frontiers in Education

TYPE Original Research
PUBLISHED 26 May 2026
DOI 10.3389/feduc.2026.1738364

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OPEN ACCESS

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RECEIVED 03 November 2025
REVISED 16 April 2026
ACCEPTED 29 April 2026
PUBLISHED 26 May 2026

CITATION
Babadoğan MC, Ecer H, Hamsi-İmrol M, Görür DZ, Selvi K, Keser AD, Babadoğan B and Selvi U (2026) Challenges of skill shortage and skill mismatch in Türkiye under the shadow of migration: evidence from official statistics and sector representatives. Front. Educ. 11:1738364. doi: 10.3389/feduc.2026.1738364

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Challenges of skill shortage and skill mismatch in Türkiye under the shadow of migration: evidence from official statistics and sector representatives

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This study analyses the labour force, the challenges of skill shortages, and skill mismatch in Türkiye in the context of the country's economic conditions, education system, and immigration. Drawing on a comprehensive literature review and the analysis of statistical data from primary and secondary national and international sources in addition to a total of 37 interviews (19 company managers considering the top five sectors with labour shortages, 15 educational institution administrators, and 3 policy makers) from different regions of Türkiye, the research describes the current employment structure as well as the supply and demand for skills in the country. By making an in-depth thematic analysis in the interview records, the current employment structure, skill supply and demand profile in the country, and the impacts of immigration have been examined. Qualitative data gathered from different sources put forward that despite its high population and a large proportion of young people; Türkiye faces various obstacles to the effective use of this workforce. Factors contributing to this controversy include destabilization in the economy, the discrepancies between education and the labour market needs, and inadequate policies to closing the skill gap and the discrepancy between the supply and demand for skills in the country. Rapid developments in technology can also lead to mismatches in the skills of new graduates. Migration stands out as a factor that shapes Türkiye's employment market. A significant disadvantage for immigrations and emigrants is related to dequalification and deskilling. According to the interviews, stakeholders have contradictory evaluations regarding the skill demand and supply trends in Türkiye. While education providers consider the skills developed through their educational programs to be harmonious with the labour market and find the quality of on-the-job training provided by some businesses poor, sector representatives and policy makers state that there is a mismatch between the skills acquired in the vocational and technical education process and the demands of the sector. The desktop study supports the views of the latter group, with high skill mismatch rates. The sector is challenged with shortage of technical staff, and the highly skilled either work in low-skill jobs or go abroad resulting in brain drain. To conclude, undocumented immigrant labour is rather common in small-scale enterprises and is perceived as a factor in the

decrease of wages and increase in the unemployment of the native workforce. To tackle these problems, several policies, including education-sector collaboration to align skills, are being developed, and they may have positive impacts if they are successfully implemented.

KEYWORDS

education system, labor market, migration, skill mismatch, skill shortages

1 Introduction

Türkiye's geopolitical position, straddling Asia, the Middle East, and Europe, assigns it a pivotal role in international workforce and migration dynamics. This report examines the labour market in Türkiye in the context of the country's macroeconomic and socio-political developments, education system and skill matching, and Türkiye's status as a destination and origin country for migrants.

With a current population of over 85 million, Türkiye ranks 18th among 194 countries in population (TURKSTAT, 2024a). Türkiye boasts a youthful demographic, with an average age of 33 and two-thirds of its population in the working age group (15–64), making it one of the youngest nations among OECD countries (OECD, 2023a, p.14). Despite its large and youthful population, the country faces significant challenges in effectively utilizing its workforce and economic hardships. According to the World Bank Classification of Income Groups, Türkiye is categorized as a middle-income country (Kilic and Biffl, 2021), with the price GDP per capita in 2023 reported at 13,243 dollars (Ministry of Commerce, 2024). Fragility and recent challenges in the Turkish economy have contributed to the increase in problems related to effectively utilizing its workforce and the labour market dynamics. These challenges include major economic recessions in the last 25 years, the consumer price inflation reaching 72.3% in 2022, the depreciation of the Turkish Lira against foreign currencies, and the exit of many foreign companies following economic instability, all of which resulting in a rise in unemployment. These were coupled with an increase in living costs straining the domestic economy and diminishing the purchasing power of citizens. In addition, these financial difficulties were exacerbated by a prolonged influx of immigrants. It was reported that the number of immigrants was 4,043,215 as of April 2025 (Directorate of Migration Management [Göç İdaresi Başkanlığı], 2025). The struggle of the native working-age population to find stable employment has intensified since many immigrants' seeking employment in the country fell into informal labour. According to TURKSTAT [TÜİK] (2024b), the inactive workforce rate was 29.2% as of July 2024. Unemployment rates among women and young people, particularly the NEET, are notably higher. Immigrants, particularly those under temporary protection, have contributed to these challenges by providing cheap and often undocumented labour (Kalkınma Bakanlığı, 2018, p. 2). Informal employment aggravates the social and economic crisis and complicates the implementation of a national employment strategy. Stringent regulations for the labour market, high wage taxes, and unemployment insurance contributed to a rise in informal employment, particularly for small enterprises who wanted to avoid taxes and unemployment insurance schemes (OECD, 2023a).

There is also a significant mismatch between the skills provided by educational institutions and the needs of the labour market. Only 29.8% of vocational and technical high school graduates possess a good skill match compared to 59.4% of university graduates (Ege and Erdil, 2023, p. 777). Reports indicate that Türkiye lags in skill alignment, with approximately 30% of formally employed individuals being overqualified for their jobs (OECD, 2023a).

From the standpoints of the labour market, education, and migration dynamics in Türkiye, this paper aims at investigating the interrelationship between these three mechanisms through gathering stakeholders' opinions in order to guide future policies and develop strategic approaches in harmonizing these key areas (Figure 1).

This article is based on the report of "Work Package 3" of the Horizon Europe Project "Skill Partnerships for Sustainable and Just Migration Patterns (SKILLS4JUSTICE, 2024)." This work package aimed to explore the possibilities and areas for sustainable and mutually beneficial skill partnerships between origin and destination countries. Specifically, the research questions addressed in the Turkish context sought answers to the following research questions:

- What are the key skill shortages in relation to the demand for qualifications in the Turkish labour market?
- How do the current educational policies in Türkiye address skill formation and mitigate skill mismatch in the labour market, particularly in vocational and technical education, and what are the implications for economic growth and workforce development?
- What are the impacts of immigration and emigration on the labour market dynamics in Türkiye, particularly in terms of employment rates, wage levels, and skill availability among the work force?

Led by these research questions, the study consisted of a literature review of national and international resources, an analysis of statistics from primary and secondary resources, and interviews with labour market representatives, education providers, and policy makers. The study provides concrete and actionable insights for policy makers, company managers, and educators through its comprehensive and multi-stakeholder analysis. Policy makers can better identify the structural causes of skill mismatch and thus develop more targeted, coordinated, and long-term policies. Company managers gain valuable insights to more accurately assess skill gaps in the labour market, improve the quality of on-the-job training, invest in workforce skill development, and establish stronger collaborations with educational institutions. Educators, in turn, are able to better understand the gap between sectoral needs and current

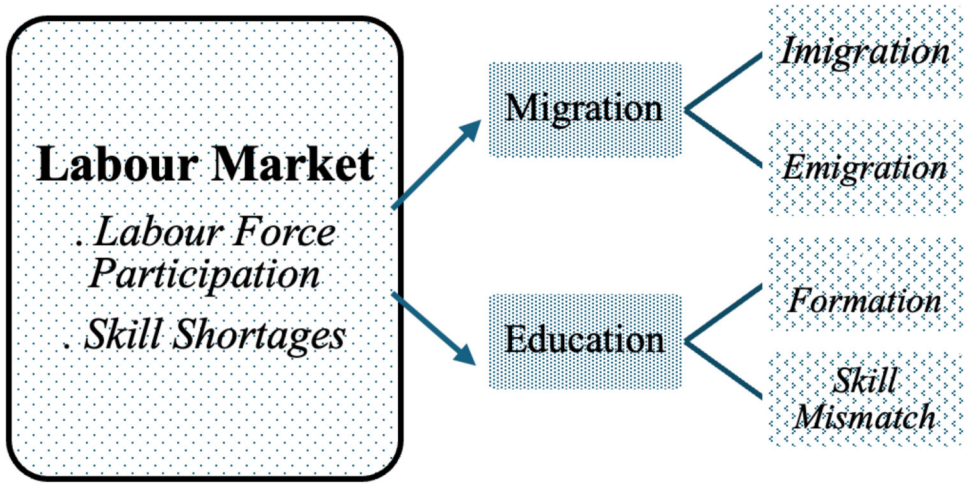


FIGURE 1
Key areas of research.

educational outcomes, enabling them to update curricula, strengthen practice-based learning, and focus on skills that enhance students' employability. In this respect, the study supports more informed decision-making among stakeholders and contributes to strengthening the alignment between education, employment, and the economy.

2 Theoretical background

This part of the paper outlines the review of the international and national literature and statistics from primary and secondary resources for the research with the aim of providing an outlook on the labour force and skill shortages, education with an emphasis on vocational education and skill matching, and migration patterns with their impacts on the labour market dynamics in Türkiye.

2.1 Labour force and skill shortages in Türkiye

Türkiye's economy and labour market demonstrate the characteristics of a developing country with high rates of unemployment and payments verging on minimum wages. In an analysis by Ayhan et al. (2023) on the dynamics of Türkiye's labour market covering non-financial companies and employees registered from 2006 to 2021, it was revealed that Türkiye's labour market is highly dynamic, with job reallocation rates ranging from 34% to 44%, which are similar to those of developing countries, and micro companies (up to 10 employees) dominate job creation and destruction.

The labour force participation rate in Türkiye is lower than that of European countries and ranks as the 148th among 186 countries. Over a decade between 2012 and 2021, the labour force increased with major distinctions evident between genders, male participation being almost double that of female labour force. Male labour force rose from 19,617 thousand in 2012 to 22,170 thousand in 2021, demonstrating a consistent upward trend. While the female labour force also saw growth, increasing from 8,404 thousand in 2012 to 8,679 thousand in 2021, it demonstrated a slower rate than that of males with a significant gap between male and female employment (OECD, 2023b). In 2024, the employment rate was 49.5%, with an estimation 66.9% for men and 32.5% for women (TURKSTAT, 2025). With an average of 54.2%, the labour force participation rate in 2024 was estimated 72.0% for men and 36.8% for women (TURKSTAT, 2025). Part-time employment accounted for 11.8% of total employment in 2012 and showed a slight decrease to 9% in 2021. The male share of part-time employment remained relatively low, indicating a preference for full-time positions. On the other hand, female part-time employment was more pronounced, rising from 24.2% in 2012 to 30.0% in 2021, suggesting an increasing trend towards part-time roles among women, possibly due to various socio-economic factors. Women are probably more involved in part-time work due to cultural and sociological factors such as taking care of the children and the elderly in families or doing housework.

Unemployment rates have fluctuated during the 2012–2021 period, reflecting broader economic conditions. With an inactivity rate of 29.2% in July 2024 (TURKSTAT 2024b), unemployment remains high in Türkiye. There is also a significant share of the population, particularly women and youth, who are not active in the labour market (OECD, 2023a, p.11). The youth unemployment rate in the 15–24 age group was 16.3% in 2024 (TURKSTAT, 2025). As a result, even though the labour force in Türkiye has expanded over the last decade with increasing participation from men and women, the disparities in unemployment and employment rates across gender and age groups remain a pressing issue. Although employment rate of the unemployed and the NEET decreased from 42% to 26% between 2008 and 2018 (OECD, 2020, p. 10), it remains high compared to OECD countries.

Türkiye's economy is mainly driven by the service sector. As shown in Figure 2, total employment in the service sector has been gradually increasing, reaching 57.9%, while the employment in the agriculture sector has been declining overall (TURKSTAT, 2025).

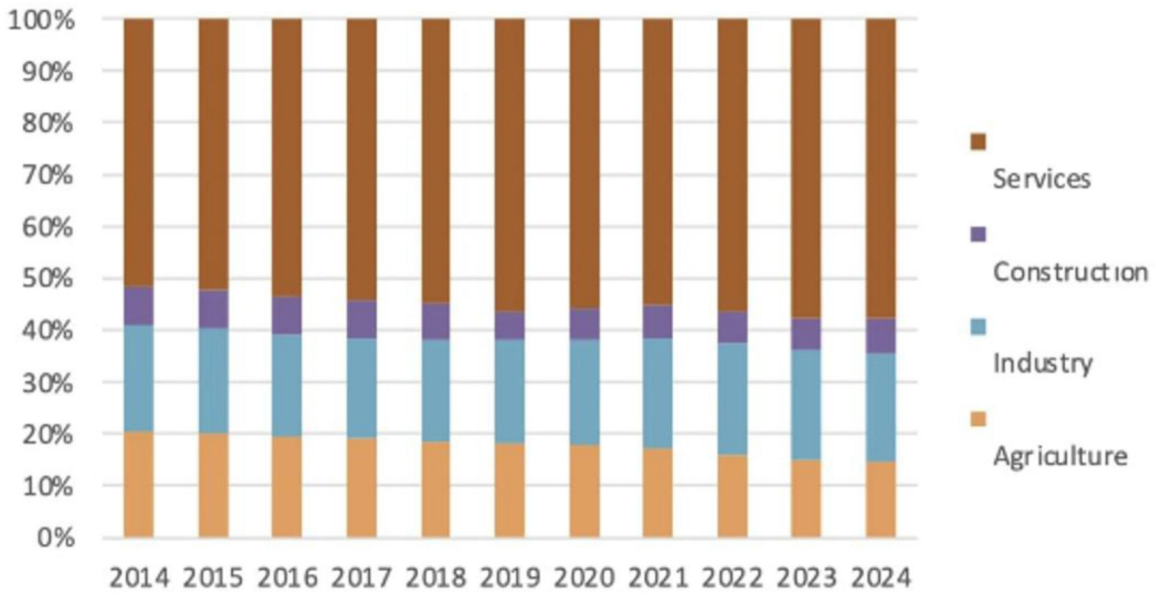


FIGURE 2
Employment rates by sector of Türkiye 2014–2024 (the ministry of environment, urbanisation, and climate change, 2024).

