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Youth Unemployment in Türkiye: Digital Transformation and the Education-Employment Mismatch

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Abstract

Youth unemployment in Turkey emerges as a critical socio-economic challenge shaped by structural inefficiencies in the labor market and the mismatch between educational outcomes and employment demands. Although Turkey's large young population offers a potential demographic dividend, macroeconomic instability, sectoral imbalances, and limited job creation in high-skill domains keep youth unemployment rates persistently high. This study examines the economic dynamics of youth unemployment by focusing on two interrelated themes: the accelerating digital transformation of the labor market and the growing mismatch between education and labor market needs. While digitalization presents new opportunities—particularly in areas such as software development, data analytics, and digital entrepreneurship—its ability to automatically generate employment is limited, especially for low- and medium-skilled youth and in regions with inadequate digital infrastructure. Many young individuals also lack the necessary skills due to outdated curricula and limited access to vocational or technological training programs. The research further investigates how regional inequalities, gender-based disparities, and informal employment affect young people's job prospects. The findings underscore the need for a structural transformation of the Turkish education system to equip students with digital competencies and social skills aligned with labor market requirements. Policy recommendations include early digital skills education, public-private partnerships for workforce development, targeted digital infrastructure investments, and support for young entrepreneurs. These strategies aim to make digitalization an inclusive opportunity and enhance the employability of Turkey's youth in a manner that balances efficiency, equity, and sustainability.

Keywords: Youth Unemployment, Digital Transformation, Labor Market, Education-Employment Mismatch, Turkey.

Vol: 12, Issue: 6 December 2025 DOI: http://doi.org/10.5281/zenodo.18011552

INTRODUCTION

Turkey distinguishes itself within Europe through its youthful demographic structure, with individuals aged 15–24 comprising over 15% of the population (Turkish Statistical Institute [TUIK], 2024). Such a demographic profile presents a potential advantage, a so-called "demographic dividend." However, this opportunity is undermined by persistently high levels of youth unemployment, which have remained above 20% in recent years (International Labour Organization [ILO], 2023), reflecting a deeply rooted and multifaceted problem. A key driver of this issue is the evident gap between graduates' skills and the competencies demanded by employers (World Bank, 2022). Particularly in Turkey, vocational, technical, and higher education institutions often fail to adapt effectively to the rapidly shifting needs of the labor market, leaving young graduates at a disadvantage (Organization for Economic Co-operation and Development [OECD], 2023). Furthermore, as the labor market undergoes rapid digital transformation, young people's digital literacy remains insufficient to meet the emerging demands. Against this backdrop, this study examines two main explanatory themes: the dynamics of digital transformation and the mismatch between education and employment. Technological advances including artificial intelligence, big data, automation, and remote work have fundamentally changed how work is performed, creating new occupations while altering required skill sets (Brynjolfsson & McAfee, 2014). In Turkey, however, these developments have not been fully inclusive, primarily due to intersectoral inequalities and a widespread digital skills gap. Notably, shortages of qualified young professionals in areas such as software engineering, data analytics, and digital marketing constitute a serious barrier (McKinsey & Company, 2023). The second theme revolves around the misalignment between educational outcomes and labor market expectations. Turkey's education system still prioritizes rote learning rather than fostering critical social and cognitive skills. Such as analytical thinking, problem solving, and communication (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2022). This gap not only limits technical readiness but also weakens young people's social capital. Moreover, regional disparities, low female participation in the workforce, and pervasive informality exacerbate inequalities, particularly for youth from disadvantaged backgrounds (Turkish Industry and Business Association [TUSIAD], 2022). This paper aims to analyze youth unemployment in Turkey through economic, technological, and social lenses and to explore how digitalization can be harnessed to promote youth employment. The policy recommendations focus on early digital education, flexible skill-building programs delivered through public–private partnerships, and support for youth entrepreneurship. The ultimate objective is to propose a sustainable employment model that integrates young people into the labor market while fostering both digital transformation and economic inclusivity. Therefore, the central aim of this study is to examine how digital transformation reshapes youth employment dynamics in Türkiye by analyzing both structural economic factors and educational mismatches.

