

The New Design of the Vocational Education & Training System in Türkiye: Recent Improvements & Initial Outcomes

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The world is undergoing a transformation that is unprecedented in history. There is an ongoing multidimensional transformation of societies that is driven by sociological and technological advancements (United Nations, 2020). As social dynamics continue to change rapidly (United Nations, 2020), technological developments and globalization have exacerbated global competition in many sectors (Dahlman, 2018; OECD, 2018a). Furthermore, as outlined by the United Nations (2020), these changes are characterized by a rise in inequalities, technological advancements, climate change, urbanization, and international migration. There were numerous socio-economic changes in this period, including the transition from rural to large cities, the transition from agriculture to commerce, the transition from isolated societies and economies to interactive societies and economies, the transition from large families to small families; transitions to higher incomes and higher education societies begin to emerge (Greenfield, 2016).

To adapt to this new paradigm, countries have had to reevaluate a number of subsystems and processes (Gagnon-Lebrun & Agrawala, 2006; Skare & Riberio Soriano, 2021). The social changes discussed above are large-scale and interconnected. It is expected that education will be one of the systems to respond quickly to changes in society due to its ability to reach all stakeholders and as the most effective means for society to adapt to them (Carstensen & Emmenegger, 2023; Facer, 2011). In this context, it is essential to train qualified and current human capital to prepare societies for these changes and contribute to the sustainable development of a country. An education system that provides a qualified education is undoubtedly the most effective tool for training the human resource described above (OECD, 2019a).

According to Facer (2011), education will contribute to the following fields:

- Enhancing the relationship between people and technology,
- Establishing new intergenerational relationships,
- Establishing new forms of knowledge and democracy,
- Alleviating the inequalities in the economy and society.

A general consensus has been reached regarding the importance of education systems in countries' adaptation to modern conditions (OECD, 2019a; UNESCO, 2005). Nevertheless, the question of how to configure a dynamic system with many stakeholders and numerous components to meet current needs remains an important subject of discussion. In this context, countries are planning to establish an education system that will prepare both school-age children and adults for this transformation process (OECD, 2018b, 2023; UNESCO, 2005). As an example, the OECD has developed the "Learning Framework 2030" taking into account feedbacks received from participating countries, which informs countries of the factors required to provide quality education (OECD, 2018b).

As a whole, the educational system plays a significant role in the transformation process, but vocational education and training (VET) stands out in achieving this transformation successfully (CEDEFOP, 2018; Özer, 2020a, 2021b). There are many opportunities for developing countries with VET, including its strong links to the labor market (CEDEFOP, 2017; Özer, 2020c), its role in sustainable development (Pavlova, 2019), and its flexibility and practice-based nature. This report reviews the main elements of the transformation process, the steps taken by countries to prepare their VET systems for this transformation, as well as the transformation and results of the VET system in Türkiye over the last few years.

Education Systems: Challenges and Opportunities

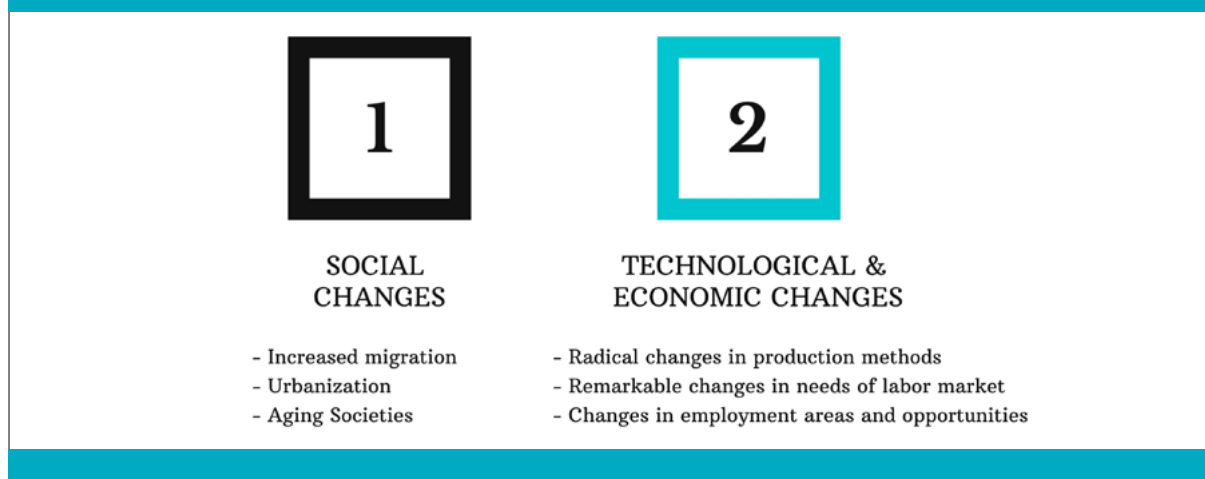
Based on the existing literature concerning the challenges encountered by the education systems, as depicted in Figure 1, these challenges can be divided into two categories: social and technological/economic. The prominent social changes include increased migration movements and the aging of societies (OECD, 2013; UNESCO & GEM, 2019). Global migration movements have witnessed an upsurge leading societies to become further heterogeneous, and thus education systems are expected to provide learning opportunities for students from diverse cultures at varying levels of readiness (UNESCO and GEM, 2019; Wiren, 2013). In addition, migration movements are not only prevalent across countries but also within countries, with people moving from rural regions to urban centers (Maarseveen, 2022; OECD, 2014). It is important to note that an increase in migration movements is accompanied by an increase in domestic population movements within a country.

increasing socioeconomic and cultural diversity.

The educational system also bears the crucial responsibility of preparing adults who are particularly vulnerable to these rapid changes (CBI, 2020; CEDEFOP, 2020a). A significant majority of societies are experiencing rapid aging, resulting in an aging workforce (CBI, 2020; OECD, 2019). Consequently, the equivalent of academic and professional skills of adults in the labor market is deteriorating. Thus, enriching lifelong learning opportunities and encouraging adult participation becomes paramount (Eurydice, 2021; OECD, 2019; Özer, 2022a; Özer & Suna, 2022a).

Technological developments and the influence of globalization have caused major transformations in the labor market, signifying a paradigm shift (Gibbs & Bazylik, 2022; Özer & Perc, 2020; Perc, Özer & Hojnik, 2019). Notably, technology has revolutionized the labor market leading

Figure 1: The challenges faced by education systems in the process of transformation



The heterogeneity of society is associated with a diversity of learning needs of individuals receiving education (Juang & Schachner, 2020; Özer, Suna & Numanoğlu, 2021). Consequently, teaching a group of students from a variety of backgrounds with varying learning needs poses significant challenges (Juang & Schachner, 2020; Suna et al., 2022). To address these challenges effectively, the education system as a whole must be made more flexible in order to provide education to a student group with an

to accelerated production and substantial changes in production technologies (Fu, 2022; Valoppi et al., 2021). The widespread adoption of automation as resulted in the displacement of numerous routine jobs, as machines have taken over these tasks (Perc, Özer & Hojnik, 2019). Moreover, artificial intelligence (AI), machine learning (ML), and deep learning (DL) applications have become more widespread in recent years, which have moved machines beyond the status of "routine tools" (Soori, Arezoo & Dastres, 2023).

The impact of this significant change in the labor market has been multidimensional particularly noticeable in the evolving skills needed by the labor market (Acemoğlu & Autor, 2011; EPRS, 2018; Ra et al., 2019). In recent years, the proliferation of automation and machine learning has drastically reshaped the demand for specific skills in the labor market (McKinsey Global Institute, 2018; OECD, 2021a; Pouliakas, 2018). This change, however, has invalidated the claim that the technologies in question will "replace human power and limit the field of employment to a great extent," as often proclaimed (Bessen, 2019). Instead, while these technologies have indeed taken over certain job roles, they have also created new opportunities across various sectors (Bazylik & Gibbs, 2022; Bessen, 2019).

According to the most recent study conducted by McKinsey Global Institute (2017), the labor market transformation has resulted in a net creation of more new jobs than the jobs replaced by machines. This indicates that while certain jobs have been taken over by machines, new job opportunities and occupations have also emerged. The employment opportunities created by this transformation are, however, predominantly concentrated in jobs and professions requiring medium to high levels of skill (World Economic Forum, 2023). To

put it more specifically, while employment areas in low-skill and routine jobs are shrinking to a significant extent, there is an expansion in employment areas in complex jobs requiring medium to high skills. It is anticipated that this situation will further polarize the labor market (labor market polarization) as well as wage polarization (wage polarization, income polarization) (Bazylik & Gibbs, 2022; McKinsey Global Institute, 2018).

Hence, solely focusing on employment volume will not present a complete picture of the issue. The changes in the labor market have significantly altered the skills required and the expectations for education. Figure 2, based on the World Economic Forum's findings (2023), illustrates some of the trends observed in this transformation process.

Maintaining a global perspective on this change is essential. In the current context, VET emerges as one of the most effective tools countries can utilize. Human resources who receive VET play a crucial role in meeting the skill requirements of the labor market (Backes-Gellner & Lehnert, 2021; Özer, 2019, 2020a; Pavlova, 2009). Following the transformation experienced, countries are taking great steps to design VET systems in line with today's conditions and the benefits of the transformation.

Figure 2: Aspects of the labor market that are expected to be shaped by 2028

- 1 The green and environmental technology sector, as well as the technology and economic sectors, have seen a number of newly formed professions.
- 2 The basis for technology adaptation is the use of big data, cloud computing, and artificial intelligence.
- 3 There are more jobs created by the new technologies developed than those inherited by new technologies. Therefore, employment opportunities are increasing.
- 4 The largest employment growth is expected in the fields of education (about 3 million new jobs), agriculture (about 3 million new jobs) and e-commerce (about 4 million new jobs).
- 5 In the traditional security, manufacturing, and trade sectors, employment is expected to decline the most.
- 6 There is a great deal of demand for analytical and creative thinking in the labor market.
- 7 It is estimated that 6 out of 10 employees will need to improve their skills by 2027. However, the current training capacity is only sufficient to train five out of ten employees.

**Based on the World Economic Forum (2023).*

Global Trends for Revising Vocational Education and Training Systems

In this section, various examples of regulations from different countries are presented, illustrating how they have adapted their VET systems to cope with the changing environment. These examples shed light on the collaborative efforts taken to enhance the quality and inclusiveness of VET within each respective country amid this significant transformation.

1. Providing vocational education that supports the transition to higher education and employment

Because of the transformation that has occurred in the labor market as described in detail in the previous section, highly cooperative and general cognitive skills are required in addition to a capability to utilize new technologies effectively and to learn quickly (CEDEFOP, 2020b; Markowitsch & Hefler, 2019). The primary purpose behind establishing mechanisms to incorporate these skills into VET is to foster a smooth transition to higher education by equipping students with relevant competencies. It was noted by Markowitsch and Hefler (2019) cooperation among European Union countries, particularly since 1995, has led to a shift from solely emphasizing technical skills and employment-focused VET to a more comprehensive approach.

1. Incorporating vocational education with general (academic) education

The convergence of VET and general (academic) education is another important development in this regard as these skills as well as general cognitive skills and digital skills have gained importance in VET (Markowitsch & Hefler, 2019; UNESCO, 2012). In the past, there used to be significant distinctions between general education and VET. However, the transformations that have taken place in the labor market and education systems have compelled these two types of education to become more integrated. The literature refers to this phenomenon as the "hybridization of general and VET," which is a consequence of the growing emphasis on practical skills in both types of education (Markowitsch & Hefler, 2019). Hybridization of the two types of education also leads to the enrichment of transition opportunities between these types of education (CEDEFOP, 2022). Specifically, the sharp distinctions used in the orientation of students before the 2000s are

abandoned, and the focus is instead on the skills that students develop through education rather than the type of education they receive.

2. Developing mechanisms for the recognition and certification of skills

Globalization of educational opportunities has resulted in a variety of skill development opportunities for both children and adults. There has been an increase in the diversity of secondary and higher education programs, education programs within the scope of lifelong learning, and certificate programs in recent years (Sahlberg, 2007; UNESCO, 2020a; World Bank, 2019a). This diversity has resulted in a more inclusive educational system while necessitating the development of various criteria for evaluating the skills acquired by students (CEDEFOP, 2023a). Various institutions provide these programs at different intervals and with diverse curricula. There is a necessity for a system that evaluates students based on their skill sets rather than the method through which they acquired those skills.

Several countries have developed assessment frameworks and methods to determine the level of skills in their education systems in response to this need. As a result, the validation of formal and informal learning/skills has become an area of cooperation between countries (CEDEFOP, 2023a; Colardy & Bjornavold, 2004). The importance of recognizing individual skills has been emphasized to such an extent that European Union countries have undertaken six arrangements on recognition methods between 2005 and 2018, as evidenced by examples from various nations (Markowitsch & Hefler, 2019). The recognition of these skills also holds significant implications in identifying the skills that are currently needed or will be needed at the national level (Werquin, 2010).

3. Promoting lifelong learning

Currently, lifelong learning activities are one of the most prominent aspects of educational systems. Technology is bringing significant social and technological benefits, but it also poses a number of risks, especially for aging societies (Pruchno, 2019). Moreover, this transformation requires a renewal of skills among adults, a growing group within societies (CEDEFOP, 2020c). In the absence of such resiliency, both the ability of this group to adapt to daily life and its employability will deteriorate.

To minimize these risks, it is crucial to promote education as a lifelong endeavor and prioritize lifelong learning activities (CEDEFOP, 2020c; Li, 2022). Essentially, lifelong learning activities are an effective way to extend education beyond the school age, extend it to the entire life span, and promote the development of professional skills. The purpose of lifelong learning activities in this context is to improve social welfare and to make society more capable of transforming (UNESCO, 2021; Waller et al., 2021). In fact, lifelong learning has been incorporated into the Sustainable Development Goals as a goal, with the objective of "providing inclusive and equitable education opportunities for all individuals and strengthening lifelong learning activities" (UN, 2015). Lifelong learning activities are of great importance, leading to the execution of a number of projects designed to improve their effectiveness and inclusiveness (Benavot et al., 2022).

4. Rise of apprenticeships

As VET underwent a transformation process, apprenticeship training has become an even more important resource for meeting labor market needs (Kuczera, 2017). A vocational apprenticeship is a training program that combines theory with practice to provide students with on-the-job training in a real work environment. (ILO, 2022; Kuczera, 2017; Özer, 2018). Apprenticeship education emphasizes the development of skills in real-life work environments so that it facilitates the transition from school to work and increases the employment rates of apprenticeship graduates on a global scale (OECD & ILO, 2017).

In an age of transformation, competencies such as adaptation, cooperation, and application skills have become more prominent in apprenticeship training's structure (Christensen et al., 2021; Özer & Suna, 2022). Consequently, many countries prioritize apprenticeship education within their VET systems and implement large-scale projects to update these apprenticeship education programs according to current needs (CEDEFOP, 2022b; European Commission, 2012). According to a McKinsey report, apprenticeship training has been identified as one of the most crucial tools for rapidly closing the skills gap that emerged after the Covid-19 outbreak (Christensen et al., 2021). CEDEFOP (2022b) also evaluates apprenticeship training as a method of increasing the effectiveness of vocational training in the post-pandemic period, facilitating rapid changes, and minimizing skill mismatches.

5. Alleviating skill mismatches

The harmony between the skills of the trained human resources and the skills needed by the labor market is another indication of technological and social transformations (McGuinness, Pouliakas & Redmond, 2019). A "skills mismatch" occurs when the skills possessed by the available human resources do not align with the skills demanded by the labor market and disparity can have adverse effects on sustainable development (Adalet McGowan & Andrews, 2015; CEDEFOP, 2010; Çidem et al., 2021; Sloane & Mavromaras, 2020) as these conflicts reduce the impact of national and individual investments in education (Somers et al., 2016; Suna et al., 2020a) and make it difficult to plan for human resources effectively.

A number of countries have implemented monitoring systems for skills gained and demanded as a result of these negative effects caused by skills mismatches. It is in this context that skill mismatch has become an area of research, and studies have been conducted on the causes and consequences of different types of conflicts, as well as what should be done to prevent them (Adalet McGowan & Andrews, 2015; CEDEFOP, 2010). Numerous studies have explored the factors contributing to skill mismatch and potential strategies to mitigate it. Among these measures, the most notable approach is strengthening the connection between the VET system and the labor market (Özer, 2020, 2020c; World Bank, 2019b). Establishing effective partnerships creates a shared platform of collaboration between different labor market stakeholders and skill development providers. As a result, reducing skills mismatches becomes a primary motivation behind global initiatives aimed at increasing stakeholder involvement in VET financing and management.