While ratio of the second most common sector of employment was similar for industry and agriculture in 2014 being approximately 20% for both, a significant overall decrease was observed in agriculture in 2024. This reflects a trend shifting from agriculture to service economy. According to the Ministry of Environment, Urbanisation, and Climate Change [Çevre, Şehircilik ve İklim Değişikliği Bakanlığı] (2024), the employment in the service sector has reached nearly to 56% based on TURKSTAT's Labour Force Statistics of 2022 data. Donat (2024) also reports that the agriculture sector is the only sector that is shrinking despite the 4.3% economic growth in Türkiye in 2023. He adds that other sectors had an increasing trend as the finance and insurance sector grew by 9.0%, construction by 7.8%, service by 6.4%, estate by 2.7%, and manufacturing by 0.8%.

The sectors with the highest number of paid employees are manufacturing, trade, administrative and support services, transportation and storage, and accommodation and food service activities according to Paid Employee Statistics by TURKSTAT (2024c).

Aydın (2024) evaluated wage inequality at the regional level in Türkiye using Gini, Theil and 90/10 rate wage inequality indices and determined that inequality has decreased from 2010 until 2018, but it started to increase slightly again after 2018. The percentage of the employees working with minimum wages and below (10% below and above) in selected sectors by considering data by the Turkish Republic Central Bank in 2023 is presented in Table 1 by DISK-AR (2023).

As reported by DISK-AR, the construction sector has the highest number of employees with payments around minimum wages by 71.4%. In the industry sector, the garment subsector has 70.5% of employees with minimum wage followed by leather goods production. Wholesale and retail in the services sector receives minimum wages the most. About half of the manufacturing, textile, furniture, and transportation and storage employees receive wages around the minimum wage

TABLE 1 Percentage of employees working with minimum wages and below.

Sector	Percentage of employees with minimum wage and below
Non-agricultural sector	43.1
Industry	50.4
Manufacturing	52.0
Textile	57.4
Garment	70.5
Leather	69.7
Furniture	57.8
Petroleum	19.9
Vehicle	26.3
Other transportation	19.6
Construction	71.4
Services	37.9
Wholesale and retail	64.4
Transportation and storage	47.3
Accommodation and food services	73.0
Public administration	5.8
Education	10.1
Finance and insurance	13.3

Source: Calculated by the Turkish Republic Central Bank, cited in DISK-AR (2023, p. 37).

According to TURKSTAT (2024b), when the distribution of employment rates for those over 15 years of age between 2014 and 2023 is examined, it is seen that as the level of educational attainment increases, the rate of employment is rising only

slightly in favour of university graduates (Figure 3). This reveals that the upper secondary level high school equivalent vocational schools are highly competitive against higher education in terms of employment rates, still with an overwhelmingly predominant male employment in the Turkish labour market.

As far as unemployment rates of young adults between the ages of 25–34 is concerned, higher education graduation does not make a significant difference, and while unemployment rates decrease as the level of education increases in the average of OECD countries, there is no such strong relationship in Türkiye (TEDMEM, 2023). In Türkiye, unemployment rates are 12.7% for higher education graduates, 12.1% for upper secondary education graduates, and 12.8% for those who do not even have secondary education (OECD, 2023a). This finding indicates that higher education is fading into insignificance under the circumstances of high unemployment conditions and imbalanced wage policies.

An analysis of skill shortages revealed that more than 80% of employers in Türkiye face difficulty in filling vacant positions, especially in middle-level skills and blue-collar jobs (OECD 2023a, p.102). The sectors with highest labour shortage require skills below higher education and can be acquired through VET courses. Based on İŞKUR (2023a), the sectors that currently suffer labour shortage are shown in Table 2.

As demonstrated in Table 2, there has been labour shortage in the textile industry, construction, welding, and service staff over the past five years between 2019 and 2023. The top five professions with skills gaps specified above are compared against the reasons in Table 3.

Table 3 showcases that the textile industry lacks employees due to all main reasons, namely lack of applications, dissatisfaction with the work environment and conditions, lack of necessary professional skills, and lack of personnel with work experience. Dissatisfaction with working environment also includes low payments. To fill the skill gaps in the textile and construction sectors, immigrants are often employed undocumented with minimum wages.

When the qualifications, skills expected, and job search methods are compared, differences are observed as the education level increases. The skill expectations of the labour market compared to education levels are demonstrated in Table 4.

The professions with shortages that require higher education mostly demand programming language, digital skills, analytical thinking, and foreign language skills. The skill demands for upper secondary education level vocational education graduates

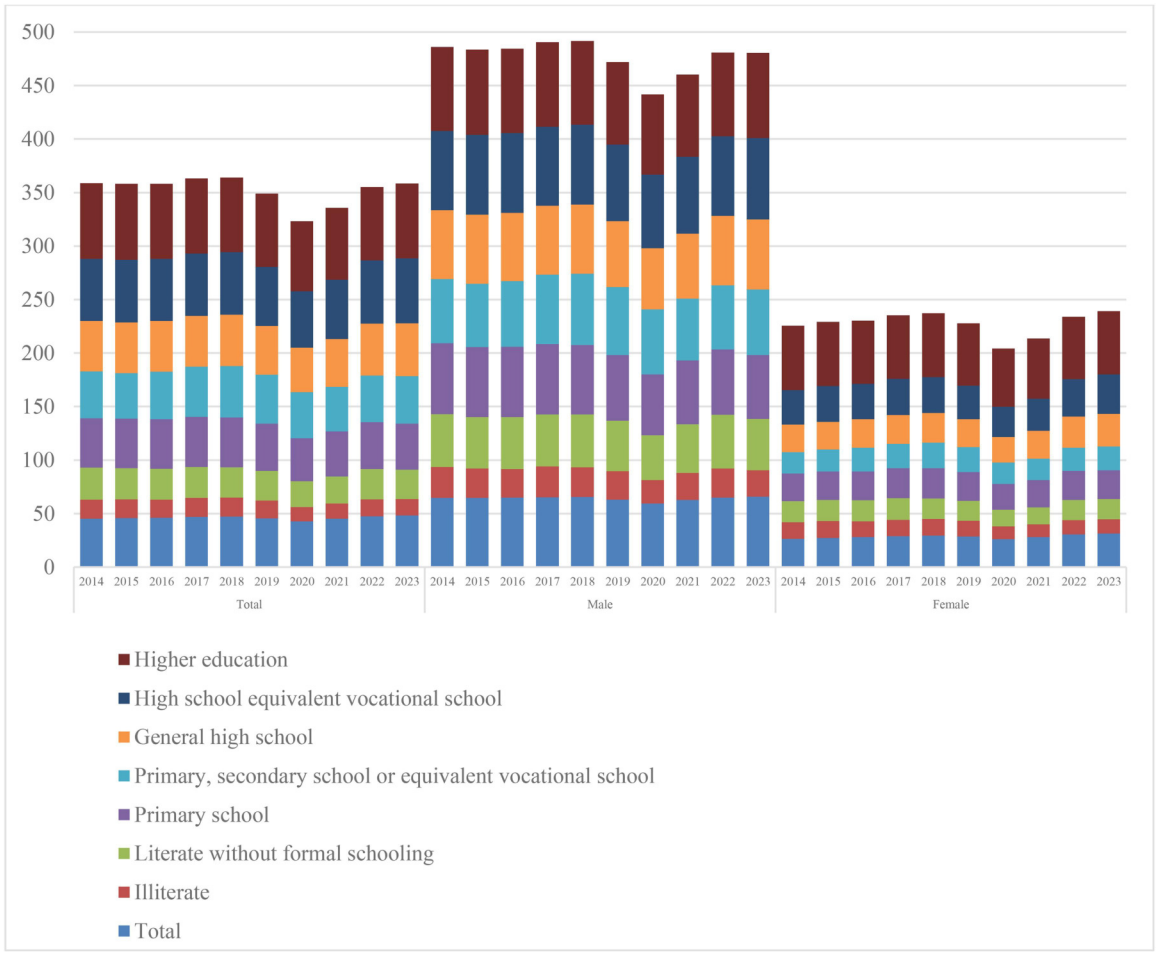


FIGURE 3
Employment rates by educational attainment and gender 2014–2023.

TABLE 2 The top five professions with labour shortage in Türkiye in the last five years.

	2019	2020	2021	2022	2023
1	Sewing machine operator (Textile)	Sewing machine operator (Textile)	Sewing machine operator (Textile)	Sewing machine operator (Textile)	Sewing machine operator (Textile)
2	Waiter/Waitress	Waiter/Waitress	Housekeeper	Waiter/Waitress	Waiter/Waitress
3	Sales consultant/ expert	Manufacturing worker	Model machine operator (Weaving, clothing, and home textile)	Weaving and apparel machine operator	Wooden furniture carpenter
4	Chef	Garment worker	Waiter/waitress (service staff)	Sales Consultant/Expert	Gas welder
5	Salesman	Straight stitcher (Textile)	MIG MAG Welder	Construction worker	Construction worker

Source: İŞKUR (2023a).

TABLE 3 Reasons for labour shortage in the top five professions in Türkiye.

	Lack of enough applications	Dissatisfaction with working environment and conditions	Lack of necessary professional skills	Lack of personnel with sufficient work experience
1	Sewing machine operator	Sewing machine operator	Sewing machine operator	Waiter/Waitress
2	Waiter/Waitress	Olive oil production staff	Wooden furniture carpenter	Sewing machine operator
3	Construction worker	Gas welder	Waiter/Waitress	Gas welder
4	Sales consultant/expert	Steel welder	Gas welder	TIR truck driver
5	Cold blacksmith	Waiter/Waitress	Sales consultant/expert	Steel welder

Source: İŞKUR (2023a).

TABLE 4 Education level, skill, and job search channel relationship in vacant jobs.

Education Level	Requested Skill 1	Requested Skill 2	Search Channel 1	Search Channel 2
Postgraduate	Foreign language	Programming language information	Private recruitment offices	Social media/online job boards
Undergraduate	Analytical thinking	Foreign language	Private employment offices	Social media/online job boards
Vocational school (associate degree, HE)	Digital skills	Analytical thinking	Social media/online job boards	Private recruitment offices
Technical Vocational High School	Sufficient professional/technical knowledge	Problem-solving and ability to take initiative	Traditional media	İŞKUR
General High School	Communication and expression ability	Persuasion ability and marketing power	Social media/online job boards	Employee referrals
Apprenticeship	Communication and expression ability	Physical sufficiency	İŞKUR	Traditional media
Below High School	Work experience	Sufficient professional/technical knowledge	Personal relationships with relatives	İŞKUR
Any Education Level	Work experience	Teamwork	Personal relationships with relatives	İŞKUR

Source: İŞKUR (2023b).

are required to have sufficient professional technical knowledge and problem-solving abilities along with ability to take initiatives. Professional groups with education levels of general high schools or lower demand work experience, teamwork, and physical and bodily competence in the first place. The job search channels also differ as the level of education increases with an inclination towards private employment offices at higher education compared to İŞKUR, the official employment agency in Türkiye, at lower education levels.

Currently, digitalization and robotization in Türkiye have two main reflections on the labour market. While the level of digitalization is fragmented and insufficient, a considerable number of jobs are at the risk of automation. According to a report on the industrial revolution and systems technology

roadmap, Türkiye's industry is positioned between Industry 2.0 and Industry 3.0. The sectors with the highest level of readiness include materials, computers, electronic and optical products, automotive, and white goods. The report also indicates that only 22% of the surveyed industries have detailed knowledge of smart production systems, and about half may be able to integrate automation and cyber-physical system technologies in the coming years (TÜBİTAK, 2017, p. 4). Furthermore, exports from Türkiye are among the least technology-intensive in OECD countries, highlighting the need to increase.

R&D expenditures. Approximately 50% of companies have web sites, only a quarter of the labour force uses computers with internet access, compared to the 55% in OECD countries. In addition, the share of jobs at risk of automation is among the highest in OECD (OECD, 2023a).

Despite the high level of unemployment, low wages, and unfavourable work conditions in some sectors, the share of enrolment in trade unions and professional organizations in Türkiye is considerably low. According to the 'Statistics on the Number of Workers in Business Lines' and the "Number of Members of Unions of the Ministry of Labour and Social Security," the rate of workers registered in unions between 2015 and 2024 varies between 10.65% and 15.22% (Ministry of Labour and Social Security, 2024). Research by the Confederation of Revolutionary Trade Unions of Türkiye (DISK) on unions covering the years 2013–2019 points out that the problems in Türkiye include a low rate of unionization, low collective labour agreement coverage, less unionization of women, and the dropped rate of strikes (DISK, 2019, p. 3–5).

