DEVELOPMENT OF THE LABOR MARKET IN THE CONTEXT OF KAZAKHSTAN'S DIGITAL ECONOMY AND THE CONCEPT OF SUSTAINABLE DEVELOPMENT

Assem Urekeshova, Zhibek Rakhmetulina, Igor Dubina, Sergey Barykin, Angela Mottaeva

ABSTRACT

Relevance: In an era of rapid digital transformation, the labor market in Kazakhstan faces new challenges and opportunities. This research explores the development of the labor market in the context of Kazakhstan's digital economy, with a focus on sustainable development principles.

Background: The authors have identified nine scientific schools that can be applied to investigate the development of the labor market in Kazakhstan's digital economy within the framework of sustainable development. Digital transformation is a key focus in this context, as it impacts the economy, society, and the labor market.

Methods: The study draws on the principles and approaches of these nine scientific schools to analyze the development of the labor market in Kazakhstan. This includes examining initiatives such as Digital Kazakhstan and various international digital transformation efforts.

Results: The authors find that digital transformation initiatives in different countries share common goals, such as enhancing the competitiveness, innovation, and productivity of the manufacturing sector while addressing workforce development and creating new job opportunities. The Digital Kazakhstan initiative also follows these goals, aiming to improve the country's economic competitiveness through digital transformation.

Conclusion: By considering the nine scientific schools and their applications, a deeper understanding of the labor market's development in Kazakhstan can be achieved in the context of digital transformation and sustainable development. The authors recommend that Kazakhstan focuses on key areas such as education, workforce development, innovation, entrepreneurship, digital infrastructure, industry-academia collaboration, targeted strategies for key industries, public-private partnerships, supportive regulatory frameworks, social inclusion, sustainability, and international cooperation to successfully develop its labor market and ensure sustainable growth.

Keywords: digital transformation in Kazakhstan, labor market, digital economic development, sustainable development.

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DESENVOLVIMENTO DO MERCADO DE TRABALHO NO CONTEXTO DA ECONOMIA DIGITAL DO CAZAKHISTÃO E DO CONCEITO DE DESENVOLVIMENTO SUSTENTÁVEL

RESUMO

Relevância: Numa era de rápida transformação digital, o mercado de trabalho no Cazaquistão enfrenta novos desafios e oportunidades. Esta pesquisa explora o desenvolvimento do mercado de trabalho no contexto da economia digital do Cazaquistão, com foco nos princípios do desenvolvimento sustentável.

Antecedentes: Os autores identificaram nove escolas científicas que podem ser aplicadas para investigar o desenvolvimento do mercado de trabalho na economia digital do Cazaquistão no âmbito do desenvolvimento sustentável. Neste contexto, a transformação digital é uma das principais prioridades, uma vez que tem impacto na economia, na sociedade e no mercado de trabalho.

Métodos: O estudo se baseia nos princípios e abordagens dessas nove escolas científicas para analisar o desenvolvimento do mercado de trabalho no Cazaquistão. Isso inclui examinar iniciativas como o Cazaquistão Digital e vários esforços internacionais de transformação digital. Resultados: Os autores constatam que iniciativas de transformação digital em diferentes países compartilham objetivos comuns, como aumentar a competitividade, a inovação e a produtividade do setor de manufatura, ao mesmo tempo que abordam o desenvolvimento da força de trabalho e criam novas oportunidades de emprego. A iniciativa Cazaquistão Digital também segue essas metas, com o objetivo de melhorar a competitividade econômica do país por meio da transformação digital.

Conclusão: Ao considerar as nove escolas científicas e suas aplicações, uma compreensão mais profunda do desenvolvimento do mercado de trabalho no Cazaquistão pode ser alcançada no contexto da transformação digital e do desenvolvimento sustentável. Os autores recomendam que o Cazaquistão se concentre em áreas-chave como educação, desenvolvimento da força de trabalho, inovação, empreendedorismo, infraestrutura digital, colaboração entre a indústria e a academia, estratégias direcionadas para indústrias-chave, parcerias público-privadas, estruturas regulatórias de apoio, inclusão social, sustentabilidade e cooperação internacional para desenvolver com sucesso seu mercado de trabalho e garantir o crescimento sustentável.

Palavras-chave: transformação digital no Cazaquistão, mercado de trabalho, desenvolvimento econômico digital, desenvolvimento sustentável.