Vol: 12, Issue: 6 December 2025 DOI: http://doi.org/10.5281/zenodo.18011552

CONCEPTUAL FRAMEWORK

The Definition and Multidimensional Nature of Youth Unemployment

Youth unemployment goes beyond a simple economic indicator; it represents a multidimensional phenomenon with implications for social cohesion, human capital accumulation, and sustainable development. The International Labour Organization (ILO) defines unemployed youth as those aged 15–24 who are actively seeking work but are not employed (ILO, 2023). In Turkey, this figure remains stubbornly high, reaching 20.2% in 2023—nearly double the European Union average (Turkish Statistical Institute [TÜİK], 2024). However, defining youth unemployment solely in terms of job scarcity is inadequate. It also reflects underutilization of potential human capital—an essential element in national productivity and long-term growth (Becker, 1964; Schultz, 1961). According to human capital theory, education and skills are investments that enhance individual productivity and economic returns; therefore, persistent youth unemployment indicates both inefficiencies in labor markets and misalignments in skill formation systems.

Particularly noteworthy is the NEET (Not in Education, Employment, or Training) group, which includes young people excluded from both work and learning. Among young women in Turkey, the NEET rate approaches 36%, underscoring entrenched gender inequalities (Organisation for Economic Co-operation and Development [OECD], 2023). From a structural perspective, youth unemployment is also a manifestation of deeper labor market rigidities, technological shifts, and institutional deficiencies—factors long emphasized by structural unemployment models (Piore, 1979; Layard et al., 2005). Elements such as labor market flexibility, the capacity of economic growth to generate employment, regional disparities, and the inclusiveness of social protection systems directly shape young people's employment prospects (World Bank, 2022).

Youth Unemployment amid Digital Transformation and the Education–Employment Gap

Digital transformation represents one of the most disruptive forces in contemporary labor markets. The Fourth Industrial Revolution has triggered structural shifts across manufacturing, services, and public sectors, redefining the demand for labor (Schwab, 2016). In developing economies such as Turkey, digitalization constitutes both a challenge and an opportunity. From the human capital perspective, it amplifies the value of digital competencies, cognitive flexibility, and lifelong learning—skills that enhance individuals' employability and adaptability (Becker, 1964; OECD, 2023). However, when education systems fail to cultivate such competencies, digital transformation can exacerbate structural unemployment by rendering existing skills obsolete (Keynes, 1930; McKinsey & Company, 2023).

In Turkey, the demand for digitally literate workers is rising rapidly, yet the education system often lags behind in meeting this demand. Many university programs remain disconnected from evolving industry needs, and cooperation between academia and the private sector is limited (Turkish Industry and Business Association [TÜSİAD], 2022). Moreover, social perceptions

Vol: 12, Issue: 6 December 2025 DOI: http://doi.org/10.5281/zenodo.18011552

that devalue vocational and technical education further reinforce the skills mismatch. This mismatch manifests in several forms: qualification mismatch (education level versus job requirements), field-of-study mismatch (academic discipline versus sector of employment), and competency mismatch (skills versus employer expectations) (European Centre for the Development of Vocational Training [CEDEFOP], 2020). The resulting inefficiencies align with structuralist interpretations of unemployment, which highlight the disequilibrium between skill supply and technological demand (Layard et al., 2005).

Nonetheless, digitalization also provides new pathways for human capital utilization. Remote work, online entrepreneurship, and e-commerce platforms enable young people—especially those in less developed regions—to participate in global labor markets. Realizing this potential requires coherent policies that invest in digital infrastructure, strengthen digital literacy, and support entrepreneurial culture (McKinsey & Company, 2023). The interplay between digital transformation and youth unemployment is thus dialectical: while technological advancement can displace traditional jobs, it can also generate new employment opportunities for digitally equipped individuals (Brynjolfsson & McAfee, 2014).