The Transformation of Vocational Education in the EU

A recent study by CEDEFOP (2023b) also examined the common steps taken in the transformation of VET. As part of this study, the common steps that the EU region countries have taken or intend to take in their VET systems have been evaluated. This section meticulously discusses the steps taken in the EU region as well as the six common policies presented in Figure 3.

Figure 3: Actions to Transform the Vocational Education Systems in the Countries of the European Union Region* (CEDEFOP, 2023b)

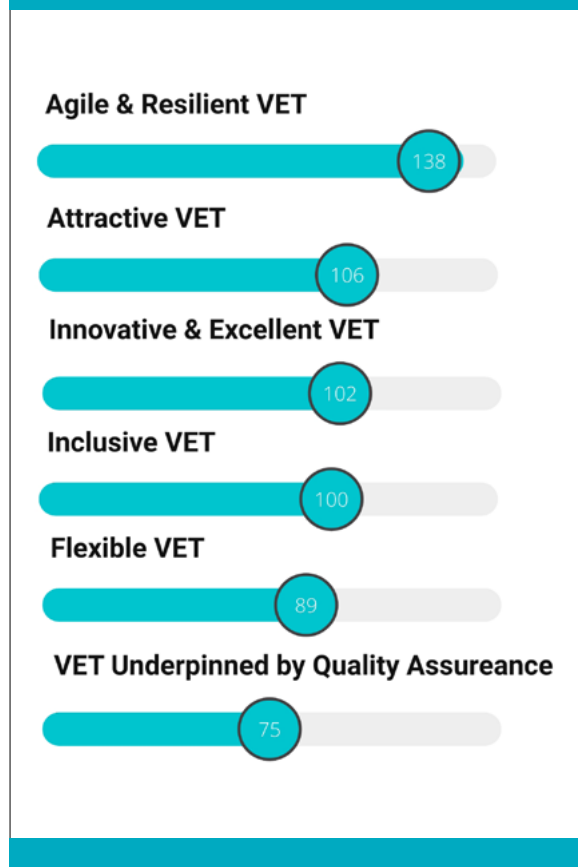
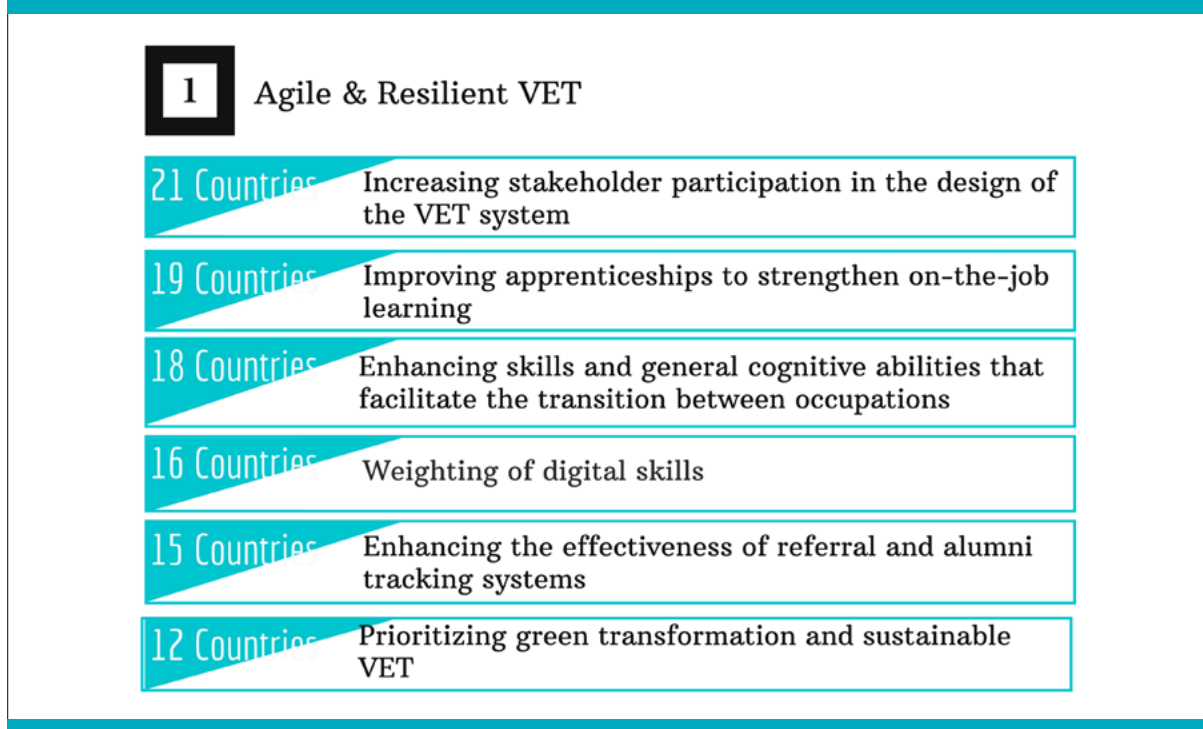


Figure 3 summarizes the steps taken by European Union countries to transform the VET system in accordance with the current needs. From the summary, it is evident that the most common policy area is the development of efficient and resilient VET systems (agile and resilient VET). In the subsequent section, we will explore strategies to enhance the prestige and appeal of VET systems to students, promoting an attractive VET. Additionally, we will delve into methods aimed at positioning this system as a hub of innovation, fostering innovative and excellent VET. Numerous policy changes have been implemented to achieve these objectives, focusing on increasing the inclusiveness of the VET system (inclusive VET), enhancing system flexibility (flexible VET), and establishing a robust quality assurance system for vocational education (VET backed by quality insurance). The subsequent section will offer more comprehensive insights into each of these sub-domains, providing detailed explanations of the measures taken to promote a more inclusive, flexible, and high-quality VET system.

1. Agile and Resilient VET

The VET system needs to respond quickly to changes in the labor market due to the close relationship between VET and the labor market (CEDEFOP, 2023b; European Commission, 2022). Moreover, as a result of the system's ability to respond quickly to changes, the human resources that are trained through it are more resilient to the negative effects of change (CEDEFOP, 2023b). In order to enhance the VET system's agility and responsiveness to changes, it is crucial to involve all its components in the decision-making process. To achieve a more resilient and adaptable VET system, 18 EU countries have either revised or are currently revising the criteria used to assess their training programs, curricula, and the overall quality of vocational training. This ongoing effort aims to create a more dynamic and effective VET system that can effectively meet the evolving demands of the labor market and the changing needs of learners. As shown in Figure 4, EU countries have taken steps to ensure their VET systems are more flexible and resilient.

Figure 4: The measures taken by EU region countries to make their vocational education systems more agile and resilient

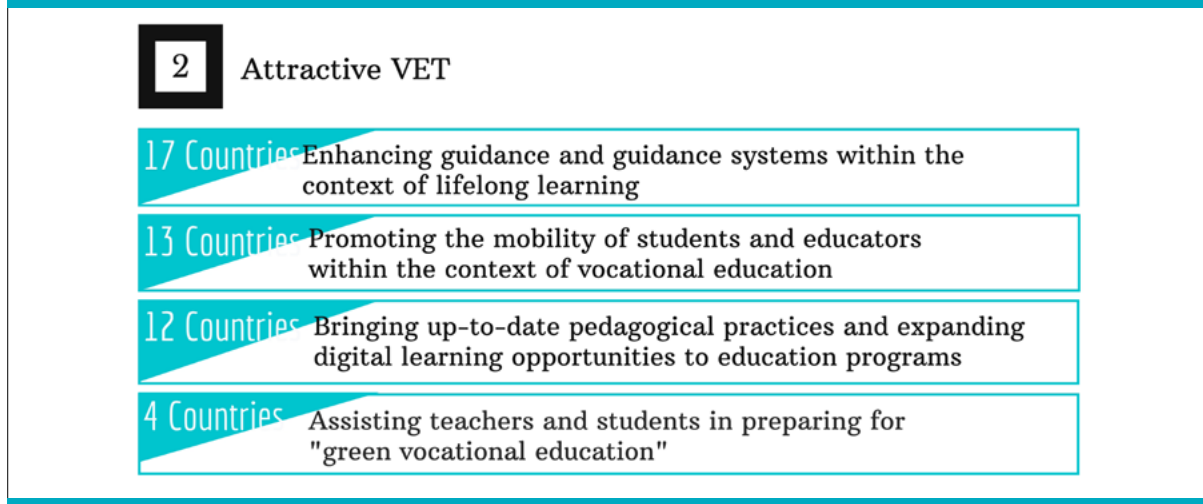


2. Attractive VET

An important aspect of the quality and inclusiveness of VET is the development of mechanisms to ensure that this type of education is among the top choices for students (Billett, 2020; Özer, 2020a). Generally, policies that increase the interaction of VET with general (academic) education and strengthen its ties with higher education are used to achieve this goal. Teacher training has been emphasized

since teacher characteristics are associated with student outcomes (ETF, 2009; OECD, 2021b; Özer, Suna & Sunar, 2021). Figure 5 depicts countries' efforts to increase digitalization and use modern pedagogical methods and materials to increase students' orientation to VET. In addition to influencing student preferences, increasing the quality of guidance studies is also seen as a policy step that should be taken.

Figure 5: Efforts taken by EU countries to make vocational education more attractive and responsive



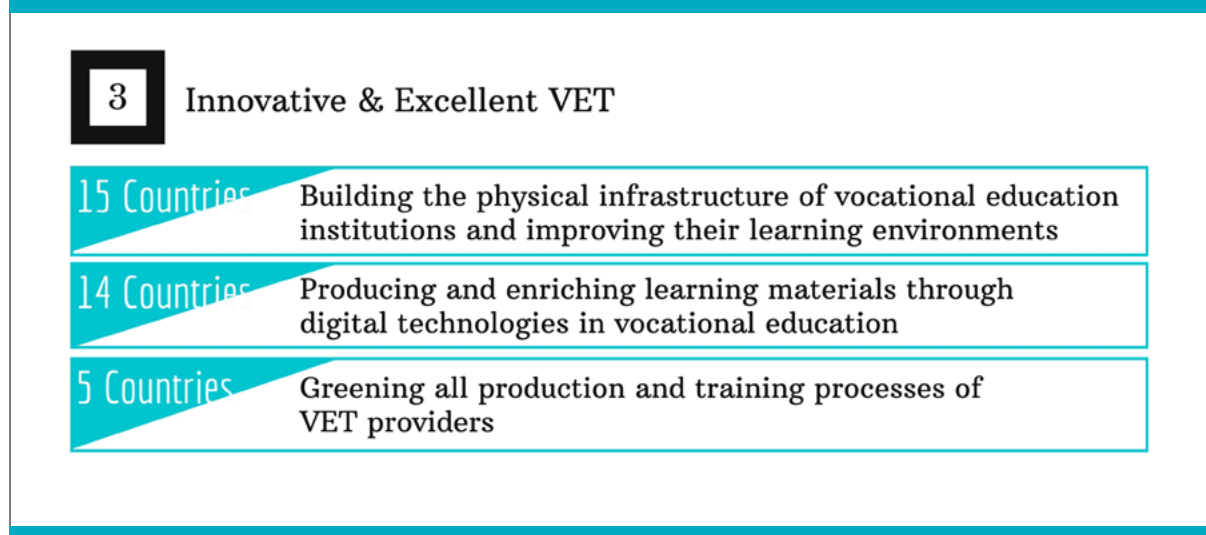
3. Innovative & Excellent VET

In positioning VET within the entire education system, it is noteworthy that it plays a leading role in innovative productions and further supports innovation in higher education (Özer & Suna, 2022c; UNESCO, 2020b). The structuring of VET in a way that promotes innovation increases its compliance with the demands of the labor market, which makes VET more attractive to students (Dawe, 2004; UNESCO, 2020b).

The current approach to promoting innovation in VET involves enhancing the quality of education and

strengthening relationships with the labor market through "centers of excellence" (ETF, 2021). By providing the necessary infrastructure support and collaborating with the private sector, these centers provide an environment where production, education, and innovative approaches come together (ETF, 2021). The center of excellence stands out in this context as an institution that will act as an example for other educational institutions. It can be seen in Figure 6 that countries place a high priority on strengthening the infrastructure of VET institutions, enriching their instructional materials, as well as transforming their environment.

Figure 6: Innovations taken by EU countries to make vocational education systems innovative



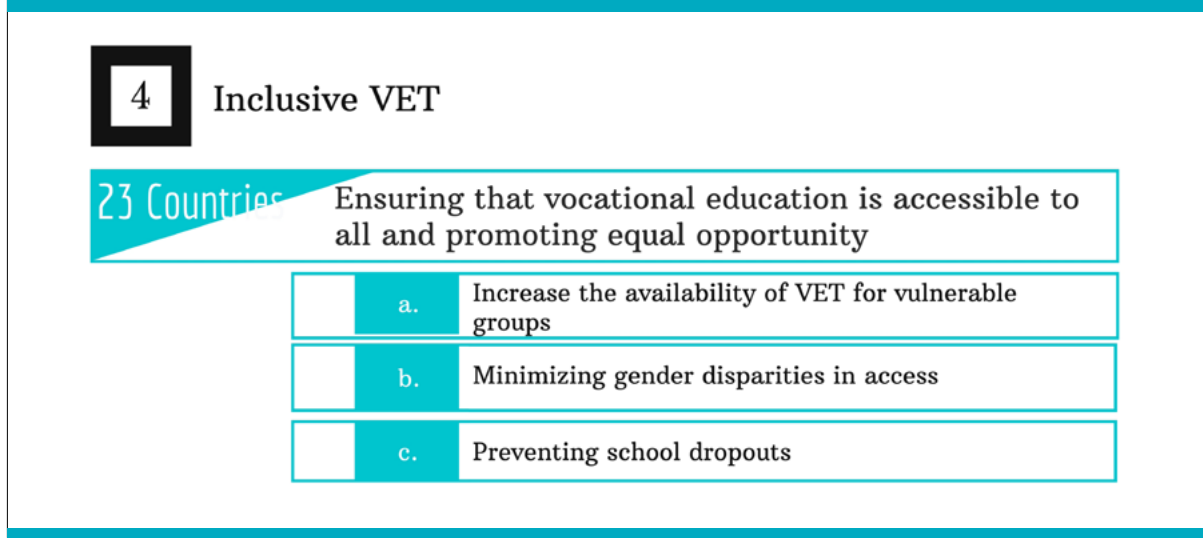
4. Inclusive VET

Promoting policies that guarantee the participation of all individuals who wish to participate in VET is a key strategy for improving the effectiveness of VET and strengthening equality of opportunity. Consequently, it becomes imperative to ensure that all segments of society have the opportunity to benefit from VET, and individuals facing various disadvantages are actively encouraged to participate in VET systems to enhance their inclusivity (ILO, 2016). Increasing access to education and reaching out to groups that currently lack educational opportunities are fundamental steps towards achieving greater inclusion (Jeon, 2019).

One of the sustainable development goals is to provide access to qualified VET and higher education to all

stakeholders by 2030 (Council of Europe, 2023). There is a goal under this heading to increase participation rates, graduation rates, and transfers between institutions, particularly for groups with low representation (Council of Europe, 2023). Since these goals contribute to the integration and employability of immigrants, VET is an effective means of facilitating their integration and employment (Jeon, 2019; Özer, Suna & Numanoğlu, 2021). To increase inclusiveness in this context, countries strive to reduce barriers to educational access for all groups. As depicted in Figure 7, policy measures primarily focus on enhancing participation rates and reducing early school leaving, particularly among groups that have limited access to VET.

Figure 7: Steps of EU Region countries for a more inclusive vocational education system design



5. Flexible VET

Changing social and technological conditions, coupled with today's labor market conditions, require education systems to be flexible in responding to these developments (Nijhof, Heikkinen & Nieuwenhuis, 2003). Upon closer examination of global trends, it is evident that there has been an increase in transitions between different types of education and educational pathways. Moreover, student mobility has seen a rise, with more students seeking educational opportunities beyond their home countries. (CEDEFOP, 2023b). Furthermore, a variety of training programs are available, evaluations of the skills of individuals are intensified, and different stakeholders are given more responsibility for financing and managing VET (Singh, 2015; Özer, 2020a).

The structure of VET should be flexible to facilitate the possibility of change across all its components. A quality and inclusive nature of in-service training activities is of utmost importance in order to provide VET teachers with the necessary skills to remain relevant (ETF, 2009; OECD, 2021b). The development of teachers' skills is one of the most important policy areas in developing a more flexible VET. Figure 8 illustrates how different education models can be used in conjunction with each other to encourage the recognition of pre-skills and to develop lifelong learning activities.

6. VET Underpinned by Quality Assurance

A comprehensive evaluation of the quality of VET is also essential in light of the major transformations in the field, as well as improving the program as a result of these evaluations. A key policy area is evaluating the effectiveness of actions taken with concrete and measurable criteria and ensuring that the evaluation is permanent (ETF, 2015; MEB, 2018a; UNESCO, 2017). To achieve this, countries conduct the necessary studies to reevaluate, revise, and strengthen the criteria they consider to be indicators of quality in VET (MEB, 2018a; UNESCO, 2017).

