

Skills Mismatch in Algeria: A Structural Constraint on Long-Term Economic Growth

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Abstract:

The persistence of skill mismatches in Algeria has far-reaching implications for economic growth, labour market efficiency, and social equity. Mismatches between education output and market demand hinder job creation, leading to higher unemployment rates and reduced economic productivity. The economy's inability to absorb its educated workforce results in significant economic losses, as overqualified individuals remain underutilised in roles that do not maximise their potential.

The primary objective of this paper is to investigate the relationship between skills mismatch and economic performance and how this issue is hindering long-term economic growth.

The methodology used to this investigation is based on secondary data collected from reports of World Bank, International Labour Organization, World Development, World Economic Forum, and PIAAC, Statista...etc.

The results reveal that Algeria faces significant mismatches between skills possessed by its labour force and the skills demanded by the market. This mismatch has a negative impact on productivity, innovations, and labour competitiveness leading to reduced economic growth and efficiency.

Keywords: Skills Mismatch; Job Misalignment; Over-Education; Under-Education, Economic Growth

Jel Classification: J24; O47; J23,

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1. Introduction.

Data from the International Labour Organization (ILO) indicate that some resource-rich countries have struggled to achieve significant economic progress, while nations like Taiwan and Singapore have made remarkable advancements by investing in a highly skilled workforce. As the OECD describes, skills have become the new global currency of the 21st century (OECD, 2012, p. 10). However, today's key challenge that economies face is ensuring that workforce skills align with labour market demands. Countries successfully adapting and developing the necessary skills and competencies are better positioned to thrive in an increasingly competitive global landscape. Yet, a persistent issue, "skills mismatch," continues to hinder labour market efficiency. Skill mismatch occurs when workers' skills do not align with job requirements due to under-qualification, over-qualification, or discrepancies in skill types (Bennett & McGuinness, 2009).

The ILO identifies skill mismatch as a major challenge from resource misallocation (Restuccia & Rogerson, 2017, p. 2). In today's rapidly evolving economy, skill mismatches create inefficiencies at multiple levels. At the individual level, they contribute to lower wages, job dissatisfaction, and high turnover rates (Brunello & Wruuck, 2021). At the organizational level, firms experience productivity losses (Haskel & Martin, 1993), increased training costs (Forth & Mason, 2006), and barriers to innovation (Nickell et al., 1997). At the national level, skill mismatches reduce labour market efficiency, distort resource allocation, and exacerbate wage inequalities, leading to measurable economic losses (Slonimczyk, 2009). This imbalance negatively impacts employment rates, economic growth, and wage levels (Wolbers, 2003, pp. 252–253), ultimately threatening national productivity and long-term economic progress.

Existing studies provide valuable insights into the consequences of skill mismatches across different contexts. In the United States, research highlights their impact on economic growth and wage structures (Cappelli, 2015). European studies reveal macroeconomic challenges linked to skill mismatches, though some skill-shortage economies have exceptions (Brunello & Wruuck, 2019). In OECD countries, well-structured labour markets help mitigate skill mismatches and improve productivity (McGowan & Andrews, 2015). African research underscores the role of skill mismatches in wage penalties and low job satisfaction (Morsy et al., 2019), while studies in the MENA region associate them with gender discrimination and labour market inequalities (Arayssi et al., 2023) like many other nations, Algeria is grappling with skill mismatches.

1.1 Research gap

In Algeria, the literature has largely focused on studying the impact of educational mismatches and skills misalignment on individuals, leaving a gap in the research about the consequences of this issue on a macroeconomic level. For example, the study of Tansel and Lassassi (2023) examined education-job mismatches but did not explore their overall economic effects (Tansel & Lassassi, 2023). Our findings led us to believe that this paper should further address the gap in the literature. Our focus went to how skill mismatches can be a constraint to the development of long-term economic growth in Algeria by analysing labour force participation, labour market utilisation (underutilisation or over-utilisation), educational attainment, and unemployment (skills not utilised).

1.2 Research Objectives

The aim of this study is to review the Algerian situation of skill mismatch and how this issue is limiting the economic growth rates focusing on Algeria, a region that has been largely overlooked in this area of research. The research main objectives are to examine the economic impacts of these mismatches and provide policy recommendations to improve workforce alignment and strengthen economic resilience. The findings will offer evidence-based insights to guide policy interventions, ensuring better workforce alignment and strengthening Algeria's economic resilience.