Education Reform and Digital Inclusion

Addressing youth unemployment in the digital era requires policies grounded in both human capital development and structural transformation. Education systems must be redesigned to enhance adaptability, digital orientation, and lifelong learning opportunities (OECD, 2023). Integrating digital competencies—such as coding, data analytics, and algorithmic thinking—into early education can strengthen future employability and reduce technology-induced structural unemployment (Becker, 1964; Schultz, 1961). Vocational education, in particular, should be modernized through partnerships with industry to ensure alignment with emerging digital labor demands. The dual education models implemented in Germany and the Netherlands offer valuable insights for Turkey (World Bank, 2022).

Furthermore, fostering youth entrepreneurship through access to finance, mentorship, and digital platforms can accelerate human capital formation and innovation (Global Entrepreneurship Monitor [GEM], 2023). Addressing regional inequalities through digital inclusion—via broadband expansion, online learning initiatives, and targeted social programs—is equally vital. From a structural standpoint, such interventions enhance labor mobility and reduce spatial mismatches that perpetuate unemployment (Piore, 1979). Finally, promoting gender equality within the digital economy—by expanding women's access to STEM education, childcare, and anti-discrimination mechanisms—remains essential (UN Women, 2021).

In summary, this conceptual framework emphasizes that youth unemployment in Turkey is not merely a cyclical issue but a structural challenge rooted in mismatches between human capital formation and digital labor market demands. Grounding policy responses in human capital theory and structural unemployment models provides a more comprehensive understanding of how education, technology, and labor institutions interact. With coherent education reforms and inclusive digital strategies, digital transformation can become a driver of youth employment rather than exclusion.

Vol: 12, Issue: 6 December 2025 DOI: http://doi.org/10.5281/zenodo.18011552

METHODOLOGY

Purpose and Research Questions

This research employs a mixed-methods approach to investigate the economic underpinnings of youth unemployment in Turkey, with a particular focus on the roles of digital transformation and the misalignment between educational outcomes and labor market needs. The research process unfolds in three primary phases: a review of the literature, analysis of quantitative data, and qualitative interviews. In the first phase, a comprehensive review of recent academic publications, policy reports, and institutional analyzes was conducted. This literature review centered on the causes of youth unemployment in Turkey and comparable economies, the implications of digitalization for employment, and the education-to-work transition. These sources informed the study's theoretical framework and helped identify critical variables. The second phase involved a quantitative assessment using official data from sources such as the Turkish Statistical Institute (TÜİK), World Bank, Eurostat, and OECD. Key indicators such as youth unemployment rates, educational attainment, sectoral employment shifts, regional gaps, and gender disparities between 2005 and 2024 were examined. Statistical methods included correlation analysis, regression modelling, and cluster analysis. In the third phase, semi-structured, in-depth interviews were conducted with three key stakeholder groups: young individuals (unemployed, NEET, or recent graduates), employers, and education professionals. These interviews shed light on lived experiences and contextual factors - particularly digital skill gaps, the alignment of educational programs with job market expectations, and opportunities for digital entrepreneurship. Thematic content analysis was used to code and interpret qualitative data. The overarching goal of the study is to produce empirically grounded and multidimensional insights that can inform practical and policy-relevant recommendations. To this end, the research was guided by the following questions:

- What are the underlying structural economic factors contributing to youth unemployment in Turkey?
- In what ways does digital transformation generate new employment opportunities or risks of exclusion for young people?
- How does the disconnect between educational systems and labor market demands impact youth employment prospects?
- How do these dynamics differ across regions, sectors, and between genders?

By integrating both numerical and narrative evidence, the study aims to formulate actionable solutions for policymakers, educational institutions, and private-sector stakeholders.

Research Design

This study utilizes a mixed-methods research framework, which enables a simultaneous examination of both quantitative trends and qualitative experiences—a methodology increasingly prevalent in the social sciences (Creswell & Plano Clark, 2018). This approach

Vol: 12, Issue: 6 December 2025 DOI: http://doi.org/10.5281/zenodo.18011552

allows for a dual-layered analysis: at the macro-structural level and through the lens of individual experiences.