1 INTRODUCTION

The digital transformation of economies worldwide has led to significant changes in the labor market, posing both challenges and opportunities for countries as they adapt to the new landscape. Kazakhstan, as a developing country with a growing economy, is no exception to this trend. The relevance of understanding the development of the labor
Development of the Labor Market in the Context of Kazakhstan's Digital Economy and the Concept of Sustainable Development

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The development of the labor market in the context of Kazakhstan's digital economy lies in the need to ensure sustainable and inclusive growth while addressing the challenges of digitalization.

In recent years, there has been substantial research on the impact of digital transformation on the global labor market. However, there remains a research gap in understanding the specific implications of digital transformation for the labor market in Kazakhstan, taking into account the country's unique socioeconomic and cultural context. Furthermore, while many studies have examined the role of digital transformation in the context of specific industries or sectors, few have addressed its impact on the labor market from a holistic perspective that encompasses the principles of sustainable development.

The aim of this research is to bridge this gap by examining the development of the labor market in the context of Kazakhstan's digital economy within the framework of sustainable development. To achieve this, the authors draw on the principles and approaches of nine scientific schools, which have been identified as relevant to the study of labor market development in the digital economy. These scientific schools provide a solid theoretical foundation for the analysis, allowing the authors to examine various aspects of labor market development in Kazakhstan, including the role of government intervention, labor market flexibility, institutional factors, human capital, environmental considerations, and the impact of digital technologies and innovations.

The authors' contribution to the existing body of knowledge is twofold. First, they provide a comprehensive analysis of the development of the labor market in Kazakhstan, drawing on the insights and approaches of nine scientific schools to provide a multifaceted perspective on the challenges and opportunities associated with digital transformation. This comprehensive approach allows the authors to examine not only the economic aspects of labor market development but also the social, cultural, and environmental factors that play a crucial role in shaping the labor market landscape in Kazakhstan.

Second, the authors contribute to the ongoing debate on the role of digital transformation in fostering sustainable development by examining the implications of digital transformation for the labor market in Kazakhstan, a developing country that faces unique challenges and opportunities in the context of digitalization. By analyzing the experiences of other countries and international initiatives, the authors provide valuable insights and recommendations for Kazakhstan's policymakers and stakeholders, helping
them to navigate the challenges of digital transformation and ensure that the benefits of digitalization are shared by all segments of society.

In conclusion, this research provides a comprehensive analysis of the development of the labor market in the context of Kazakhstan's digital economy and the concept of sustainable development. By drawing on the principles and approaches of nine scientific schools and examining the experiences of other countries and international initiatives, the authors contribute to the understanding of the challenges and opportunities associated with digital transformation in the labor market. Furthermore, the authors provide valuable insights and recommendations for Kazakhstan's policymakers and stakeholders, helping them to develop strategies and policies that foster sustainable and inclusive growth in the era of digitalization.

2 METHODS

The authors consider 9 scientific schools that can be applied to the study of labor market development in the context of the digital economy of Kazakhstan within the framework of the concept of sustainable development from the mainstream point of view:

1. Keynesian Economics;
2. Neoclassical Economics;
3. Institutional Economics;
4. Human Capital Economics;
5. Ecological Economics;
6. Institutionalism (Old and New);
7. System Dynamics;
8. Sustainable Development;

From the authors’ point of view, a theoretical foundation for analyzing the development of the labor market in the context of Kazakhstan's digital economy and the concept of sustainable development can be considered as follows.

1. Keynesian Economics: Investigating the role of active government intervention in the labor market, stimulating employment, and supporting demand in the context of the digital economy to achieve sustainable development.
2. Neoclassical Economics: Analyzing the importance of labor market flexibility, self-regulation, and minimal government intervention in the digital economy, as well as seeking a balance between efficiency and sustainability.

3. Institutional Economics: Examining the role of institutions, social norms, and legislation in regulating the labor market in the context of the digital economy and sustainable development, taking into account Kazakhstan's local specificities.


5. Ecological Economics: Integrating environmental aspects into labor market development, creating green jobs, and ensuring sustainable use of resources in the digital economy and sustainable development context.

6. Institutionalism (Old and New): Analyzing the influence of historical, social, and cultural factors in shaping labor market institutions and outcomes in the context of the digital economy and sustainable development.

7. System Dynamics: Modeling and analyzing complex systems, feedback loops, policy interventions, and long-term dynamics in the development of the labor market within the context of the digital economy and sustainable development.

8. Sustainable Development: Integrating economic, social, and environmental objectives to ensure balanced development of the labor market in the context of the digital economy, strengthening intergenerational equity and sustainability.