1.3 Research Problem

In reaching this aim, we have asked this:

Research question: To what extent does skills mismatch in Algeria's labour market impact economic growth?

1.4 Research Hypothesis

To investigate this research problem, we proposed the following hypothesis:

Hypothesis: Skills mismatches in Algeria's labour market have a significant negative impact on economic growth.

2. Theoretical Framework and Literature Review

2.1 Skills Mismatch

Skill mismatch has been used to describe the disparity between the skills required for specific jobs (usually specified by employers) and those held by job seekers, highlighting a gap between skills and job expectations. Skill mismatch, also referred to as skill gaps and skill shortages characterized by “over- or under-education” and “over- or under-skilling” and “horizontal mismatch”, could be categorized as over-qualification, under-qualification, and horizontal mismatch (Shi, 2024).

- Underqualification occurs when the skills and competencies of the workforce are under job requirements.
- Overqualification is a situation that occurs when employees possess qualifications or more specialised skills that exceed the job's demands.
- Horizontal mismatch occurs when job seekers have the appropriate level of education but are employed in industries unrelated to their academic background and vocational training (Schweri et al., 2021).

2.2 Skill Mismatch in Algeria

Algeria's circumstances demonstrate how structural, institutional, and demographic factors intensify the issue of skills mismatch that acknowledged the existence of a substantial divergence between the competencies provided by Algerian educational institutions and those demanded by employers.

Investigations conducted on English majors at Ibn Khaldoun University in Tiaret disclose that graduates frequently lack critical collaborative and research analytical skills, which are essential for employability within contemporary industries (Mehdaoui, 2022).

Gender inequities further compound these challenges. Women in Algeria encounter elevated rates of job mismatch and brain waste, prompting an increased exodus of women in pursuit of enhanced prospects (BOUKLIA-HASSANE, 2011).

Boutayeba and Ramli (2019) discerned a long-term equilibrium relationship between education and economic growth, yet no causal connection, indicating that the quality of education and alignment with market demands are of greater importance than mere expansion (Boutayeba & Ramli, 2019).

Comparative analyses further underscore Algeria's inadequate utilisation of human resources, Bouznit et al. (2015) demonstrated that the elasticity of the country's human capital is two and a half times lower than that of South Korea, thereby illustrating how the ineffective deployment of human capital restricts economic transformation.

2.2 Skills Mismatch and Economic Growth: A Literature Review

Academic investigation highlights the complex and multi-dimensional ways in which mismatches influence both individual and macroeconomic outcomes. Skills mismatches emerge in various forms. At the individual level, a study conducted by Guvenen et al. (2020) proposes a multidimensional measure of mismatch that compares occupational skill requirements with worker abilities (Guvenen et al., 2020), the research results indicate that mismatches suppress current wage

growth and generate long-term “scarring effects” that reduce lifetime earnings. Skill mismatch has a negative impact on workforce efficiency (Tang & Wang, 2005). The reason why skills mismatches have a negative impact on productivity is companies fail to fill employees with required skills, most commonly less skills required that boost job inefficiency (Bellmann & Hübler, 2014).

Companies that fail to build a strategic mechanism to fill and unfilled job vacancies are threatened to experience high skill mismatch (Bennett & McGuinness, 2009). (Forth & Mason, 2006) found that skill mismatch has an indirect impact on the in British ICT firm’s productivity and hinders the adoption of new technologies. Companies often use “temporary employment” and “outsourcing” to reduce the mismatches of the workforce skills (Healy et al., 2011).

At the national level, Country-specific evaluations introduce an additional dimension of intricacy. In the context of China, disparities among graduates from institutions of higher education diminish productivity in critical sectors such as manufacturing and high technology, which may adversely affect the nation's long-term competitive stance. Consequently, it is posited that enhanced vocational training and more effective alignment between academic institutions and labour markets are of paramount significance (Shi, 2024). In South Africa, continuous divergences between skill supply and labour demand hinder sustainable growth, underscoring the necessity of reforming educational institutions (Samuel & Thakhathi, 2012) Critical studies like the Malaysian framework shown empirical investigations suggesting that over-qualification exhibits a positive correlation with regional economic growth, indicating that not all instances of mismatch denote inefficiency; rather, in certain contexts, they may foster economic vitality. Similar to Zúñiga and Yuen (2020) who contend that such mismatches facilitate labour mobility, thus mitigating disparities over time and enhancing overall productivity (Odio Zúñiga & Yuen, 2020).

