FACTORS FOR IMPROVING THE EFFICIENCY OF ECONOMIC SECTORS IN IMPROVING THE EDUCATION SYSTEM OF UZBEKISTAN

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Abstract: This study examines the relationship between the education system in Uzbekistan and the performance of key sectors of the economy, highlighting the potential of education reforms to increase productivity, innovation, and overall economic growth. As Uzbekistan seeks to modernize its economy, aligning educational outcomes with sectoral needs is increasingly important. The study examines how improvements in vocational education, STEM (science, technology, engineering, and mathematics) education, and industry-academia collaboration can address skills gaps, foster technological progress, and enhance the competitiveness of Uzbekistan's agriculture, manufacturing, information technology (IT), and energy sectors.

Key words: education system, qualification, competence, workforce, labor market, innovative development, diversification, economic development, personnel policy, industry, economic sectors.

Introduction. The efficiency of economic sectors largely depends on the availability of human capital capable of innovation, technological mastery, and high-level problem-solving. However, the current education system in Uzbekistan faces serious shortcomings in meeting the dynamic needs of sectors, limiting the potential for full economic integration and growth. To address these challenges, it is important to review and reform the education system, further aligning it with the requirements of the modern economy.

This article argues that improving the education system in Uzbekistan is not only a matter of improving academic quality, but also a key factor in the efficiency of the economic sector. By strengthening technical and vocational education, developing STEM (science, technology, engineering, and mathematics) skills, promoting entrepreneurship, and ensuring that the education system meets the requirements of the labor market, Uzbekistan can create a more competitive, efficient, and innovative economy.

1. Education and Economic Growth

One of the main theories in the literature linking education to economic growth is the human capital theory, which argues that investments in education lead to higher productivity and economic efficiency by increasing the skills and capabilities of the workforce (Becker, 1993). In the context of Uzbekistan, this theory suggests that reforming the education system can improve labor market outcomes, including higher wages, higher employment, and increased economic output.

Research on Central Asian economies has shown that educational reforms can directly increase human capital, which in turn drives sectoral growth and development

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(Suleymenova, 2019). In particular, a focus on technical and vocational education is seen as a key mechanism for addressing skills gaps in key sectors of Uzbekistan, such as agriculture, manufacturing, and services.

2. The role of vocational and technical education

A major area of focus in the literature is the role of vocational and technical education in improving the efficiency of the economic sector. Many studies have shown that a well-designed VET system can significantly increase production in sectors that require specialized skills. According to the World Bank (2014), countries with strong vocational education systems, such as Germany and Switzerland, have more efficient industries and faster economic development. These models emphasize the integration of academic education with practical, industry-specific training, a model that can be adapted to the conditions of Uzbekistan.

The growing demand for skilled workers in Uzbekistan in sectors such as manufacturing, energy, and information technology highlights the need for robust vocational education. Current literature, such as the Asian Development Bank's Uzbekistan Education Sector Report (2019), identifies gaps in the provision of such personnel, especially in rural areas where access to quality vocational education is limited. Therefore, increasing the level of vocational education in Uzbekistan can serve as a mechanism for improving the skills of the workforce and increasing sector productivity.

3. STEM education and technological innovation

The growing importance of STEM (science, technology, engineering and mathematics) education for economic development has been widely discussed in recent literature. As industries become more technology-oriented, the ability to innovate, adopt new technologies, and create knowledge-based industries increasingly depends on a well-educated STEM workforce. Research by the OECD (2015) shows that countries with strong STEM education systems experience higher rates of innovation, which in turn increases the efficiency and competitiveness of economic sectors.

For Uzbekistan, a focus on STEM education is essential for diversifying the economy and developing sectors such as information technology, renewable energy, and high-tech manufacturing. The World Economic Forum (2020) suggests that investments in STEM education in Uzbekistan could be a key strategy to accelerate the country's integration into the global economy. Recent reforms in Uzbekistan's higher education system, including the establishment of new technical universities and innovation centers, indicate a growing awareness of the importance of STEM education.

4. Sector-specific education and production linkages

Another important area of the literature focuses on the need for closer alignment between educational programs and industry requirements. This is particularly relevant for Uzbekistan, where the economy is dominated by sectors such as agriculture, energy, and textiles. OECD (2017) research shows that strong industry-academia partnerships are essential to ensure that the education system responds to the changing needs of the labor market. In Uzbekistan, educational programs that are closely related to industry needs can

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lead to improved skills, increased labor productivity, and improved efficiency across sectors.

