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How compatible is the Supply of Vocational Education and Training Graduates with Labor Market Demand in Turkey?*

Türkiye'de Mesleki Ortaöğretimden Mezun Arzı ile İşgücü Piyasası Talebi Ne Kadar Uyumlu?

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ABSTRACT

The transition of a country's graduates with vocational skills into the labor market indicates both the efficiency of vocational education and training (VET) and economic development. Many countries have conducted studies to monitor and match the expectations of the labor market with students' preferences. Scholars and policymakers in Turkey have long debated the compatibility of the level of VET graduates' skills and needs of the labor market and called for field studies to form a basis for national policy. The current study examines the relationship between open job positions in diverse professions, as indicated by İŞKUR's 2019 Labor Market Research (IPA), and the vocational fields of VET students at the regional level. The skills required by the open positions and the vocational fields in which these skills were acquired are linked in this study to evaluate their compatibility. The research findings showed remarkable differences between the demands of the labor market and the supply of VET graduates across Turkey. In some vocational fields, the imbalance occurred simultaneously across multiple regions. The results emphasize the importance of improving the balance between supply-and-demand at both the regional and provincial level to increase the compatibility between labor market demands and supply in VET.

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ÖZ

Eğitim sürecinde mesleki beceriler kazanan mezunların işgücü piyasasına geçişi, mesleki eğitimin verimliliği ve ülkelerin ekonomik gelişimi açısından oldukça önemlidir. Birçok ülke, işgücü piyasasının beklentileri ile öğrencilerin tercihlerini izlemek ve uyumlandırmak için çeşitli çalışmalar yapmaktadır. Türkiye'de meslek eğitim mezunlarının işgücü piyasasının ihtiyaçlarını karşılayabilme düzeyi uzun süredir tartışılmaktadır. Bu bağlamda oluşturulacak eğitim politikasına dayanak oluşturacak şekilde detaylı saha araştırmalarına ihtiyaç duyulmaktadır. Bu çalışmada İŞKUR'un 2019 İşgücü Piyasası Araştırmasında (İPA) gösterilen ön lisans altı açık pozisyonlar ile aynı yıl mesleki ortaöğretimden mezun olan öğrencilerin meslek alanları arasındaki uyum bölgesel düzeyde incelenmiştir. Uyumun belirlenmesinde açık pozisyonlarda gereken beceriler ile bu becerilerin kazandırıldığı meslek alanları ilişkilendirilmiştir. Araştırma bulguları, Türkiye genelinde işgücü piyasasının talepleri ile mesleki eğitim mezunlarının arzı arasında önemli farklılıklar olduğunu göstermiştir. Ayrıca, bazı alanlardaki uyumsuzluğun birçok bölgede eşzamanlı görüldüğü belirlenmiştir. Çalışma sonuçları, mesleki eğitimde işgücü piyasası talepleri ile mezun arzı uyumunun artırılması için bölge ve il düzeyinde yapılması gereken iyileştirilmelere işaret etmektedir.

Anahtar Sözcükler: *Mesleki ve teknik eğitim, Arz ve talep, Beceri uyuşmazlığı, İşgücü piyasası, Mezun arzı.*

INTRODUCTION

Education serves multiple roles in contemporary society, leading to both social and economic consequences (Brown & Lauder, 1991; OECD, 2020; Özer, 2021b). The individual and national economic benefits have been emphasized more frequently in recent years (OECD, 2019, 2020). As outlined in human capital theory, increasing the educational level and number of years that individuals spend in school leads to marginal benefits, as well as increasing national economic competitiveness (Castellano et al., 2018; Temple, 2000). Providing a longer and more qualified education to individuals provides benefits both in the short and long term.

The massification of education since the 1960s has led to a gradual increase in its benefits, both at the individual and national level. Investigating and illuminating the direct relationships of education with economic development and social welfare has significantly increased investments in education (Boissiere, 2004; UNESCO, 1999).

Education becomes even more critical to increase the competitiveness of countries in the current age, when technology and automation are leading to rapid transformations (Özer & Perc, 2020; Perc et al., 2019). Although there are many advantages of digital and automation technologies, their advancements also pose challenges for education (CEDEFOP, 2010, 2018). On the one hand, the alignment of the needs of the labor market with educational outcomes becomes even more critical; on the other hand, these needs are often outpacing the ability of educational systems to keep up and produce qualified graduates (Özer & Perc, 2020; Solga et al., 2014).

In order to maximize the social and economic benefits of education, it is critical to align educational outputs with the demands of the labor market (Hanushek et al., 2011; Kupetz, 2016). Important steps have been taken to increase participation in education in recent years, but such increased participation must be distributed in a balanced manner to meet the needs of various industries. In this way, the educational system can meet the need for human resources in different fields by training students in the appropriate skills and competencies. Otherwise, the incompatibilities between the trained graduates available and the employees needed can lead to challenging problems (CEDEFOP, 2010; McGuinness et al., 2017; Özer & Suna, 2020).