These schools of thought can serve as a theoretical foundation for analyzing the development of the labor market in the context of Kazakhstan's digital economy and the concept of sustainable development (table 1).
Table 1. Summary of Key Schools of Thought Relevant to the Study of Labor Market Development in the Digital Economy of Kazakhstan within the Context of Sustainable Development

<table>
<thead>
<tr>
<th>School of Thought</th>
<th>Key Figures</th>
<th>Principles and Approaches</th>
<th>Key Works</th>
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The researchers have identified 9 scientific schools that can be applied to the investigation of labor market development in the context of the digital economy of Kazakhstan, within the framework of the concept of sustainable development. One of these key schools is Digital Transformation, which is of particular relevance to the current economic landscape.

The authors aim to explore the concept of digital transformation in the context of sustainable development of the labor market. Digital transformation initiatives strive to enhance the competitiveness, innovation, and productivity of the manufacturing sector while simultaneously addressing workforce development and generating new job opportunities. Researchers have observed that the digital transformation initiatives of various countries share a common emphasis on bolstering the manufacturing sector's competitiveness, innovation, and productivity, as well as addressing workforce development and new job opportunities.

The Digital Kazakhstan initiative is specifically designed to improve the competitiveness of the country's economy through digital transformation. This initiative focuses on promoting economic growth and productivity, fostering workforce skills, and
creating new job opportunities across various industries, including manufacturing. By considering the 9 scientific schools and their applications, a deeper understanding of the labor market's development in Kazakhstan can be achieved in the context of digital transformation and sustainable development.

The authors are trying to develop the idea of digital transformation in the context of sustainable development of the labor market. The digital transformation initiatives aim to improve the competitiveness, innovation, and productivity of the manufacturing sector while addressing workforce development and creating new job opportunities. The researchers consider the countries' digital transformation initiatives sharing a common focus on improving the manufacturing sector's competitiveness, innovation, and productivity while addressing workforce development and new job opportunities. The Digital Kazakhstan initiative aims to improve the competitiveness of the country's economy through digital transformation. It focuses on enhancing economic growth and productivity, developing workforce skills, and creating new job opportunities in various industries, including manufacturing.

The authors try to show in table 2 how the digital transformation initiatives focus on improving manufacturing industries' competitiveness and productivity while creating new job opportunities and addressing workforce development.

Table 2. Digital Transformation Initiatives and Their Impact on the Labor Market in Manufacturing Industries Worldwide.