To summarize the labour market profile in relation to macroeconomic conditions, as a country with a developing economy dominated with small businesses and occasional financial distress, Türkiye's labour market faces challenges in terms of a low level of labour force participation, especially in terms of women and the NEET. Most of the labour force is employed in service sectors with increasingly less engagement in the agriculture sector. The wage inequality and minimum wage policy becomes more complicated with the decreasing value of holding a higher education degree. The sectors with the highest labour shortages include mostly middle-level skills and blue-collar jobs, especially in manufacturing (e.g., textile), construction, operations, and logistics, usually due to lack of professional skills, insufficient work experience, or unfavourable work conditions. Undocumented work by immigrants negatively affects the employment conditions.

2.2 Education system and skill mismatch in Türkiye

In higher education institutions (HEIs), vocational and undergraduate education are delivered through formal, secondary, distance, and open education programs. At HEIs, along with 4-year BA studies, 2-year associate degree programs are offered which aim at vocational training (OECD, 2018 as cited in OECD, 2020). The number of students in HEIs in 2023–2024 are shown in Table 5.

In 2024, approximately 40% of the students were enrolled in vocational schools (2-year associate degree), while about 53% of them were studying in BA programs. Nearly 8% of the students were registered in graduate programs. Of the 7,081,289 HEI students, approximately 52% were female and 48% were male. Despite the increase in the number of students at HEIs, the average in Türkiye is still below the OECD level, and nearly half of the 25–64 year-olds graduated from school's below upper secondary level. According to the "Education at a Glance" report by the OECD (2023c, p. 42), the educational attainment of 25–64 year-olds in Türkiye in 2022 (below upper secondary: 53%; upper secondary or post-secondary non-tertiary: 22%; tertiary: 25%) was lower compared to the OECD average (below

TABLE 5 Summary of number of students in HEIs, 2023–2024.

Academic Degree Level	Male students	Female students	Total number of students	Total % in the type of degree
Associate degree (vocational training)	1.327.912	1.494.714	2.822.626	39.86
Formal education	501.711	450.313	952.024	
Secondary education	99.541	76.668	176.209	
Distance education	19.999	16.994	36.993	
Open education	706.661	950.739	1.657.400	
Undergraduate (BA)	1.803.511	1.936. 660	3.740.171	52.82
Formal education	1.103.070	1.217.334	2.320.404	
Secondary education	122.488	87.659	210.147	
Distance education	13.694	17.397	31.091	
Open education	564.259	614.270	1.178.529	
Master's	210.273	199.286	409.559	5.78
Doctorate	54.071	54.862	108.933	1.54
Total	3.395.767	3.685.522	7.081.289	
Total %	47.94	52.05		100.00

Source: Author's compilation using Higher Education Information Management System (2024).

upper secondary: 20%; upper secondary or post-secondary non-tertiary: 40%; tertiary: 40%).

The OECD "Education Policy Outlook in Turkey" (2020) reports that the employment rate for university graduates has decreased by 6% within the past decade, with women affected more, while the employment rates for graduates below upper secondary education have increased. The undergraduate program with the highest rate of employment was special education teaching with 96.0% of employment according to TURKSTAT (2023a). This was followed by medical faculties (94.3%), electrics teaching (91.3%), electronics teaching (90.6%), automotive teaching (90.1%), computer teaching (89.9%), computer systems teaching (89.6%), midwifery (89.6%), nursing (89.1%), and metal teaching (88.6%). On the other hand, there is an oversupply of tertiary graduates, and the relative earnings are decreasing in 25–64 year-old tertiary graduates compared to non-tertiary graduates (OECD, 2023a).

To complicate the issue of unemployment, skill mismatch is significantly higher in Türkiye compared to the OECD average (OECD, 2023a). Apart from the fact that the level of educational attainment is still low in Türkiye with around 40% of young people not completing upper secondary education (OECD, 2023a, p. 11), many university graduates reconcile, at least temporarily, to work in medium- or low-level skills, which leads to over skilling and overeducation due to the high level of unemployment. The qualification mismatch problem is predominantly "overqualification" in Türkiye with a high degree of percentage difference in wages between qualified workers and their well-matched counterparts, that is, same qualifications with well-matched jobs.

The mismatch problem seems to have roots at education levels below higher education. Figure 4 demonstrates the results of a survey by TURKSAT in 2016 (cited in Vocational and Technical Education General Directorate, 2022, p. 10). When the graduates at all education levels were asked about the extent to which schools contributed to their work life, the satisfaction with education decreased in parallel to the level of education. When general and vocational upper-secondary schools were compared, those who received vocational and technical education were more positive about the contribution of their education to their work life. The figure suggests that most curriculum content seems irrelevant or too theoretical to meet the labour market needs as the level of education decreases.

Recently, vocational and technical education is gaining popularity due to increased employability and demand for blue-collar workers from EC countries. The labour force statistics by TURKSTAT reveal that upper secondary level vocational and technical education fields are advantageous in labour force participation (Vocational and Technical Education General Directorate, 2022, p. 9). Table 6 displays that the employment rate and labour force participation of vocational and technical upper secondary graduates are relatively competitive against higher education graduates while the unemployment rate is similar at all levels.

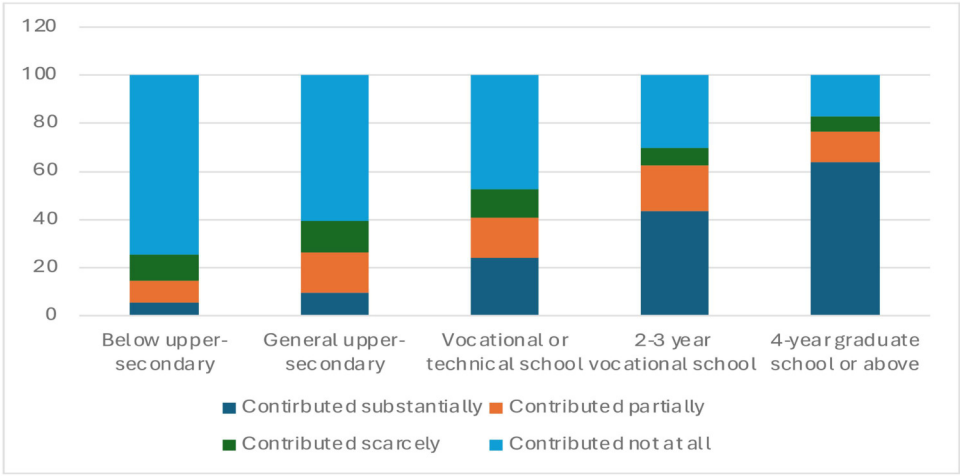


FIGURE 4
Belief of contribution of education to work life.

TABLE 6 Labour force participation, employment, and unemployment rates by education level.

Education level	Labour force participation rate	Employment rate	Unemployment rate
Below upper secondary	45.6	40.5	11.2
Upper secondary	52.0	44.7	14.1
Vocational and technical upper secondary	64.0	55.7	12.9
Higher education	76.5	67.0	12.4

Source: TURKSAT, İş Gücü İstatistikleri [Labour Force Statistics], 2021-Yearly cited in Vocational and Technical Education General Directorate (2022, p. 9).

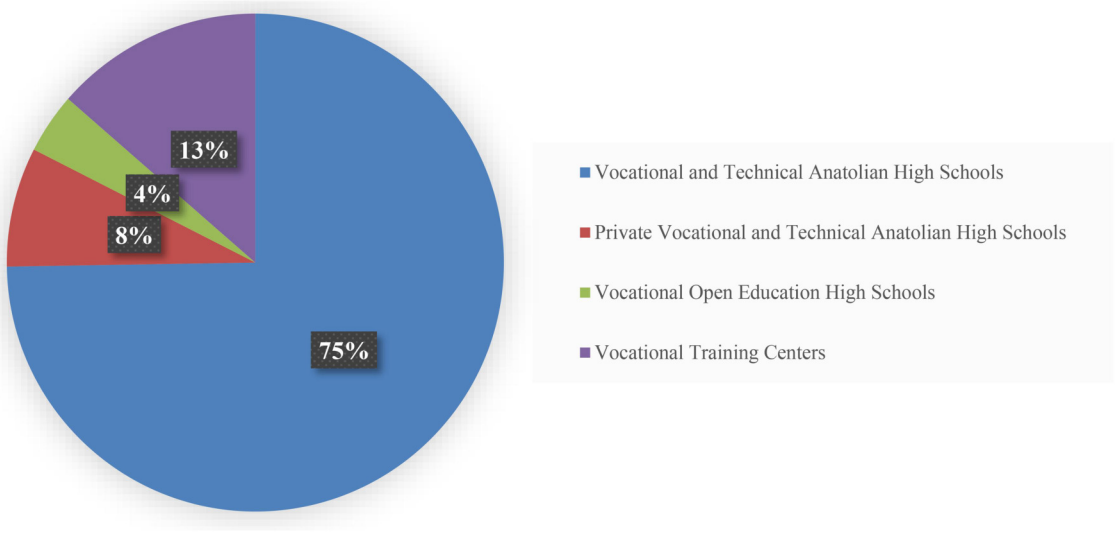


FIGURE 5
The number of learners registered to the VET institutions in 2024 *(made by the author using data in vocational education Map of Türkiye)*.

Vocational and technical education is delivered in public and private upper secondary schools (vocational high schools) at pre-tertiary levels, and in vocational schools, high schools, faculties, and institutes in HEIs. Regarding non-formal education, various technical and vocational courses are organized by public and private institutions and lifelong learning institutions under the supervision of the Ministry of National Education – MoNE (Mesleki ve Teknik Eğitim Genel Müdürlüğü, 2024, p. 15).

The types of formal initial vocational and technical training (IVET) schools at pre- tertiary, upper secondary level are as follows (Mesleki ve Teknik Eğitim Genel Müdürlüğü, 2024, p. 16):

- vocational and technical Anatolian high schools (VTAHs)
- multi-program Anatolian high schools
- vocational open education high schools
- special education vocational high schools
- special education practice schools for individuals with special education needs.

In addition, there are vocational training centres (MESEMs) which are available for secondary school graduates, for those who dropped out of or graduated from any upper secondary schools, university graduates, and for those who work in a workplace without any age limit (Mesleki ve Teknik Eğitim Genel Müdürlüğü, 2024, p. 16). In 2024, the percentage of learners registered to the VET institutions are presented in Figure 5.

The highest number of students are found in VTAHs followed by vocational training centres, whereas vocational open education high schools are the least preferred. According to the report by the General Directorate of Vocational and Technical Education (2024), the largest number of student enrolment is in electrical and electronics technology, followed by information technologies, health services, and child development and education programs (Table 7). In contrast, programs with the lowest number of students are mining technology, metallurgical technology, firefighting and fire safety, laboratory services, and plastic arts.

Within the scope of the MoNE, Vocational Training Centres (MESEMs) are included into the face-to-face and compulsory education. Individuals above the age of 14 may enrol to these intensively work-based centres after graduating from lower-secondary schools at any education level. Table 8 shows the total course hours in these centres.

As shown in Table 8, a substantial ratio at 76% of the course hours are allocated to practice in businesses with an additional 13% of vocational course hours at MESEMs. These vocational training centres are particularly appealing to students with lower academic ambitions or even those who have university diplomas but want to re-train for a vocation.

In contrast to the popularity of IVET, continuous vocational education and training (CVET) is insufficient in Türkiye. In a study conducted by SETA (2012) regarding vocational training provided to employees in the workplace, it has been found that more than half of the companies participating in the study (68.1%) had training available for employees within the last year while in 31.9% of the companies, there was no training organized. When the in-service training given to current employees within the last year was examined according to the size of the companies, it was seen that the rate of companies organizing training increased as the company size grew. In their last year, only 31.9% of micro-scale companies offered training for their current employees compared to 79.6% of large-scale companies.

In 2023, vocational courses that attracted the highest number of learners are presented in Figure 6.

According to Figure 6, courses for assembly workers, corporate resource planning experts, train machinists, system and network analysts (predominantly male trainees in the latter three), and metal surface painters were the top five courses in demand, followed by band welders and sewing machine operators among those with trainees above 100 participants.

From the standpoint of vocational education, skill mismatch is still a controversial issue between educational institutions and the sector. While schools send graduates who they consider

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TABLE 7 Most and least preferred programs by vocational technical high school students in 2024.

Most preferred 15 programs	Number of students	Least preferred 15 programs	Number of students
Electrical-Electronic Technology	173.386	Biomedical Device Technologies	4.975
Information Technologies	163.976	Radio-Television	4.732
Health Services	140.615	Aircraft Maintenance	4.047
Child Development and Education	100.841	Printing Technology	4.017
Accounting and Finance	94.397	Animal Husbandry and Health	3.870
Beauty Services	7.444	Family And Consumer Services	3.480
Motor Vehicle Technology	72.267	Rail Systems Technology	3.373
Metal Technology	44.515	Shipbuilding	3.153
Furniture and Interior Design	40.584	Plastic Technology	2.789
Fashion Design Technologies	35.394	Journalism	2.065
Office Administrative Assistant	32.476	Plastic Arts	1.854
Plumbing Technology-Air Conditioning	27.961	Laboratory Services	1.740
Justice	27.412	Firefighting and Fire Safety	1.697
Graphics and Photography	23.366	Metallurgical Technology	1.079
Chemistry	20.544	Mining Technology	588

Source: General Directorate of Vocational and Technical Education (2024).