The incompatibility of the expectations of trained human resources and the labor market is referred to as *skill mismatch*, and every country faces this problem to some extent (CEDEFOP, 2014; ILO, 2017). Skill mismatch occurs when the skills acquired by graduates through education do not adequately match the qualifications or requirements of their job (CEDEFOP, 2018; McGuinness et al., 2017). This incompatibility renders insufficient the investments that countries and individuals make in education (Ortiz et al., 2020; Palmer, 2017; Somers et al., 2016). Such a situation requires employers to support employees with additional training to supplement their previous education that does not match their current position, and might even decrease graduates' overall wages and job satisfaction (Badillo-Amador & Vila, 2013; Somers et al., 2016; Shevcuk et al., 2019)

There are two primary types of skill mismatch identified in the literature (McGuinness et al., 2017; Suna et al., 2020a). *Vertical skill mismatch* occurs when the skills that a graduate has acquired through education are higher or lower than the skills required in their job. *Horizontal skill mismatch,* on the other hand, occurs when the education fields of graduates fail to correspond with their fields of employment (McGuinness et al., 2017; Suna et al., 2020a). Graduates working outside of their field of study experience horizontal mismatch because they cannot sufficiently apply the skills gained through education at work. Both types of skill mismatch involve a significant imbalance between the skills gained in education and the skills used in the labor market.

Many international organizations monitor the issue of skill mismatch and share best practices and coping strategies across diverse national contexts (CEDEFOP, 2014, 2018; McGuinness et al., 2017; OECD, 2009; Temple, 2000). In other words, these institutions provide examples of policies followed by different countries to manage human resources in accordance with national social and economic policies (OECD, 2009). Given the importance of this issue, many countries adopt different methods to match student demands with the needs of the labor market. Such methods include gathering feedback from labor market representatives about their needs, conducting predictive studies about the required skills of the market (*skill forecasting),* establishing independent boards on the subject, and structuring national regulations in line with board suggestions (OECD, 2009).

Although skill mismatch can cause problems across many different branches of a nation's education system, vocational education and training (VET) faces additional challenges that may lead to skill mismatch (CEDEFOP, 2018; Özer & Suna, 2019; Suna et al., 2020a). First, because VET has a very close relationship with the labor market, it can be more susceptible to market changes, such as the rapid advancement of technology and automation in many sectors (Acemoğlu & Restrepo, 2018; Özer & Perc, 2020). Second, each vocational field is affected by such changes to a different extent based on structural differences. For example, production and service-based fields, where automation and artificial intelligence technologies are widespread, are naturally more

affected by these developments, while fields with more traditional production and services are less affected. Therefore, a special importance is attached to the compatibility of VET students' skills with labor market needs (CEDEFOP, 2010, 2018; OECD, 2009).

The compatibility of VET with the labor market has been a matter of debate for many years in Turkey. The government has developed different VET system models, each of which aims to more effectively provide students with the skills required by the labor market. Especially after 2018, concrete steps taken in VET aim for a holistic improvement in this type of education (Özer, 2018, 2019a, 2019b; Özer & Suna, 2019). Among these steps, increasing the participation and contribution of labor market representatives in different aspects of VET and improving collaborations are particularly important for alleviating the skill mismatch (Özer, 2020a, 2020b, 2021a). Such interventions attempt to respond more adequately to industry needs building a better understanding of the expectations and skill requirements of the labor market. In line with this purpose, research determined for the first time the vocational fields, distribution of employees, and the production areas at the provincial level, thus creating the Vocational Map of Turkey (Özer, 2020a, 2020b). This visualization revealed the coherence between vocational fields and sector needs. In addition, the official vocational field designations have been updated and aligned with national occupational standards through research on the demands of the labor market and active participation of sector representatives (Canbal et al., 2020). These are essential steps to strengthen the links between VET and the labor market and mitigate skill mismatch.

The structure of the VET system forms an important factor impacting vocational skill mismatches (Özer, 2020a; Raffe, 2007). In countries such as Germany and Austria, the VET system is structured according to an "employment logic," where the transition of graduates to the labor market is prioritized. Consequently, a strong relationship is established between the VET system and the labor market, and measures are taken to ensure that educational outcomes correspond with labor market expectations. In countries where VET is structured according to an "education logic," the main priority

is to ensure the transition of students to higher education (Fuller, 2015; Iannelli & Raffe, 2007; Özer, 2020a). In this approach, the links between VET with the labor market are more flexible. Since the Turkish VET system does not clearly follow either of these approaches, it becomes difficult to evaluate the coherence between the labor market and the VET system.

Although important steps have been taken in recent years to increase the cooperation between VET and the labor market in Turkey, relatively few data-based studies have been conducted to examine the coherence between them (Bartlett, 2013; Ege, 2020; Erikli, 2015; Filiztekin, 2011; Galasi, 2008; MEB, 2018; Mercan et al., 2015; Özer & Suna, 2020; Suna et al., 2020a; Susanlı, 2020). As in many countries (Cappelli, 2015; CEDEFOP, 2018; McGuinness et al., 2017), although employers in Turkey frequently complain that they cannot find the employees they are looking for, it remains unclear whether these complaints indicate real problems, or which fields experience the greatest difficulty in this area. Additionally, fields with a higher supply of graduates than needed can experience issues such as high competition and low wages. For this reason, the present study analyzes the compatibility of VET graduates with the demands of the labor market in Turkey across regions by using a comprehensive data set. This study constitutes one of the most comprehensive investigations of horizontal skill mismatch in Turkey, since it takes into account all students who graduated from VET in 2019 and all available job positions listed in the IPA database.