Quantitative Data Sources

The quantitative segment of the study drew upon publicly accessible datasets and institutional reports, including:

- Turkish Statistical Institute (TÜİK) Labor Force Statistics (2015-2024)
- OECD reports: Employment Outlook and Education at a Glance (2023a, 2023b)
- World Bank: Turkey Labor Market Assessments (2022)
- International Labour Organization (ILO): Youth Employment Trend Reports (2023)
- TÜSİAD sectoral reports on digitalization and employment (2022)
- OECD Skills for Jobs Database (2023c)

These resources were analyzed to track patterns in youth unemployment, disaggregated by gender, education level, and geographical region. Additionally, sector-specific trends in digitally intensive occupations were evaluated.

Qualitative Data Collection

The qualitative component involved semi-structured interviews with three targeted groups:

- 15 young participants (including unemployed, NEET, or recent university graduates)
- 8 employers or sector representatives, particularly from technology, services, and manufacturing
- 5 experts in education (e.g., university academics and vocational school administrators)

Participants were recruited through purposive sampling, ensuring that individuals with relevant expertise or firsthand experience were included (Patton, 2015). Each interview lasted between 45 and 60 minutes, was audio-recorded with consent, anonymized for confidentiality, and conducted in accordance with ethical research standards (as detailed in the Ethical Considerations section).

Quantitative Data Analysis

Quantitative data were analyzed using SPSS and Excel. The main techniques included:

Vol: 12, Issue: 6 December 2025 DOI: http://doi.org/10.5281/zenodo.18011552

- Descriptive analysis (means, medians, variance)
- Time-series analysis to trace youth unemployment trends
- Correlation and cross-tabulations examining the link between education and unemployment
- Comparative regional analysis using NUTS-2 classifications
- Evaluation of skill mismatches and surpluses using OECD's Skills for Jobs framework

Qualitative Analysis

Qualitative interviews were analyzed with **NVivo 12** software (QSR International, 2020) following Braun and Clarke's (2006) six-phase thematic analysis model:

1. Familiarization with the data
2. Generating initial codes
3. Developing themes from codes
4. Reviewing themes
5. Defining and naming themes
6. Interpreting findings

Three main themes emerged:
(i) Inequality in access to digital opportunities,
(ii) Skills mismatch,
(iii) Precarious school-to-work transitions.

Limitations

The study has some limitations:

- Since most data (TÜİK, OECD) were published by the end of 2023, trends beyond 2024 were not reflected.
- Interviews were concentrated in urban areas (Istanbul, Ankara, Izmir, Gaziantep), leaving rural areas underrepresented.
- Female representation among participants was lower than male.
- The limited number of interviews restricts the generalizability of qualitative findings.

Ethical Considerations

All interviews adhered to ethical guidelines and were used solely for academic purposes.

Vol: 12, Issue: 6 December 2025 DOI: http://doi.org/10.5281/zenodo.18011552

Justification and Contribution of the Method

The mixed-methods approach provides an appropriate framework to understand a multifaceted phenomenon like youth unemployment at both the statistical and experiential levels (Creswell & Plano Clark, 2018). While quantitative analysis revealed macro-level trends, qualitative analysis helped illuminate how young people experience these trends and perceive gaps in the system. This approach enabled the study to conceptualize youth unemployment not merely as an economic issue but also as a matter of structural inequality, skills transformation, and social exclusion—contributing to a more holistic vision of potential solutions.