It has been noted previously that stakeholders have become increasingly involved in the financing and management of VET. Moreover, since VET is a significant area of investment, monitoring and sharing the results of these investments are also key aspects of quality assurance (UNESCO, 2017). Figure 9 illustrates how countries are striving to strengthen their quality assessment systems by using both internal and external evaluation methods.

Figure 8: Increasing the flexibility of vocational education systems in EU countries

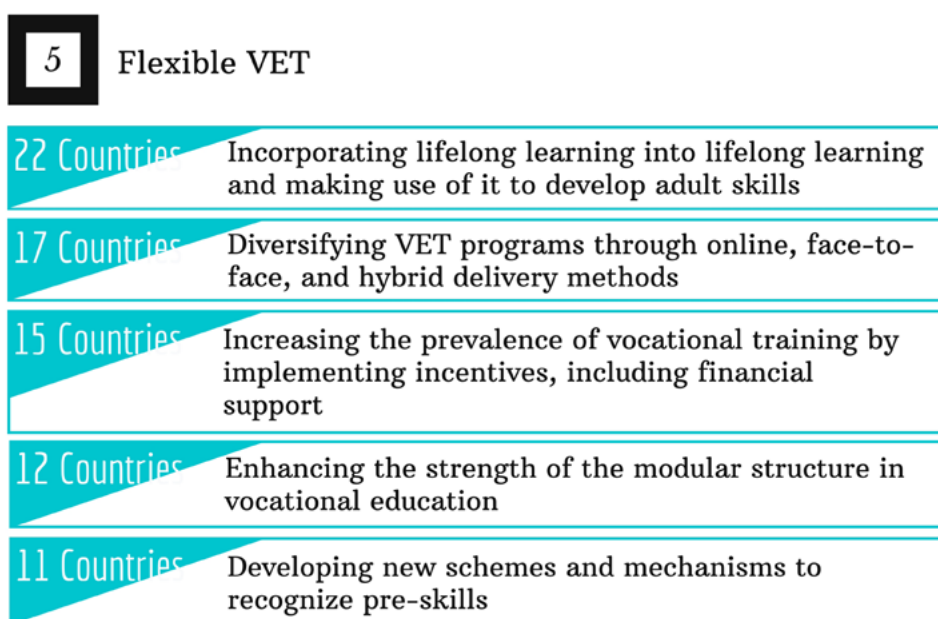
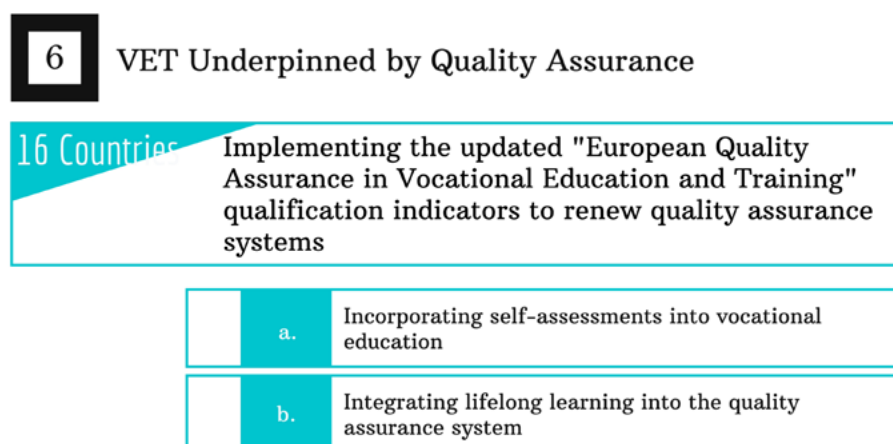


Figure 9: Efforts made by EU countries to strengthen their quality assurance systems



VOCATIONAL EDUCATION AND TRAINING DURING THE PRE-TRANSFORMATION PERIOD IN TÜRKİYE

Origins of VET in Türkiye

Türkiye has a history and experience in VET dating back to the Ottoman Empire (MEB, 2018b). During the imperial period, vocational training was primarily motivated by military needs. "Mühendishane-i Bahri Hümayun" opened in 1734 and "Mühendishane Berri-i Hümayun" opened in 1796 are two important institutions that provide equipped vocational training and were opened in line with military needs (Semiz & Kuş, 2004). As far back as the Ottoman era, a vocational training approach led by tradesmen's organizations has been used within the context of the "Ahi" tradition, which dates back to the principality period (Ekşiolu & Taşpınar, 2019; MEB, 2018b). Within the Ahi tradition, students acquired skills that played an important role in meeting the needs of VET at that time. This education approach, however, is carried out within the framework of non-formal education and is therefore far from being systematic. Following the dissolution of the Ahi organization, VET in the Ottoman Empire was carried out using the master-apprentice relationship within a guild organization (Güllülü, 1977; MEB, 2018b). With a master-apprentice relationship approach, VET aims to provide

children with professional skills at a young age in a similar manner to the Ahi Organization.

During the Tanzimat Period (1839-1876), this approach and the limitations of the human resources raised through the Guild Organization began to be expressed more frequently (Semiz & Kuş, 2004). During this period, VET institutions have become more systematic in order to support industrial development, particularly in Western countries (MEB, 2018b). There has been a growing trend toward systematic approaches in areas such as curriculum, skill development, and applied training, which are all distinct areas of expertise. A systematic approach to VET was introduced to the Ottoman Empire with the signing of the Ministry of Education Regulation during the Tanzimat Period. Furthermore, the fields of education were expanded during this period by establishing new schools, such as Orman Mektebi, Maâdin Mektebi, and Mektebi Maarif-i Adliye (Ekşiolu & Taşpınar, 2019). As schools were opened during this period, western education approaches began to gain traction and became the basis for VET.

VET in the Pre-Transformation Period

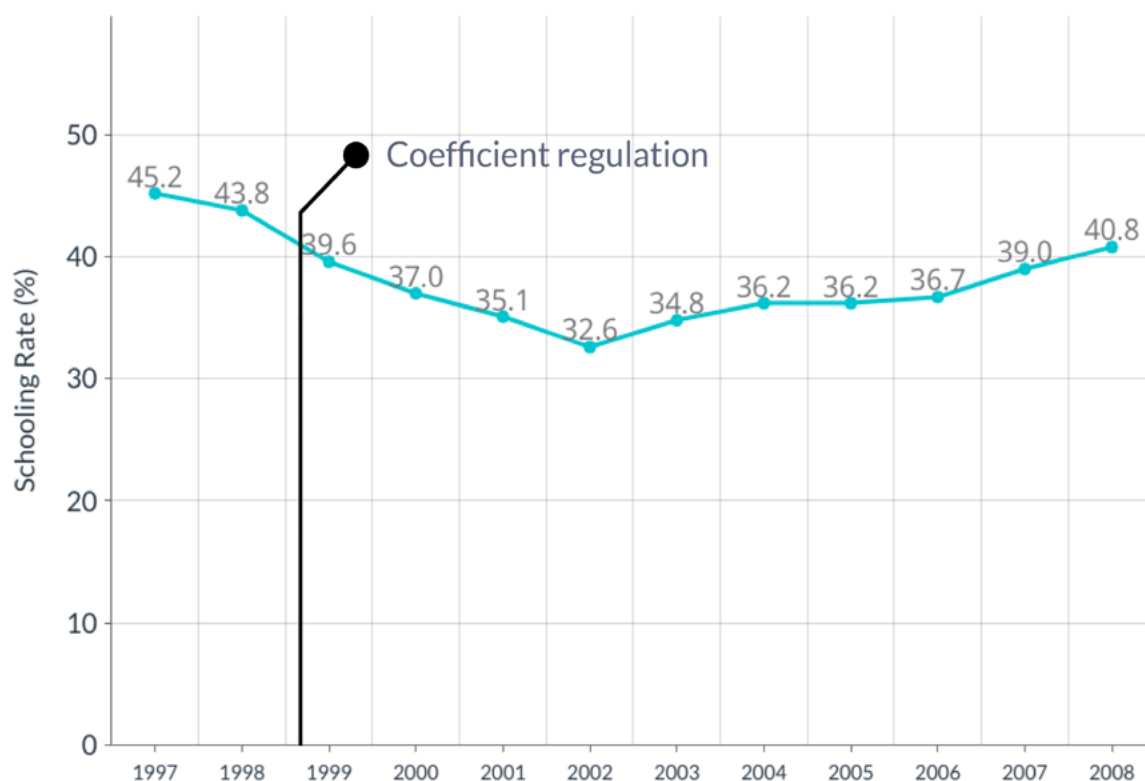
The development of VET in Türkiye can be viewed in terms of periods since there are frequent structural changes. Between 1920 and 1930, efforts were made to establish a more systematic approach to VET in Türkiye and to integrate it into state policies. However, significant advancements in VET did not occur until the 1940s, marking a substantial development period for VET in the country (Demir & Şen, 2009). The Sixth National Education Council convened in 1957 discussed VET and public education extensively. In addition to the opening of an "Apprenticeship School," the council also passed a law on apprenticeships in 1977 (Demir & Şen, 2009).

Upon reviewing the Development Plans and Councils relating to VET from the Sixth National Education Council until the 1990s, statements regarding the VET system and the industry are particularly noteworthy. Additionally, there is a need to increase the prevalence of VET schools, increase the proportion of VET in secondary education, and facilitate the transition from vocational secondary education to higher education. In recent years, these proposals have been presented more frequently, indicating that the relationship between VET and the labor market in Europe has become stronger and that this relationship contributes to sustainable development.

The VET system, which became somewhat widespread until 1999, developed relations with the labor market, and reached a relatively systematic structure, experiencing great negative effects due to external intervention this year (Özer, 2018, 2020a). In conjunction with the "coefficient regulation", when vocational secondary school students sought higher education outside of their field, their achievement level decreased, and this practice, which was practiced for more than ten years, resulted in numerous negative consequences (Özer, 2022b, 2022c). As a result of the implementation of the regulation, the natural flow of students to vocational education has been disrupted. As a result of this practice, the VET preferences of successful

students, particularly those who wish to continue their education at the university level, are restricted (Özer, 2020a). The contrast in VET preference rates before and after the implementation of the coefficient indicates that the coefficient has a negative impact on student flow. According to Figure 10, the share of VET in secondary education was between 44% and 45% before the coefficient regulation began, then it decreased to 37% and then to lower levels (Demir & Şen, 2009). Following the coefficient regulation, student flow in vocational education, which was attempted to be made more attractive through national and international projects, failed to reach the period before the coefficient regulation again.

Figure 10: The share of vocational education in secondary education (1997-2008)



*Demir & Şen (2009)

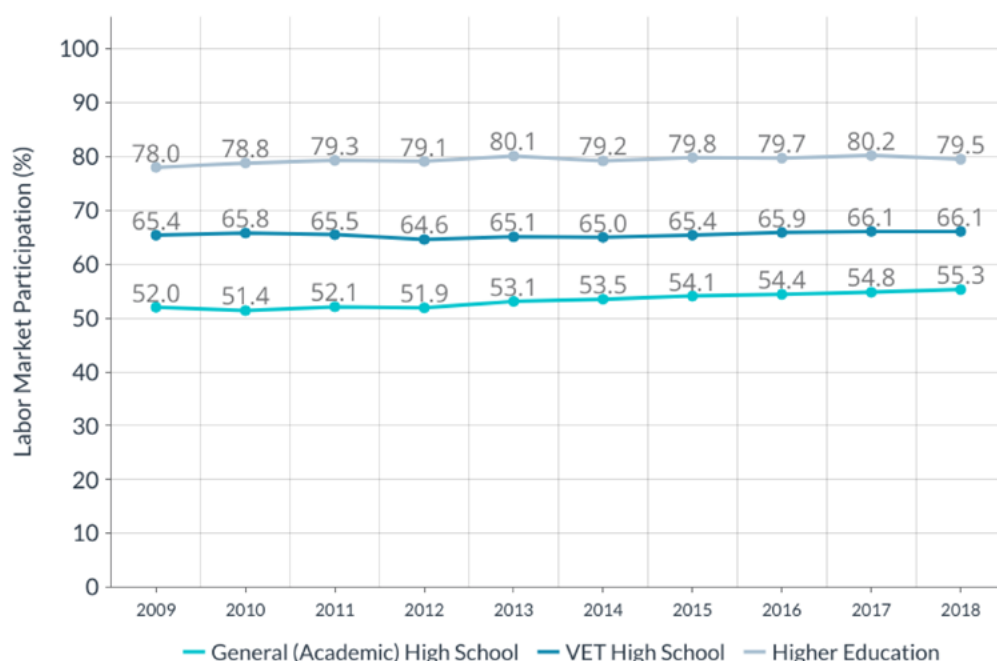
Secondly, the application of the coefficient leads to a transformation in the socioeconomic profile of students. Over time, this implementation has gradually diminished the status of VET, relegating it to a "secondary choice" among students. Consequently, there has been a concentration of students who primarily aim to attend other types of schools but lack the academic performance required for admission, thereby opting for VET as an alternative. During this period, vocational high schools were associated with disciplinary problems, low achievement, and employment difficulties (Özer, 2021). The fact is that studies have shown that VET is the type of education most heavily used by socioeconomically disadvantaged students (Suna & Özer, 2021a; Suna et al., 2020b).

A negative impact of the coefficient regulation is evident not only in the field of education, but also in the labor market (Özer, 2021). It is true that the change in the profile of VET during this period also affected the employability of graduates, and the phrase "I cannot find an employee with adequate skills" began to be expressed more and more by employers. The coefficient application has also reduced the potential to support development through graduates trained through VET.

Despite the abolition of the coefficient regulation in 2010, the long-term implications of this practice were not immediately compensated. Although eight years have passed since the abolition of the coefficient regulation, the rate of preference for VET has not reached the level of 1999 and before, and its social perception has not been sufficiently improved. The transition of VET graduates into the labor market is marked by significant skill mismatches (MEB, 2018b; Özer & Suna, 2020; Suna et al., 2020a). A recent study has shown that the percentage of VET graduates employed in their fields of education is below 10% in many occupational fields (MEB, 2018b).

While VET graduates still have an advantage over general (academic) high school graduates in terms of transition to employment, skill mismatch remains an important issue. There is no doubt that this situation is closely related to the VET system, the labor market, and the personal characteristics and preferences of graduates (Suna et al., 2020a). Nevertheless, the Eleventh Development Plan, published in 2018, aims to improve the quality of VET by 2023. The following conclusions have been made regarding the current state of VET (Ministry of Development, 2018).

Figure 11: Participation rates in the labor market by educational level (%)



*Based on TURKSTAT data.

Insights from Quality of Vocational Education in the Eleventh Development Plan

- According to the results of the current (2017) survey conducted by İŞKUR, An estimated one in five enterprises have difficulty meeting their human resource requirements,
- According to the TEPAV (2016) study, 46.5% of employers have difficulty finding the human resources they require,
- In a study conducted by TOBB, the umbrella organization for the Turkish labor market, the lack of "sufficient skills/knowledge of graduates" was cited as the main reason for not being able to reach the desired human resources.
- The labor market has difficulties finding the skills it needs, and the reasons for the skill mismatch include the inability to clearly define the skills that are sought,
- Since the coefficient application was abolished, projects such as SVET and IKMEP have made significant contributions to increasing the share of VET in secondary education.
- International large-scale assessments indicate that students who choose vocational secondary education perform relatively poorly,
- It appears that the results of international large-scale studies indicate that adult skills in Türkiye are significantly below the OECD average and that participation is low.
- As one of the youngest countries in Europe, Türkiye ranks among the countries with the highest youth unemployment rates.
- Türkiye ranks first among European countries in the percentage of young people who are neither in education nor employment (NEET). It is evident from this situation that there are a number of serious limitations both in terms of employment and transition to education.
- There is a skill mismatch among VET graduates due to the physical and psychological problems caused by working in the field in which they were educated.
- The TEPAV (2016) report indicates that VET students believe their education is not adequately preparing them for the conditions of the labor market.
- However, the societal perception of VET is still not adequately improved and it is classified as a part of the general (academic) education system,
- A lack of vocational maps based on skill maps contributes to VET's inability to respond rapidly to change,
- A lack of infrastructure in VET institutions can limit the development of students' skills,
- A career guidance/career guidance system has not been developed to support the career choices of students.