Studies on Skill Mismatch in Turkey

This section outlines the studies in the literature on skills mismatch in Turkey in chronological order to illustrate the change in results over time. Galasi (2008) used *European Social Survey* data to determine the vertical skill mismatch in 25 European countries, identifying Turkey among the countries with below average education duration and the highest level of skill mismatch. The findings indicated that only 1.4% of the employed population in Turkey were working in jobs compatible with their education level—the lowest among the European countries in the study. In Filiztekin's (2011) study, the level of vertical skill mismatch reviewed through Household Budget

and Consumption Expenditure Survey between 1994 and 2002. While 63.2% of the individuals surveyed in 1994 had received adequate education to succeed in their jobs, this proportion decreased to 60.7% by 2002. It is also showed that, over-educated and under-educated individuals reported lower wages than individuals with the same educational level who did not experience skill mismatch. Bartlett's study (2013) revealed that skills mismatch was lower at primary and higher education levels in Turkey in comparison with neighboring European countries, and higher at the intermediate level. The study concluded that the greatest mismatch existed at the high school level, and that the level of mismatch in general education was higher than that of VET.

TEPAV's study on vertical skill mismatch (2013) through the Household Labor Force Survey data showed that approximately 8.8% of the Anatolian high school (academic high-schools) graduates of and VET high schools –approximately 425,000 graduates in 2011- worked in jobs that do not require any qualifications. Erikli (2015) investigated the reasons for the high levels of skill mismatch in the northern city of Sinop, and found that that skill mismatch was among the main reasons for the increase in both available job positions and unemployment between 2012 and 2013. Mercan et al. (2015) revealed that the skill mismatch varied greatly between sectors: sectors with the highest rate of under-educated employees were agriculture and fisheries (39.9%), legal experts and senior civil servants (33.1%), and sales professionals and promotion staff (32.8%), respectively. In contrast, fields with the highest proportion of over-educated employees were physics and engineering specialists (36.6%), installation specialists (35.6%), customer relations specialists (32.7%), and commercial workers within the scope of metal and machine production (31.5%). Susanlı (2020) identified the factors affecting skill mismatch by the Enterprise Surveys of World Bank. Findings showed that the likelihood of skill mismatch is higher in larger firms (20–99 employees) than in smaller firms (5–19). Moreover, the study found that the probability of skill mismatch is 11% lower in foreign-partnered companies than in other companies. This finding is attributed to the tendency of foreign-partnered companies to focus more on on-the-job training of

employees. Suna et al. (2020) investigated the reasons for horizontal skill mismatch by through interviews and questionnaire with VET graduates and found that the main reasons are graduates' inability to find sufficient open positions in their field, lack of difference in wages, employers' preference for experienced employees and working conditions. These findings indicated that the horizontal skill mismatch in VET in Turkey is largely due to labor market dynamics. Lastly, Ege (2020) found significant differences between the fields of education and employment (i.e., horizontal skill mismatch) for VET graduates. Furthermore, it is found that out-of-field employment increased between 2012 and 2016 and labor market conditions are among the most prominent reasons for out-of-field employment.

Research Questions

The purpose of this study was to examine the compatibility of VET graduates with available job positions across Turkey and at the regional level, using the data from the 2019 IPA study and the 2019–2020 VET graduate population. In line with this general purpose, answers to the following questions were sought:

1. How does the compatibility between VET graduates and available job positions vary across Turkey by vocational field?

2. How does the compatibility between VET graduates and available job positions vary at the regional level by vocational field?

2.a. How do the vocational fields with the lowest ratio of graduates to the number of available positions vary by region?

2.b. How do the vocational fields with the highest ratio of graduates to the number of available positions vary by region?

METHOD

Research Design

This study was carried out according to a descriptive research design to determine the compatibility between the supply of VET graduates and labor market demand in Turkey. Descriptive research aims to examine the characteristics in question comprehensively without external intervention (Creswell, 2002).

Participants

The data sources used in this study included the Labor Market Research (IPA) collected by İŞKUR in 2019 and statistics on the student population who graduated from VET high schools during the 2019–2020 academic year. In İŞKUR's research, companies were divided into three categories according to their size: those with 2–9, 10–19, and 20 or more employees, respectively. İŞKUR collected data on a total of 1,411,802 workplaces with 13,022,547 employees for the study.

While the IPA was planned to include 83,887 companies representing 1,411,802 workplaces across Turkey, a total of 76,844 workplaces were visited by the conclusion of the research. Information about available positions and the education levels expected in these positions were collected from these companies. The number of available positions and their distribution by education level reported in the 2019 IPA results are given in Table 1.

Table 1. Distribution of Available Positions by Education Levels in Turkey According to the 2019 İŞKUR IPA

Expected Education Level	**Number of Available Positions**	**Rate of Available Positions (%)**
Not Important	123,398	37.47
Apprenticeship Training	3,275	1.00
Below High School	59,965	18.21
General High School	67,966	20.64
Vocational School (High School Level)	27,791	8.44
Vocational School (University Level)	14,007	4.25
Undergraduate Level	32,097	9.75
Graduate Level	786	0.24
Total	**329,285**	**100.00**

As shown in Table 1, approximately 85.76% of the available positions in the labor market in 2019 required education at or below the high school level. The study took into consideration available positions linked with VET fields that required education below the undergraduate level. It is also important to note that the percentage of available positions without any education level expectation is quite high (37.47%).