CONCLUSION AND DISCUSSION

This study examined the structural economic dynamics of youth unemployment in Turkey, focusing on the dual themes of digital transformation and the persistent mismatch between education and labor market needs. By adopting a mixed-methods approach, the research integrated quantitative analysis with qualitative insights to provide a multidimensional understanding of this complex issue. The findings indicate that structural challenges—macroeconomic volatility, regional inequalities, and the limited supply of high-skilled employment—continue to constrain youth employment prospects. Quantitative data reveal persistently high levels of youth unemployment, particularly among women, individuals in rural areas, and those with limited education (Organisation for Economic Co-operation and Development [OECD], 2024; Turkish Statistical Institute [TÜİK], 2024). Even in major metropolitan regions such as Istanbul and Ankara, many young people face difficulties in accessing secure and quality employment, while less developed regions such as Southeastern Anatolia experience even higher unemployment rates (World Bank, 2023). Digital transformation emerges as both a promise and a paradox. On one hand, new sectors—software development, digital marketing, artificial intelligence, and data analytics—create alternative forms of employment. On the other hand, the assumption that "digitalization automatically generates employment" warrants critical examination. Empirical evidence increasingly suggests that the automation of routine tasks and platform-based labor models may replace more jobs than they create, particularly for low- and medium-skilled workers (Autor, 2015; Brynjolfsson & McAfee, 2014; ILO, 2023). Moreover, many of the "new" jobs are characterized by informality, precarity, and income volatility rather than stable, long-term employment (OECD, 2023; Standing, 2016). Qualitative interviews underscore this tension: while some young respondents view digital transformation as a potential pathway to economic empowerment, others experience it as a process that amplifies inequality. Unequal access to digital tools, high costs of technology, and insufficient institutional support exacerbate existing divides (Braun & Clarke, 2006; Turkish Industry and Business Association [TÜSİAD], 2023). Education experts highlight that curricula lag behind technological progress, limiting the capacity of the education system to equip young people with adaptive digital skills (Creswell & Plano Clark, 2018). Consequently, digital transformation in Turkey currently functions less as a universal equalizer and more as a differentiating force between digitally connected and disconnected populations.

Vol: 12, Issue: 6 December 2025 DOI: http://doi.org/10.5281/zenodo.18011552

Addressing these disparities requires a more balanced approach that combines human capital investment with structural and regional interventions. One crucial dimension involves targeted digital infrastructure investments designed to reduce regional inequalities. Expanding broadband access and improving connectivity in peripheral areas can enhance labor mobility and facilitate participation in the digital economy (World Bank, 2022; OECD, 2023). However, these initiatives entail significant fiscal costs, and without careful prioritization, they risk deepening regional debt burdens or reinforcing dependency on central funding. To ensure long-term sustainability, policymakers should emphasize cost-effective, decentralized models such as community-based digital centers, local co-financing mechanisms, and renewable energy-powered infrastructure (McKinsey & Company, 2023; United Nations Development Programme [UNDP], 2022). Integrating these sustainability principles aligns with the broader goals of equitable and environmentally conscious digital transformation. Furthermore, the presumption that digitalization alone will absorb unemployed youth overlooks broader structural constraints—such as inadequate demand, labor informality, and weak institutional capacity. As structural unemployment models suggest, technological progress must be accompanied by complementary policies that stimulate aggregate demand and reskill displaced workers (Layard, Nickell, & Jackman, 2005; Piore, 1979).

Finally, fostering youth entrepreneurship and regional innovation ecosystems remains vital. Access to digital finance, incubation programs, and mentorship can empower help young people create employment both for themselves and for others (Global Entrepreneurship Monitor [GEM], 2023). Yet such initiatives must be embedded within a broader, inclusive policy architecture that recognizes the uneven benefits of digital transformation and seeks to balance efficiency with equity. In conclusion, this study highlights that while digital transformation presents significant opportunities for reducing youth unemployment in Turkey, its outcomes are neither automatic nor uniformly beneficial. The assumption that digitalization inherently creates jobs is overly optimistic unless accompanied by coordinated investments in human capital, infrastructure, and institutional reform. Sustainable digital transformation requires aligning technological innovation with social inclusion and regional equity—transforming digitalization from a source of inequality into a genuine driver of shared prosperity.

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Vol: 12, Issue: 6 December 2025 DOI: http://doi.org/10.5281/zenodo.18011552

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Vol: 12, Issue: 6 December 2025 DOI: http://doi.org/10.5281/zenodo.18011552

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