TABLE 8 Course hours in MESEMs.

Couse hours	Total	Ratio (%)
Basic academic course hours	684	11
Vocational course hours	756	13
Course hours in businesses	4.608	76
Total	6.048	100

Source: Mesleki ve Teknik Eğitim Genel Müdürlüğü (2024).

successful to the market as labour force, the sector finds them inadequate in terms of the required skills. Only 29.8% of vocational and technical high school graduates has a good skill match compared to 59.4% of university graduates, and the total skill match of vocational high school and HEI graduates working in Türkiye was 50.4% on average, that is, half of them worked in jobs that did not match their skills (Ege and Erdil, 2023, p. 777).

Employment policies are one of the sources of the problem since skill match is often ignored without making necessary skill examinations in order not to increase expenses. In this case, the sector creates its own bottleneck leading to new skill incompatibilities. In addition, the degree of education-sector collaboration is still not at the desired level. Strengthening the relationship between the sector and educational institutions and developing new practices that will enable students to establish strong ties with the sector will be effective in reducing youth unemployment. Participation of all stakeholders is needed in the solution of problems, and functional solutions such as supporting youth with appropriate employment policies including consultancy, mentoring, referral to expert support, personalized education, and job placement (Görmüş, 2024, p. 422) are necessary. Ege and Erdil (2023, p. 780) put forward the following:

The first policy recommendation could be to balance the supply of graduates by focusing on the highest priority fields of study, where both field mismatch and full mismatch rates are the highest. The second policy recommendation could focus on improving the efficiency of the labour market mechanism by taking into account the labour market needs and technological developments. The third policy recommendation could aim to increase the reasonable employment of vocational and technical education graduates at both high school and the associate degree level. … The fourth policy recommendation could focus on increasing the awareness of high school students about occupations/professions and improving the job seeking skills of senior students in both high schools and universities.

A third factor in skill alignment is that while businesses strive to implement technological developments in the sector, they ought to consider skill matching. If the sector maintains its workflow without renewing existing technologies, further problems may arise concerning new products and markets since technological change and innovation will trigger skill mismatch or skill shortage. On the other hand, Gökbayrak and Çalışır (2024, p. 245) state that while digital transformation leads to the emergence of new professions, it also increases the need for new skills in the existing workforce. Therefore, regular updating of education curricula and constant training of the employees become essential in meeting the labour market needs while the labour market is also compelled to update their technology to compete with the global market.

As a qualifications policy in the technical and vocational education and training (TVET), Türkiye implements the National Vocational Qualifications System (NVQS) by the VQA (European Commission, 2023, p. 107). To establish a market-oriented education system, the level of harmony between the demand for skills in the labour market and the supply in the education and training system can be achieved by updating the qualification framework determined by the VQA in cooperation with educational institutions and the sector. In addition, accreditation of vocational and technical education institutions according to the qualification framework will contribute to the solution of skill mismatches.

Additionally, another factor affecting skill mismatch in Türkiye has been the wave of migration from Syria since 2012. There is a concern that the skills of the immigrants are not properly verified. Since their skill determination is mostly based on verbal declaration, there are serious issues in determining whether the skill is clearly possessed and to what extent.

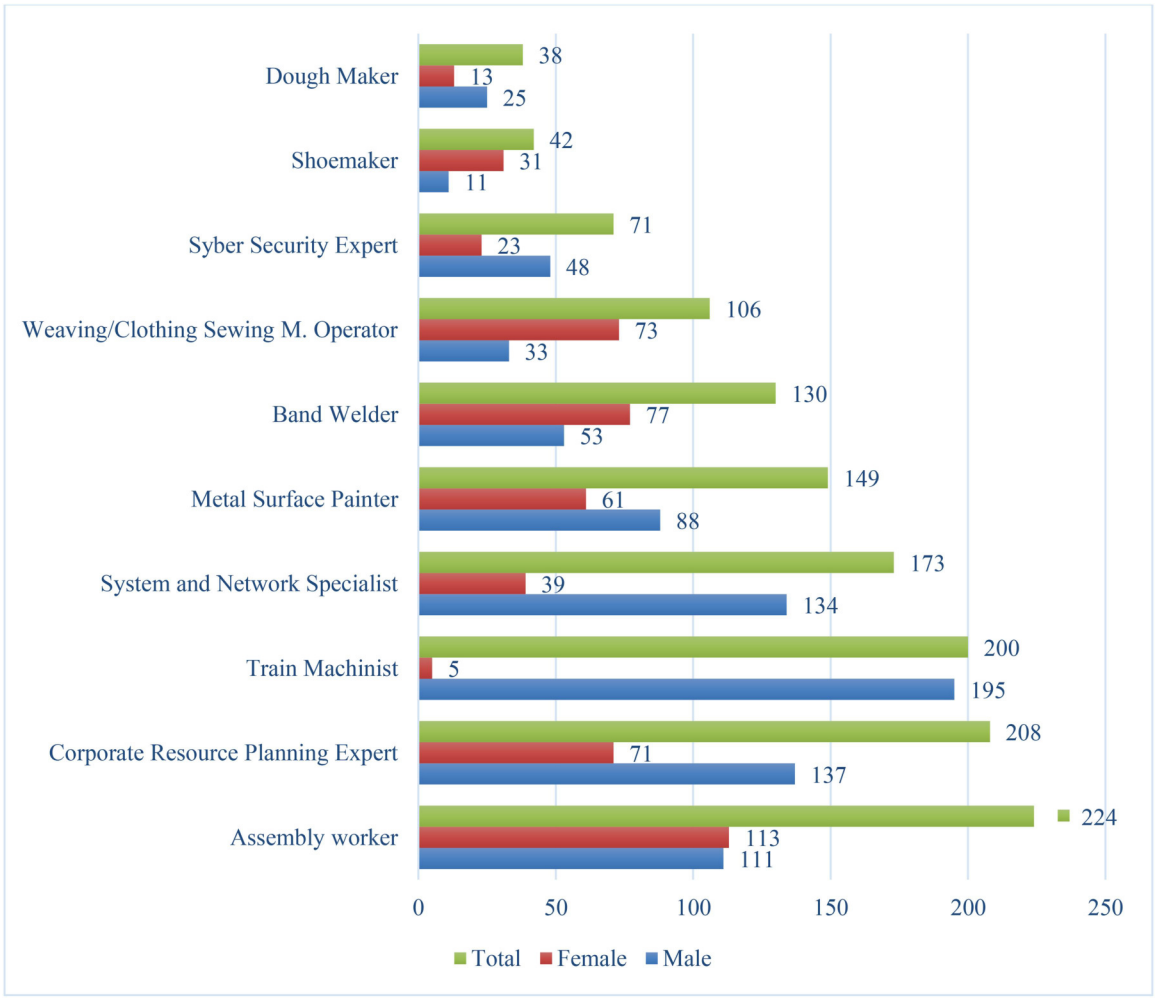


FIGURE 6
Vocational courses with highest number of attendances in 2023 *(Top 10)*.

To summarize the education outlook and labour force relationship in Türkiye, the overall education attainment is still low with a 53% of the 25–64 year-olds having education below upper secondary level. The gender participation in education is almost equal at non-tertiary and tertiary levels, but female employment is almost half the size of male employment. Despite the fact that the rate of university graduates is below the OECD average (20% compared to 40%, respectively), the number of university graduates is considered superfluous. While many university degree holders are employed at jobs that do not match their field of training, mostly being "over skilled", their salaries are decreasing. On the other hand, educational curriculum content and labour market skills alignment is still a problem especially in lower levels and non-vocational types of education as put forward by graduates who are working in sectors. Education seems to be theoretical-based and needs more adequate match with the labour market. Vocational education and training are increasingly in demand by the labour market, and the employment rates and salaries are becoming highly competitive against higher education, impairing its value. Information technologies, health services, and child development and education are particularly preferred by initial vocational education and training students, while continuous vocational education and training courses for assembly workers, corporate resource planning experts, train machinists, system and network analysts (predominantly male trainees in the latter three), and metal surface painters are in demand in business life. Businesses, especially small enterprises, need to offer more in-service training to their employees, and they need to adapt to technological changes both in terms of their infrastructure, and in terms of updating the skills of their workers. In addition, although there are efforts towards education-sector cooperation, a great deal remains to be done for both sides at all education levels. Finally, it is necessary to develop better measures and policies in the recognition of skills and education of the immigrants.

2.3 Migration movements in Türkiye and their impacts on the labour market

When looking at the phenomenon of migration from Türkiye's perspective, there are three aspects on migration that come to the fore. The first phenomenon is the internal

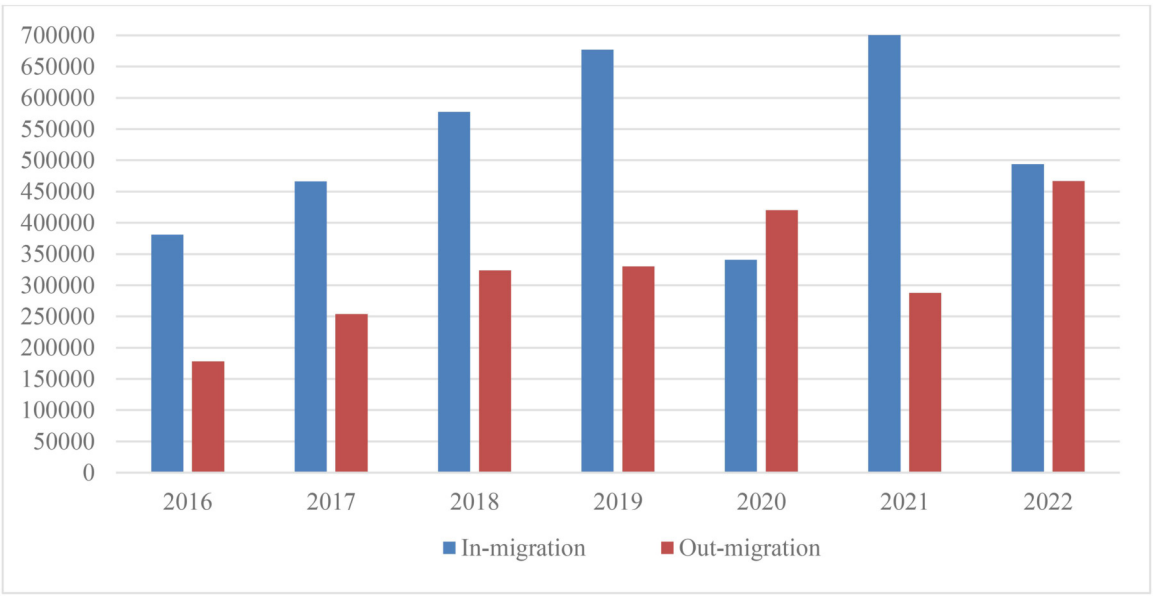


FIGURE 7
Migration to and from Türkiye by age group and gender, 2016–2022.

migration caused by the earthquake on February 6, 2023. An area of approximately the size of Germany was affected by the earthquake. More than 15.6 million people, accounting for nearly 16% of Türkiye's population, including 1.5 million Syrian refugees were reported to be impacted, and the disaster resulted in the deaths of over 50,000 people, with approximately 107,000 injuries (ILO, 2023). According to the May 2023 data of the Social Security Institution, the number of paid employees in the earthquake region decreased by 23.6% (approximately 446,000), whereas the number of workplaces decreased by approximately 30.2% (more than 66.000) (TEPAV, 2023, p. 1). A shortage occurred especially in the packaging, textile, construction, and agriculture sectors (TEPAV, 2023, p. 2).

As a second migration phenomenon, there has also been an increase in the rate of migration from Türkiye to other countries. According to TURKSTAT (2023b), the number of people migrating from Türkiye in 2023 increased by 53% compared to the previous year and reached 714,579. Türkiye's migration abroad consists of mostly qualified labour leading to brain drain and employment gaps (Figure 7).

As can be seen in Figure 7, the number of received immigrants was higher than the number of emigrants leaving Türkiye until 2022. However, in 2022, immigration and emigration rates nearly equalled. Increasingly more people at the ages of 20–39 left Türkiye recently, which indicates that the country has been losing its young labour force. In 2023, the number of people migrating abroad from Türkiye rose by 53% compared to the previous year.

According to TURKSTAT, the training fields with most brain drain in 2023 were information and communication technologies (6.8%), engineering, manufacturing, and construction (4.4%), and natural sciences, mathematics, and statistics (2.6%). In terms of departments, the undergraduate programs with highest brain drain were molecular biology and genetics (17.9%), bioengineering (10.2%), business engineering (9.8%), electronics engineering (9.1%), mathematics engineering (8.9%), and computer engineering (8.4%). The top five countries immigrated to are the United States (21.4%), Germany (17.5%), the United Kingdom (11.2%), the Netherlands (6.9%) and Canada (4.9%) (TURKSAT, 2024e).

The largest "Youth Research" conducted by Yeditepe University and MAK Consulting Center for Social Research with the 18–29 age group in 2020 demonstrated that 76% of the participants want to live abroad for a better future, but 14% said if they had the same conditions in Türkiye, they would not leave the country (Cumhuriyet, 2020; Yeditepe University, 2020). In 2023, the foreign nationals emigrating from Türkiye were Russian citizens (17%) followed by Iraq (15.7%), Afghanistan (8.3%), Iran (6.5%) and Turkmenistan (4.9%) (TURKSTAT, 2024d).