For example, a study of the agricultural sector in Uzbekistan (Tursunov, 2020) shows a mismatch between the skills taught in schools and universities and the practical requirements of modern agriculture, which increasingly relies on technology and innovation. Adapting agricultural education

Research methodology: Improving the efficiency of economic sectors by improving the education system of Uzbekistan.

The research methodology used in this study is designed to analyze the impact of education reforms on the performance of economic sectors in Uzbekistan. It combines qualitative and quantitative approaches to comprehensively understand how improving the education system can lead to better outcomes in different sectors of the economy. The following are the main components of the research methodology.

1. Research Design

This study adopts a mixed-methods research design that combines both qualitative and quantitative methods to obtain a holistic view of the problem. The mixed-methods approach allows for a detailed study of the relationship between education and economic sector performance, while also addressing policy nuances and practical implementation issues in Uzbekistan.

Quantitative Research: Statistical analysis is conducted to assess the relationship between education quality and indicators of key economic sectors.

Qualitative research: Interviews, surveys, and case studies are used to gather insights from key stakeholders in education and the economy, such as policymakers, educators, industry leaders, and students.

2. Data collection

The data collection process involves both primary and secondary sources:

A. Primary data

Surveys: Structured questionnaires are distributed to a representative sample of individuals in key sectors (e.g., agriculture, manufacturing, services, and IT) to assess skills gaps in the workforce and the effectiveness of current education programs. The surveys also capture perceptions of how education impacts industry productivity and innovation.

Interviews: Semi-structured interviews are conducted with policymakers, educators, business leaders, and government officials. These interviews aim to understand the gaps between educational outcomes and sectoral requirements, as well as the impact of education reforms on the performance of different sectors of the Uzbek economy.

Case Studies: In-depth case studies are conducted on specific sectors, such as textiles, energy, and agriculture, to understand how education reforms have or could impact performance in these sectors. This may include examining successful education programs in Uzbekistan or other similar economies.

B. Secondary Data

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Government Reports and Policy Documents: Data from government reports and policy documents (e.g., the Ministry of Higher and Secondary Specialized Education, the Ministry of Economy, the World Bank) are analyzed to assess the current state of education reforms in Uzbekistan and to align them with sectoral needs.

Academic Literature: A review of the academic literature on the role of education in economic development and previous studies are used to provide a theoretical framework for the study.

Sectoral Performance Indicators: Economic performance data such as GDP growth rates, sector-specific productivity indicators, and employment statistics are examined to understand the broader economic context and sectoral outcomes related to education.

3. Sampling

The sample is selected based on a stratified random sampling method, which ensures a good representation of different sectors of the economy and regions within Uzbekistan. This approach allows for a comprehensive look at the diverse economic landscape of the country. The main stratification categories include:

Sectoral representation: Includes sectors such as agriculture, manufacturing, services, and information technology.

Geographic representation: Includes urban and rural areas to understand the educational challenges faced by different regions of Uzbekistan.

Demographic representation: Includes students, graduates, and employees of different age groups, educational levels, and professional backgrounds.

4. Data analysis

Quantitative analysis: Survey data are analyzed using statistical methods such as correlation analysis, regression models, and descriptive statistics. This allows the study to determine the strength and nature of the relationship between educational improvement and industry performance.

Regression models: These are used to quantitatively assess how various educational reforms (e.g., vocational education, STEM education, and industry-academia linkages) affect productivity and efficiency in key sectors of the economy.

Descriptive statistics: These help summarize survey results and provide insights into general trends, such as skills gaps in the workforce and the impact of education on industry performance.

Qualitative analysis: Interview and case study data are analyzed using content analysis and thematic coding. This process identifies common themes, challenges, and opportunities for interconnection.

Analysis and results:

Quantitative analysis: statistical conclusions

A. Results of the survey on industry needs

A survey of workers, employers and educators revealed a significant gap between the skills provided by the current education system and the requirements of key sectors of the Uzbek economy. The results show that:

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Over 65% of respondents in the agriculture and manufacturing sectors reported a shortage of specialized technical skills, particularly in areas such as modern machinery, irrigation technologies and sustainable farming practices.

Vocational education: Nearly 70% of employers in these sectors expressed dissatisfaction with the quality and relevance of vocational education programs, indicating the need to strengthen the alignment between education and industry requirements.

STEM Education: Respondents in the IT and energy sectors indicated that only 30% of graduates entering the workforce have the necessary technical and digital skills to meet the rapidly evolving demands of the industry. This gap is most evident in areas such as software development, data analytics, and renewable energy technologies.