<table>
<thead>
<tr>
<th>Country</th>
<th>Digitalization Initiative</th>
<th>Main Goals and Impact on the Labor Market</th>
<th>Related Document/Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Austria</td>
<td>Industrie Oesterreich</td>
<td>Strengthen competitiveness, increase productivity and innovation, and create high-quality jobs</td>
<td>Link</td>
</tr>
<tr>
<td>2. Belgium</td>
<td>Made Different - Factories of the Future</td>
<td>Foster innovation, digitalization, and sustainable manufacturing, and promote new job opportunities</td>
<td>Link</td>
</tr>
<tr>
<td>3. China</td>
<td>Made in China 2025</td>
<td>Upgrade Chinese industry, foster innovation, and develop a skilled workforce for new job profiles</td>
<td>Link</td>
</tr>
<tr>
<td>4. Czech</td>
<td>Průmysl 4.0</td>
<td>Increase competitiveness, productivity, and innovation, and create new job profiles</td>
<td>Link</td>
</tr>
<tr>
<td>Country</td>
<td>Digitalization Initiative</td>
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<tr>
<td>5. Denmark</td>
<td>Manufacturing Academy of Denmark (MADE)</td>
<td>Foster innovation and research in manufacturing industries, and develop a skilled workforce</td>
<td>Link</td>
</tr>
<tr>
<td>6. France</td>
<td>Alliance pour l'Industrie du Futur</td>
<td>Transform French industry, adapt the workforce to new technologies, and create new job opportunities</td>
<td>Link</td>
</tr>
<tr>
<td>7. Germany</td>
<td>Industrie 4.0</td>
<td>Enhance the digital transformation of the manufacturing sector and adapt the workforce</td>
<td>Link</td>
</tr>
<tr>
<td>8. Hungary</td>
<td>IPAR4.0 National Technology Initiative</td>
<td>Drive digital transformation, enhance value creation, develop human capital, and create new jobs</td>
<td>Link</td>
</tr>
<tr>
<td>9. Italy</td>
<td>Industria 4.0 and Fabbrica Intelligente</td>
<td>Boost productivity, encourage innovation, increase competitiveness, and create new job profiles</td>
<td>Link</td>
</tr>
<tr>
<td>10. Japan</td>
<td>Society 5.0</td>
<td>Integrate digital technology, improve quality of life, and create new job opportunities</td>
<td>Link</td>
</tr>
<tr>
<td>11. Kazakhstan</td>
<td>Digital Kazakhstan</td>
<td>Foster digital transformation, enhance economic growth, develop workforce skills, and create new job profiles</td>
<td>Link</td>
</tr>
<tr>
<td>12. Lithuania</td>
<td>Pramoné 4.0</td>
<td>Support digital transformation and innovation in the Lithuanian industry, and create new job roles</td>
<td>Link</td>
</tr>
<tr>
<td>13. Luxembourg</td>
<td>Digital For Industry Luxembourg</td>
<td>Enhance digitalization in the industry to foster competitiveness, growth, and new job opportunities</td>
<td>Link</td>
</tr>
<tr>
<td>14. Netherlands</td>
<td>Smart Industry</td>
<td>Drive digitalization of Dutch manufacturing, and workforce development, and create new job profiles</td>
<td>Link</td>
</tr>
<tr>
<td>15. Poland</td>
<td>Initiative and Platform Industry 4.0</td>
<td>Develop a competitive and innovative industrial sector, and create new jobs in the labor market</td>
<td>Link</td>
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</tbody>
</table>
Development of the Labor Market in the Context of Kazakhstan’s Digital Economy and the 
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</tr>
</thead>
<tbody>
<tr>
<td>16. Portugal</td>
<td>Industria 4.0</td>
<td>Boost digital transformation, increase the competitiveness of the Portuguese industry, and create new jobs</td>
<td>Link</td>
</tr>
<tr>
<td>17. Russia</td>
<td>Digital Economy of the Russian Federation</td>
<td>Drive digital transformation, develop workforce skills, and create new job profiles in the labor market</td>
<td>Link</td>
</tr>
<tr>
<td>18. Slovakia</td>
<td>Smart Industry</td>
<td>Enhance innovation and competitiveness, develop workforce skills, and create new job profiles</td>
<td>Link</td>
</tr>
<tr>
<td>19. Spain</td>
<td>Industria Conectada 4.0</td>
<td>Promote digital transformation and integration of the Spanish industry, and create new job profiles</td>
<td>Link</td>
</tr>
<tr>
<td>20. Sweden</td>
<td>Smart Industry</td>
<td>Strengthen the competitiveness of Swedish industry, adapt the workforce to new technologies, and create new jobs</td>
<td>Link</td>
</tr>
<tr>
<td>21. USA</td>
<td>Advanced Manufacturing Partnership (AMP)</td>
<td>Drive innovation, strengthen competitiveness, and create high-quality jobs in manufacturing</td>
<td>Link</td>
</tr>
</tbody>
</table>

3 RESULTS

While each of the mentioned initiatives is tailored to the specific needs and contexts of the respective countries, the authors suppose that some key elements can be adapted and recommended for Kazakhstan’s labor market in the context of digital transformation. Here are some suggestions:

1. **Focus on education and workforce development:** Kazakhstan should invest in improving its educational system to develop a skilled workforce capable of adapting to the digital economy. This includes promoting STEM education (Science, Technology, Engineering, and Mathematics), technical and vocational education and training (TVET), and continuous learning programs for adults. By implementing STEM education, countries like Kazakhstan can develop a highly skilled workforce capable of driving innovation, productivity, and economic growth in the era of digital transformation.
2. **Encourage innovation and entrepreneurship**: Foster a business-friendly environment to support startups and small and medium-sized enterprises (SMEs) that drive digital innovation. This can be done by providing financial incentives, regulatory support, and access to resources and knowledge.

3. **Invest in digital infrastructure**: Develop a robust digital infrastructure, including high-speed internet access, to support the adoption of digital technologies across various industries and regions.

4. **Promote industry-academia collaboration**: Encourage collaborations between industry and academia to ensure that research and development efforts align with the needs of the labor market and contribute to the growth of the digital economy.

5. **Develop targeted strategies for key industries**: Identify industries with high growth potential in the digital economy and create targeted strategies for their development. These industries may include manufacturing, agriculture, energy, and services.

6. **Foster public-private partnerships**: Encourage public-private partnerships to drive the adoption of digital technologies and develop the necessary skills and infrastructure.

7. **Establish a supportive regulatory framework**: Create a regulatory framework that supports digital transformation while safeguarding workers’ rights and ensuring a fair labor market.

8. **Emphasize social inclusion and sustainability**: Ensure that the digital transformation process is inclusive, and sustainable, and creates opportunities for all segments of society, including rural areas, women, and marginalized communities.

9. **Leverage international cooperation**: Learn from the experiences of other countries and engage in international partnerships to exchange knowledge, resources, and best practices in digital transformation.