A PARADIGM CHANGE IN VOCATIONAL SECONDARY EDUCATION: RECENT IMPROVEMENTS

As of 2018, the concrete and multidimensional steps taken in the vocational secondary education system have resulted in a paradigm shift (Özer, 2020a, 2020b). Following the previous section, there were significant differences in the approach to VET throughout the Republican era. This period was distinguished by monitoring global developments in the plans made, setting quantitative

targets, simultaneously executing legal planning and implementation, informing society about the steps taken, and monitoring the results of improvements based on the collected data. We discuss in this section the steps that led to a paradigm shift in VET since 2018 and then the results of those steps.

a. Developing stronger relationships with the labor market in all professional areas

One of the most critical current steps concerning VET is the swift and effective response of the VET system to the demands of the labor market. To achieve the desired agility, it is imperative to reinforce the VET system's connection with the labor market and actively involve sector representatives in all aspects of the VET system. This is evident in the inclusion of more stakeholders in current approaches to VET, the expansion of partnerships with the business world in areas such as infrastructure, design, and employment, as well as the increased participation of the

labor market in decision-making processes.

As of 2018, the Ministry of National Education (MoNE) took an important decision to strengthen its partnership with the labor market and to establish new collaborations in all the professions where training is offered. In establishing new or deepening cooperation with the labor market, MoNE has adopted five principles as a guideline.

The principles of strengthening relations with the labor market

- Physical infrastructure improvements
- Curriculum and training program co-updates and evaluations
- Involvement of representatives from the business world in teacher training
- Implement internships and on-the-job training in real business environments for students
- A guarantee/priority of employment for successful graduates

By incorporating these principles into the establishment and development of cooperation, the labor market has assumed a prominent role in all aspects of VET. This situation has the additional benefit of making the labor market a key player in resolving the problem of "I cannot find the employee I am looking for," which has become rhetoric by the labor market. Therefore, this approach has resulted in the labor market shifting from one that constantly voices concerns to one that takes an active role in resolving them.

Through this approach, cooperation has been established with labor market representatives in all occupational

fields where training is provided. The cooperation has also resulted in several secondary benefits. One of these benefits is the reorganization of all professions and branches in accordance with the demands of the labor market. Along with the views of the labor market, global trainings were also taken into consideration during this reorganization process. This has led to a wide field and branch definition, which encourages horizontal and vertical transitions between professions on a global scale (Canbal et al., 2020). With this definition, the field and branches of the profession have been simplified and the equivalents of the fields and branches have been redefined in the labor market.

Results

An improvement policy was adopted throughout Türkiye following the steps taken by MoNE to strengthen its cooperation with the labor market. The following are some examples of collaborations with umbrella organizations and large-scale representatives of the Turkish labor market as a result of this policy.

■ **81 Vocational High School Protocols with the Union of Chambers and Commodity Exchanges of Türkiye (TOBB):** MoNE and TOBB have developed a joint management model to be used in at least one vocational high school in every province. The physical infrastructure of the schools involved in the project was improved, the curriculum and training programs were updated together, on-the-job training was carried out in institutions affiliated with TOBB, scholarships were awarded to successful students, and TOBB experts were used in teacher training.

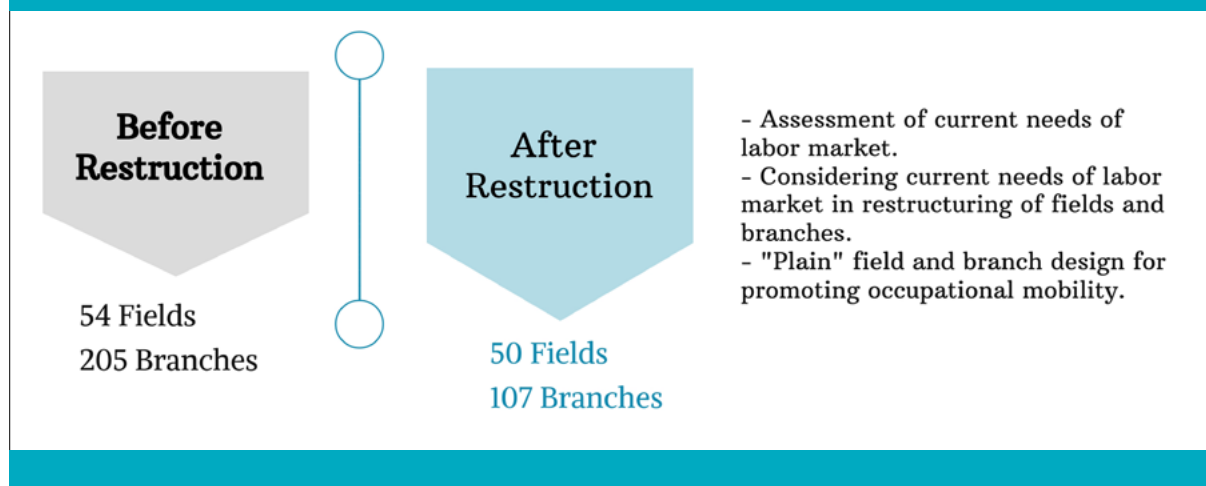
■ **Cooperation with the Union of Chambers and Commodity Exchanges of Türkiye (TOBB) in the Field of Vocational Training Centers:** In addition to the previous protocol between TOBB and MoNE, a second step has been taken to strengthen vocational training centers where apprenticeships are conducted. In this context, relations are established with VET centers and members of the chambers and commodity exchanges affiliated with TOBB, member institutions are provided to strengthen the infrastructure of vocational education centers, and employment of graduates from vocational education centers is prioritized.

■ **Information Technologies Collaboration Project between Istanbul Chamber of Industry (ISO) and Casper at Vocational Education Centers:** A six-month employment-oriented training program has been developed for MoNE, ISO and Casper in order to meet the requirements for human resources in the field of information technologies. The production and maintenance processes of mobile phones, computers, and tablets, which are increasingly used, are carried out through vocational training.

■ **Ankara Chamber of Industry (ASO) Cooperation Protocol for Vocational Education Development:** As a result of the cooperation between MoNE and ASO, many steps have been taken together to improve VET: providing teacher training with the support of ASO, providing students with on-the-job training in ASO institutions, strengthening school infrastructure, and assisting successful students with granting scholarships.

The steps taken also resulted in the updating of the fields and branches of the profession. The equivalents of existing fields and branches have been re-evaluated in Figure 12, and as a result, a "simplified" definition of field and branch has been adopted, which will facilitate the transition between occupations. A transition was made from a 'very specific field/occupation definition' to a 'general and broad field definition, similar to global trends' with this regulation.

Figure 12: Redesign of Professional Fields and Branches



b. Designing a system that is responsive to the demands of the labor market

Updates to curriculum and training programs

The updating of the curriculum and training programs is another important element of the paradigm shift in the vocational secondary education system. There is no doubt that curriculum and training programs play a significant role in the learning process (Snilstveit et al., 2016). Consequently, the VET system needs to provide students with up-to-date skills that are in demand in the labor market by updating the curriculum and training programs. A need for updating the VET curriculum and training programs in Türkiye has also been identified in the 11th Development Plan of the Presidency.

As part of this initiative, work has been accelerated to update the curriculum and training programs in VET, and all occupational fields will be updated in 2020. The update study increased the weight given to general cognitive skills and digital skills as well as applied skills (Canbal et al., 2020). The transition opportunities between sub-programs of vocational secondary education have been enhanced. A more flexible vocational secondary education program was created within the framework of this revision by supporting the academic skills of students who wish to pursue higher education.

Taking vocational courses in the first year of secondary school

MoNE has taken a significant step by initiating students immediately after their transition into vocational secondary education, thereby facilitating a seamless and timely integration into the VET system. Until 2019, vocational courses were taught in the 10th grade, rather than the 9th grade, which is the first year of secondary education in Türkiye (Özer, 2018). As a consequence of this situation, vocational secondary school students recognized VET with a delay and was cited as one of the reasons for negative outcomes including absenteeism and school dropout. As a matter of fact, by making the necessary arrangements as a result of the feedback received from the stakeholders involved in VET, students could start their vocational courses in the same year by choosing their occupational fields in the ninth grade.

Increasing the number of practical training hours

A further measure taken to enhance students' practical skills in VET is to increase the number of internships and on-the-job training hours. As discussed in the previous section, graduates' practical skills are an important indicator of the quality of VET. From this perspective, MoNE

intended to overcome the "limitations in the practice skills of graduates" that have been identified in many strategy documents and technical reports on the quality of VET.

During the last year of secondary education, the on-the-job training period was increased from 24 hours to 39 hours as a result of regulations contained in Vocational Education Law No 3308. Additionally, students were provided with the opportunity to receive 16 hours of on-the-job training per week in their third year of secondary education. In summary, the amount of time allocated to practical training in the training program has more than doubled (Özer, 2018). As a result of this step, weighting applied skills in training programs and curriculum arrangements was greatly supported.

Providing apprenticeship training in all organized industrial zones

The practice-based nature of VET makes Organized Industrial Zones (OIZs) an important resource for this type of education. OIZs provide students with a number of opportunities to develop their professional skills through the production and service opportunities they provide (Özer, 2020a). A decision was taken by MoNE in 2021 to open a vocational training center where apprentice training is provided to all OIZs in Türkiye. As of January 2022, all 255 industrial centers in Türkiye have been equipped with vocational training centers providing apprenticeship training. In this way, students who underwent apprenticeship training in real business

environments received on-the-job training from experts in the OIZs, and relationships with the labor market were strengthened.

Increasing production through production-oriented vocational training

Students' practical skills can be developed through the steps discussed in the previous chapters, however, these steps must be supported by appropriate physical infrastructure. This perspective has led MoNE to adopt a "learning by doing" approach to acquiring skills through VET and to take practical steps to establish the necessary physical infrastructure in schools. As part of these steps, it was intended to start production in schools that do not have revolving funds, as well as increase existing production in other schools to the highest level.

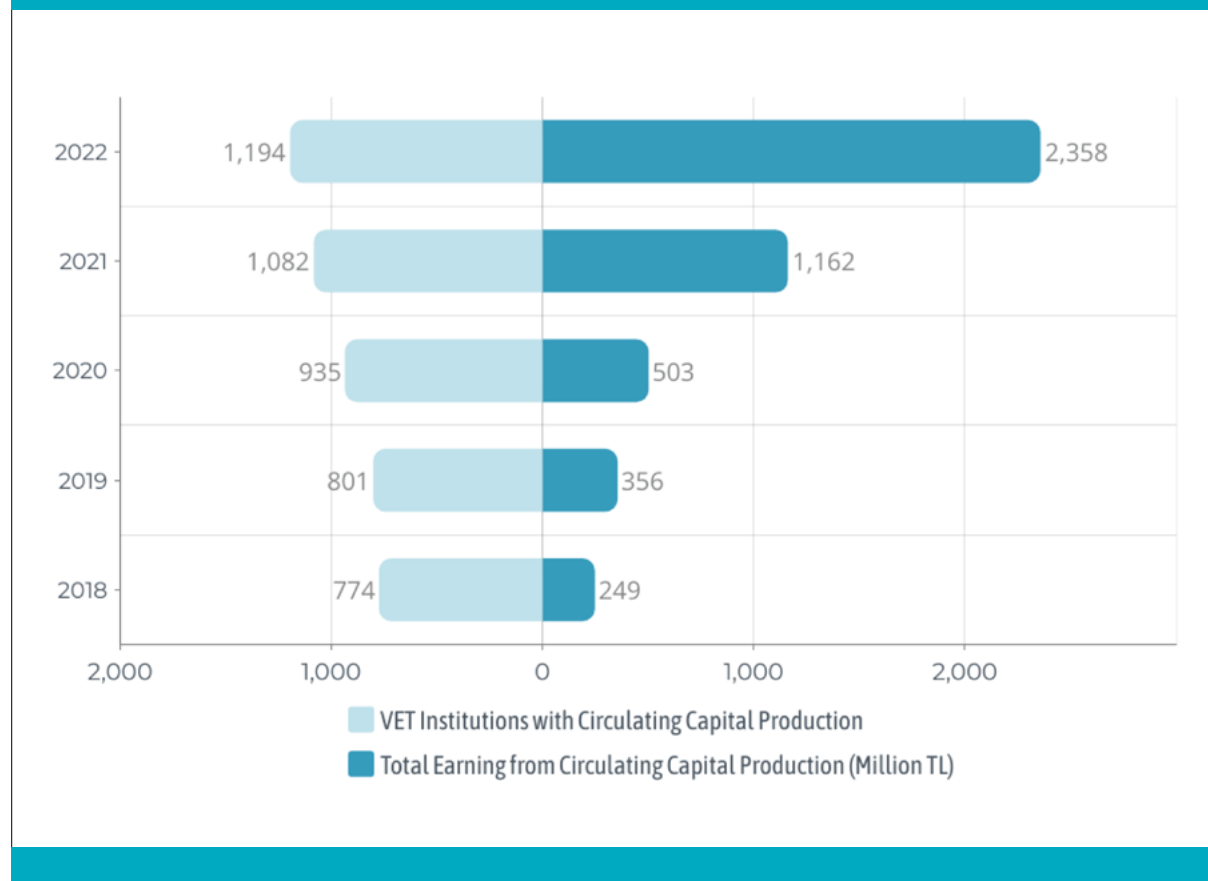
Many material needs of educational institutions in Türkiye have been encouraged to be met with productions within the scope of vocational training to set quantitative targets on intellectual property. Furthermore, the treasury deduction from the revolving fund was reduced from 15% to 1%. By taking this step, all education stakeholders contributing to production have been able to earn more and provide more resources for the improvement of school infrastructure.

Results

Within the scope of VET, the practice-based approach has resulted in a significant increase in revolving fund revenues. Based on Figure 13, production-based revolving fund earnings in VET have increased continuously for the last four years and have reached their peak in 2022. Revenues from the revolving fund, which were 249 million TL in 2018, are expected to reach approximately 2.4 billion TL by the end of 2022. The number of vocational secondary education institutions that produce revolving funds increased from 774 to 1,194 as a result of the support

provided. It is also important to note that the increase in revolving fund revenues represents the increasing capacity of VET to produce goods and services. Further, as illustrated in Figure 13, the revolving fund earnings increased in parallel with the increase in production, leading to significant increases in student and teacher earnings. As opposed to student earnings of 14.7 million TL in 2018 and personnel earnings of 30.8 million TL in 2018, the said earnings will reach 110.5 million TL in 2022 and 235.9 million TL in 2023.

Figure 13: Production of revolving funds and sharing of gains in vocational education (2018-2022)



c. Enhancements to apprenticeship training

In addition to offering flexible and practice-oriented training, apprenticeship training offers excellent opportunities to close the skill gap and respond to rapid changes in VET. The apprenticeship education in Türkiye remained far below the expected level until 2019, and its share of vocational secondary education remained below 10% (Özer and Suna, 2022). As of 2019,

MoNE has initiated efforts to make apprenticeships more attractive to students by emphasizing their significance in addressing the country's workforce requirements. This endeavor commenced with the removal of restrictions on apprenticeship training, enabling a more accessible and inclusive apprenticeship system.

Facilitating the attainment of a high school diploma through apprenticeships

In Türkiye, one of the significant obstacles to participation in apprenticeship training is the lack of direct access to a high school diploma for graduates of the four-year apprenticeship program. Even after successfully completing the apprenticeship program, graduates cannot obtain high school diplomas directly. However, they are entitled to receive high school diplomas through an alternative pathway by enrolling in vocational open-education high schools and completing the different courses determined by MoNE (Özer, 2018, 2019). After completing a four-year program based on application, graduates may enroll in the program in which theoretical courses are taught through open education. As a result,

apprenticeship education continues to deteriorate, as it is unable to meet the socially necessary demand.

Since 2019, MoNE has offered the opportunity to take different courses face-to-face at vocational training centers to facilitate the attainment of a high school diploma by students who receive apprenticeship training. Therefore, students are taking the courses necessary to obtain the diploma during the course of their apprenticeship education and face-to-face. These courses can be completed during the education period, thus allowing students to take advantage of the advantages of face-to-face education.

Training qualified trainers through distance education

In light of the fact that apprenticeship education is based on practice and that the training is primarily conducted by master trainers in the workplace, qualified trainers play an important role in apprenticeship education. To ensure the success of apprenticeship education, it is extremely important to have a sufficient number of qualified trainers in different professions. Even though qualified trainers play a crucial role in apprenticeship training, their heavy workloads prevent them from obtaining a certificate of qualification. In fact, trainers were required to participate in the necessary trainings and submit an application for the certificate. Face-to-face trainings were an important

obstacle for trainers whose daily workload was already heavy (Özer, 2018).

By 2020, qualified trainers will be able to participate in trainings via distance education and apply for their documents. Further, qualified trainer exams were provided in an electronic format following the training. Consequently, together with the number of qualified trainers, the number of institutions that offer on-the-job training has also increased, and a significant step has been taken to improve apprenticeship quality and inclusion.