Data

For the purposes of the present study, the provincial data of the İŞKUR 2019 İPA was obtained and used through collaboration with the General Directorate of Vocational and Technical Education (MTEGM) and İŞKUR.

Data Analysis

To evaluate the horizontal skill mismatch at the regional level, available positions were matched with the fields of education of VET graduates. Within this scope, the skills expected in the available position were compared with the education programs corresponding with the vocational field. Consequently, three possible cases emerged from these comparisons: first, a situation where there are available positions and these positions can be matched with the vocational fields available; second, a situation where there are available positions, however, these positions cannot be matched with the

vocational fields available; and third, a situation where there are VET graduates in diverse vocational fields available, but no available positions. To assess the mismatch between labor market demand and supply of VET graduates, the first and third cases were considered, as illustrated in Table 2.**Table 2.** Three Potential Cases for Matching Labor Market Demand with VET Supply in the Present Study

Available Positions	VET Graduates and Matching	Inclusion to Analysis
Yes	Yes - Associated	Included
Yes	Not associated	Excluded
No	Yes - Associated	Included

To evaluate the skill mismatch in a descriptive way, the match ratio (MR) was calculated by using the following formula:

Match ratio (MR) = Number of available positions / Number of graduates

Here, an MR of 1 indicates that the supply and demand are 100% compatible. As the MR value rises above 1, the skill mismatch increases. A decrease in the MR indicates that there are many more VET graduates than available positions, while an increase in MR above 1 indicates that there are far fewer VET graduates than the labor market demands. Based on this assessment of mismatch, positions with a frequency and/or number of matched VET graduates lower than 50 were not included in the analysis.

The Turkish Nomenclature of Territorial Units for Statistics (Turkey NUTS1) was used for regional analysis. The NUTS1 classification enabled the association of the research findings with diverse educational indicators and ensured consistency with current education monitoring studies.

Ethical Considerations

The provincial data was officially requested from İŞKUR by MTEGM (Report no. 111002, published 02.01.2020). The data on VET high school students from the 2019–2020 academic year were used with official approval of MTEGM as well.

RESULTS

Results regarding the compatibility between available positions and the supply of VET graduates across Turkey

Responding to the first research question, results on the compatibility of VET graduates with available positions in the labor market across Turkey are provided in Table 3.

Table 3. Number of Available Positions in Labor Market and VET Graduates in Diverse Vocational Fields across Turkey

Vocational Fields	Number of Available Positions	Number of VET Graduates	Match Rate (%)
Health Services	319	36,303	0.01
Child Development and Education	412	26,345	0.02
Information Technology	959	33,296	0.03
Patient and Elderly Services	548	6,426	0.09
Radio-Television	191	1,087	0.18
Maritime	446	1,924	0.23
Electric-Electronics Technology	6,621	503	0.23
Aircraft Maintenance	195	28,790	0.25
Graphics and Photography	1,584	6,190	0.26
Shipbuilding	159	569	0.28
Chemical Technology	1,161	3,823	0.30
Accounting and Finance	5,612	17,054	0.33
Office Management	2,297	6,877	0.33
Animal Breeding	302	692	0.44
Industrial Automation Technology	870	1,737	0.50
Handicraft Technology	598	1,077	0.56
Jewelry Technology	203	270	0.75
Agricultural Technology	592	724	0.82
Installation Technology and Air Conditioning	3,570	3,934	0.91
Machine Technology	11,234	12,323	0.91
Transport Services	2,491	2,695	0.92
Printing Technology	722	647	1.12
Motor Vehicle Technology	6,144	5,500	1.12
Metal Technology	6,731	5,703	1.18
Journalism	642	512	1.25
Furniture and Interior Design	6,759	4,547	1.49
Food Technology	3,980	2,395	1.66
Accommodation and Travel Services	5,389	3,040	1.77
Construction Technology	8,408	4,330	1.94
Beauty and Hair Care Services	5,545	2,843	1.95
Public Relations and Organization Services	5,148	2,188	2.35
Food and Beverage Services	40,488	15,282	2.65
Textile Technology	4,291	1,409	3.05
Family and Consumer Services	3,604	1,128	3.20
Metallurgy Technology	546	105	5.20
Plastics Technology	1,977	324	6 10
Marketing and Retail	25,805	2,732	9.45
Shoe and Leathercraft Technology	1,653	158	10.46
Fashion Design Technologies	53,045	4,562	11.63
Ceramic and Glass Technology	2,545	135	18.85
Mining Technology	2,865	0	-

As seen in Table 3, the supply of VET graduates and labor market needs vary remarkably in certain vocational fields across Turkey. These differences are also clearly seen in the MR. It is noteworthy that the number of graduates in technology and patient/elderly services is more than 30 times the available positions in these fields. Considering the labor market needs, these fields are among the ones with the highest number of graduates across Turkey. Moreover, the numbers of VET graduates from radio/television, maritime, electric/electronics technology, aircraft maintenance, graphics and photography, shipbuilding, chemical technology, accounting, and finance are more than three times the number of available positions in these fields. Considering that students graduating from academic high schools may also prefer these industries for employment, it seems likely that there will be a skill surplus in these fields.