Countries with well-aligned workforce capabilities demonstrate higher productivity, innovation, and economic resilience (Davia et al., 2017). Regional studies shown that in Europe vertical educational mismatches hinder inclusive growth, associating with elevated unemployment and poverty rates, with effects differing within occupational groups (Kesküla et al., 2025) and (Vandeplas & Thum-Thysen, 2019). The lack of reliable data and the absence of differentiated policies, a challenge prevalent in numerous low- and middle-income nations, further constrains the efficacy of interventions (Bergin et al., 2019). Numerous low- and middle-income nations encounter issues of “over education” and insufficient job creation, culminating in the underutilisation of skilled labour and diminished economic returns on educational expenditures (Handel et al., 2016). These dynamics illustrate broader continental African patterns, wherein inadequate skills and education among youth lead to mismatches, wage penalties, and diminished job satisfaction (Morsy & Mukasa, 2019).

3. Methodology

The methodology used to investigate the Algerian skills situation is analysing a huge amount of secondary data specifics for the labour participation, labour underutilization, and level of education, GDP rates growth and so on collected from numerous studies, surveys, reports and databases such as: International Labour Organization (ILO), World Bank Report, World Development Report, World Economic Forum Report, The Program for the A international Assessment of Adult Competencies Survey (PIAAC), Statista, DGFPPRA. Among them, reports that present a wide range of country skills profiles helped us access the data of Algeria for a good understanding of the effect of skills mismatch on the economic growth of Algeria. Thus, the results of our research might be a good comprehensive for policy makers and stakeholders for better understanding of the status of skills of the Algerian labour market and its effect on economic growth rates.

4. Results and Discussion

4.1 Algerian Labour market

Algeria ranks 131st worldwide in the Labour Market pillar, with a score of 47.1, indicating a weak and inflexible labour market structure. Critical issues include high redundancy costs (17.3 weeks of salary), which add significant financial burdens on employers when managing workforce adjustments. Hiring and firing practices score 4.0 (55th rank), showing limited flexibility, and internal labour mobility scores only 4.6 (59th), suggesting workers face challenges in moving within sectors. Despite a mid-range workers' rights score (57.0), labour policies and wage flexibility scores (5.5 and 4.9) remain low, showing restricted adaptability in labour regulations.

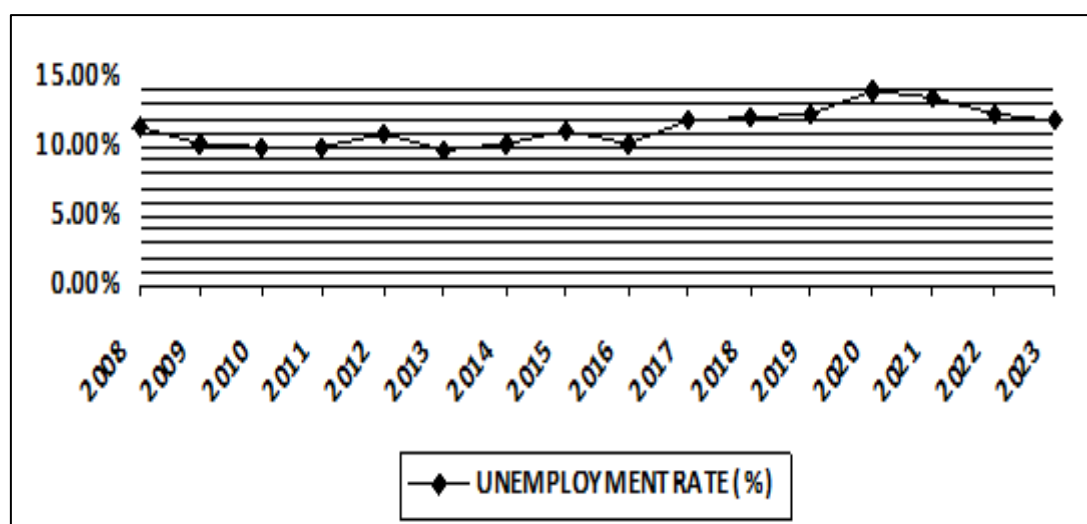
Improving flexibility and reducing hiring and redundancy costs could make Algeria's labour market more agile and responsive to economic shifts. In the first quarter of 2021, Algerian companies faced several recruitment challenges, with 56% of businesses struggling to find candidates possessing the necessary skills or qualifications, highlighting a significant skills gap in the labour market. This issue points to a mismatch between workforce competencies and industry demands, possibly fuelled by misaligned educational programs or rapidly evolving job requirements.