Enhancing apprenticeship training rights and incorporating it into state security measures

Although apprenticeship education is a practice-based education, students have limited rights and their financial responsibility lies with the institutions where on-the-job training is provided. This is one of the primary obstacles to establishing apprenticeship education as a widespread practice-based education. The Vocational Education Law No. 3308, passed under the leadership of MoNE in 2021, resulted in two important gains (Özer, 2022a, 2022c; Özer & Suna, 2022b). In the first instance, the wages of journeymen

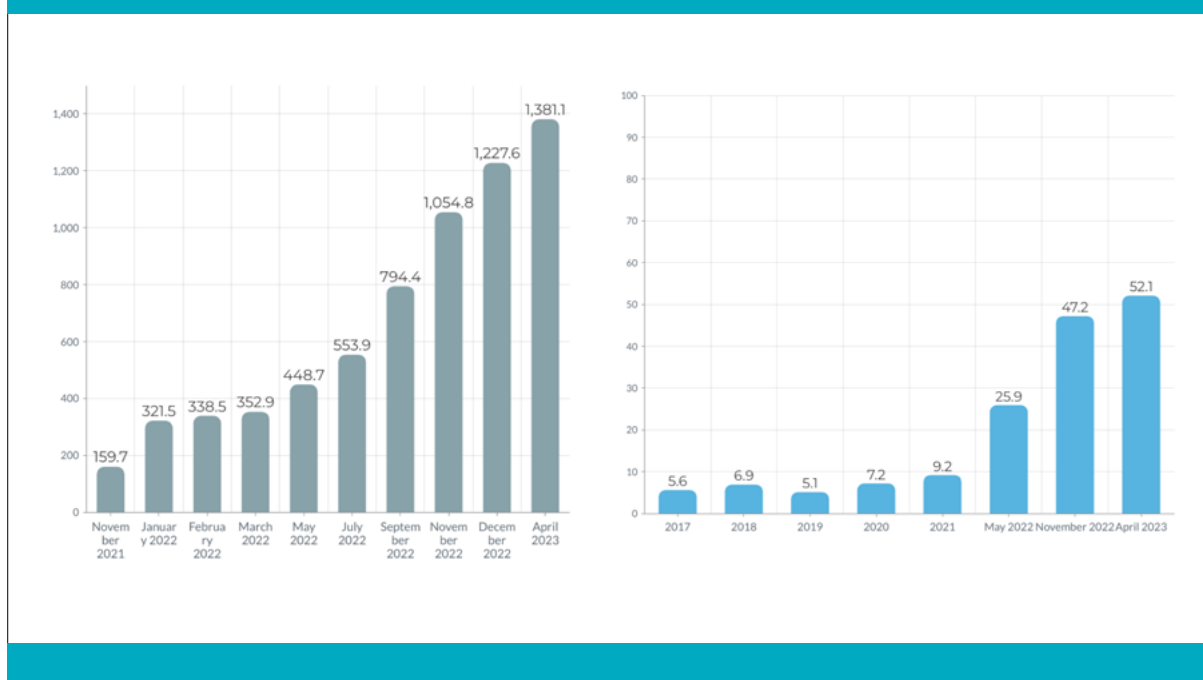
who have completed the 11th grade and have advanced to the last year have been raised from one-third to half of the minimum wage. Secondly, the government has begun to cover the wages of students who receive apprenticeship training throughout their education. Consequently, it was ensured that the improvements in the minimum wage were reflected in the apprenticeship training of students, and that the state had primary responsibility for the protection of individual rights.

Results

Through the change in the number of students participating in apprenticeship training, MoNE was able to evaluate the results of its actions related to improving personal rights, facilitating access to high school diplomas, and disseminating the program. In approximately 1.5 years, the number of students receiving apprenticeship training has increased from 159 thousand to 1 million 400 thousand.

Similarly, in Figure 14, the share of apprenticeship training in vocational secondary education increased from 5% to 52%. As a result of the steps taken, the demand for apprenticeship training programs increased significantly and reached a similar level as international examples within the field of VET.

Figure 14: Number of Students Receiving Apprenticeships and Share of Apprenticeships in VET Education



d. Alleviating skill mismatches

In previous chapters, we have explained in detail how skill mismatch can negatively impact sustainable development. Many studies have indicated that many branches of VET in Türkiye are experiencing a high level of skill mismatch, and that graduates tend to work outside of their field of education (Çidem et al., 2021; ETF, 2022; Suna et al., 2020a; Şahin, 2021). To minimize this conflict, it is crucial

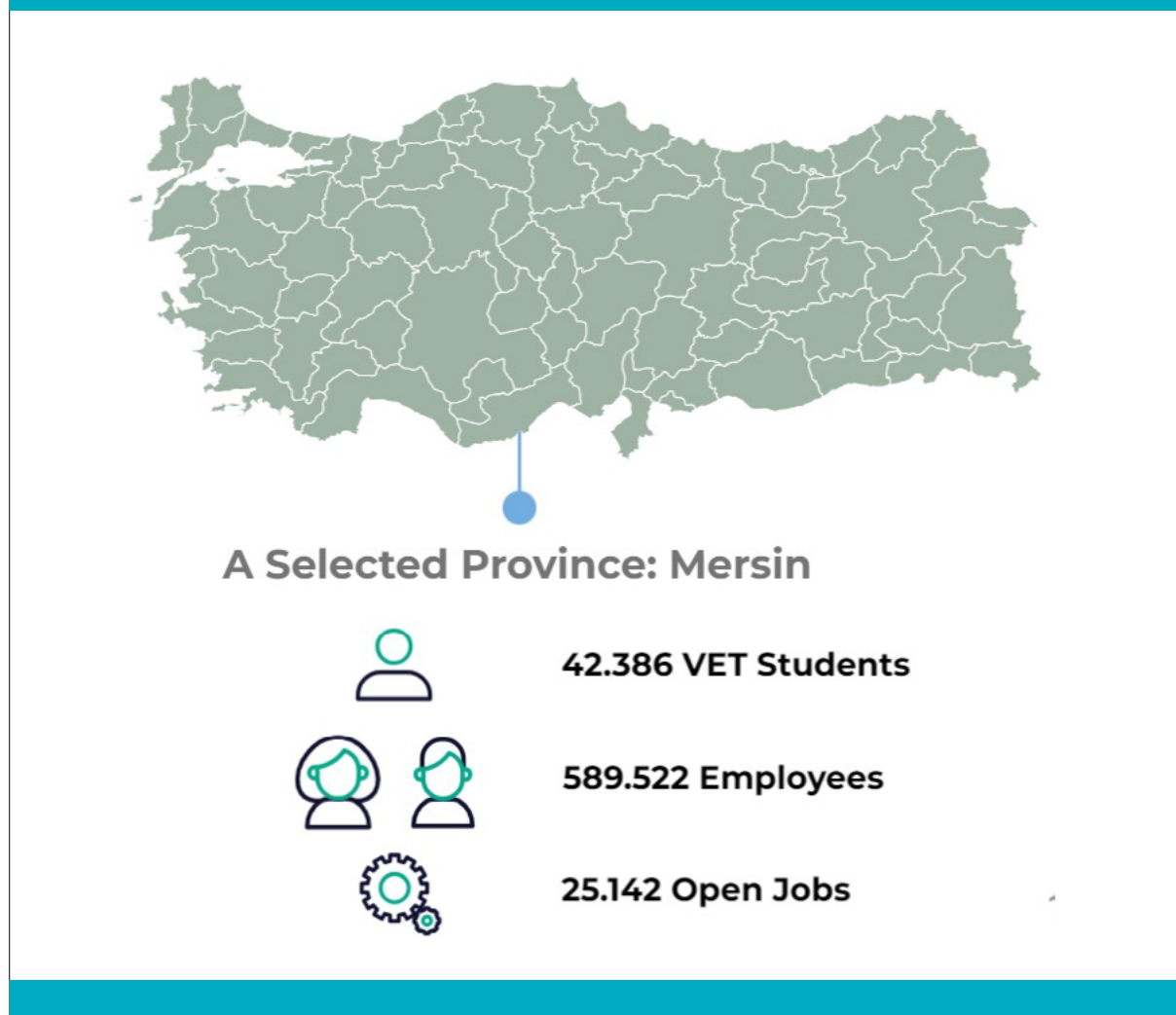
to strengthen the relationship between the labor market and the VET system. Additionally, implementing certain structural arrangements within the VET system holds significant importance. The following section outlines the steps that have been undertaken to achieve this objective within the framework of VET.

Developing the Turkish Vocational Education and Training Map

MoNE developed the "Vocational Education and Training Map" in 2020 in order to evaluate the skills mismatch between education and employment at the provincial level. As can be seen in Figure 15, this map visualizes the distribution of students studying in each province by occupation and by employment areas. This map was designed as an open-source tool to explore the correlation between VET offerings in each province and the demand for human resources within the province

and neighboring provinces. Accessible through <https://meslekiegitimharitasi.meb.gov.tr/>, the map enables decision-making on the need to introduce new vocational fields in specific provinces and also allows evaluation of the existing fields. Furthermore, the map's development holds the potential to make substantial contributions to addressing the deficiency identified in the 11th Development Plan - mapping the relationship between regional employment areas and vocational training fields.

Figure 15: An Exemplary Province on Türkiye's Vocational Education and Training Map: Mersin



Establishment of “My Profession is My Life” Platform

A key element in minimizing skill mismatch is to ensure that students receive the right information about the field they intend to study and make conscious choices through vocational guidance. However, it is well known that there is a low level of social awareness and a negative perception of vocational education in Turkish society (Özer, 2021a).

In 2019, MoNE established the “My Profession is My Life” platform to raise public awareness about VET and support the conscious choices made by students. The platform, which can be accessed at <https://meslegimhayatim.meb.gov.tr/>, aims to bring together all stakeholders in

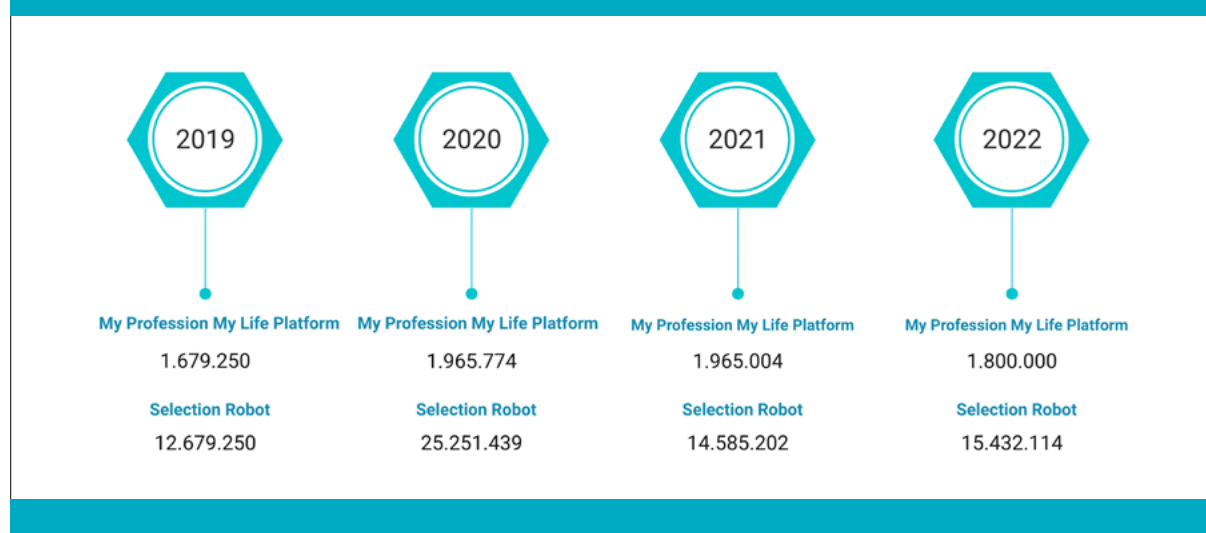
VET on a single digital platform and provide them with information regarding current developments in VET. The platform provides information about vocational fields and VET institutions, as well as the Selection Robot to assist in making choices within the Transition to High School System (LGS), career paths in VET, success stories, a variety of forms that students may require, and products produced by VET institutions. Additionally, students and schools are encouraged to share their projects and good practices. Furthermore, the platform is integrated with the İŞKUR infrastructure to provide students with information regarding employment opportunities.

Results

This platform, which was established in 2019 by MoNE and has become a common platform for stakeholders in VET, has attracted great interest from students, teachers, employers and other stakeholders involved in VET as a result of the opportunities that it provides. Figure 16 illustrates the increase in users in preference periods since 2019, and the number of users has approached 2 million. A selection robot that is accessible through the platform has been used between 12 million and 25 million times. As a result of using the platform effectively,

students and parents can learn about VET institutions and the opportunities offered within those institutions, learn about VET institutions where they may be placed upon receiving points, and discover employment opportunities. By the European Training Foundation (ETF, 2020), the My Profession is My Life Platform has been recognized as an exemplary practice in the area of International Trends and Innovation in Career Guidance.

Figure 16: My Profession is My Life Platform, and Selection Robot Usage



e. Enhancing vocational education's preference and social reputation

VET encounters numerous challenges, notably a weaker social perception compared to general (academic) education, leading to its preference by socioeconomically disadvantaged groups. A low level of social awareness regarding VET in society, resulting in various segments lacking sufficient information about the opportunities offered by VET. Consequently, VET tends to be ranked lower on their list of priorities. The concentration of relatively

disadvantaged students in VET may also contribute to the increase in achievement gaps between schools, given the important relationship between socioeconomic level and academic achievement. In order to ensure the participation of all segments of society in VET, MoNE has taken important steps to inform them about the increasing opportunities available within this field.

Establishment of Prestigious Vocational Education Institutions

By collaborating with Türkiye's leading labor market representatives, MoNE has taken important steps in establishing prestigious vocational training schools in response to current needs. Currently, ASELSAN Vocational and Technical Anatolian High School and Istanbul Technical University (ITU) Vocational and Technical Anatolian High School are in operation. In 2020, Teknopark Istanbul Vocational and Technical Anatolian High School, while in 2021, ASELSAN Konya Vocational and Technical Anatolian High School have opened. In 2022, the YTU Vocational and Technical Anatolian High School and Demirören Media Vocational and Technical Anatolian High School has opened as well.

Students derive significant benefits from the laboratories, workshops, and well-equipped physical facilities available at VET institutions, which enable them to receive training in a diverse array of fields. Moreover, the curriculum and training programs are developed in close collaboration with cooperating institutions, ensuring relevance and alignment with industry needs. Additionally, these institutions often offer employment guarantees or prioritize job opportunities for graduates who successfully complete the VET program, providing them with enhanced career prospects and increasing their employability.

Results

Among the most demanded institutions in secondary education are VET institutions, which were established by MoNE in collaboration with strong representatives of the labor market sector since 2019. As shown in Figure 17, these institutions have been the preferred choice of students in the highest achievement segment since 2019. A significant increase has been observed between 2019 and 2022 in the number of VET institutions accepting students with the highest achievement levels. It is evident from this

result that vocational high schools have begun to take the place of the science high schools and social science high schools that have been preferred by the most successful students for many years. As a result of this result obtained in a short time, it is evident that institutions preferred by high-achieving students and cooperating with strong representatives of the labor market can influence the perception of VET positively.

Figure 17: Achievement Levels of Students in Vocational and Technical Anatolian High Schools Established in Recent Years

	 ASELSAN VET High School	 İTÜ VET High School	 ASELSAN Konya VET High School	 Teknopark İstanbul VET High School	 Demirören Medya VET High School	 İstanbul Havalimanı VET High School
Field	Electric- Electronic Tech	Information Tech	Electric- Electronic Tech	Information Tech	Radio & Television	Aircraft Maintenance
2019 - Top Percentage	0,46	1,26				
2020 - Top Percentage	0,33	1,47		0,47		
2021 - Top Percentage	0,55	0,71	0,99	0,18		
2022 - Top Percentage	0,44	2,09	1,96	0,40	0,12	1,14

The 1,000 School in Vocational Education and Training Project

To ensure a holistic improvement in VET and to increase its popularity among all segments of society, a school-based improvement policy is required. As part of the "1,000 Schools in Vocational Education and Training" project, which is one of the largest studies in VET history, MoNE adopted a school-based approach to improving VET in 2020. From Türkiye's 81 provinces, 1,000 VET high schools, which are the most disadvantaged according to concrete criteria, were selected for this project and their needs were met through a multidimensional support approach (Özer, 2022). It involves an improvement process that involves all stakeholders in the field of VET and physical infrastructure.