On the other hand, the numbers of graduates in the fields of textile technology, family and consumer services, metallurgical technology, plastics technology, marketing and retail, footwear and saddlery technology, fashion design technologies, ceramics and glass technology, and mining technology represent less than one-third of the number of available positions in these fields. Although the difference between the available positions and the number of VET graduates can be met with graduates from academic high schools, this option may cause horizontal skill mismatch. In particular, the fact that there are no graduates in mining technology despite a total of 2,685 available positions makes it difficult to find human resources with adequate vocational skills in this field.

Results regarding the compatibility between available positions and the supply of VET graduates at the regional level

Responding to the second research question, results on the compatibility of VET graduates with available positions in the labor market at the regional level are provided in Table 4.

Table 4. Vocational Fields with the Lowest Match Rates for VET Graduates by Regions

Mediterranean	**%**	**Western Anatolia**	**%**	**Western Marmara**	**%**
Plastic Technology	0.00	Ceramics and Glass Technology	0.00	Mining Technology	0.00
Ceramics and Glass Technology	0.00	Shoes And Saddlery Technology	5.74	Plastics Technology	0.00
Marketing And Retail	11.91	Jewelry Technology	7.61	Beauty And Hair Care Services	10.14
Public Relations and Organization Services	25.05	Fashion Design Technologies	12.76	Fashion Design Technologies	10.73
Journalism	35.28	Marketing and Retail	13.09	Marketing and Retail	14.12
West Black Sea	**%**	**East Black Sea**	**%**	**East Marmara**	**%**
Textile Technology	0.00	Public Relations and Organization Services	10.63	Metallurgical Technology	0.00
Mining Technology	0.00	Family and Consumer Services	11.65	Family And Consumer Services	2.24
Marketing And Retail	6.86	Marketing And Retail	13.69	Ceramics And Glass Technology	5.20
Fashion Design Technologies	15.29	Food Technology	15.97	Fashion Design Technology	10.92
Food and Beverage Services	26.74	Fashion Design Technology		Marketing and Retail	12.33
Aegean	**%**	**Southeastern Anatolia**	**%**	**Istanbul**	**%**
Mining Technology	0.00	Shoes And Saddlery Technology	1.74	Agricultural Technology	0.00
Metallurgical Technology	6.20	Fashion Design Technologies	12.18	Fashion Design Technologies	4.34
Journalism	10.40	Marketing And Retail	13.40	Ceramics And Glass Technology	7.12
Construction Technology	11.22	Industrial Automation	33.33	Plastics Technology	8.47
Marketing And Retail	12.85	Public Relations and Organization Services	37.67	Marketing And Retail	9.33
Northeast Anatolia*	**%**	**Central Anatolia**	**%**	**Middle East Anatolia***	**%**
Marketing And Retail	8.23	Marketing And Retail	4.58	Fashion Design Technologies	7.22
Agricultural Technology	18.08	Food Technology	15.50	Marketing and Retail	18.53
		Family and Consumer Services	21.82	Textile Technology	20.55
		Accommodation and Travel Services	32.96	Public Relations and Organizational Services	83.33
		Machinery Technologies	41.98		

**The number of vocational fields with low match rate is less than 5.*

As seen in Table 4, although there are available positions across the labor market, the vocational fields with inadequate supply vary significantly between regions.

Additionally, the fields where VET graduates have difficulty meeting the human resource needs largely correspond with the production areas of each respective region.

Table 4 also shows the specific vocational fields that experience the greatest difficulty matching available positions with the supply of VET graduates. For example, marketing and retail are among the fields with the lowest MR across all regions. Similarly, fashion/design technology is among the fields with lowest MR in 8 of 12 regions. Similarly, public relations and organization services is among the fields where the number of VET graduates is at the lowest level in meeting the needs of the labor market in four regions, while mining technology graduates are scarce in three different regions. Therefore, although each region should be evaluated according to its own needs, it is important to emphasize that many regions are struggling with skill surplus in the same vocational fields. Finally, it is also important to highlight that although there are available job positions in 7 of 12 regions, there are no VET graduates matched with this position.

Next, the compatibility of VET graduates with available positions in the labor market at the regional level was examined; the vocational fields with the highest match rates are provided in Table 5.