The third and most pressing phenomenon about migration is related to immigrants who come to Türkiye from other countries. The majority of Türkiye's refugee population is from the Syrian Arab Republic. The participation of migrants, refugees, and those under temporary protection in the labour force in Türkiye is perceived to cause problems, some of which are summarized in Figure 8.

Türkiye has been receiving both regular and irregular migration not only from neighbouring countries with historical ties where Turkish people live (e.g., Greece, Bosnia, Bulgaria, Kosovo, Romania, and North Macedonia), but also from Middle Eastern, Asian, African, and European countries. The largest populations of migrants are from countries with internal conflicts or wars such as Syria, followed by Afghanistan, Iraq, and Iran. In addition, more than 400,000 Ukrainians arrived in the country to seek refuge due to war in 2022 (Regional Refugee and Resilience Plan, 2023, p. 5).

Türkiye is reported to host 3,9 million migrants and refugees, 90% of whom are Syrians who are subject to temporary protection

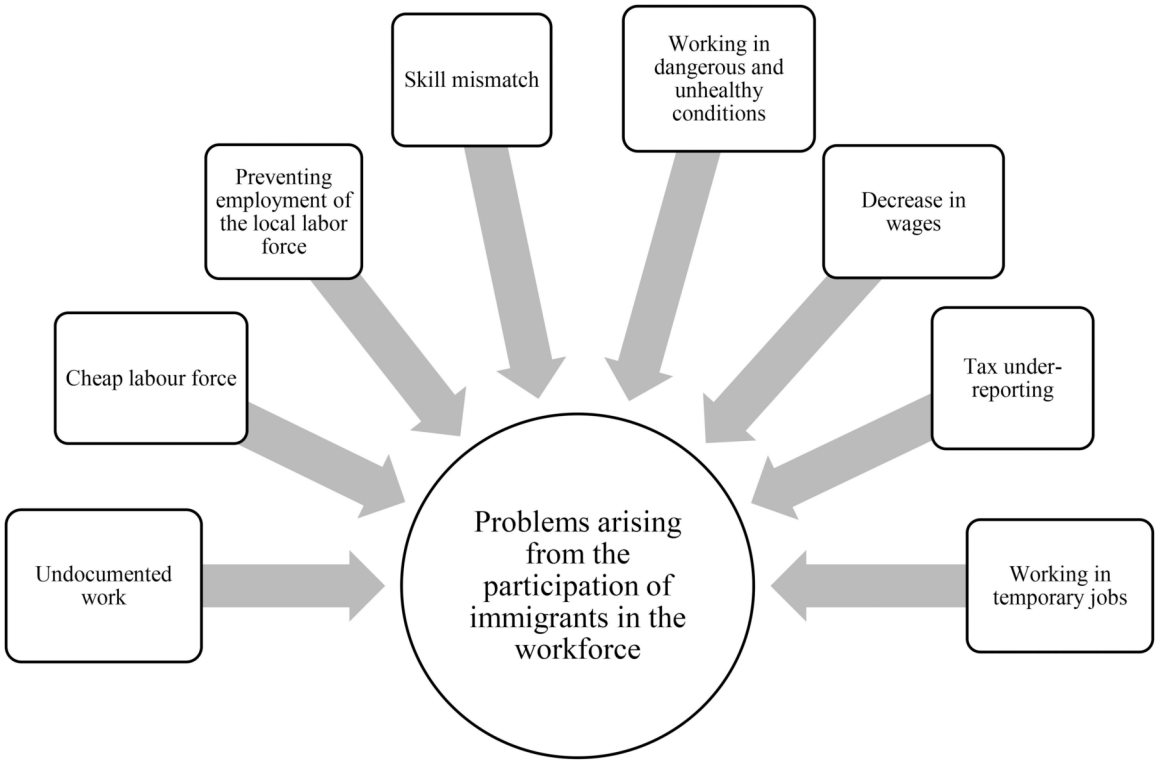


FIGURE 8
Problems that might be caused by immigrants' labour force participation in Türkiye.

TABLE 9 Distribution of immigrants in Türkiye by country in 2019.

Country	Number of immigrants
Syria	3.600.000
Afghanistan	170.000
Iraq	142.000
Iran	39.000
Somalia	5.700
Other	11.700

Source: Görür (2021) based on 2019 UNHCR data.

regulations (IOM Türkiye, 2024). The distribution of the largest numbers of immigrants as of 2019 by country is presented in Table 9.

Some immigrant groups in Türkiye, particularly 40% of Syrian refuges, want to move to another country due to reasons such as the reversal of the economic boom in the 2000s (Imrie-Kuzu and Özerdem, 2023, Sirkeci and Esipova, 2013). The most important reason is the precarious legal status of "temporary protection" of the refugees, which prevents them to gain access to some local rights and move legally to European countries. As Imrie-Kuzu and Özerdem (2023) point out, Türkiye signed the 1951 Geneva Convention and its 1967 Additional Protocol on the status of refugees, which grants asylum rights to Europeans only. While the 2013 Law on Foreigners and International Protection did not change the geographic limitations, Syrians were permitted to stay in Türkiye for indefinite periods but without the rights of refugees. Türkiye also issued the Temporary Protection Regulation in 2014 as a framework of the rights and obligations for migrants under temporary protection (UNHCR, 2024). However, the laws did not guarantee Syrians social security, health services, education, or employment rights, and these were provided to them as a gesture of goodwill. This prolonged status caused discomfort both for the refugees and the local people, who thought refugees deprived them of their own resources and that their unregistered labour causes decrease in wages and increase in native unemployment. Imrie-Kuzu and Özerdem (2023) summarize the cycles of problems experienced by Syrians and local people with the "reluctant integration".

With the 2016 Regulation on Work Permit of Refugees under Temporary Protection, work permits became possible for doctors, nurses, and teachers (Eder and Özkul, 2016). The top five sectors in which immigrants work with permits in 2023 are accommodation, domestic personnel, wholesale trade, construction of non-building structures, and clothing and textile manufacture (Ministry of Labour and Social Security, 2023). Syrians work mostly in informal work conditions and in sectors such as trade, construction, and manufacturing, which account for 79.1% of their work, and these are followed by the largely informality-based textile, clothing, leather and footwear industries where 30% of working Syrians are employed (Pinedo-Caro, 2020). Based on his calculations using Turkish Household Labour Force Surveys (HLFS) of 2017, Pinedo-Caro's research on Syrian labour force in Türkiye, it is demonstrated that fewer young Syrian immigrants are in the education process and start working earlier compared to Turkish natives between the ages

of 15–39. Most Syrian women are engaged in housekeeping with few of them receiving education in contrast to Turkish women who may pursue education until ages 39 and are more active in the labour market (2020, p. 58). Another striking finding by the same researcher is the level of informal labour. Over a period of 12 years, the rate of informal work decreased from about 45% in 2005 to 30.4% for the local labour force in 2017. However, when the Syrian workers are added, the informal work is calculated at 38.5% in the textile-clothing-leather-footwear (TCFL) industries. In 2017, the rate of informal workers was 35.3% without Syrian workers but 38.4% with them in the construction sector, and 36.9% local informality was reported compared to 38.8% with Syrians in the food and beverage sector (Pinedo-Caro, 2020, p.65). Textile, garments, leather, and shoe industries are the most common employment areas for refugees besides woodworking, agriculture, domestic work, shepherding, and collecting solid waste.

To summarize immigration patterns and the Turkish labour market, the influx of controlled and uncontrolled immigrations to Türkiye lead to an increase in undocumented work, especially in jobs with minimum wages. Small enterprise employers might exploit immigrants' work to avoid taxes and insurance responsibilities. On the other hand, some locals feel that the high population of the immigrants put themselves at disadvantages in terms of the availability of jobs, decreasing wages, and increasing inflation including soaring housing and food prices. With the economic and social negativities, more and more young Turkish people aspire to live abroad hoping to have better life and work conditions. The desire to emigrate are more evident in the engineering field and leads to loss of brain power as well as the country's resources spent on their education. The massive earthquake affecting 10 cities in 2023 in the east and south-east hit hard the Turkish economy with labour loss and re-allocations within the country. Türkiye is still trying to rebuild the destroyed cities and has provided subsidies to people who lived or moved from the area. As a result, immigration dynamics definitely have a substantial impact on the labour market.

2.4 Brief note on recovery initiatives

After the brief overview on the possibilities and limitations in the Turkish economy, education in relation to the labour market, and the impact of immigration flows, an outlook is necessary about the efforts to improve the conditions.

In 2024, the Turkish economy began to show signs of recovery, largely attributed to measures such as public sector reforms, including reductions in public office expenses. The growth in the service sector accounted for more than half of new employment opportunities (OECD, 2023a, p. 18). Employment subsidies, including initiatives by the Turkish Employment Agency (İŞKUR), have been implemented to alleviate social security costs for new formal employees and programs targeting youth not in education, employment, or training (NEET) (İŞKUR, 2022). Several policy recommendations have been put forward to address labour market challenges. These include balancing the supply of graduates by focusing on high-priority fields of study, improving the efficiency of the labour market mechanism by aligning it more closely with labour market needs and technological developments, and enhancing vocational and technical education to improve employment rates among graduates.

Strategic Development Plans are five-year plans which "… continue to maintain their status as main policy documents, incorporating the country's 60 years of planning experience along with global trends, risks, and uncertainties. These plans aim to leverage Türkiye's potential to higher levels by utilizing its resources effectively, and they include objectives of becoming an influential actor at the global level in the medium and long term" (Türkiye Cumhuriyeti Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı, 2023a, p.1).

To address the skill gaps as well as mismatch and insufficient cooperation between the sector and educational institutions, the 12th Strategic Plan envisages the actions of participation of the private sector in decision-making processes in vocational education, developing a vocational education management model with responsibilities of all stakeholders defined, and opening branches in vocational and technical secondary education in line with local needs and sector demands (Türkiye Cumhuriyeti Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı, 2023b, pp.151–164).

The 12th Development Plan (2024–2028) outlines reforms aimed at addressing workforce challenges, which include but are not limited to the following (Türkiye Cumhuriyeti Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı, 2023b):

- Improving skill development by enhancing skill levels in existing and emerging professions.
- Strengthening the collaboration between the private sector and educational institutions to close skill gaps.
- Updating the qualification framework to align with market needs and improving accreditation of vocational institutions
- Developing a vocational education management model in collaboration with all stakeholders.
- Implementing Higher Education reforms by aligning university quotas with labor market demands and fostering partnerships among universities, businesses, and government entities.
- Updating the qualification framework to align with market needs and improving accreditation of vocational institutions.

Future plans for higher education institutions (HEIs) in 2024–2028 include "determining quotas of universities in accordance with current labour supply and demands and regional needs, strengthening university-private sector-local government-NGO cooperation, creating curricula with participation of sector representatives, monitoring labour market performances of graduates, ensuring that doctoral programs focus on priority sectors, supporting technologies such as artificial intelligence, robotics, and big data, updating the curricula of vocational schools within the framework of standards and qualifications published by the Vocational Qualifications Authority" (Türkiye Cumhuriyeti Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı, 2023b, pp. 153–161).

TABLE 10 Information about interviews.

	Companies HRM Departments	HEIs		VET Secondary	VET Training Centres	Policy Providers (National & Regional)	Social Partners, Labour Market Interned.	Total
		Faculties	Vocational Schools (2-year)					
Planned	20	2	5	4	4	3	2	40
Conducted	19	2	5	4	4	3	–	37

If the reforms proposed in the 12th Development Plan are effectively implemented, they are expected to significantly enhance the labour force, vocational education and training (VET) system, and higher education institutions (HEIs), address skill mismatches and foster economic recovery.

3 Materials and methods

Qualitative research design was used in the study. Along with desktop study of official statistics, interviews were conducted to gather data from representatives of three different categories (sector representatives, educational institution representatives, and policy makers). In the field data collection, interview questions that were developed by the Work Package 3 leader in the Skills4Justice project. The interview questions were specifically prepared to each group of sector representatives, educational institution representatives, and policy makers.

3.1 Characteristics of the study group

The study employed a maximum variation sampling strategy to ensure sufficient diversity capable of capturing the multifaceted nature of the phenomenon under investigation. This approach enabled a comprehensive, in-depth, and multidimensional examination of the issue across diverse contexts (Patton, 2015). Accordingly, participants were purposively selected from a range of sectors, provinces (to ensure geographical diversity), and enterprises of varying sizes (to ensure structural diversity), thereby enhancing the representativeness and analytical breadth of the research sample.

A total of 40 interviews were planned for Work Package 3 of the Skills4Justice Project. However, due to the continuous postponement of appointments, particularly with policy makers and social partners, organizations, and labour market intermediaries, 37 of the planned interviews were conducted. All 37 participants in the study group voluntarily participated in the research. Information regarding the planned and conducted interviews is provided in Table 10 below.

As seen in Table 11, 19 of the participants are company managers, 15 are educational institution administrators and 3 are policy makers. In determining the study group, the sectors with the highest labour shortages in the last five years, as indicated by İŞKUR, and geographic representation across the country were used as the basis.

The company managers were selected from the eight sectors with the highest labour shortages in the last five years, which

TABLE 11 Characteristics of the study group.