Furthermore, 35% of companies reported difficulties due to the inexperience of applicants, suggesting that while candidates might hold academic credentials, they often lack the hands-on expertise required for effective performance, which increases training costs and on boarding times for employers. Additionally, 28% of companies noted problems with candidates whose educational backgrounds did not align with job requirements, underscoring the disconnection between academic training and private-sector needs. These challenges reflect broader systemic issues in Algeria's labour market, emphasizing the need for improved coordination between educational institutions, industry stakeholders, and government bodies to align curricula and training programs with market demands (Statista, 2024).

4.2 Unemployment

According to the Bayt.com survey of Fresh Graduates in the MENA region, in July 2015, 76% said that the foremost challenge of their generation is finding a job. Almost 30% stated that their jobs were not related to their studies, and more than 80% viewed their current jobs as interim and are looking to leave.

Figure 1 Unemployment rate (%) in Algeria from 2008 to 2023



Source: Statista, 2024

The graph illustrates fluctuations in the youth unemployment rate from 2004 to 2023. The data shows an initial high in 2004, with the unemployment rate near 35%, followed by a general

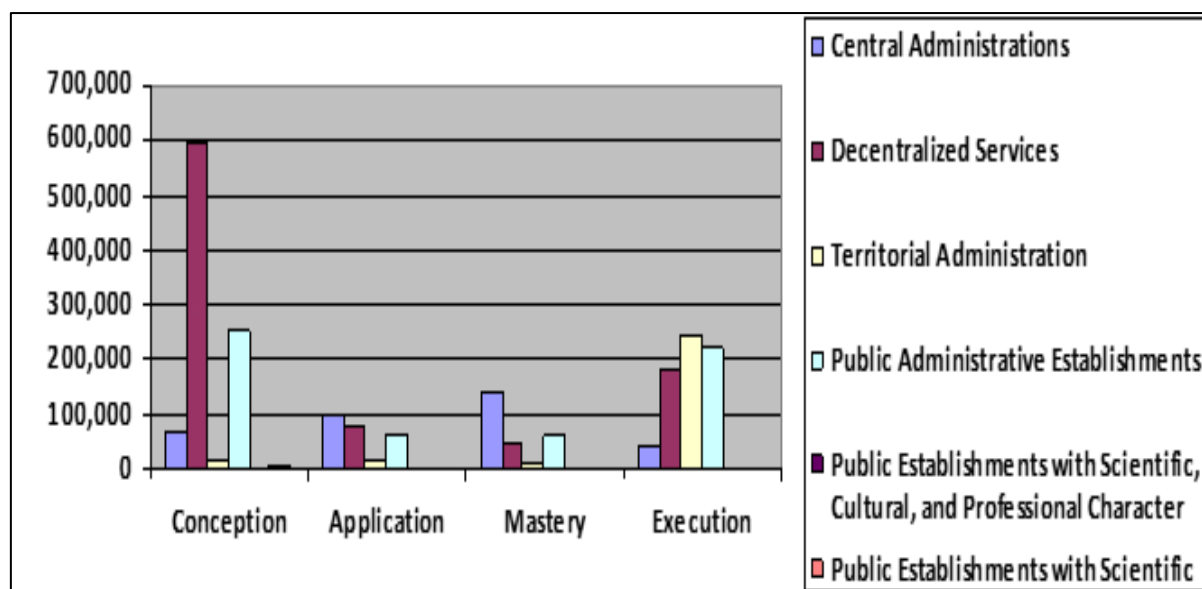
downward trend reaching a low around 2010. However, starting from 2011, the youth unemployment rate began a gradual upward trend, peaking around 2020, potentially influenced by global economic challenges and the COVID-19 pandemic. After 2020, there was a noticeable decline, indicating possible economic recovery efforts or improved employment opportunities for young people. This trend suggests that while youth unemployment remains a persistent issue, recent efforts may be positively impacting job prospects for this demographic

4.3 Workforce Qualification

The workforce's qualification level plays a critical role in determining institutional performance and capacity. Understanding the distribution of qualifications across different institutional sectors provides valuable insights into workforce deployment and its alignment with organizational goals. The following graph illustrates the distribution of workforce by qualification level across various institutional entities, highlighting their respective areas of focus and operational expertise.