Table 5. Vocational Fields with the Highest Match Rates for VET Graduates by Regions

Mediterranean	**%**	**Western Anatolia**	**%**	**Western Marmara**	**%**
Information Technologies	1731.90	Health Services	5432.81	Office Management	323.73
Electrical-Electronics Technology	681.01	Accounting and Finance	2205.13	Metal Technology	305.66
Office Management	308.52	Child Development and Education	1538.27	Electrical-Electronics Technology	244.09
Accounting And Finance	271.67	Office Management	1104.69	Machinery Technology	182.37
Motor Vehicles Technology	208.78	Electrical-Electronics Technology	900.26		
Western Black Sea	**%**	**Eastern Black Sea***	**%**	**Eastern Marmara**	**%**
Metal Technology	482.83	Electrical-Electronics Technology	1672.55	Office Management	1415.09
Office Management	330.15	Machine Technology	200.63	Electrical-Electronic Technology	1045.94
Electrical-Electronic Technology	309.45			Accounting and Finance	347.32
Accounting and Finance	254.17			Installation Technology Heat and Air Conditioning	304.65
Family and Consumer Services	188.24			Public Relations and Organization Services	258.76
Aegean	**%**	**Southeastern Anatolia***	**%**	**Istanbul**	**%**
Information Technologies	972.59	Accounting and Finance	347.88	Information Technologies	5289.39
Accounting And Finance	464,90	Electrical-Electronic Technology	323.84	Health Services	4435.78
Electrical-Electronic Technology	410.89	Food and Beverage Services	259.86	Child Development and Education	3944.83
Chemical Technology	361.11			Printing Technology	570.77
Graphics and Photography	266.54			Office Management	187.86
Northeast Anatolia*	**%**	**Central Anatolia**	**%**	**Middle East Anatolia**	**%**
		Office Management	376.14	Child Development and Education	1472.82
		Construction Technology	348.48	Information Technologies	1105.62
		Metal Technology	316.30	Construction Technology	280 00
				Finance and Accounting	201.89

**The number of vocational fields with a high match rate is less than 5.*

As seen in Table 5, the MR rates between VET graduates and available positions, as well as the vocational fields with the highest rates differ remarkably between regions. In the Mediterranean, West Anatolia, East Marmara, Istanbul, and Middle East Anatolia regions, there are vocational fields where the number of VET graduates is more than ten times the number of available positions. In other regions, the number of VET graduates compared to available positions is more reasonable.

Furthermore, Table 5 illustrates some common vocational fields where the supply of VET graduates far outnumbers available job positions. For example, electrical-electronics technology is among the fields with the highest oversupply in 8 of 12 regions. Moreover, office management is listed among the most oversaturated fields in 7 of the 12 regions, accounting and finance in 5, and information technologies in 4. In other words, the high supply of VET graduates compared to labor market needs is seen across multiple regions in these fields.

DISCUSSION and CONCLUSION

To maximize the economic benefits of education at the national level, the compatibility of educational outcomes with labor market needs is critical. Many countries establish regulations both in their education systems and in the labor market to increase this coherence (CEDEFOP, 2018; OECD, 2009). Even in education systems where student preferences are prioritized, systemic regulations are made to ensure that educational outcomes align with labor market needs (OECD, 2019).

VET is directly related to the labor market; thus, the direct transition of its graduates to the labor market is considered as an important performance indicator (Kupetz, 2016). Studies conducted by TURKSTAT have shown that the employment rates and average wages of VET graduates have been higher than those of graduates from academic high schools for many years (Özer, 2020b; Özer & Suna, 2020). Although this situation provides a general employment advantage to VET graduates, studies on the employment areas of graduates indicate a critical skill mismatch problem (Bartlett,

2013; Ege, 2020; Erikli, 2015; Filiztekin, 2011; Galasi, 2008; MEB, 2018; Mercan et al., 2015; Özer & Suna, 2020; Suna et al., 2020a). Therefore, although VET graduates in Turkey have a significant advantage in terms of employability, there are great discrepancies between the fields of employment and the fields of education. This imbalance reduces the productivity of investments in education and employment at the national level. Moreover, the level of mismatch varies between fields due to the structure of these fields. Previous studies on skill mismatch in Turkey have typically provided results for particular regions or specific vocational fields. The present study aimed to examine the horizontal skill mismatch in VET across all vocational fields, using İŞKUR IPA research and VET graduate population data. Considering the employment possibility of VET graduates in nearby provinces other than their own, skill mismatches were examined at the regional level according to the NUTS1 system.

The first result of the study indicated that skill mismatches vary greatly by vocational field across Turkey. Health services, which accounts for a large share of the students receiving VET, is the field with the highest supply of graduates compared to labor market demand. There is a much higher supply of graduates in the health services and child development/education than in other fields. Moreover, fields that are in demand at the higher education level—such as information technology and electrical-electronic technology—also see a skill surplus. Suna et al. (2020a) explained that skill surplus is the main reason why VET graduates work outside of their field-of-study. Such a surplus increases horizontal skill mismatches in the labor market. On the other hand, the numbers of graduates in fields such as mining technology, marketing and retail, shoe and saddlery technology, fashion design technologies, and ceramic and glass technology are lower than market demand. This situation also triggers vertical skill mismatches. Therefore, it is necessary to reorganize the VET supply in Turkey, primarily in the fields experiencing shortages, according to the available job positions in the labor market at the national scale. In other words, the present study reveals the need for reevaluation of student quotas and preferences in VET fields throughout Turkey in a way that will balance the supply of human capital with labor market demands.