Group		Number of Participants	Area
Company	Manufacturing	5	Central Anatolia, Marmara, Aegean, Mediterranean, Eastern Anatolia
	Education	2	
	Accommodation and Food	2	
	Information and Communication	5	
	Administrative and Support	5	
	Total	19	
Educational institution	Vocational High School	4	Central Anatolia, Mediterranean, Southeastern Anatolia, Eastern Anatolia,
	Vocational Training Center	1	
	Vocational School	5	
	Faculty	2	
	Adult Vocational and Technical Education	3	
	Total	15	
Policy maker	Total	3	Central Anatolia

are furniture ($n = 1$), welding ($n = 1$), textiles ($n = 2$), footwear ($n = 1$), administrative and support services (private security, $n = 5$), accommodation and food services (hotel, $n = 1$), education ($n = 3$), and software ($n = 5$). Company size was considered, including small, medium, and large enterprises, to capture a range of organizational perspectives. Additionally, geographic distribution across the country was considered to reflect regional variations in the business environment.

In the second group, three participants of policy makers from national and regional policy providers and social partners contributed to the research. Finally, 15 educational institution administrators participated in the study were from diverse range of institutions as secondary education schools, higher education institutions, and vocational education centres. And they were from different cities to ensure geographic representation across the country. The characteristics of all the participants in the study group are provided in Table 11 below.

Almost all interviews were conducted by the researchers face-to-face or online depending on the participants' requests; however

one company in the textile sector preferred to send the answers to the interview questions in writing.

3.2 Data collection and analysis

The interviews lasted for an average of 45–60 min. Before starting the interviews, the purpose of the research was explained to the participants, and their informed consent was obtained.

Data were collected through interview questions prepared for three different interview groups consisting of companies, education providers, and policy makers. Thematic analysis was used to analyse the data. In-depth thematic analysis was preferred because it enables the systematic identification of common patterns, contradictions, and underlying meanings across the perspectives of different stakeholder groups (Braun and Clarke, 2006). Issues such as the employment structure in Türkiye, the balance between skill supply and demand, and the impacts of immigration are complex and context-dependent and therefore cannot be fully explained through quantitative data alone. In this regard, thematic analysis provides a suitable methodological approach to explore participants' experiences and perceptions in depth, making it possible to reveal structural problems as well as differences in stakeholder perspectives. Moreover, it enhances the analytical depth of the study by allowing findings from different data sources to be compared and integrated under meaningful themes. Two researchers coded the interviews first independently and negotiated to create a common code book. The themes were guided by both top-down process based on the interview questions and with a bottom-up approach by identifying new and unexpected themes.

In the analysis of the data, firstly the audio recordings obtained from the interviews were transcribed and put into written form in Microsoft Word. The data in Word were first read as a whole, and potential themes and categories were tried to be found by detailed reading. The determined themes and categories were transferred to Microsoft Excel with an attempt to reach the concepts and relations that could answer the research questions.

The data on the themes obtained were supported with statements of participants. While the participant quotations were presented in the text, codes given for each participant (A1, A2, B1, B2, P1, P2, …) were used to avoid revealing their identity. Company managers were symbolized with the letter A, educational institution administrators with B, and policy makers with P.

4 Results

The study consisted of an analysis of literature and statistics and interviews with stakeholders. The results of the desktop study are presented in the theoretical background section. Briefly, regarding the labour force, statistical data analysis showed that participation of the workforce to the labour has remained around 50% in recent years, alongside a 10% unemployment rate. Moreover, low female employment rates contribute to deepening skill shortages in the labour market. The labour force participation rate in Türkiye is lower than European countries and ranks 148th among 186 countries (Data Commons, 2024). While employment in the service sector is increasing, the agricultural sector is shrinking. According to the last five labour market reports by İŞKUR (Turkish Employment Agency), jobs in demand are primarily in mining and quarrying, the garment industry, tourism and accommodation, and manufacturing. Administrative and support sectors, such as cleaning and security services, also face labour shortages. Additionally, the education sector is experiencing high demand for teachers. OECD (2023a, p.102), supports this data and states that more than 80% of employers in Türkiye face difficulty in filling vacant positions, especially in middle-level skills and blue-collar jobs. Most vacant positions remain unfilled due to lack of professional skills or insufficient work experience. Moreover, around 40% of young people do not complete upper secondary education (OECD, 2023a). Due to the high-level unemployment, many university graduates reconcile, at least temporarily, to work in medium- or low-level skills, which leads to over-skilling and overeducation. The study field mismatches were about 45% compared to the nearly 32% OECD average, and the share of all tertiary graduates by field (IT and STEM) were among the lowest.

The interviews with the stakeholders revealed the following findings.

4.1 Availability of the skilled labour force and reasons and strategies to deal with the problem

The shared opinions of all participants revealed that nearly all companies faced serious difficulties in finding skilled labour. The companies that did not experience a problem in accessing skilled labour were in the administration and support sector, specifically one private security company and one municipality. Seventeen out of 19 companies stated that they experienced problems in finding skilled labour for their sectors or companies.

> "At the end of our interviews, if we cannot find personnel with the required qualifications, we prefer to end our search rather than leave the position unfilled. Instead, we distribute the workload among our existing skilled labour for that project." (A15)

The labour shortage is not the same in every field; it varies. The views of company representatives regarding professions and qualifications with insufficient or lacking workers in recent years showed that there are shortages of skilled labour in white-collar positions in the production and service sectors, areas requiring physical labour, and professions categorized as intermediate staff.

> "Recently, we've been struggling across all departments without distinction. However, processes in administrative units progress more smoothly compared to production departments. In white-collar roles, we receive numerous responses whenever we post a job advertisement. However, this pertains only to the volume of applications. For our production departments, we don't receive nearly as many responses. In fact, we face this issue across all areas in production. From our cleaning staff to quality control, weaving, garment production, ironing, intermediate ironing,

> and machine operators, we face serious problems in every aspect." (A12)

On the other hand, among the easiest professions and qualifications to find are unskilled jobs such as warehouse workers and manual labour that do not require expertise. Professions such as machine operators in the production sector, teachers in the education sector, and engineers or cooks in the service sector are noted to be among the easily found roles despite having issues related to qualifications. This situation could be attributed to an oversupply of trained workforce in these fields, combined with deficiencies in their training processes.

> "If you're talking about a cleaning staff member, yes, they are available. There are people for food preparation, cooks, kitchen staff, or what we call "utility workers" who tidy up and ensure order and cleanliness. However, when the job requires more qualifications, such as an upholstery master, a furniture cutting master, a banding master, or a CNC machine operator, we face difficulties finding them." (A14)

Moreover, there are some professions/qualifications that are newly demanded. Companies operating in various sectors identify technological advancements as a source for this issue. The idea that technologies such as artificial intelligence, robotics, and automation should be integrated into the operations of companies is supported by all participants. In this context, teachers proficient in Web 2.0 tools, personnel capable of drone-based pesticide applications, and software developers and engineers who can develop and integrate artificial intelligence are noted to be in demand today.

> "Teachers and trainers who know how to use Web 2.0 tools in educational technologies, developers skilled in creating cloud-based SaaS software, and programmers knowledgeable in artificial intelligence integration are in demand. It is crucial for these individuals to follow the latest technologies, be open to continuous learning, and embrace innovation." (A9)

> "We need people who are a bit technology-focused, automation-oriented, and capable of critical thinking. As you know, artificial intelligence is now everywhere. Currently, we are working on digital transformation in our company." (A14)

Newly demanded professions are mainly emerging in the context of digitalization and technological advancements. The lack of sufficiently trained labour for newly emerging professions triggers a shortage of skilled workforce. However, this is not the only reason for the case. The unwillingness of trained labour to work long-term and having high expectations were noted as the critical reasons by company representatives. Policy makers similarly emphasized that young workers have high expectations, prefer to work less while earning more, and leave their current institutions for higher-paying opportunities. They also underlined the large segment of the population not involved in education or employment as a contributing factor to labour shortages.

> "The disloyalty of trained employees is a major issue, especially in the textile sector. The new generation no longer wants to work regular 9-to-5 shifts or rotational schedules." (P1)

> "Even among vocational high school graduates, there is a significant lack of knowledge about basic concepts. I'm not sure whether it's due to poor training or a lack of structured education, but it's a big problem." (A14)

> "There is a very large segment of around 6.5 million people who are neither in education nor employment. The failure to integrate this group into the labour market is a major issue. The demand for skilled labour only by large companies exacerbates structural unemployment problems." (P2)

Dealing with the problem, companies expressed their strategies to enhance labour quality. Improving working conditions and organizing activities that support professional development to attract high-quality labour and retain employees in the system are just some of them. The most frequently mentioned incentives include practices such as offering high salaries, flexible working conditions, social benefits, and providing career and development opportunities.

> "Supporting personnel motivation through events, salary and bonus systems, private health insurance, suitable office environments, communication, and valuing employees within the framework of ethical rules." (A5)

> "Our company focuses on building strong connections with our employees and supporting their development to minimize the loss of skilled labour due to migration. We aim to retain our employees by offering flexible working conditions, competitive salaries, and career development opportunities. Additionally, we attract new talent through internship programs and collaborations with universities." (A15)

On-the-job training, organizing in-service training, and collaborating with training centres, consultancy companies, chambers of commerce, and universities to support employee development are the other common practices of the companies.

> "We mostly provide in-house training for missing skills and education. Additionally, training is provided with external consultancy support. However, no collaboration is established with vocational training providers or universities." (A11)

> "Our company regularly organizes training programs and skill development activities aligned with the demands of the business world to support education and training providers. In this context, we established U2 Soft Academy in 2024. By offering training, particularly in software and technology fields, we contribute to the development of a skilled labour

> force. Our internship programs and collaborative projects play a significant role in this effort." (A15)

4.2 The role of education policies and training systems in skill formation

4.2.1 Inadequacy of the education system

Inadequacy of the vocational and higher education system is emphasized by all participants as a significant factor contributing to the lack of skilled labour force. Company representatives stated that education curricula in schools are heavily theoretical, disconnected from practical applications and the real needs of the business world, leading to a lack of quality in workforce training. They highlighted the need for stable education policies, the introduction of attractive vocational training, the development of practical skills, and increased quality in vocational and technical education to ensure the training of intermediate staff.

> "Insufficient and mismatched with needs. Practical skills required by the business world are not adequately included in the curriculum. The biggest challenge is that education is not sufficiently aligned with the business world and is slow to catch up with current demands." (A15)

> "I attribute it to the fact that university education is not fully aligned with sector needs and fails to impart these skills. I also think it's due to the lack of strong university-industry collaboration." (A9)

Policy makers also emphasized that the education processes aimed at developing a skilled labour force are insufficient. They noted that the education system is falling behind in catching up with global innovations and the quality of students entering vocational education is low. They suggested revisiting school admission criteria, as was done in previous years.

> "As technologies evolve globally, I believe there are significant shortcomings in Türkiye's ability to adopt models that catch up with innovations in job sectors." (P3)

> "Our graduates, especially, face skill mismatches. For instance, a student trained on a machine in school may struggle to adapt when encountering a new technological machine in a workplace." (P3)

> "There are serious flaws stemming from Türkiye's vocational education system. The quality of students entering vocational education is very low. Because the quality of students coming to vocational high schools from middle schools is low, the talent and abilities of children graduating from public vocational high schools are also very poor. Adapting them to the industry takes a long time. Their internships and on-the-job training waste significant time for companies. Training one person can take six months to a year." (P1)

Companies reported support to vocational high school and university students by providing internship training. While this helps developing practical knowledge and skills, it is noted that the quality of internship training can be questioned. In this context, it is emphasized that collaboration with educational institutions remains superficial.

> "We have created a community with young people studying at universities. These young people receive training related to the work we do in this community. We organize briefings and seminars. Among these individuals, we also evaluate those who can contribute to our work for potential employment after graduation. This way, while they are still in university, we give them an idea of how companies like ours in the market operate, provide them with experience, offer them pocket money, and even a source of income. It's an additional income source. At the same time, we try to hire those who want to work in educational technologies with us." (A9)

> "Students studying in faculties of education are assigned to schools to receive field training. "CO-OP", short for Cooperative Education Program, is a University-Business integrated education model. It is described as "school in the workplace, workplace in the school". The university has agreements with over 5,000 institutions. For instance, if you study tourism management, you can work at the Hilton. If you study mechanical engineering, you can get internship opportunities in engineering-related units. This program introduces you to your profession and also helps you decide if this is the right job for you, if you can do it, or what you might be lacking." (A10)

Policy makers also aim to contribute to the development of a skilled labour by establishing vocational training institutions and providing training. However, one policy maker highlighted the need to support second vocational training opportunities for university graduates.

> "From our perspective, we established a vocational high school to address the intermediate staff needs of our industry." (P1)

> "University students should now also be supported in acquiring a second profession in fields required by the market. Unemployed youth or university students should receive vocational training based on their talents to prepare themselves for a second profession." (P3)

4.2.2 Contrastive views of the educational institutions

Contrary to the other participants, evaluations of the educational institution administrators generally showed positive and adequate conditions about the education and training system. Twelve out of 15 educational institution administrators stated that the education they provide in the institutions meets the qualification demands of the labour market. It was

specifically noted that graduates from vocational high schools and vocational training centres are in demand abroad, indicating that these institutions prepare students with the necessary qualifications.