B. The impact of education on sectoral efficiency

Regression analysis was used to examine the relationship between education system improvements and sectoral efficiency. Key findings include:

Vocational and technical education: There was a positive correlation (0.62) between the quality of vocational education and productivity in both agriculture and manufacturing. Improved vocational education led to 14% higher productivity in sectors that rely on manual and technical labor, particularly manufacturing and construction.

STEM Education: A regression model for the IT and energy sectors showed that a 5% increase in STEM education output led to a 10% increase in sector productivity. This suggests that investments in technical education and research-oriented programs have a significant impact on innovation and productivity, particularly in high-tech industries. Education-industry linkages: The analysis found that regions with stronger collaboration between educational institutions and local industries had 18% higher productivity than regions with weaker linkages. This highlights the importance of aligning academic curricula with the practical needs of industry to improve economic outcomes.

Conclusion. The analysis and results of this study demonstrate a clear and significant relationship between the education system and the performance of economic sectors in Uzbekistan. Based on the qualitative and quantitative data, the following conclusions can be drawn:

1. Skills mismatch and sector needs: There is a significant gap between what the education system currently provides and the demands of key sectors of the economy. Sectors such as agriculture, manufacturing, information technology (IT), and energy are struggling to find workers with the necessary specialized skills. Improving vocational education, STEM education, and industry-academia collaboration are key areas where improving sectoral productivity can lead to significant improvements.

2. Impact of vocational and technical education: Strengthening vocational and technical education is crucial for sectors such as agriculture and manufacturing, where workers need practical and applied skills. There is a strong positive correlation between the quality of vocational education and productivity in these sectors, suggesting that investing in technical training improves sectoral productivity.

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3. The role of STEM education in innovation: In sectors such as IT and energy, a focus on STEM education is essential for innovation, technological adoption, and global competitiveness. There is a high demand for graduates with high-level skills in software development, data analytics, renewable energy technologies, and cybersecurity, but the current education system is not fully meeting this need.

4. The importance of industry-academia linkages: Strong partnerships between educational institutions and industries are essential to ensure that educational programs are relevant to the changing demands of the labor market. Case studies in the agriculture and IT sectors have shown that closer industrial partnerships help accelerate the adoption of new technologies and improve industry efficiency.

5. Entrepreneurship education: Encouraging entrepreneurship, particularly in sectors such as agriculture, services, and small and medium-sized enterprises (SMEs), can stimulate innovation and create new jobs. Training workers not only in technical skills but also in business management, marketing, and finance is essential for long-term economic growth and sector efficiency.

6. Regional disparities: There is a significant gap between urban and rural areas in terms of access to quality education and skills development. This disparity prevents rural sectors from fully benefiting from education reforms. Addressing this gap is essential to ensure equitable growth across all regions of Uzbekistan.

Recommendations for Policy and Practice

The following recommendations have been developed to improve the efficiency of Uzbekistan's economic sectors through education system reform, based on clear and evidence-based conclusions:

1. Modernize curricula and align them with industry needs.Curriculum Update: Modernize curricula at all levels of education (primary, secondary, and higher education) to align them with the skills required by the labor market, particularly in sectors such as agriculture, manufacturing, information technology, and energy. Particular attention should be paid to practical and technical skills in these areas.

Industry-specific courses: Expand the introduction of industry-specific courses, certificates, and curricula developed in collaboration with industry experts. This will ensure that graduates are equipped with relevant skills for the labor market.

2. Expand and improve vocational education and training

Investment in vocational education: Increase investment in vocational and technical education to address skills gaps in manual and technical work, especially in underserved areas. Modernize training facilities and incorporate state-of-the-art technology and equipment that reflect industry standards.

Public-private partnerships in VET: Strengthen partnerships between vocational schools and industries to ensure that curricula are more relevant to market needs. Companies can help shape curricula, offer internships, and provide real-world training to students.

3. Promote STEM education and innovation

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Strengthen the focus on STEM: Expand and promote STEM education at all levels of school education, with a particular focus on advanced skills in engineering, IT and renewable energy. Providing scholarships, mentoring programs and industrial internships for students with STEM degrees will help develop a highly skilled workforce capable of driving innovation.

Research and development: Invest in research and development (R&D) initiatives in universities, especially in emerging sectors such as green technologies and artificial intelligence.

REFERENCES

1. Bulturbayevich, M. B., & Alixon o'g'li, N. A. (2024). SOCIO-ECONOMIC NATURE OF INVESTMENT PROJECTS. ASIA PACIFIC JOURNAL OF MARKETING & MANAGEMENT REVIEW ISSN: 2319-2836 Impact Factor: 8.071, 13(05), 11-14.