This study also revealed that skill mismatches show regional variations—but there are also significant cross-regional commonalities. When the regional distribution of the fields with far lower VET supply than the labor market needs is examined, marketing and retail come to the fore. This field was among the least saturated across all 12 regions, alongside fashion and design technologies. On the other hand, mining technology is among the fields where the supply of graduates is the lowest in the Western Black Sea, Aegean, and Western Marmara regions, where mining production is concentrated in Turkey. This research also provided important findings about the professions where the number of graduates greatly exceed the available positions. Fields such as electric-electronic technology and office management are among the areas where skill surplus is evident across most of the regions. Therefore, the skill mismatches change significantly according to field at the regional level across Turkey.

Concrete steps taken after 2018 began creating holistic improvements in the Turkish VET system. These improvements have contributed to the prominence of VET in many aspects, from student preferences towards VET institutions, to the production of urgent products needed during the COVID-19 pandemic (Özer, 2020c, 2020d, 2020e). Labor market representatives have been given more responsibility in diverse aspects of VET by improving existing collaborations and developing new partnerships. However, to increase the quality of VET, its compatibility with the demands of the labor market must be optimized. To this end, “Turkey's Occupational Map” was created to gauge this coherence and identify areas of improvement. In the light of the information provided by this map and the labor market feedback, the relevant agencies have begun reevaluating suitability of the VET fields presented. Additional field studies should be conducted focusing on the cause of these mismatches at the regional level, beginning with the vocational fields with common mismatches in many regions.

This study is limited with descriptive mapping of İŞKUR IPA data and VET graduates’ distribution to vocational fields. Consequently, the findings are important for determining the major regional incompatibilities between labor market demands and VET. It is also important to conduct studies on the reasons of the skill mismatch at

diverse vocational fields in provincial and regional level. These studies will contribute to alleviate the skill mismatch and give data-based feedback to VET system for future predictions.

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GENİŞ ÖZET

Giriş

Eğitimin toplumdaki işlevi çok boyutludur ve çıktıları üzerinden sosyal ve ekonomik sonuçlar doğurmaktadır. Eğitimin bireysel ve ulusal düzeyde sağladığı ekonomik fayda son yıllarda yapılan çalışmalarda daha sık gösterilir hale gelmiştir (OECD, 2019; 2020). Eğitimden sağlanan sosyal ve ekonomik faydayı en üst düzeye çekebilmek için eğitim çıktıları ile işgücü piyasasının taleplerini uyumlu hale getirmek kritik bir öneme sahiptir (Hanushek, Woessmann ve Zhang, 2011; Kupetz, 2016). Aksi durumda, yetişen insan kaynağı ile ihtiyaç duyulan insan kaynağı arasındaki uyumsuzluklar çok farklı problemlere yol açabilmektedir (CEDEFOP, 2010; McGuinness vd., 2017; Özer ve Suna, 2020). Yetişen insan kaynağı ve işgücü piyasasının beklentilerinin uyuşmaması durumu beceri uyumsuzluğu (skill mismatch) olarak tanımlanmakta ve her ülkenin yüzleştiği bir sorun alanını oluşturmaktadır (CEDEFOP, 2014; ILO, 2017). Beceri uyuşmazlığı, mezunların eğitim aracılığı ile kazandıkları becerilerin yaptıkları işle yeterli uyumu göstermemesi durumunda oluşmaktadır (CEDEFOP, 2018; McGuinness vd., 2017). Bu uyumsuzluk, bireylerin eğitime yaptıkları yatırımın yanı sıra devletin eğitime yaptığı yatırımları da verimsizleştirmektedir (Ortiz vd., 2020; Palmer, 2017; Somers vd., 2016).

Beceri uyumsuzluğu eğitim sisteminin tüm çıktıları için bir sorun alanı olmakla beraber mesleki ve teknik eğitim bu konuda özel bir yere sahiptir (CEDEFOP, 2018; Özer ve Suna, 2019; Suna vd., 2020a). Öncelikle, işgücü piyasası ile çok yakın ilişkiye sahip olan mesleki eğitim, bu ilişkisi dolayısıyla işgücü piyasasındaki değişikliklerden daha fazla etkilenmektedir. Türkiye'de mesleki ortaöğretim ve işgücü piyasası arasındaki işbirliğini artırmak için son yıllarda önemli adımlar atılmakla beraber bu uyumu veriye dayalı inceleyen çalışmalar oldukça sınırlıdır (Bartlett, 2013; Ege, 2020; Erikli, 2015; Filiztekin, 2011; Galasi, 2008; MEB, 2018; Mercan vd., 2015; Özer ve Suna, 2020; Suna vd., 2020a; Susanlı, 2020). Bu nedenle bu çalışmada Türkiye'de işgücü piyasasının taleplerinin mesleki ortaöğretim mezunları ile karşılanma düzeyleri kapsamlı bir veri seti üzerinden bölgelere göre incelenmiştir. Çalışmada 2019 yılında mesleki ortaöğretimden mezun olan tüm öğrenciler ve İPA veri tabanındaki tüm iş ilanlarının dikkate alınması dolayısıyla Türkiye'de yatay beceri uyumsuzluğuna dair alanyazında en kapsamlı çalışmalardan bir tanesini oluşturmaktadır.