> "All programs are highly aligned with the qualification demands of the regional and national labour market." (B4)

> "Recently, particularly due to Europe's needs, there has been demand for students in fields like hairdressing, welding, and mechanics even before they graduate. We issue certificates for these graduates almost daily so they can go abroad. Europe especially demands our apprentice students, those in Grades 9, 10, and 11. They don't even want Grade 12 students. They want those who have completed Grade 11 and hold a journeyman certificate. According to our regulations, we issue journeyman certificates to students completing apprenticeships. If you have a journeyman certificate, you are guaranteed a job in Europe. Based on this, we can say our efforts and education align with Europe's standards." (B11)

While the majority highlighted the alignment of their education with the labour market, two institutions noted that this varies depending on the program. Some programs, especially in healthcare and specific businesses, were identified as insufficient in developing the necessary skills.

> "The answer to this question depends on the program being implemented. For example, the Child Development Program meets local needs both in quality and quantity. However, in terms of healthcare programs, both national and local demand is high, and the students in these programs don't have the same opportunities as those in schools in the western regions of the country. Therefore, they are unable to reach the desired level of qualifications." (B3)

> "Some businesses strive to provide excellent vocational training, but others fail to deliver the necessary skills outlined in the educational program. Some businesses only impart 20%–30% of the required skills, forcing students to leave these businesses. Problems originating from schools, teacher qualifications, and on-the-job training at businesses hinder the level of vocational and technical education we aim to achieve." (B13)

> "We don't conduct any assessments or evaluations regarding education. We don't know the level of employability skills because the target group is still in the process of being educated and hasn't gained practical experience in the labour market." (B10)

All participants evaluated the compatibility of the qualifications they provide based on employed graduates but stated that they lacked statistical data or student tracking systems.

> "We receive positive feedback from the sector regarding alignment, but we don't have any research or statistics to confirm this—there's no student tracking system, just feedback we receive." (B14)

> "We don't have a complete system for tracking and monitoring students and graduates." (B15)

Some institutions update their curricula in accordance with central directives from the Ministry of Education or the Board of Education and Discipline, while most institutions incorporate feedback from internal and external stakeholders. Besides, all participants from education sector indicated that they collaborate with relevant sectors and businesses.

> "We conduct satisfaction surveys with students, review them, and evaluate how we can improve. Additionally, every April, we work on the education plans for the following academic year. For instance, this year we brought together stakeholders to review and revise course plans for the 2024–2025 academic year. These meetings include representatives from at least three businesses for each program, two alumni, two current students, and the teaching staff. We update course plans and make improvements to existing courses. This annual effort is part of our improvement work." (B9)

> "We keep track of company demands and maintain active discussions because we are located within the Organized Industrial Zone Directorate." (B2)

> "As a higher education unit that trains teacher candidates, we try to follow developments both in Türkiye and globally, gather stakeholder opinions, and collaborate to include elective courses in our education catalogues." (B7)

4.2.3 Characteristics of the prospective labour force

Based on the findings from interviews with educational institution administrators, characteristics of the students in the vocational and higher education institutions are expressed in four sub-themes: "gender inequality in educational programs", "migrant students in educational programs", "school dropout rates", and "brain drain of graduates".

According to the views of educational institution administrators, when considering gender-specific skill gaps and mismatches in relation to labour market needs, 11 out of 15 of institutions have not undertaken any specific efforts in this regard. However, four institutions have implemented positive discrimination practices to increase female employment.

> "We haven't undertaken any specific work to address or promote gender diversity. For instance, in the child development program, the percentage of female students is over 90%, and the same is true for beauty and haircare programs. These rates vary depending on the program type but are likely balanced in most cases. For example, in electrical and electronics programs, the number of female students is very low due to the nature of the program. This

> is generally the case across Türkiye. I don't think a child development program could ever achieve a 50–50 gender balance." (B9)

> "We haven't done anything specific in this regard, but during our field visits, we highlight gender-specific disparities. Personally, as the president of three village associations, I occasionally gather the residents in large meeting halls to discuss issues such as employment and vocational and technical education with middle school students." (B11)

When educational administrators were asked whether there were migrant students enrolled in their institutions, three institutions reported having none, five reported having 2–3 migrant students, six had an average of 5%, and one institution in the south-east of Türkiye reported that 75% of its student population consisted of migrants, most of whom are Syrians.

> "We currently have no migrant students." (B1)

> "The number of international students is very low. I've encountered only three students so far." (B5)

According to the views of administrators, nine institutions reported no significant or noteworthy dropout rates, while six institutions observed an increase in dropout rates compared to previous years. In institutions where dropouts were observed, the reasons included financial problems, concerns about finding employment after graduation, family issues, and opportunities for high school graduates to pursue careers as non-commissioned officers or police officers. It is worth to mention that B1 is the director of a private vocational and technical high school built by the industrial zone authorities while B8 is the director of a public vocational and technical high school. That is, enrolling into a private vocational school is considered privileged with very little dropout in contrast to public vocational schools.

> "Our students rarely drop out because only about one-third of applicants are admitted. They see it as an opportunity and don't leave." (B1)

> "Thirty percent of students drop out. This rate has increased significantly over the last 5–10 years. Previously, around 10% of students dropped out, but now it's closer to 30%. The main reasons include financial difficulties, Syrian students not speaking Turkish, and families not wanting to send their daughters to school." (B8)

Considering brain drain of graduates, eight out of the 15 institutions reported that their graduates do not go abroad for employment or further education. In the remaining institutions, the proportion of graduates going abroad was found to be very low.

> "We do not have any graduates who have migrated abroad." (B8)

> "Approximately 3%–5% of our graduates go abroad. Those with journeyman diplomas settle abroad." (B11)

When asked about their participation in exchange programs, six institutions reported no involvement, while nine institutions indicated participation in Erasmus programs with a small number of students. In addition, most of them stated that they had no formal efforts in the recognition of the qualifications and competencies they provide. They just rely on feedback from their graduates to evaluate themselves.

> "We don't have any students participating in exchange programs." (B9)

> "In 2014, we hosted a group of 25 people from Nigeria and provided them with welding training. After completing their training, they returned to their country." (B2)

> "In the context of the Erasmus program and vocational education-focused programs, our students both go abroad and host students from other countries." (B5)

Institutions have expressed the impact of exchange programs on the employment of their graduates as they improve foreign language skills, and the presence of international experience in students' CVs positively contribute to their employability. Also, when they were asked about the students' desire to migrate after participating in such programs, the consensus was that these programs might encourage migration aspirations. However, the decision to migrate largely depends on the individual experiences students have during their stay abroad. Some participants also highlighted that their aims do not include training workforce for other countries.

4.2.4 Internationalisation of the curriculum

While five institutions gave negative responses about utilizing national, sectoral, and regional qualifications frameworks for the recognition, comparability, and transferability of competencies and degrees, other institutions use frameworks such as EQF (European Qualifications Framework), TYYÇ (Turkish Higher Education Qualifications Framework), and NQF (National Qualifications Framework of Türkiye).

> "No, we don't apply them. I don't think the responsible personnel at our institution are even aware of these qualifications." (B3)

> "As a faculty preparing teacher candidates, we consider the European Qualifications Framework (EQF) and the Turkish Higher Education Qualifications Framework (TYYÇ) along with the Ministry of National Education's Teacher Qualifications as the basis for determining program qualifications." (B7)

> "We are required to apply national, sectoral, and regional qualifications frameworks (EQF, NQF). Our work aligns with these frameworks." (B10)

When examining tools related to the visibility and transparency of degrees and competencies gained by students in national qualifications systems and abroad, nine institutions responded negatively, while others reported using tools such as Europass and ESCO.

> "I am not knowledgeable about these tools; we don't have such an application." (B9)

> "Since it has become mandatory for us as part of EU compliance, the Europass feature is integrated into the Professional Competency Authority certification." (B2)

> "We provided Europass certificates to some of our students. For instance, we sent students from food and beverage services to France." (B8)

When educational institution administrators were asked about joint education/work programs with vocational schools or higher education institutions in other countries, it was found that, apart from one institution working on a draft project and one institution with existing partnership agreements, no other institutions had such collaborations. They generally lack having partnerships with educational programs in other countries.

> "We don't have any work in this area." (B3)

> "We have a 15-day draft project to send our trainers abroad for training. We are still working on the draft. It will likely be in Germany or Japan." (B2)

> "As of 2024, our university has 77 ERASMUS KA171 agreements with EU member countries and 23 agreements with non-EU countries. In terms of agreements with other countries, the total number is 65. International joint education/work agreements and subsequent activities are highly prioritized by our university. In particular, the number of outgoing/incoming academic staff within these agreements has increased over the past two years. Although the number of such studies is currently quite limited, there is an encouraging trend in this regard." (B7)

According to the views provided by educational institution administrators, EU support is required to provide international education and training for the students. This support can be in different fields such as economic, equipment and infrastructure development, improvement of the qualifications of academic staff, better utilization of European Union funds, longer-term student exchange programs, and common professional standards for the same occupational groups across countries.

> "The resources we need the most are financial and qualified human resources. Infrastructure, learning resources, and the support and investment in qualified and sufficient educators are necessary." (B7)

> "Financial support (scholarships), increasing the number and accessibility of international exchange programs, and project support to address societal problems." (B6)

> "If we are talking about a single vocational education field, for instance, welding in Türkiye is the same as in Germany. They perform the same tasks consistently, so the standards need to be entirely the same. A worker should be able to do the same job in Türkiye as they do in Europe. That's where we face challenges." (B2)

4.3 Impact of migration on the skilled labour shortage

4.3.1 Migration from Türkiye

Migration from Türkiye is seen by most company representatives as a threat and is cited as a cause of labour loss. Policy makers also support this view.

> "Of course, I see it as a danger because you lose the added value that the people you train could bring to you. In this sense, I see it as a threat, and the country needs to recover quickly, take ownership of educated migration, and prevent it." (A7)

> "We've created an army of unemployed graduates. We now see its reflection as migration to other European Union countries. Our young people, especially university graduates, are forced to migrate to Europe to find jobs and earn higher incomes. This is brain drain. In the coming years, we will feel the damage of brain drain on countries more deeply." (P3)

> "Today, many of our colleagues want to go to the Netherlands, Germany, or other European countries because the standard of living there is quite high. They don't face challenges in balancing income and expenses. Among my own friends who have left, I hear, "What I do there doesn't matter much. I was an engineer in Türkiye, but now I drive for Uber, and I've been doing it for three years. My standard of living is very high."" (A12)

Only one company mentioned having an employee who returned to Türkiye. That person was a teacher who returned due to skill mismatches and under qualification abroad. Policy makers noted that no steps have been taken to encourage the return of skilled migrants. They criticized this situation and emphasized that efforts should first focus on retaining these individuals and subsequently ensuring that those who migrate transfer their acquired skills back to the country.

> "I personally spoke to the teacher about this and said, "I'm very eager to know why". He said, "I wouldn't have been able to continue my teaching profession in the country I went to. Instead, I would have been working as an infrastructure worker, like on streets and roads. That's why

> I chose to work in my own country and profession and returned". The primary reason for this return is skill mismatch. A highly skilled individual leaves the country, only to be forced to work in a lower-skilled job abroad." (A7)

> "We need to develop policies to retain our people here. They contribute significantly to their companies and the country economically. Learning new technologies, gaining new knowledge, meeting new people, building new collaboration networks—all these provide substantial benefits." (P1)

> "For example, someone who worked on innovation, digitalization, or the green economy abroad and came to Türkiye to establish start-ups or used their network and capital to create something—this is a high-quality, comprehensive benefit." (P2)

4.3.2 Migration to Türkiye

Migration to Türkiye is considered by some company representatives as both an opportunity and a necessity to address labour shortages. Policy makers acknowledge that while migration can help to fill labour gaps, the migrants arriving in the country are largely unqualified and their contribution is not to the desired level.

> "These people need jobs and money, so they want to work. When you hire them, you quickly realize within a week or ten days whether they will continue or work properly. If they are not good workers, we let them go quickly, within a week or so. But if they stay after 10 or 11 days, it means they need the job and will work, and 90% of them work properly. Let me say this: we have never experienced issues like arguments, theft, or inappropriate behaviour like harassment or anything criminal in the workplace." (A1)

> "The desired efficiency cannot be achieved; they can only handle simple tasks and have low qualifications. However, we could only fill certain key occupational gaps this way." (P1)

> "As a country, we are unable to attract skilled migration. Qualified migrants go to other countries. It is important to adapt skilled workers to the labour market and integrate them into production as quickly as possible by aligning them with local labour rights." (P3)

Policy makers also suggested that collaboration with the European Union could be leveraged to effectively benefit from migrants. They proposed supporting their integration into society and work life and enhancing their qualifications through targeted training programs.

> "It is up to the state. With substantial financial resources from the European Union, serious efforts could be made to improve the qualifications of the migrant labour force we receive. New vocational training centres could be established solely for educating these people. Structures could be created to adapt them to business life, industry, trade, and tourism, teaching them Turkish societal norms, work ethics, and practices. With significant projects and budgets, collaborations with NGOs like ours, chambers, and industrial zones could be initiated. If resources are allocated to these areas, we are ready to work on training these people and integrating them as workforce contributors to society and industry." (P1)

> "We are in a position of being exploited—a temporary gathering zone. Unfortunately, the policies of cooperation are far from adequate. Leaving Türkiye to handle this alone, with only 2.5 or 3 billion euros in aid, is not a sustainable solution." (P2)

Some participants noted that labour shortages are being addressed through migrant workers and that no significant issues have been encountered. However, other companies reported avoiding hiring migrants due to challenges such as language barriers, legal difficulties, and skill mismatches.