Data from national direction of public work illustrates significant disparities in workforce qualifications across institutional sectors. Decentralized Services dominate in terms of personnel, especially in the “Execution” category, with nearly 700,000 employees, reflecting a focus on operational tasks. Public Administrative Establishments show a balanced distribution across all qualification levels, while Central and Territorial Administrations prioritize higher-level qualifications like “Conception” and “Mastery”. Specialized Public Establishments with “Scientific, Cultural, and Professional” or “Scientific and Technological” focus emphasize advanced qualifications, highlighting their need for expertise in specialized fields. Overall, the data underscores the varied workforce structures aligned with each sector's operational priorities.

Figure 2 Institutional level by qualification level in Algeria



Source: data from <https://www.dgfp.gov.dz/fr/index.asp>

Data from ILO (2024) illustrated the workforce skills in Algeria, it ranks 86th with a score of 34.4 pointing to substantial gaps in research and commercialization. The diversity of the workforce is moderate at 4.2 (53rd rank), but the state of cluster development (4.3, 52nd) indicates limited industry specialization and collaboration. Algeria has very low scores in international co-inventions (0.02) and R&D expenditures as a percentage of GDP (0.03%), reflecting minimal global collaboration and investment in research. Additionally, patent applications and scientific publications

are sparse, with low rankings in patent filings (0.3 per million population, ranked 110th) and publication scores. The lack of robust R&D investment and limited intellectual property activities highlight Algeria's struggle to transition into a knowledge-based economy. Enhancing research infrastructure and fostering international collaborations are crucial to improving Algeria's innovation capacity and competitiveness

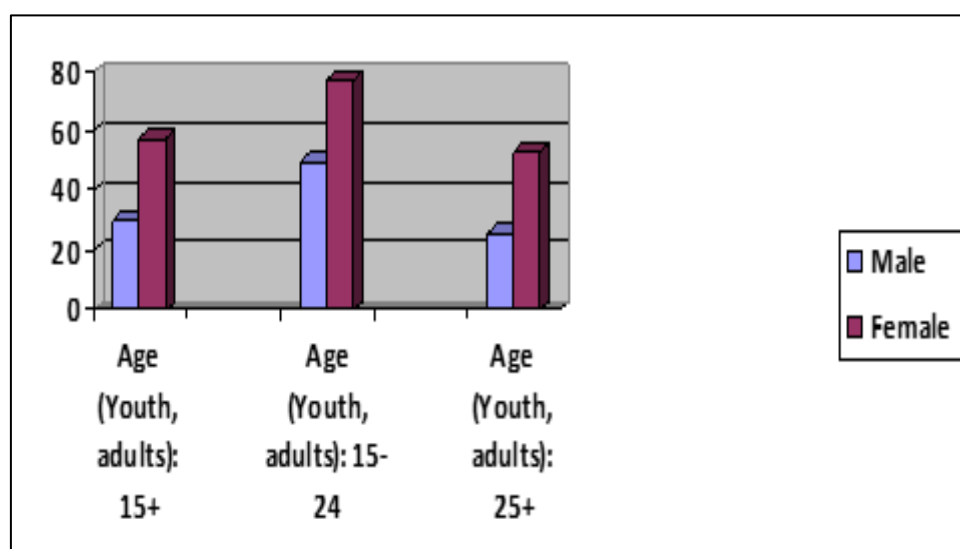
Algeria ranks 89th out of 141 countries in workforce skills, highlighting gaps that may hinder economic growth. Key challenges span both the current workforce and the future workforce. For the current workforce, Algeria's average schooling years (8.7) and low scores in vocational training and digital skills reflect a need for more advanced training. With a digital skills score of 49.5 (82nd), Algeria's workforce lacks sufficient digital literacy, a critical requirement in today's economy. Moreover, the ease of finding skilled employees score (52.0, 76th) suggests a mismatch between worker skills and job market demands. Looking at the future workforce, Algeria's school life expectancy of 14.3 years is relatively high, but the quality of education needs improvement. Low scores in critical thinking (37.0) and a high pupil-to-teacher ratio (24.2) point to issues in fostering problem-solving skills and effective learning environments.