Yöntem

Bu çalışma, Türkiye'de mesleki ortaöğretim mezun arzı ile işgücü piyasası talebi arasındaki uyumu belirlemek amacıyla betimsel araştırma deseni kullanılarak gerçekleştirilmiştir. Araştırmada yatay beceri uyumunu bölge düzeyinde değerlendirebilmek için açık olan pozisyonlar ile mesleki eğitim mezunlarının eğitim alanları karşılaştırılmıştır. Bu değerlendirme sürecinde açık pozisyonda beklenen beceriler ile hangi meslek alanında bu becerilerin kazanıldığı ilişkilendirilmiştir. Mesleki ortaöğretim mezunlarının açık iş pozisyonları ile uyumunu betimsel bir yolla değerlendirmek için uyum oranı aşağıdaki formülle hesaplanmıştır.

$$Uyum\ \ Oranı = Açık\ İş\ Sayısı / Mezun\ Sayısı$$

Burada uyum oran değeri MR=1 olduğunda arz-talep uyum oranının %100 uyumlu olduğunu göstermektedir. MR değeri küçüldükçe ve 1'in üzerine çıktıkça uyum bozulmaktadır. MR değerinin küçülmesi iş pozisyonundan çok daha fazla mezun verildiğini gösterirken MR değeri 1'in üzerine çıktığında işgücü piyasasının talep ettiğinden çok daha az mezun verildiğini göstermektedir.

Bulgular

Bulgular, sağlık hizmetleri, çocuk gelişimi ve eğitimi, bilişim teknolojileri ve hasta ve yaşlı hizmetleri olmak üzere farklı alanlarda verilen mezun sayısının, bu alanlarda açık pozisyonlardan çok daha fazla olduğunu göstermiştir. Benzer şekilde, radyo-televizyon, denizcilik, elektrik-elektronik teknolojisi, uçak bakım grafik ve fotoğraf gemi yapımı, kimya teknolojisi, muhasebe ve finansman alanlarından mezun olan öğrencilerin sayısı da bu alanlardaki açık pozisyon sayısının üç katından fazladır.

Diğer taraftan, tekstil teknolojisi, aile ve tüketici hizmetleri, metalürji teknolojisi, plastik teknolojisi, pazarlama ve perakende, ayakkabı ve saraciye teknolojisi, moda tasarım teknolojileri, seramik ve cam teknolojisi ve maden teknolojisi alanlarında verilen mezun sayısı, bu alanlardaki açık pozisyonların sayısının üçte birinin altındadır. Açık pozisyonlar ile mezun sayısı arasındaki fark diğer lise türlerinden mezunlar ile karşılanabilmekle beraber, bu durum gerekli mesleki becerilerin yeterli şekilde kullanılamamasına yol açabilir.

Bulgular, ayrıca işgücü piyasasında açık pozisyonlar olmasına rağmen mezun sayısının bu ihtiyacı en az karşılayabildiği meslek alanları bölgelere göre önemli değişimler gösterdiğini işaret etmektedir. Örneğin pazarlama ve perakende, tüm bölgelerde uyum oranının en düşük olduğu meslek alanları arasında yer almaktadır. Benzer şekilde, moda ve tasarım teknolojileri alanı 12 bölgenin 8'inde insan gücü talebinin karşılanmasında eksiklik olan alanlar arasındadır. Diğer taraftan, elektrik-elektronik teknolojisi alanı, 12 bölgenin 8'inde arz fazlalığının en yüksek olduğu alanlar arasındadır. Büro yönetimi 12 bölgenin 7'sinde, muhasebe ve finansman alanı 5'inde, bilişim teknolojileri ise 4'ünde mezun arzının fazla olduğu alanlar arasında bulunmaktadır.

Tartışma ve Sonuç

Mesleki eğitimde 2018 yılı sonrasında atılan somut adımlar bu eğitim türünde bütüncül iyileşmeler sağlamıştır. Özellikle işgücü piyasası temsilcilerinin mesleki eğitimin her alanına dâhil olarak süreçtedaha fazla sorumluluk sahibi olmaları sağlanmıştır. Mevcut işbirlikleri de derinleştirilmiş, tüm meslek alanlarında işgücü piyasası temsilcileriyle ilişkiler geliştirilmiştir. Türkiye'nin Meslek Haritası ile birlikte bu gelişmeler beceri uyumsuzluğunu azaltmak için önemli adımlardır. Bununla birlikte mesleki eğitimin niteliğinin artması için işgücü piyasası ile uyumunun artırılması kaçınılmazdır.

Araştırma bulguları, iş piyasası talepleri ile mesleki ortaöğretim mezunlarının arzı arasında bölgesel düzeyde önemli farklılıkların olduğunu işaret etmektedir. Ulusal ölçekte işgücü piyasasındaki açık iş pozisyonlarına göre öncelikle arz eksikliği olan alanlar olmak üzere Türkiye'de mesleki eğitim arzının yeniden düzenlenmesi gerekmektedir. Bir başka deyişle, Türkiye

genelinde mesleki eğitim alanlarında öğrenci kontenjanları ve tercihlerinin işgücü piyasası talepleri ile dengesini artıracak şekilde tekrar değerlendirilmesi ihtiyacını ortaya koymaktadır. Birçok bölgede ortak görülen meslek alanlarından başlayarak bölgesel düzeyde bu uyumsuzlukların nedenine odaklanan saha araştırmaları yapılmasına ihtiyaç duyulmaktadır.