> "For example, we have spoken with companies like shoemakers. They mostly employ foreign workers. There's no way to maintain production otherwise. This is a debatable issue. People talk about sending migrants, like Syrians, back. If we send all of them back, we will face serious production problems." (A1)

> "We do not apply for migrant worker recruitment from abroad. We avoid it because the hiring procedures are complicated and time-consuming." (A11)

> "For the education sector, challenges would include not being familiar with our general standards or not having proficiency in our language." (A3)

Migration out of the country results in the loss of existing labour and potential workforce, negatively impacting educational institutions, business life, society, and individuals. For individuals, migration often driven by the pursuit of higher income and better living standards can result in local workforce depletion and brain drain.

5 Discussion and conclusion

In this study, the labour market, labour force and problems arising in skill matching in Türkiye have been analysed in the light of the country's current economic conditions, education system, and immigration. Along with the literature review and collection of statistical evidence from national and international sources, interviews were conducted with sector representatives, training providers, and policy makers. By making an in-depth thematic analysis in the interview records, the current employment structure as well as skill supply and demand profile in the country have been examined.

The first research question was about the key skill shortages in relation to the demand for qualifications in the Turkish labour market. Despite its high population and a large proportion of

young people, Türkiye faces various obstacles to the effective use of this workforce. Factors contributing to this controversy include the facts that the private sector has contracted, and many foreign companies have left the country after destabilization in the economy, paving the way for an increase in unemployment. Policies developed to eliminate the job deficit are small-scale and inadequate in closing the skill gap. The difficulties of the native working-age population in finding a place for themselves in the labour market causes immigrants who want to be included in the country's employment to be trapped in the circle of informal employment. While informal employment results in the deepening of the social and economic crisis, it also misleads the establishment and implementation of a national employment strategy.

Regarding the labour force, the participation of the work force has been around 50% in recent years, compared to the approximately 10% of unemployment rate. Low female employment deepens skill shortages in the labour market. More people are beginning working in the service sector while those in agriculture are decreasing. According to the past five labour market reports by İŞKUR, the jobs highest in demand are those related to mining and quarrying, the garment industry with sewing machine operators in particular, the tourism and accommodation sector with many jobs in demand such as waiters, chefs, housekeepers, and the manufacturing sector where welders are insufficient in number. In addition, administrative and support sector lacks staff such as cleaners and security guards. The reports also reveal that the education sector is highly in demand for teachers. Sector representatives in the interviews highlighted a serious shortage of skilled labour in sectors such as garment production, weaving, furniture-making, machine operation, and front-office reception, particularly for intermediate-skilled positions. There are shortages of skilled labour in white-collar positions in the production and service sectors, areas requiring physical labour, and professions categorized as intermediate staff. With technological advancements, fields such as artificial intelligence, robotics, and automation are emerging as areas in need of new skills.

In line with the literature review, the interviews with sector representatives point out that there is a shortage of qualified workforce in the production and service sector such as garments, weavers, furniture masters, machine operators, front office reception personnel, and in professions that can be regarded as intermediate staff. However, unskilled jobs such as auxiliary services, daily worker, packaging, warehouse staff and manual labour that do not require mastery are among the most easily available professions and competencies. In addition to these fields, with the development of technology, areas such as artificial intelligence, robotization and automation are seen among the newly demanded professions or competencies.

Furthermore, in the interviews with the companies, it is understood that there is a problem in hiring qualified workforce due to the lack of trained personnel or the overqualified workforce. In parallel with this view, policy makers state that the presence of a large population that does not participate in either the education or employment process is a reason for skill gaps. Concerning the availability of skilled labour force, the shared opinions revealed that the unwillingness of trained labour to work long-term, high expectations, and qualification issues are significant factors. Policy makers similarly emphasized that young workers have high expectations, prefer to work less while earning more, and leave their current institutions for higher-paying opportunities. Şahin (2019) also supports this finding by demonstrating that, although they are unemployed, members of the labor force are unwilling to work in insecure, temporary, unskilled, and low-paid jobs. To cope with this problem, companies use incentives such as high salaries, flexible working conditions, social benefits, and career development opportunities.

The second research question was related to how current educational policies in Türkiye address skill formation and mitigate skill mismatch in the labour market, particularly in vocational and technical education and the implications for economic growth and workforce development. The contribution of the Turkish education system to the labour market is achieved by mainly Vocational Anatolian High Schools (VTAHs), which are upper-secondary institutions with the highest share among other types of vocational schools, and through vocational schools in HEIs. When compared to the undergraduate programs, the registered employment rate for tertiary undergraduates was %71.7 in 2022, compared to 64.9% for vocational school graduates (TURKSTAT, 2023c). However, the employment rate for university graduates in general has decreased by 6% within the past decade.

Both the literature review and interviews point out that there is considerable skill mismatch in Türkiye. One of the most important factors of skill mismatch and skill gaps is the content of the education system. The education provided does not comply with the conditions of business life. Approximately 50% of skill mismatch is reported, and the sector representatives expressed this concern in the interviews. In the literature, employees who graduated from various education levels state that more than half of the educational content provided at all stages of schooling was incompatible with the needs of the sector (Vocational and Technical Education General Directorate, 2022, p. 10) indicating the overly theoretical aspect of the curricula. This finding aligns with Suna et al. (2020), who highlight that horizontal skills mismatch is a predominate issue in Türkiye, particularly because vocational graduates often secure employment in fields entirely unrelated to their education due to curriculum-market discrepancies. Ecer (2026) also found that higher education institutions, particularly at the faculty level, have been inadequate in updating their programs in line with sectoral needs, and that skill mismatch is widespread. In line with this conclusion, OECD (2023a) reports indicate that skill mismatches in the Turkish labour market are closely linked not only to individual qualifications but also to structural and institutional factors. According to OECD (2023a), the skill mismatch rate in Turkey is above the OECD average, and this stems from the inadequacy of training programs to meet sector needs. Similarly, the "Skills Mismatch Framework" model of the European Centre for the Development of Vocational Training and Education (CEDEFOP) (2018) demonstrates that such mismatches are fuelled by a lack of coordination between education and labour institutions.

In line with the literature and statistics, the company representatives mentioned in the interviews that the inadequacy of education is as an important factor in the lack of qualified

workforce. As education systems and training programs fall short of adopting a future-oriented perspective, they are unable to implement workforce development strategies for the professions that will be in demand. Company representatives stated that the curricula of educational institutions are heavily theoretical, disconnected from practical applications and the real needs of the business world, leading to a lack of quality in workforce training. As a contribution to the solution of this problem, they emphasize that they cooperate with educational institutions by contributing to the training of vocational high school and university students, but this remains insufficient. However, in the interviews with education providers, most of them stated that they delivered training suitable for the labour market, while the institutions that expressed the opposite opinion pointed out that the practical training given in the companies were inadequate in gaining skills. In other words, while most education providers consider their training to be sufficient for the labour market needs, employers, students, and policy makers are doubtful towards this claim. Sector representatives highlighted the need for stable education policies, the introduction of attractive vocational training, the development of practical skills, and increased quality in vocational and technical education to ensure the training of intermediate staff. Although some companies collaborate with educational institutions to offer internships for vocational school and university students, this remains inadequate. Education providers, however, largely believe that their programs are well-suited to labour market demands, although some institutions pointed out that practical training in companies is insufficient for skill development.

Rapid developments in technology can also lead to mismatches in the skills of new graduates. The schools responsible for skill formation cannot keep up with the rapid change in the sector and the pace of innovation, technology use, and automation in production. The accelerated pace of change in new technologies, especially robotization, is faster than updating the education curricula. This fact is also supported with the views of sector representatives who said that they need qualified workers with skills in automation and digitalization. Some education administrators, especially of non-private schools, also mentioned that they need better infrastructure, materials, supplies, and teachers with better skills to cope with technological advancements while training their students. Companies operating in various sectors identify technological advancements as a source for newly demanded professions or qualifications, and the idea these technologies should be integrated into the operations is supported by all participants.

The third research question aimed at the impacts of immigration and emigration on the labour market dynamics in Türkiye, particularly in terms of employment rates, wage levels, and skill availability among the work force. Regarding migration, Türkiye currently shelters the largest refugee population in the world (OECD, 2023a, p. 82). Migration stands out as a factor that shapes Türkiye's labour market. Most of the incoming Syrian migrants are unskilled or medium-skilled workers. The fact that most immigrants are non-European, they do not have normal refugee rights due to the 1951 Convention, and their being under temporary protection regulations puts both immigrants and Türkiye in a risky situation. Syrian immigrants are considered "guests", and their expenses such as health and education have been covered by the government for about 12 years. This state has led to the reactions of local citizens for many reasons such as the depletion of national resources, increase in rents, increased unemployment of natives, and decrease in salaries through undocumented work. On the other hand, employers take advantage of the precariousness of immigrants and use them as cheap and illegal labour for their own interests, avoiding obligations such as taxes and social security. Especially in low-skill sectors such as textiles, shoemaking, and agriculture, migrant workers have been employed more intensively. To deal with malpractice, appropriate and fair wage policies should be implemented ensuring all employees are registered in legal status and covered by insurance, and tax leakages should be prevented.

In the interviews, policy makers and company representatives see immigration as a threat and consider it among the reasons for the loss of workforce. Although it is thought that immigrants coming to Türkiye can be a resource in closing the labour shortage, most of them are stated to be unqualified and therefore not contributing to the country at the desired level. Although the company representatives stated that the lack of labour was eliminated through immigrants, there are also representatives who stated that migrant employees were not preferred due to language problems, legal difficulties, and qualification problems.

Due to the economic hardships experienced in Türkiye in the last decade, many qualified young people want to live in another country. Akın and Kardaş (2023, p. 97) stated that highly skilled software developers and engineers perceive their labour as undervalued in Türkiye, both economically and in terms of social status. In their study, emigrants stated that companies in the destination countries allow them to work remotely and respect their work, private lives, and individuality. Generally, tertiary education graduates go abroad, while representatives of educational institutions mainly from upper secondary level education stated that their graduate students do not usually go to other countries for employment or further education. This is probably due to lack of foreign language skills and the maturity level of students.

A significant disadvantage for immigrations and emigrants is related to dequalification and deskilling. In both ways, the qualifications of the migrant workers are not fully recognized, and they might face challenges such as language barriers, lack of information, and identity-based discrimination (Eder and Özkul, 2016). Therefore, measures towards matching qualifications globally should be considered.

To conclude, with economic hardships, unfavourable work conditions, and a high number of immigrants, Türkiye is exposed to multifaceted challenges. A series of steps are needed to overcome the difficulties such as increasing wages and job opportunities especially for the young, NEET, and women. In this context, priority should be given in the short term to accelerating work permit procedures and increasing incentives for employers; in the medium term to expanding language and vocational training programs based on sectoral needs; and in the long term to developing systems for the recognition of diplomas and qualifications. Furthermore, establishing regular monitoring

and evaluation mechanisms is essential to ensure the effectiveness of these policies.

Addition, establishing a strong sector-education collaboration and increasing the standard of education with providing skills that appeal to the labour market is essential. The MoNE and the HEIs should closely cooperate with the sector in the design and implementation of curricula. To eliminate skill mismatches, certificate and diploma programs and credit system should be made compatible with the sector and labour demands and provide the skills demanded by the labour market. The micro credit system, which is expected to be effective in eliminating skill mismatches, might be considered. In addition, quality assurance of VET institutions according to the qualification framework will contribute to the solution of mismatch problems by minimizing skill mismatches. This will ensure that training programs are consistently aligned with labour market needs and that graduates possess the competencies required by employers. Besides, policies to involve migrant workers decently are needed. Government authorities envisage substantial measures in their development plans; but it is important to put these in practice. Thus, more cooperation with the EC is needed in terms of both labour and education.

Data availability statement

The datasets presented in this article are not readily available because the raw data are kept within the research team indefinitely, as the informed consent form expressly guaranteed that no personal data would be shared with any third parties. Requests to access the datasets should be directed to Assoc. Prof. Dr. M. Cem Babadoğan, cem@ankara.edu.tr.

Ethics statement

The studies involving humans were approved by Ankara University Educational Sciences Scientific Research and Publication Ethics Committee. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and institutional requirements. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

MB: Writing – review & editing, Writing – original draft. HE: Writing – review & editing, Writing – original draft. MH-I: Writing – original draft, Writing – review & editing. DG: Writing – review & editing, Writing – original draft. KS: Writing – review & editing, Writing – original draft. AK: Writing – review & editing, Writing – original draft. BB: Writing – original draft, Writing – review & editing. US: Writing – review & editing, Writing – original draft.

Funding

The author(s) declared that financial support was received for this work and/or its publication. This research was funded by the Horizon Europe Project "Skill Partnerships for Sustainable and Just Migration Patterns (SKILLS4JUSTICE)" is co-funded with support from the European Commission (S4J-project no. 101132435-HORIZON-CL2-2023-TRANSFORMATIONS-01/03).

Conflict of interest

KS was employed by Kıymet Selvi Education Support and Consultancy Limited Company. US was employed by Selvi Financial Consultancy. BB was employed by Babadogan Tech and Edu Limited Company.

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

Generative AI statement

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

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