As part of the project, 1,000 schools with the highest level of disadvantage and need for support were determined based on criteria such as physical infrastructure need, absenteeism, low achievement, and dropout rates (Özer, 2021c). Subsequently, the specific physical needs of the selected VET institutions were identified, and comprehensive plans were formulated to address these requirements. Every school has been equipped with

new laboratories/workshops as permitted by its physical space, small and medium-sized maintenance and repair work has been carried out, and the digital infrastructure of schools, especially computers, has been upgraded. Workshops and laboratories were upgraded and new materials were purchased. Furthermore, VET institutions without libraries were included in the project "No School Without a Library" and had their libraries installed. All of the schools participating in the project have benefited from the enrichment of their library resources.

The project also prioritizes the academic achievement and well-being of students in these schools. To address learning deficiencies among students in the selected schools, academic support programs were established and offered free of charge (Özer, 2022d). Additionally, given the prevalence of disciplinary issues, absenteeism, and negative behaviors, such as school dropout, in these schools, psychosocial support programs are being developed to enhance the overall well-being of the students.

A significant component of the project is the enhancement of professional development opportunities for teachers. Teachers in the participating schools were provided with an intensive professional development program. Lastly, the project has actively involved parents, prioritizing their participation in open secondary schools, open education high schools, and open vocational high schools to enhance their involvement in the educational process. Local administrations under MoNE informed parents of

the schools included in the project about the opportunities for pursuing higher education. Moreover, the project took into account parents' requests for VET, guiding them towards public education centers in addition to opening vocational high schools. These incentives have resulted in the participation of more than 11 thousand parents in training sessions, highlighting the success of efforts to engage parents in the education of their children and foster a supportive educational environment.

Results

Multiple supports were provided to VET institutions in 81 provinces of Türkiye as part of the "1,000 Schools in Vocational Education and Training" project, which was initiated by MoNE through its school-based improvement approach. In Figure 19, it can be seen that the project

has a considerable scope: approximately 24.8% of VET institutions in Türkiye, 37.5% of vocational secondary education students, and 36.4% of teachers in VET institutions benefited from the project (Özer, 2007, 2022d).

Figure 18: The Scale of 1,000 Schools in Vocational Education and Training Project

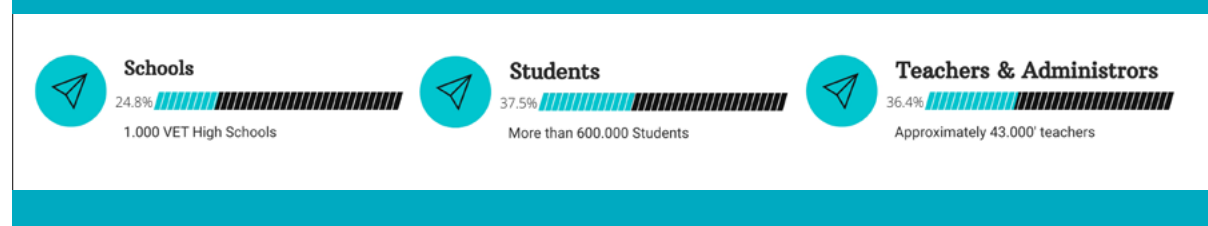


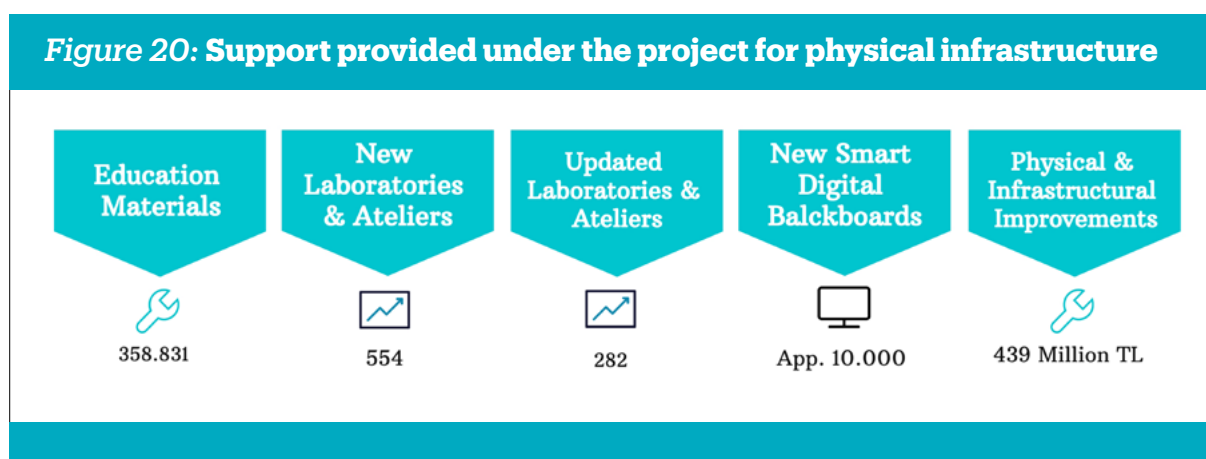
Figure 19 shows how many students have participated in other training and activities within the project's scope, as

well as how many teachers and school administrators have participated.

Figure 19: Participation of students and teachers in education and project activities



Figure 20 outlines the steps taken to improve school infrastructure in addition to providing support to students, teachers, and school administrators.



f. Innovating and internationalizing vocational education

The preceding sections have extensively highlighted the significant role of VET in fostering innovative productions within its own framework and facilitating the realization of these innovations at the higher education level. As a result, countries employ diverse approaches to emphasize and promote innovative productions while transforming

their VET systems. One of these approaches is to establish "centers of excellence" bringing together the labor market, education, and research. This collaboration allows the VET system to incorporate and utilize the most recent scientific approaches and products.

Establishment of R&D centers and centers of excellence

To strengthen the ties between VET and the labor market, promote collaboration between research and education, and offer exceptional educational opportunities for students, MoNE has undertaken the establishment of Research and Development (R&D) centers and centers of excellence in various regions of Türkiye. In recent years, R&D centers have made significant strides in developing innovative productions within their respective fields. Their enriched infrastructure and production-oriented approaches have enabled them to achieve remarkable progress in generating innovative solutions in a relatively short period. Since May 2023, 55 R&D centers have been established, contributing greatly to the country's needs, especially during the COVID-19 epidemic that we

experienced in 2020. The topic of vocational training in connection with the COVID-19 outbreak is discussed in more detail under the title "Contributions of Vocational Education and Training during the COVID-19 Epidemic".

Centers of excellence, on the other hand, serve as institutions where collaborations are developed with leading representatives of the labor market to provide students with the best educational environments. Toward this end, MoNE has prepared and coordinated the necessary infrastructure for the transformation of 15 VET institutions into centers of excellence. This figure illustrates the distribution by province and area of Centers of Excellence and R&D Centers as of June 2023.

Period of intellectual property in vocational education

Global competition is primarily determined by intellectual property rights (IPR) at the point where the labor market has reached. As a matter of fact, institutions can only protect their innovative productions through intellectual property during this period when copying becomes widespread and similar productions can be manufactured

quickly (Moerman & Vander Laan, 2006). By placing the product under the umbrella of intellectual property, legal rights can be claimed over the product and commercial profit can be realized. A major factor in evaluating the level of development of a country in terms of technological and innovative production is intellectual property products.

Figure 21a: Distribution of Vocational Excellence Centers in Türkiye by province and area



Figure 21b: Distribution of R&D Centers in Türkiye by province and area



MoNE has introduced a systematic approach to intellectual property production in VET through a study that was initiated in 2023 (Özer & Suna, 2022). The Turkish Patent and Trademark Office has provided intensive training on project development, project management, and intellectual property production process to managers and teachers in VET institutions. Secondly, an "Intellectual Property Office" was established within MoNE, allowing the

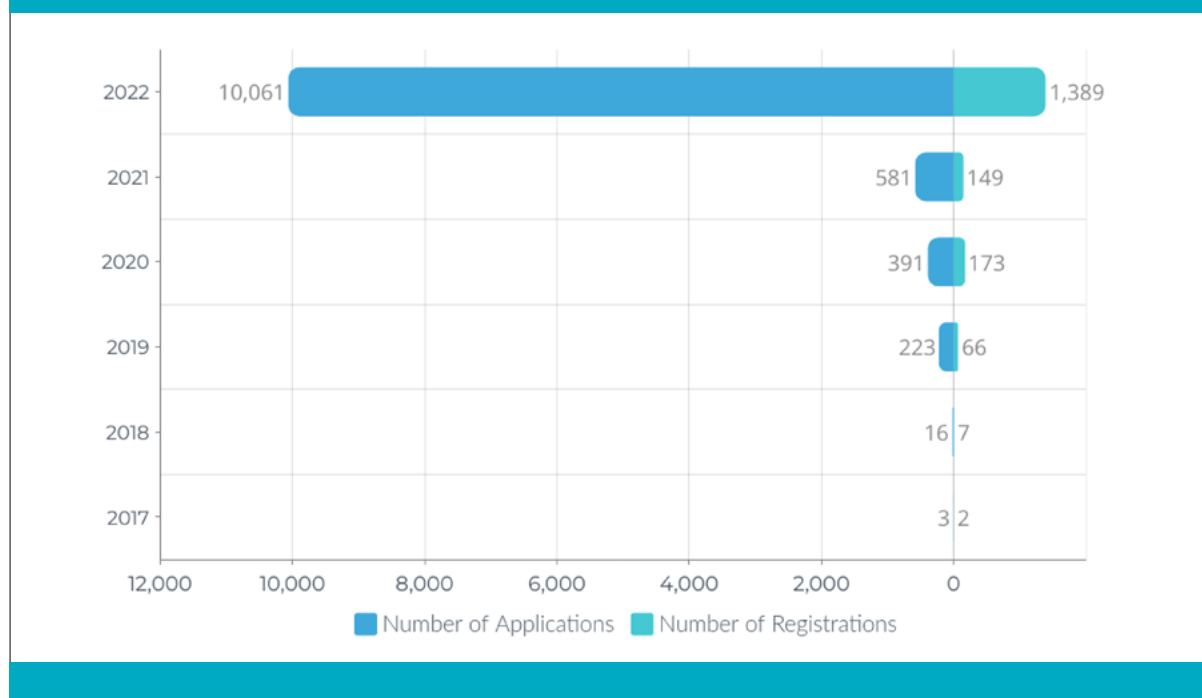
entire process of intellectual property to be coordinated centrally. MoNE institutions were also exempted from application fees in connection with the cooperation with the Turkish Patent and Trademark Office. In this way, it has become easier for institutions to apply for and register products they have developed without being concerned about financial concerns (Özer & Suna, 2022c).

Results

During the intellectual property period initiated by MoNE, the steps taken with the assistance of the Turkish Patent and Trademark Office produced tangible results within a short time. Based on Figure 22, the number of applications and registrations made by MoNE institutions began to increase in 2021 and reached its highest level in 2022. In fact, the number of applications and registrations below 10 before 2017 approached 14 thousand in 2022, while

the number of registrations received by VET institutions increased to over 8 thousand from all MoNE institutions (Özer & Suna, 2022c). According to the results of this study, VET institutions can have a significant impact on increasing intellectual production when the necessary support is provided and monitoring is carried out to ensure the quantitative targets are met.

Figure 22: Vocational education institutions' IPR applications and registrations (2017-2022)



Establishment of international vocational education institutions

A paradigm shift has occurred in VET as a result of the steps taken to address the COVID-19 epidemic (Özer, 2020a). International Vocational High Schools were established by MoNE in 2022 to allow Turkish students, as well as students from nearby areas, to benefit from this transformation in VET. As a result of collaborating with the labor market in different fields, students have a greater opportunity to find employment both in Türkiye and in their own countries by taking advantage of the benefits

of foreign language courses in these institutions. Students from six Balkan countries -Kosovo, North Macedonia, Bosnia and Herzegovina, Serbia, Bulgaria, and Albania- will continue their education in international vocational high schools beginning in 2022. In the near future, MoNE plans to increase the number of international vocational high schools as well as the diversity of students enrolled in these institutions.

Exporting Vocational Education Institutions

Internationally, VET institutions have been leading innovative productions, especially R&D centers and centers of excellence. A variety of productions have been prioritized by VET institutions during the COVID-19 epidemic, and the product portfolio has been enriched. As a result of the COVID-19 epidemic, the volume of exports initiated by France, Belgium, Netherlands, Bulgaria,

Czechia, and the United Kingdom was increased with the addition of Romania, Iraq, Bosnia and Herzegovina, and North Macedonia. Educational experiment sets, disinfectant and hygienic materials, cleaning sets, shawls and scarves, and oven sets for use in education are among the most frequently exported products.

Refugees' social integration through vocational education

Many countries, particularly those in the OECD, use VET to increase the employability of immigrants and facilitate their social integration (Jeon, 2019). With its practice-based structure, VET allows immigrants to be less affected by the language barrier and cultural differences they often encounter (Özer, Suna & Varimoğlu, 2021). Additionally, immigrant students can recognize their pre-learning within the framework of vocational education. Social and Economic Cohesion Through Vocational and Technical

Education - SEUP and Quality Apprenticeship in Türkiye are two programs that were launched in 2020 to assist immigrant students in integrating socially, increasing their employability, and gaining access to education through VET in Türkiye. The "Program for Facilitating the Access of Syrians and Host Communities to Employment - IMEP" through Vocational Training provides vocational training for more than 77,000 refugee students.

g. Advancing Lifelong Learning

A lifelong learning program is crucial to increasing the skill development and social adaptation of an aging society. Several studies have demonstrated that participation in lifelong learning activities increases adults' employability and social cohesion by contributing significantly to their skill development (Nilsson & Nyström, 2013). Many countries are undertaking large-scale projects to expand the scope of lifelong learning activities and encourage their participation.

The level of participation in lifelong learning activities in Türkiye, however, is significantly below the average. It is evident from both the PIAAC (OECD, 2013b) study and the evaluation studies conducted by Eurydice (2021) that the participation rate is low. The basic literacy skills of adults in Türkiye, as well as the situation in regard to digital skills, which are becoming increasingly important, are still significantly below the international average. Despite Türkiye's relatively young population, there is a significant gap in terms of social adaptation and employment participation among adults.

Enhancing the Inclusion of Public education Courses

The purpose of this initiative is to encourage participation in 'public education courses,' which has been the main method of education within the scope of lifelong learning for several years. To increase the prevalence of public education courses throughout Türkiye, MoNE has

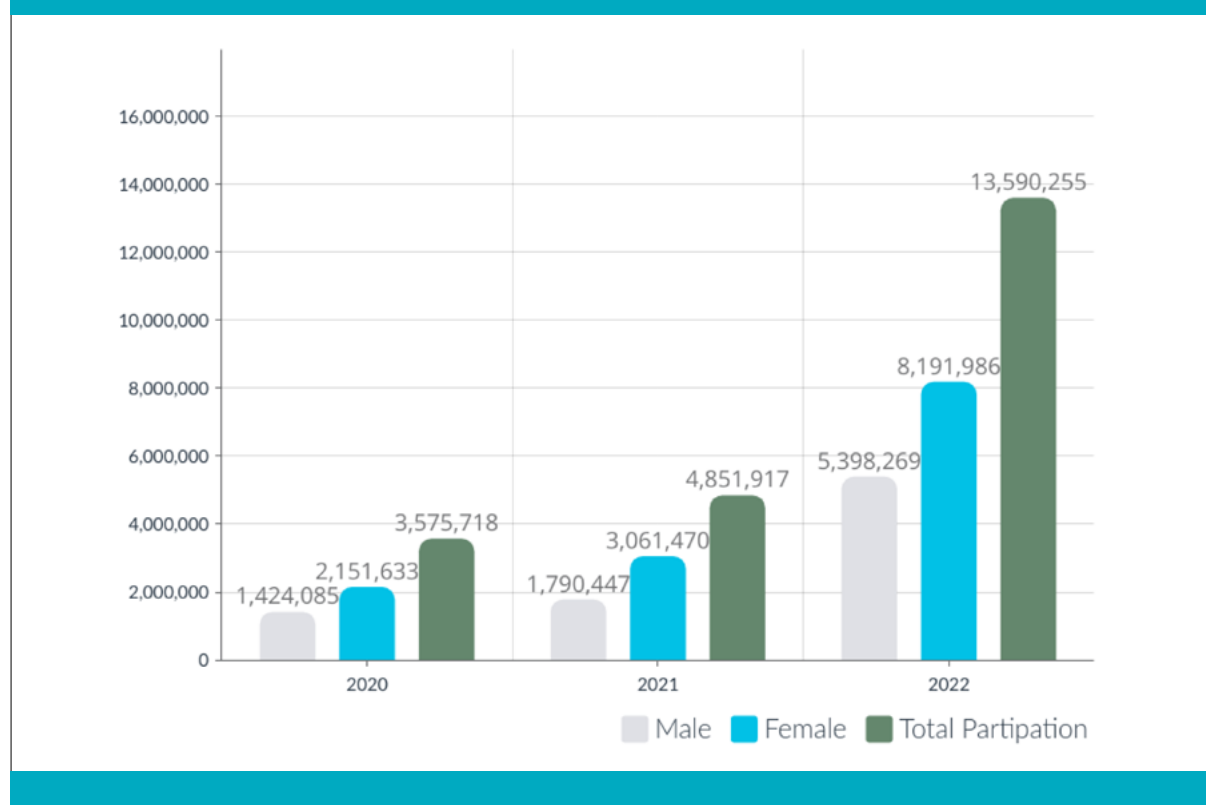
developed an approach to consider the needs of society when determining the fields of education. Moreover, women benefit from public education courses at a higher rate than men, thus these courses contribute significantly to female employment.