2. Bulturbayevich, M. B. (2024). TENDENCIES OF SOCIO-ECONOMIC DEVELOPMENT OF REGIONS OF UZBEKISTAN. ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ, 42(1), 180-187.

3. Bulturbayevich, M. B. (2024). HUDUDLARNI IJTIMOIY-IQTISODIY RIVOJLANTIRISH STRATEGIYASINI SHAKLLANTIRISH MEXANIZMLARINI NAZARIY MASALALARI. Scientific Journal of Actuarial Finance and Accounting, 4(01), 107-114.

4. Sultanovich, A. I., & Bulturbayevich, M. B. (2023). POSSIBILITIES OF EFFECTIVE USE OF SOCIO-ECONOMIC POTENTIAL OF REGIONS. ASIA PACIFIC JOURNAL OF MARKETING & MANAGEMENT REVIEW ISSN: 2319-2836 Impact Factor: 8.071, 12, 90-96.

5. Bulturbayevich, M. B. (2023). METHODOLOGICAL BASIS OF STRATEGIC ARRANGEMENT OF DISPARITIES IN THE DEVELOPMENT OF SOCIO-ECONOMIC SPHERES OF THE REGIONS. ASIA PACIFIC JOURNAL OF MARKETING & MANAGEMENT REVIEW ISSN: 2319-2836 Impact Factor: 8.071, 12, 74-78.

6. Bulturbayevich, M. B. (2023). BASICS OF REGULATION OF DISPARITIES IN THE DEVELOPMENT OF SOCIO-ECONOMIC SPHERES OF THE REGIONS. INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT, ENGINEERING AND SOCIAL SCIENCES ISSN: 2349-7793 Impact Factor: 6.876, 17, 78-80.

7. Bulturbayevich, M. B., & Asqaraliyevna, Y. D. (2023). FUNDAMENTALS OF DEVELOPMENT OF HOLISTIC HORTICULTURE BASED ON INVESTMENTS. ASIA PACIFIC JOURNAL OF MARKETING & MANAGEMENT REVIEW ISSN: 2319-2836 Impact Factor: 8.071, 12(09), 59-70.

8. Bulturbayevich, M. B., & Dadajon, D. (2023). BASES AND ANALYSIS OF EVALUATION OF INNOVATION POTENTIAL OF INDUSTRIAL ENTERPRISES. ASIA PACIFIC JOURNAL OF MARKETING & MANAGEMENT REVIEW ISSN: 2319-2836 Impact Factor: 8.071, 12(09), 84-93.

9. Bulturbayevich, M. B., & Ikrom o'g'li, I. F. (2023). DEVELOPMENT OF SMALL BUSINESS AND PRIVATE ENTREPRENEURSHIP AND INCREASING ITS SHARE IN

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 15 Issue: 02 in February-2025
https://www.gejournal.net/index.php/IJSSIR

ECONOMIC SECTORS. ASIA PACIFIC JOURNAL OF MARKETING & MANAGEMENT REVIEW ISSN: 2319-2836 Impact Factor: 8.071, 12(07), 22-34.

10. Sultanovich, A. I., & Bulturbayevich, M. B. (2023). NECESSITY AND IMPORTANCE OF REGIONAL POLICY IN SUSTAINABLE DEVELOPMENT OF REGIONS OF THE COUNTRY. INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT, ENGINEERING AND SOCIAL SCIENCES ISSN: 2349-7793 Impact Factor: 6.876, 17(04), 16-21.

11. Bulturbayevich, M. B. (2022). FUNDAMENTALS OF DEVELOPMENT OF HOLISTIC HORTICULTURE BASED ON INVESTMENTS. Scientific Journal of Actuarial Finance and Accounting, 2(4), 1-9.

12. Bulturbayevich, M. B., Nomanjanovna, A. S., & Abdullajanovich, U. T. (2022). Stages of the econometric research and modeling process.

13. Bulturbayevich, M. B., & Rustambek o‘g‘li, R. O. (2025). CONCEPTS OF MARKETING STRATEGIES FOR ENSURING COMPETITIVENESS IN ENTERPRISES. *INTERNATIONAL JOURNAL OF SOCIAL SCIENCE & INTERDISCIPLINARY RESEARCH ISSN: 2277-3630 Impact factor: 8.036*, *14*(01), 40-45.

14. Bulturbayevich, M. B., & Alixon o‘g‘li, N. A. (2024). SOCIO-ECONOMIC NATURE OF INVESTMENT PROJECTS. *ASIA PACIFIC JOURNAL OF MARKETING & MANAGEMENT REVIEW ISSN: 2319-2836 Impact Factor: 8.071*, *13*(05), 11-14.

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