4.4 Labour force Underutilisation

Results from the Algerian LFS- Household Employment Survey highlighted that Algerian labour market is experiencing a gender disparity consistently among women who are experiencing higher rates than men across all age groups. Data from ILO confirmed that the current situation of gender disparity and labour underutilisation in Algeria. Underutilisation is especially high for women, reaching 77.44%, compared to 49.98% for men, highlighting a notable gender gap in workforce engagement.

Young women in Algeria face significant challenges in securing adequate employment opportunities. Females aged (15 – 24) experience the highest rates of gender disparities. In the 25+ age category, the underutilisation rate drops but still shows a marked disparity, with 53.5% of women underutilising compared to 25.69% of men. This trend is also evident in the 15+ age group, where 57.37% of women are underutilized compared to 29.82% of men. Fig. (01) Illustrates the current situation of Algeria in labour underutilisation by gender.

Figure 3 Composite rate of labour underutilization by gender & age (%)

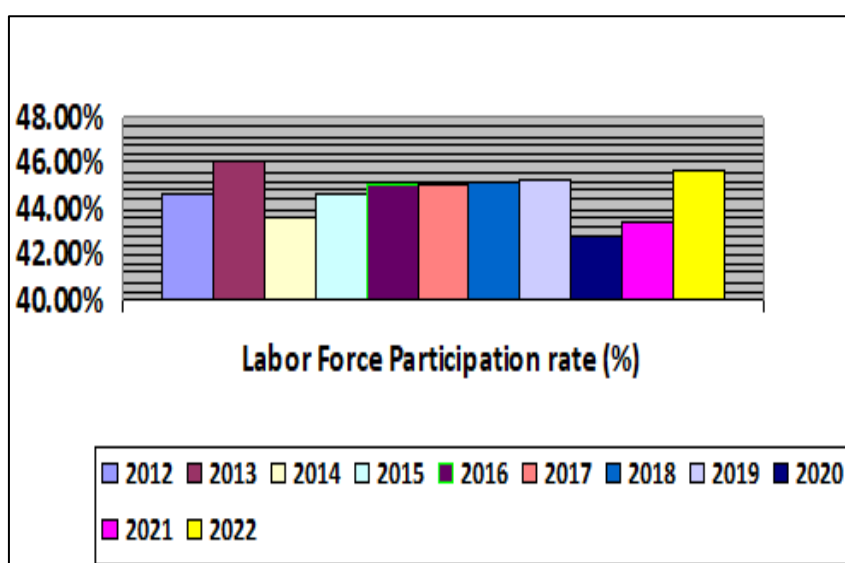


Source: By the author based on the ILO database, 2024

4.5 Labour Force Participation

Algeria is experiencing significant challenges with labour force participation and employment inequalities. The labour force participation in Algeria, according to the data from Statista (2024), is experiencing a disparity among gender utilisation; female labour participation is lower than male engagement, staying in the range of approximately 15% to 20%. Male participation consistently remains high, hovering around 70% throughout the period, with only minor fluctuations. As female participation remains less than a third of the male rate, they are facing several challenges when entering the Algerian labour market. Despite slight increases in female participation over the years, the data shows a persistent divide, reflecting broader socio-economic and cultural barriers affecting women's employment in Algeria.

Figure 4 Labour force participation in Algeria from 2012 to 2022



Source: By the author, based on data from Statista 2024

4.6 Human Capital and Economic Score Metrics

The data from the World Economic Forum's (WEF) "Future of Growth Report 2024" highlights several human capital challenges that may be holding back Algeria's economic growth. These challenges are grouped into four key pillars: Sustainability, Inclusiveness, Resilience, and Innovativeness.

- a. Resilience:** The data highlights weaknesses in healthcare and workforce adaptability. Algeria scores only (1.9) for "Hospital Beds per 1,000 population" and (2.9) for "Health Workers per 10,000 population," signalling inadequate healthcare infrastructure. Moreover, there is a lack of data on "Investment in Reskilling" and "Mid-Career Training," suggesting underinvestment in continuous workforce development. Building healthcare capacity and enhancing reskilling programs would improve the workforce's resilience and adaptability. (WEF, 2024)
- b. Inclusiveness:** Algeria scores poorly on key indicators: (22.3) for "Gender Parity in Labour Force" and (31.5) for "Inequality in Education." These low scores indicate high levels of gender and educational inequality, which restrict access to economic opportunities for large segments of the population. Addressing these disparities through equitable workforce and education policies could increase productivity and enhance overall economic participation. (WEF, 2024)
- c. Innovativeness:** Shows a major gap in digital and technology skills, with a score of (3.1) for "Digital and Technology Talent" and (2.7) for "Availability of Talent," resulting in low

economic scores (35.6 and 29.0, respectively). Despite a moderate investment in ICT capital (62 USD per capita), Algeria lacks the skilled labour necessary to drive innovation. Investing in digital skills and education would enhance Algeria's ability to compete in a technology-driven global economy. (WEF, 2024)