Results

As of 2021, MoNE's approach, which increases adult learning inclusion and pays more attention to adult feedback, has produced an answer within a short timeframe. Figure 23 shows that total enrollment in public education courses increased significantly after the decline caused by the COVID-19 outbreak in 2020 and peaked

in 2022. The high participation rates of women were maintained despite a large increase compared to previous years. Through its increased capacity and quantitative targets, MoNE exceeded its target of reaching one million citizens per month (MEB, 2022) and ensured the participation of more than 13 million citizens in 2022.

Figure 23: Total participation in public education courses by gender (2020-2022)



Establishment of the VTC Skill Development Programs

By creating a new professional skill development program in 2022, MoNE intends to increase participation in lifelong learning activities. According to the program, adults will be able to reskill & upskill through relatively short training programs (6-8 months) (Özer & Suna, 2022a). The

development of this program was guided by the flexible and employment-oriented approach of vocational training programs. Participation in the developed program was open to all adults with a high school diploma or equivalent.

Results

As shown in Figure 24, the short-term and employment-oriented VTC Skill Development Program, launched by MoNE in 2022, drew a large amount of attention in a short time, with participation exceeding 900 thousand in a short period. As shown in Figure 24, this program has clearly demonstrated the need for talent development programs

by attracting a great deal of interest from a range of age groups and educational levels. It is also important to note that this program has the highest gender balance in VET. It is evident that the program developed in this context has the potential to significantly close the skills development gap in Türkiye.

Figure 24: Number of Participants in the VTC Skill Development Program (February 2022-April 2023)

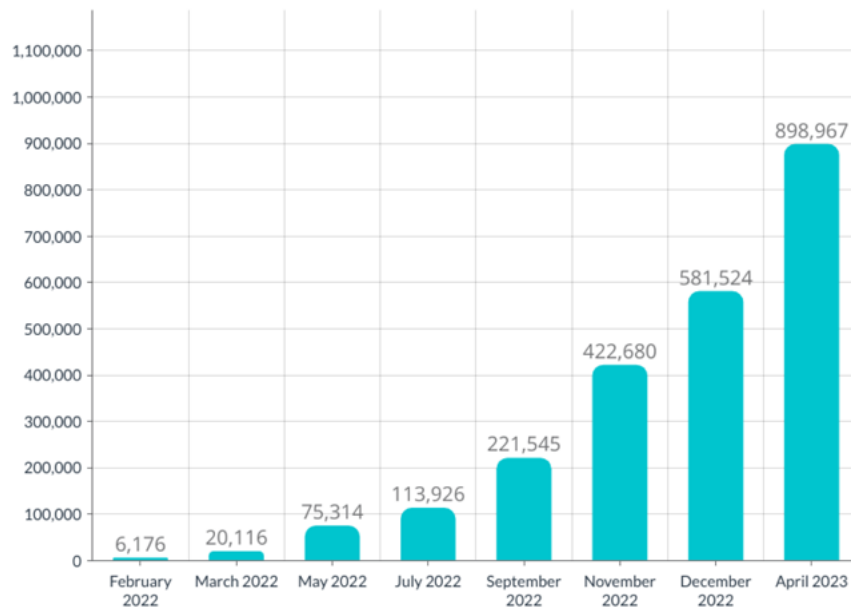
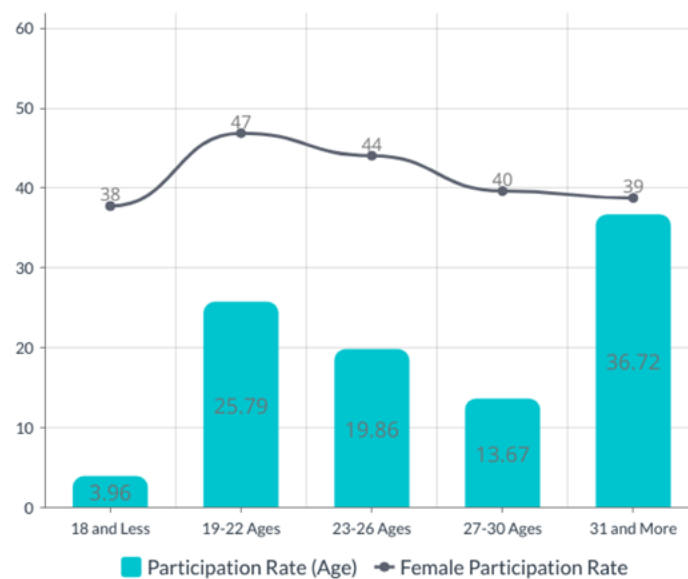


Figure 25: Distribution of Age and Gender in VTC Skill Development Program*



*Özer and Suna (2022), using data from the first four months.

Establishing public education centers for the disabled

Public Education Centers (PECs) for the Disabled were established to provide vocational education to all segments of society and to increase access by prioritizing disadvantaged groups. The purpose of these centers is to provide VET and employment opportunities to adults with a variety of disabilities. By taking into account the special

needs of individuals with disabilities, 112 centers were established in a short period of time. MoNE has completed the necessary plans for establishing at least one Disabled Public Education Center in each of the 920 districts by 2023.

Contributions of Vocational Education and Training during the COVID-19 Epidemic*,**

* Özer, M. (2020d). Vocational education and training as "A Friend in Need" during the Coronavirus pandemic in Türkiye. *Bartın University Journal of Faculty of Education*, 9(2), 1-7.

**Özer, M. (2020e). Educational policy actions by the Ministry of National Education in the times of COVID-19 pandemic in Türkiye. *Kastamonu Education Journal*, 28(3), 1124-1129.

As a result of the COVID-19 epidemic, the daily routine of life has been greatly disrupted, which has impacted the education system and social life negatively. Several products, including hygiene products and medical products, had to be produced urgently in order to prevent the spread of the epidemic. Aside from the rapid production, the scale of the production must be quite large and the product must be delivered to the necessary stakeholders after the production is completed. Globally, the mandatory transition to these products has resulted in major production and logistics issues. For many countries to overcome these problems, they have had to rely on international cooperation in addition to their own resources.

When the impact of the epidemic was most acute in Türkiye in 2020, VET institutions were the main producers of urgently needed products. Additionally, disposable gowns, face shields, and other basic health supplies, such as face protectors and disinfectants, were prioritized over masks, face protectors, and disinfectants, which

are essential daily items. Following the creation of the necessary capacity to meet basic needs, the R&D process was initiated by advancing production one step further. It took only a few months for a non-contact thermometer, N-95 mask machine, air cleaner, intensive care bed, patient care unit, etc. to be manufactured.

With these measures, MoNE has given greater prominence to R&D activities in VET, which has changed the face of the epidemic and has begun to prepare for the reopening of schools. Nearly 55 thousand educational institutions in Türkiye will require disinfectants, cleaning materials, and masks in this context. The necessary infrastructure has therefore been established. The vocational training program has also completed the production of rapid antigen tests, which provide faster results than PCR tests and are easy to perform in large numbers. With the products it produces as well as the great effort of all its stakeholders, VET has contributed greatly to the normalization of Türkiye during the epidemic process.

OVERVIEW

Technology has brought many opportunities along with the ongoing global transformation, but it has also forced societies into a period of significant change. As a result, society as a whole must develop the skills necessary to adapt to this change. Further, the rapidity

of this transformation necessitates quick action in order for society to adapt. In the literature, VUCA (Volatility, uncertainty, complexity, ambiguity) is defined as a period with many breaks and uncertainties.

During the VUCA period, VET offers a wide range of possibilities for social transformation through its flexible solutions and practice-based training. Because of its strong ties with the labor market, it can respond quickly to changes in the business world; Moreover, it can provide individuals beyond the school age with the necessary skills through lifelong learning activities. In terms of supporting sustainable development and enabling society to adapt to change, VET occupies a privileged position.

The transformation of VET initiated in Türkiye in 2018 aims to support the country's development process on the one hand and to establish a VET system that is compatible with global change on the other. Taking concrete steps to solve the chronic problems that have plagued VET in Türkiye for many years has been the most important feature of this period. Both economic and implementation aspects have been considered in the planning of improvement policies, and progress has been made through the setting of quantitative targets. Throughout the projects, the scale was kept at a level that represented the entire country, and improvements did not focus on any particular region. As part of this study, these improvements were discussed in detail and compared to global examples in order to assess their similarity.

The image below clearly demonstrates that substantial progress has been made in all aspects of global trends as part of the transformation initiated in the VET system in Türkiye since 2018. Among the notable achievements, the most significant steps have been taken towards designing an agile and resilient VET system, capable of adapting to evolving demands. Moreover, there has been considerable effort in enhancing the attractiveness of VET in Türkiye, making it an appealing and viable option for students

across the country. Consequently, the greatest advances in the transformation have been made in addressing the chronic problems of VET in Türkiye. It is widely recognized that the quality of vocational education is determined by its ability to respond to the needs of the labor market and to provide students and adults with the skills they need to succeed in the modern world. As a result, the existing ties between the labor market and VET have been significantly strengthened, and the labor market has assumed a central role in the design and implementation of VET initiatives. Throughout the process of transformation, the labor market and vocational education have been seamlessly integrated to work towards a shared objective.

These steps have also contributed to making vocational training more accessible and flexible. In vocational secondary education, apprenticeship education has been given a much greater weight, which has been limited for many years. A recent example of exemplary practice in the area of inclusion is the opening of the "Public Education Centers for People with Disabilities". As a result of this initiative, a novel approach has been formulated to enhance the vocational skills of disadvantaged citizens. Through a short-term and employment-oriented "mastery compensation program," which aligns with international examples in adult education, nearly 900 thousand adults have actively participated in the program within a single year.

For the establishment of a globally competitive VET system in Türkiye, these steps must be resolutely continued. Therefore, this transformation process, which prioritizes Türkiye's needs and also takes global trends into account, also plays a significant role in contributing to the sustainable development of our country.



References

- Acemoğlu, D., & Autor, D. (2011). Skills, tasks and technologies: Implications for employment and earnings. In *Handbook of Labor Economics* 4B: 1043–1171.
- Adalet McGowan, M., & Andrews, D. (2015). Skill mismatch and public policy in OECD countries. Economics Department Working Papers No. 1210. Retrieved from <https://www.oecd.org/economy/growth/Skill-mismatch-and-public-policy-in-OECD-countries.pdf>
- Backes-Gellner, U., & Lehnert, P. (2021). The contribution of vocational education and training to innovation and growth. Oxford Research Encyclopedia of Economics and Finance. Retrieved from <https://oxfordre.com/economics/display/10.1093/acrefore/9780190625979.001.0001/acrefore-9780190625979-e-653.jsessionid=B62311A1D50F1D-56F796A79BDE3BCA3E>
- Bazylik, S., & Gibbs, M. (2022). How is new technology changing job design?. IZA World of Labor 2022, 344.
- Benavot, A., Hoppers, C. O., Lockhart, A. S., & Hinzen, H. (2022). Reimagining adult education and lifelong learning for all: Historical and critical perspectives. *Int Rev Educ*, 68, 165–194.
- Bessen, J. (2019). Automation and jobs: When technology boosts employment. *Economic Policy*, 34(100), 589–626.
- Billett, S. (2020). Perspectives on enhancing the standing of vocational education and the occupations it serves. *Journal of Vocational Education & Training*, 72(2), 161–169.
- Canbal, M. S., Kerkez, B., Suna, H. E., Numanoğlu, K. V., & Özer, M. (2020). Mesleki ve teknik ortaöğretimde paradigma değişimi için yeni bir adım: Eğitim programlarının güncellenmesi. *Eğitim ve İnsan Bilimler Dergisi*, 11(21), 1–25.
- Carstensen, M. B., & Emmenegger, P. (2023). Education as social policy: New tensions in maturing knowledge economies. *Social Policy & Administration*, 57(2), 109– 121.
- CBI (2020). Learning for life: Funding a world-class adult education system. CBI People and Skills. Retrieved from <https://www.cbi.org.uk/media/5723/learning-for-life-report.pdf>
- CEDEFOP (2010). Skill mismatch in Europe: Europe's challenge is not just to improve skill levels, but to match people with the right skills to the right jobs. Briefing Note. Retrieved from https://www.cedefop.europa.eu/files/9023_en.pdf
- CEDEFOP (2017). Education and labour market outcomes for vocational education and training graduates in different types of VET systems in Europe. Retrieved from https://www.cedefop.europa.eu/files/working_paper_4.1_education_and_labour_market_outcomes_for_vet_graduates_in_different_types_of_vet_systems_in_europe.pdf
- CEDEFOP (2018). The changing nature and role of vocational education and training in Europe: Volume 3- the responsiveness of European VET systems to external change (1995-2015). Retrieved from https://www.cedefop.europa.eu/files/5567_en.pdf
- CEDEFOP (2020a). Empowering adults through upskilling and reskilling pathways: Vol. 2: Cedefop analytical framework for developing coordinated and coherent approaches to upskilling pathways for low-skilled adults. Cedefop Publications Office.
- CEDEFOP (2020b). Key competences in initial vocational education and training: Digital, multilingual and literacy. Cedefop Publications Office.
- CEDEFOP (2020c). Empowering adults through upskilling and reskilling pathways: Vol. 1: adult population with potential for upskilling and reskilling. Cedefop Publications Office.
- CEDEFOP (2022a). The future of vocational education and training in Europe Volume 2. Delivering IVET: institutional diversification and/or expansion?. Cedefop Publications Office.
- CEDEFOP (2022b). Built to last: Apprenticeship vision, purpose, and resilience in times of crisis: Short papers from the Cedefop community of apprenticeship experts. Working Paper Series No: 12. Retrieved from https://www.cedefop.europa.eu/files/6212_en.pdf
- CEDEFOP (2023a). European guidelines for validating non-formal and informal learning. (Third edition). Cedefop Publications Office.
- CEDEFOP (2023b). Working together towards attractive, inclusive, innovative, agile and flexible VET. Briefing Note. Retrieved from https://www.cedefop.europa.eu/files/9180_en.pdf

Colardyn, D., & Bjornavold, J. (2004). Validation of formal, non-formal and informal learning: Policy and practices in EU member states. *European Journal of Education*, 39(1), 69-89.

Council of Europe (2023, 23 June). Agenda for sustainable development: 4.3 Equal access to technical/vocational and higher education. Retrieved from <https://www.coe.int/en/web/education/4.3-equal-access-to-technical/vocational-and-higher-education>

Christensen, L., Gittleson, J., Smith, M., & Stefanski, H. (2021). Reviving the art of apprenticeship to unlock continuous skill development. *McKinsey Quarterly*, October 2021.

Çidem, Y., Yalın, F., Saka, F., Özer, M., Suna, H. E., & Numanoğlu, K. M. (2021). How compatible is the Supply of Vocational Education and Training Graduates with Labor Market Demand in Turkey?. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi*, 41(2), 1023-1050.

Çinar, E. (2007). XIX. yüzyılda Osmanlı Devleti'nde mesleki ve teknik eğitim. *Yüksek Lisans Tezi*, Selçuk Üniversitesi, Konya.

Dahlman, C. (2018). Technology, globalization and international competitiveness: Challenges for developing countries. In *Industrial Development for the 21st century* (pp. 29-83). United Nations.

Dawe, S. (2004). Vocational education and training and innovation. NCVER. Retrieved from <https://files.eric.ed.gov/fulltext/ED495131.pdf>

Demir, E., & Şen, H. Ş. (2009). Cumhuriyet dönemi mesleki ve teknik eğitim reformları. *Ege Eğitim Dergisi*, 10(2), 39-59.

Ekşioğlu, S., & Taşpınar, M. (2019). Türkiye'de mesleki ve teknik ortaöğretimin gelişimi. *Sakarya University Journal of Education*, 9(3), 614-627.

