerships, and career services) will address the supply-side mismatch. Simultaneously, fostering job creation, including through private sector incentives and entrepreneurship, will tackle the demand-side gap. It must be ensured that women and marginalized groups are included in these initiatives, as they are currently the most mismatched.

If these measures are pursued with commitment, Balochistan can gradually move from a scenario of “skills waste” to one of productive employment. Reducing mismatch will not only improve individual livelihoods (via higher incomes and job satisfaction) but also contribute to overall economic growth – as more workers will be in roles where they can be fully productive. In essence, the province can start converting its youthful population and training investments into tangible economic gains, thereby breaking the cycle of educated unemployment and underemployment. This will require persistent policy effort and stakeholder collaboration (government, industry, academia, donors, and communities). The evidence provided by this study serves as a call to action for policymakers: the human capital is there – the task now is to utilize it effectively by closing the gap between education, skills, and jobs.

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