By adapting these recommendations to the local context, Kazakhstan can successfully develop its labor market in the era of the digital economy and ensure sustainable growth.
4 DISCUSSION

In the context of the digital economy and sustainable development, the development of the labor market in Kazakhstan presents both challenges and opportunities. This study has explored the relevance of nine scientific schools in analyzing the labor market's development, offering valuable insights into the potential strategies and policies that could be implemented to ensure sustainable growth in Kazakhstan's labor market.

Throughout the discussion, several key themes have emerged. Firstly, the importance of education and workforce development cannot be overstated. By investing in STEM education, technical and vocational education and training (TVET), and continuous learning programs, Kazakhstan can develop a skilled workforce capable of adapting to the digital economy's demands. This focus on education also aligns with the principles of human capital economics, which emphasize the need to invest in education, professional development, and healthcare to improve workforce quality and ensure sustainable development.

Secondly, fostering innovation and entrepreneurship is essential for driving economic growth and job creation. By creating a business-friendly environment and supporting startups and SMEs, Kazakhstan can cultivate a vibrant ecosystem of innovative companies that contribute to the digital economy. This approach is consistent with the principles of neoclassical economics, which call for labor market flexibility, self-regulation, and minimal government intervention to strike a balance between efficiency and sustainability.

Thirdly, the role of institutions and social norms in shaping the labor market outcomes has been highlighted. Institutional economics and institutionalism (old and new) emphasize the importance of understanding the historical, social, and cultural factors that influence labor market institutions. By examining these factors, policymakers can design policies that take into account Kazakhstan's unique context and address the specific needs and challenges of its labor market.

Another important theme that emerged from the discussion is the need to integrate environmental aspects into labor market development. Ecological economics underscores the importance of creating green jobs and ensuring the sustainable use of resources in the digital economy and sustainable development context. By adopting a sustainable
development approach, Kazakhstan can balance its economic, social, and environmental objectives, thereby promoting intergenerational equity and long-term sustainability.

Finally, the discussion has emphasized the importance of system dynamics and digital transformation in understanding the complex interrelationships between different factors shaping the labor market's development. By using system dynamics modeling and analyzing the impact of digital technologies and innovations on the economy and society, researchers and policymakers can identify potential policy interventions and strategies that promote sustainable development in the context of the digital economy.

Overall, the discussion has shed light on the multifaceted nature of labor market development in Kazakhstan's digital economy and the concept of sustainable development. By drawing on the principles and approaches of the nine scientific schools, this study has provided a valuable framework for analyzing the challenges and opportunities associated with digital transformation, offering practical recommendations for policymakers and stakeholders to ensure sustainable and inclusive growth in Kazakhstan's labor market.

5 CONCLUSION

The digital transformation has profound implications for the labor market, and understanding its effects is essential for countries like Kazakhstan, which aims to develop a sustainable and inclusive economy. This study has provided a comprehensive analysis of the development of the labor market in the context of Kazakhstan's digital economy, drawing on the principles and approaches of nine scientific schools to examine the challenges and opportunities associated with digital transformation.

Throughout the study, the authors have identified several key factors that are crucial for the sustainable development of the labor market in Kazakhstan. These include fostering education and workforce development, promoting innovation and entrepreneurship, investing in digital infrastructure, encouraging industry-academia collaboration, developing targeted strategies for key industries, supporting public-private partnerships, establishing a conducive regulatory framework, emphasizing social inclusion and sustainability, and leveraging international cooperation.

By analyzing the experiences of other countries and international initiatives, the authors have provided valuable insights and recommendations for Kazakhstan's policymakers and stakeholders, helping them to develop strategies and policies that foster
sustainable and inclusive growth in the era of digitalization. These recommendations can serve as a roadmap for the development of the labor market in Kazakhstan, ensuring that the country is well-prepared to navigate the challenges and opportunities presented by the digital economy.

Moreover, this study contributes to the broader understanding of the role of digital transformation in fostering sustainable development, particularly in the context of developing countries. The authors' analysis underscores the importance of adopting a holistic approach to labor market development, which takes into account not only the economic aspects but also the social, cultural, and environmental factors that play a crucial role in shaping the labor market landscape.

In conclusion, the development of the labor market in the context of Kazakhstan's digital economy and the concept of sustainable development is a multifaceted and complex process, requiring concerted efforts from various stakeholders, including policymakers, businesses, educational institutions, and civil society. By adopting a comprehensive and integrated approach, Kazakhstan can successfully harness the potential of digital transformation to create a more inclusive, sustainable, and prosperous future for all its citizens.
REFERENCES