ETF (2009). Vocational teacher professional development in a policy learning perspective. Retrieved from https://www.etf.europa.eu/sites/default/files/m/C12578310056925BC12577520045BFEO_NOTE86WGVV.pdf

ETF (2015). Promoting quality assurance in vocational education and training: the ETF approach. Retrieved from <https://www.etf.europa.eu/sites/default/files/m/>

[B77049AC22B5B2E9C125820B006AF647_Promoting%20QA%20in%20VET.pdf](https://www.etf.europa.eu/sites/default/files/m/B77049AC22B5B2E9C125820B006AF647_Promoting%20QA%20in%20VET.pdf)

ETF (2020). Kariyer rehberliğinde uluslararası trendler ve inovasyon - 2. Cilt: Ülke vaka çalışmaları. Retrieved from https://openspace.etf.europa.eu/sites/default/files/2021-01/10%20Career%20guidance_Vol%202%20-%20TR.pdf

ETF (2021). The role of centres of vocational excellence in work-based learning: Initial findings from a study based on practices from six ETF partner countries. Retrieved from https://www.etf.europa.eu/sites/default/files/2021-10/coves_role_in_wbl_summary_note_0.pdf

ETF (2022). Skills mismatch in ETF partner countries: Cross-country report. Retrieved from https://www.etf.europa.eu/sites/default/files/2022-08/Skills%20Mismatch%20Measurement_final%20report_EN.pdf

European Commission (2012). Apprenticeship supply in the Member States of the European Union: Final report. Retrieved from https://pmb.cereq.fr/doc_num.php?explnum_id=805

European Commission (2022). Vocational education and training: Skills for today and for the future. Publications Office of the European Union. Retrieved from <https://op.europa.eu/webpub/empl/VET-skills-for-today-and-future/pdf/KE0621179ENN.pdf>

Eurydice (2021). Adult education and training in Europe: Building inclusive pathways to skills and qualifications. Publications Office of the European Union.

Facer, K. (2011). *Learning futures: Education, technology and social change*. Routledge.

Fu, Q. (2022). How does digital technology affect manufacturing upgrading? Theory and evidence from China. *PloS one*, 17(5), e0267299.

Gagnon-Lebrun, F., & Agrawala, S. (2006). Progress on adaptation to climate change in developed countries: An analysis of broad trends. OECD Publishing.

Greenfield, P. M. (2016). Social change, cultural evolution, and human development. *Current Opinion in Psychology*, 8, 84-92.

Güllülü, S. (1977). *Ahi birlikleri*. Ötüken Yayınları.

ILO (2016). Including persons with disabilities in technical and vocational education and training: A guide for administrators and instructors to disability inclusion. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-dhaka/documents/publication/wcms_543304.pdf

ILO (2017). Making TVET and skills systems inclusive of persons with disabilities. Policy Brief. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_605087.pdf

ILO (2022). Adapting apprenticeships for the reskilling and upskilling of adults. The Future of Work and Lifelong Learning. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_861710.pdf

Jeon, S. (2019). Unlocking the potential of migrants: Cross-country analysis. OECD Reviews of Vocational Education and Training. OECD Publishing.

Juang, L. P., & Schachner, M. K. (2020). Cultural diversity, migration and education. *Int J Psychol*, 55, 695-701.

Kalkınma Bakanlığı (2018). On birinci kalkınma planı: Mesleki eğitimde niteliğin artırılması çalışma grubu raporu (2019-2023). Retrieved from <https://www.sbb.gov.tr/wp-content/uploads/2022/08/Mesleki-Egitimde-Niteli-gin-Artirilmasi-Calisma-Grubu-Raporu.pdf>

Kuczera, M. (2017). Striking the right balance: Costs and benefits of apprenticeship. OECD Education Working Papers No: 153. Retrieved from <https://www.oecd-ilibrary.org/docserver/995fff01-en.pdf?expires=1688121417&id=id&accname=guest&checksum=7853FB2792F6EAF8D-677D3A88A00EEFD>

Li, L. (2022). Reskilling and upskilling the future-ready workforce for industry 4.0 and beyond. *Inf Syst Front*.

McGuinness, S., Pouliakas, K., & Redmond, P. (2019). Skills-displacing technological change and its impact on jobs: Challenging technological alarmism?. IZA DP No. 12541. Retrieved from <https://docs.iza.org/dp12541.pdf>

McKinsey Global Institute (2018). Skill shift-Automation and the future of the workforce. Retrieved from <https://www.mckinsey.com/-/media/mckinsey/industries-public%20and%20social%20sector/our%20insights/skill%20shift%20automation%20and%20the%20future%20of%20the%20workforce/mgi-skill-shift-automation-and-future-of-the-workforce-may-2018.pdf>

MEB (2018a). Mesleki ve teknik ortaöğretimde kurumsal dış değerlendirme raporu. Eğitim Analiz ve Değerlendirme Raporları Serisi No: 2. MEB Yayınları.

MEB (2018b). Türkiye'de mesleki ve teknik eğitimin görünümü. Eğitim Analiz ve Değerlendirme Raporları Serisi No: 2. MEB Yayınları.

MEB (2022). 2022 icraatlarından 2023 hedeflerine. Retrieved from https://www.meb.gov.tr/meb_iys_dosyalar/2022_12/26102600_Egitimde_Turkiye_Yuzyili.pdf

Moerman, L., & Van der Laan, S. L. (2006). Accounting for intellectual property: Inconsistencies and challenges. *Journal of Intellectual Property*, 11(4), 243-248.

Nijhof, W. F., Heikkinen, A., & Nieuwenhuis, L. M. F. (2003). Shaping flexibility in vocational education and training: Institutional, curricular and professional conditions. Springer.

Nilsson, S., & Nyström, S. (2013). Adult learning, education, and the labour market in the employability regime - European Journal for Research on the Education and Learning of Adults, 2, 171-187.

OECD (2013). Trends shaping education 2013. Retrieved from https://www.oecd.org/education/ceri/Ageing_Societies_Spotlight.pdf

OECD (2013b). OECD skills outlook 2013: First results from the Survey of Adult Skills. OECD Publishing.

OECD (2014). Trends shaping education 2014: Urban life: The rise of the megacity. Retrieved from <https://www.oecd.org/education/ceri/Spotlight%20No3%20Urban.pdf>

OECD & ILO (2017). Engaging employers in apprenticeship opportunities: Making it happen locally.

OECD (2018a). Maintaining competitive conditions in the era of digitalisation OECD report to G-20 Finance Ministers and Central Bank Governors, July 2018. Retrieved from <https://www.oecd.org/g20/Maintaining-competitive-conditions-in-era-of-digitalisation-OECD.pdf>

OECD (2019a). Philanthropy and education - Quality education for all: Lessons and future priorities. OECD Development Centre. OECD Publishing.

OECD (2019b). Getting skills right: Future-ready adult learning systems. OECD Publishing.

OECD (2021a). What happened to jobs at high risk of automation?. Policy Brief on the Future of Work. Retrieved from <https://www.oecd.org/future-of-work/reports-and-data/what-happened-to-jobs-at-high-risk-of-automation-2021.pdf>

OECD (2021b). Teachers and leaders in vocational education and training. OECD Publishing.

Özer, M. (2018). 2023 Eğitim Vizyonu ve mesleki ve teknik eğitimde yeni hedefler. Yükseköğretim ve Bilim Dergisi, 8(3), 425-435.

Özer, M. (2019). Reconsidering the fundamental problems of vocational education and training in Turkey and proposed solutions for restructuring. İstanbul Üniversitesi Sosyoloji Dergisi, 39(2), 455-473.

Özer, M. (2020a). Mesleki eğitimde paradigma değişimi: Türkiye'nin mesleki eğitim ile imtihanı. Maltepe Üniversitesi Yayınları.

Özer, M. (2020b). Türkiye'de mesleki eğitimde paradigma değişimi. Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi, 40(2), 357-384.

Özer, M. (2020c). Mesleki eğitimde okuldan işe geçişi etkileyen yeni parametreler: Küresel dönüşümde yeni eğilimler. İnsan ve Toplum, 10(3), 1-27.

Özer, M. (2020d). Özer, M. (2020d). Vocational education and training as "A Friend in Need" during Coronavirus pandemic in Türkiye. Bartın University Journal of Faculty of Education, 9(2), 1-7.

Özer, M. (2020e). Educational policy actions by the Ministry of National Education in the times of COVID-19 pandemic in Türkiye. Kastamonu Education Journal, 28(3), 1124-1129.

Özer, M., & Perc, M. (2020). Dreams and realities of school tracking and vocational education. Palgrave Communications, 6, 34.

Özer, M., & Suna, H. E. (2020). The linkage between vocational education and labor market in Turkey: Employability and skill mismatch. Kastamonu Education Journal, 28(2), 558-569.

Özer, M. (2021a). The new steps taken for improvement of vocational education and training in Turkey. International Journal of Turkish Educational Studies, 9(16), 1-16.

Özer, M. (2021b). Eğitim politikalarında sistemik uyum. Maltepe Üniversitesi Yayınları.

Özer, M. (2021c). A new step towards narrowing the achievement gap in Turkey: "1,000 Schools in Vocational Education and Training" project. Bartın University Journal of Faculty of Education, 10(1), 97-10.

Özer, M., Suna, H. E., & Numanoğlu, K. V. (2021). Increasing the social integration of Syrian refugees in Turkey through vocational education and training. International Journal of Management Economics and Business, 17(3), 861-876.

Özer, M., Suna, H. E., & Sunar, L. (2021). Türkiye'de mesleki ve teknik eğitimde hizmet içi öğretmen eğitime yönelik öğretmen görüşlerinin değerlendirilmesi. Marmara Üniversitesi Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi, 54, 1-22.

Özer, M. (2022a). The universalization of education in Türkiye and new orientations. TRT World Research Center.

Özer, M. (2022b). Türkiye'de eğitimin evrenselleşmesi. Maltepe Üniversitesi Yayınları.

Özer, M. (2022c). Türkiye'de eğitimi düşünmek. VakıfBank Kültür Yayınları.

Özer, M. (2022d). School-based improvement in VET: "The 1,000 Schools in Vocational Education and Training Project". Bartın University Journal of Faculty of Education, 11(2), 268-279.

Özer, M., & Suna, H. E. (2022a). A new roadmap for reskilling and upskilling (R&U) in Türkiye: Vocational training center skill development programs. Kastamonu Education Journal, 30(4), 914-924.

Özer, M., & Suna, H. E. (2022b). 3308 Sayılı Mesleki Eğitim Kanunu'nda yapılan değişiklik sonrası mesleki eğitim merkezi programlarının 2022 yılı ilk üç aylık performans değerlendirmesi. Uluslararası Türk Eğitim Bilimleri Dergisi, 10(18), 1-17.

Özer, M., & Suna, H. E. (2022c). The intellectual property and industrial rights in the National Technology Initiative: Recent educational improvements in Türkiye. In National Technology Initiative: Social reflections and Türkiye's future (pp. 61-80). Turkish Academy Sciences.

Özer, M. (2023). Türkiye'de eğitimin geleceği: Eşit, kapsayıcı ve kaliteli. VakıfBank Kültür Yayınları.

- Pavlova, M. (2019). Technology and vocational education for sustainable development: Empowering individuals for the future. Springer.
- Perc, M., Özer, M., & Hojnik, J. (2019). Social and juristic challenges of artificial intelligence. *Palgrave Communication*, 5, 61.
- Ra, S., Shrestha, U., Khatiwada, S., Won Yoon, S., & Kwon, K. (2019). The rise of technology and impact on skills. *International Journal of Training Research*, 17(1), 26-40.
- Sahlberg, P. (2007). Secondary education in OECD countries: Common challenges, differing solutions. European Training Foundation.
- Singh, M. (2015). Global perspectives on recognising non-formal and informal learning: Why recognition matters. UNESCO & Springer Open.
- Skare, M., & Riberio Soriano, D. (2021). How globalization is changing digital technology adoption: An international perspective. *Journal of Innovation & Knowledge*, 6, 222-233.
- Sloane, P. J., & Mavromaras, K. (2020). Overeducation, skill mismatches, and labor market outcomes for college graduates. IZA World of Labor 2020: 88v2. Retrieved from <https://wol.iza.org/uploads/articles/536/pdfs/overeducation-skill-mismatches-and-labor-market-outcomes-for-college-graduates.pdf?v=1>
- Snilstveit, B. et al. (2016). The impact of education programmes on learning and school participation in low- and middle-income countries. International Initiative for Impact Evaluation. Retrieved from <https://www.3ieimpact.org/sites/default/files/2019-05/srs7-education-report.pdf>
- Somers, M. A., Cabus, S. J., Groot, W., & van den Brink, H. M. (2016). Horizontal mismatch between employment and the field of education: Evidence from a systematic literature review. TIER Working Paper Series No 16/02. Maastricht: Top Institute for Evidence Based Education Research.
- Soori, M., Arezoo, B., & Dastres, R. (2023). Artificial intelligence, machine learning and deep learning in advanced robotics, a review. *Cognitive Robotics*, 3, 54-70.
- Suna, H. E., Tanberkan, H., Eroğlu, E., Özer, M., & Gür, B. S. (2020a). Horizontal skills mismatch in vocational education in Turkey: The reasons for out-of-field employment. *İstanbul Üniversitesi Sosyoloji Dergisi*, 40, 931-955.
- Suna, H. E., Gür, B. S., Gelbal, S., & Özer, M. (2020b). Fen lisesi öğrencilerinin sosyoekonomik arkaplanı ve yükseköğretime geçişteki tercihleri. *Yükseköğretim Dergisi*, 10(3), 356-370.
- Suna, H. E., & Özer, M. (2021). The impact of school tracking on secondary vocational education and training in Turkey. *Hacettepe University Journal of Education*, 36(4), 855-870.
- Suna, H. E., Çelik, Z., Açar, M., Eroğlu E., & Coşkun, I. (2021). Türkiye’de Suriyeli göçmen çocukların eğitime uyumlarını destekleme: Psikolojik destek, dil becerileri, aile desteği, ders dışı sosyal etkinlikler ve öğretmen yeterlilikleri. *İstanbul Üniversitesi Sosyoloji Dergisi*, 41, 381-407.
- Şahin, Ö. (2021). Regional analysis of skills-mismatch in Turkish labor markets. *İktisat Politikası Araştırmaları Dergisi*, 8(1), 1-27.
- UNESCO (2005). Contributing to a more sustainable future: quality education, life skills and education for sustainable development. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000141019>
- UNESCO (2012). Transforming technical and vocational education (TVET): Building skills for work and life. United Nations Educational, Scientific and Cultural Organization.
- UNESCO (2017). Towards quality assurance of technical and vocational education and training. United Nations Educational, Scientific and Cultural Organization. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000259282>
- UNESCO & GEM (2019). 2019 youth report: Migration, displacement and education: Sustainable development building bridges, not walls. Retrieved from http://gem-report-2019.unesco.org/wp-content/uploads/2019/02/GEM-R_2019-YouthReport-EN_Interactive.pdf
- UNESCO (2020a). Towards universal access to higher education: International trends. United Nations Educational, Scientific and Cultural Organization.
- UNESCO (2020b). Innovating technical and vocational education and training: A framework for institutions. Retrieved from https://unevoc.unesco.org/pub/innovating_tvvet_framework.pdf
- UNESCO (2021). Embracing a culture of lifelong learning: Lifelong learning in ageing societies - lessons from Europe. United Nations Educational, Scientific and Cultural Organization.

United Nations (2015). Transforming our world: The 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly on 25 September. United Nations.

United Nations (2020). World Social Report 2020: Inequality in a rapidly changing world. Department of Economic and Social Affairs.

van Maarseveen, R. (2022). Urbanization and education: The effect of childhood urban residency on educational attainment. *Economic Studies* 206. 210 pp. Uppsala: Department of Economics, Uppsala University.

Valoppi, F., Agustin, M., Abik, F., Morais de Carvalho, D., Sithole, J., Bhattarai, M., Varis, J. J., Arzami ANAB, Pulkkinen, E., & Mikkonen, K. S. (2021). Insight on current advances in food science and technology for feeding the world population. *Front. Sustain. Food Syst.* 5, 626227.

Waller, R., Hodge, S., Holford, J., Milana, M., & Webb, S. (2021). Reassessing the social benefits of lifelong learning in light of the COVID pandemic. *International Journal of Lifelong Education*, 40(5-6), 435-438.

Werquin, P. (2010). Recognition of non-formal and informal learning: Country practices. OECD Publishing.

Wiren, E. (2013). Migrants in education – what factors are important?. A study of European countries participating in TIMSS 2007. European Commission.

World Bank (2019a). World development report 2019: The changing nature of work. World Bank Publishing.

World Bank (2019b). Minding the skills gap and mismatches: A report on secondary vocational education in the Prešov region of the Slovak Republic. Retrieved from <https://documents1.worldbank.org/curated/en/610971561036926530/pdf/Minding-the-Skills-Gap-and-Mismatches-A-Report-on-Secondary-Vocational-Education-in-the-Prešov-Region-of-the-Slovak-Republic.pdf>

World Economic Forum (2023). Future of jobs report 2023: Insight report. Retrieved from https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf