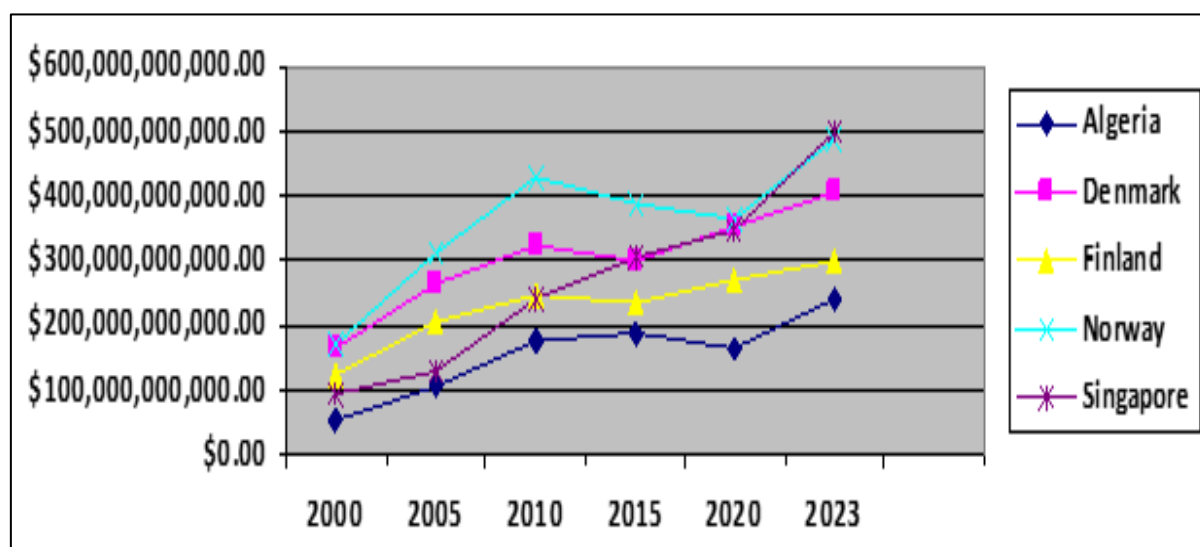
- d. Sustainability:** Algeria scores (4) out of (7) for "Talent for Green and Energy Transition" and (3.5) for "Buyers' Sophistication on Environment and Nature," with respective economic scores of (50.6) and (42.4). This suggests that, while there is moderate talent for green transitions, there's limited market demand for sustainable products. Strengthening both workforce skills and consumer awareness around sustainability could drive Algeria toward a greener economy. (WEF, 2024)

4.7 Economic performance

The graph demonstrates significant disparities in GDP (current US\$) growth among Singapore, Algeria, Finland, Denmark, and Norway over the years 2000 to 2023. These countries were chosen to comparison because they benefit from highly skilled and educated workforces, which foster innovation, productivity, and competitiveness, essential drivers of economic performance.

These chosen countries exhibit consistently higher GDP levels than Algeria, with Singapore showing a notable surge, reflecting its position as a global hub for innovation and technology which underscores the critical importance of investing in education and skills development to bridge economic disparities and stimulate growth.

Figure 5 GDP (current US\$) - Singapore, Algeria, Finland, Denmark, Norway



Source: authors based on World Bank Data, 2024

3. Findings and Discussion.

The present study was designed to set out the aim of assessing the issue of skills mismatch as a barrier to long-term economic growth in Algeria. The findings of this study indicate that skills mismatches in Algeria's labour market have a significant negative impact on long-term economic growth. Therefore, confirming the association between job misalignment and labour productivity, highlighting structural and institutional factors that promote the misalignment between educational outputs, workforce competencies, and the evolving needs of the Algerian economy which restrict productivity and limit the country's capacity to adapt to global technological and economic transformations.

The most obvious finding to emerge from the analysis is that the Algerian labour market has significant disparities in worker qualifications across institutional sectors, coupled with weak research infrastructure and minimal international collaboration, reinforcing the structural rigidity of the Algerian labour market, similar findings were shown by (Benchouat & Ghezal, 2025). A possible explanation for this result may be the lack of adequate labour with a restricted knowledge transfer, weakening the capacity to generate innovation-led growth. Previous studies have confirmed that skill mismatches place countries at a competitive disadvantage compared to economies that successfully integrate higher education with industry needs, such as (Tansel & Lassassi, 2023).

Another important implication from these results was that gender disparity is a critical dimension of labour under-utilisation. Low female participation reflects not only the absence of gender equity but also a significant loss of potential human capital that could otherwise contribute to economic diversification and inclusivity, similar findings were shown on the study conducted by (Kaci & Larib, 2024). These results agree with the findings of other studies, such as Morsy et al. (2019), in which they emphasise gender imbalance reduces labour market dynamism and undermines inclusive growth, thereby amplifying the negative effects of skills mismatches.

There are, however, other results that indicated the existence of deficits in digital competencies, vocational training, and intellectual property development hinder the transition towards a knowledge-based economy. This inconsistency is visible in Algeria's weak performance in international patent activity and co-invention, reflecting both a lack of alignment with global innovation systems and an inability to foster technology-driven competitiveness.

Finally, rigid labour market regulations further exacerbate the skills gap which brought inflexible employment protection, high redundancy costs, and outdated educational programmes collectively hinder the responsiveness of the labour market to shifting economic demands. This could be explained by the persistent disconnect between academic training and private sector needs, which reinforces graduate unemployment, while the lack of critical thinking and digital literacy among job seekers reduces their adaptability to emerging industries.

In general, therefore, it seems that these findings conclude that skills mismatch in Algeria acts as a structural constraint on long-term economic growth. The consequences that emerged from skills mismatch are multifaceted that include unemployment, underutilisation of human capital, and a reduced capacity for economic resilience.

4. Recommendations

Relying on the findings and conclusions presented, the following recommendations are suggested. First, the persistent imbalance between academic training programmes and industry demand requires urgent attention in the Algerian labour market. Therefore, educational reform should be incorporated with industry requirement skills. Recommendations are given to invest in twinning initiatives between industry and university to align educational programmes with industry mechanisms.

Schemes that foster collaboration between the university and industry through research laboratories, internships, increasing funding for applied research, and supporting innovation ecosystems through incubators, technology hubs and sponsorships of conferences are going to be a win-win collaboration for both the university and industry (Bellmann & Hübler, 2014). Additionally, embedding digital skills and technical training into educational frameworks can prepare the workforce for technological advancements and the changing nature of work (Shi, 2024)

Second, developing lifelong learning pathways and expanding vocational and digital skills programmes are central to preparing the workforce for technological and economic transformation. Reward mechanisms such as tax benefits, competitive research grants, and intellectual property protection can stimulate entrepreneurship, knowledge transfer, and technology-driven competitiveness.

Recommendation is given by this research to address gender inequalities in labour force participation and utilisation that contribute significantly to skill underutilization and economic inefficiencies (McGowan & Andrews, 2015). Since gender disparities remain a major source of

labour underutilisation and participation in Algeria, thus, decreasing future economic potential. The Ministry of Work and Employment should incorporate the integration of women into the workforce; initiatives such as affordable childcare, flexible working arrangements, and mentorship might motivate women to participate in the labour market and to shorten the labour participation gap between genders in Algeria.

Therefore, policy reforms should streamline hiring and redundancy procedures, reduce administrative barriers to job mobility, and create incentives for continuous learning. Training subsidies and tax breaks for firms investing in reskilling and upskilling initiatives can foster adaptability, while public-private partnerships can ensure that training programs reflect evolving industry requirements (Forth & Mason, 2006).

5. Conclusion

This study investigates the issue of skills mismatch as a barrier of long term economic performance in Algeria. The findings suggested that there is a significant skill mismatch in the labour market that resulted from various interconnected issues such as skills underutilisation, gender inequality, and disparities in workforce qualification, weak research infrastructure, inflexible regulations, limited industry specialisation, and few international mobility. Together these challenges hinder the transition toward a knowledge-based economy.

To further advance the understanding of Algeria's labour market challenges, future research could focus on sector specific disparities, brain drain, empirical research, and intersectionality in labour market inequality would also offer valuable insights.

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