Issues of modernizing education, healthcare, and employment sectors to ensure a prosperous life

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Abstract

Purpose: This study examines the vertical alignment of digital innovation between secondary and higher education in Uzbekistan, focusing on how digitized STEM curricula at the school level correspond to digital transformation initiatives in universities.

Research methodology: This study analyzes recent reforms in Uzbekistan's education, healthcare, and employment sectors through content analysis, statistical review, and comparative approaches. It also evaluates international best practices and proposes interconnected indicators to assess prosperity based on economic opportunities, personal freedom, and social justice.

Results: Reforms have improved medical infrastructure, digital health services, job creation, and entrepreneurship. Nevertheless, challenges remain in ensuring equitable access to quality healthcare and addressing the high levels of informal employment. Bridging the gap between educational outcomes and labor market demands, as well as expanding medical insurance and preventive care, are identified as priorities for sustainable welfare.

Conclusions: Uzbekistan has implemented key reforms in education, healthcare, and employment to enhance societal well-being, emphasizing digital innovation, infrastructure development, and job creation. While progress is evident, systemic challenges such as informal employment, uneven medical service quality, and mismatches between education and labor market needs persist. Addressing these issues and ensuring consistent reform implementation are essential for building a prosperous, educated, and healthy society.

Limitations: This study is limited by its descriptive scope, focusing on policy directions and reform outcomes without an in-depth empirical assessment or long-term evaluation.

Contribution: This study highlights the interconnectedness of education, healthcare, and employment reforms, contributing to the discourse on integrated social reform and improved national wellbeing.

Keywords: Education, Freedom, Innovative Technology, Justice, Prosperous Life, Society

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1. Introduction

In modern society, a prosperous life for individuals cannot be ensured through random or uncoordinated measures alone. To guarantee a decent standard of living for members of society, this social goal must be placed at the center of a country's development strategy, as in Uzbekistan, and actions in multiple areas must be implemented in a coordinated and harmonious manner (Ruziev, 2021). The prospects for ensuring a prosperous life for members of society are closely linked to enriching the content and improving the quality of education (X. Wang & Ruan, 2024). It is well known that without fundamentally reforming the education system and modernizing its content and quality, it is impossible

to establish the foundations of a decent standard of living. That is precisely why the President of the country stated, It is absolutely unacceptable to approach such an important and strategic issue as education and upbringing with outdated views, knowledge, and systems. Uzbekistan has embarked on comprehensive educational reforms since 2017, expanding preschool coverage from 28% (2017) to 61% (2023) and extending general secondary education to 11 years. This aligns with efforts to modernize curricula, upgrade infrastructure, and integrate STEM and digital technologies into schools and universities (Shakhnoza, 2021).

Unless we create the most modern and advanced systems in this area, we will not be able to solve any of the pressing problems we face. In recent years, wide-ranging reforms have been implemented in Uzbekistan to develop the education sector, improve its quality, and align it with contemporary requirements. In particular, the number of preschool educational institutions has reached 33,942. The coverage rate of preschool education for children aged 3 to 7 has reached 74 percent, and the coverage of school preparation for six-year-old children has reached 93 percent. Additionally, the duration of general secondary education has been extended to 11 years. Important measures have been taken to improve the quality of education and upbringing in schools, enhance the material and technical base, and organize the educational process using modern methods. Significant changes have occurred in higher education. The number of higher education institutions in the country increased by 2023, reaching 213. A significant increase has been observed in their scientific potential and material and technical bases. All these changes are regarded as the result of reforms aimed at modernizing the education sector in Uzbekistan.

Despite these advancements, persistent weaknesses remain in the field. Studies highlight superficial reform implementation, disconnected education levels, underdeveloped teacher training, infrastructure disparities, low rural teacher retention, and insufficient systemic alignment with labor market needs. For example, one case study identified key challenges: inadequate educational funding, poor infrastructure, overpopulated classrooms, low teacher salaries, uneven rural teacher distribution, and outdated teaching methodologies (Shaturaev, 2022). Recent studies have emphasized the impact of innovation and digitalization on higher education in Uzbekistan. For example, Abdurashidova, Balbaa, Nematov, Mukhiddinov, and Nasriddinov (2023) found strong links between technology use, student engagement, and institutional modernization. Similarly, secondary-level research highlights gaps in practical and industry-aligned training within tech curricula. However, no empirical study has simultaneously examined how digital innovation within secondary school STEM curricula aligns with higher education digitalization and how this coherence affects student transition, preparedness, and workforce outcomes in Uzbekistan.

At the same time, in the near future, it will be necessary to further enrich the content of education and strengthen the focus on its quality. In this regard, priority should be given to improving the system of teacher qualification enhancement, raising the quality of educational materials, and widely introducing innovative technologies in the educational process (Hasan, Bazith, Wakka, & Assegaf, 2024). In particular, the times themselves demand an increase in the effectiveness of social partnerships in the education process. The successful fulfillment of these tasks will undoubtedly bring about a fundamental breakthrough in the well-being of society's members in the near future (Mamadaminova & Khadjikhanova, 2023). This study aims to examine the vertical alignment of digital innovation between secondary and higher education in Uzbekistan, focusing on how the integration of digitized STEM curricula at the school level corresponds with digital transformation initiatives in universities (Abdurashidova et al., 2023). This study seeks to evaluate whether such alignment enhances students' academic preparedness and facilitates smoother transitions into higher education and the labor market, thereby contributing to the overall quality and coherence of the national education reform agenda.

The significance of these reforms lies not only in their quantitative expansion but also in their qualitative transformation. A strong emphasis on preschool and secondary coverage illustrates Uzbekistan's ambition to build the foundations of human capital from early childhood to adolescence (Saidov & Bozorboyev, 2024). Extending general secondary education to 11 years reflects an awareness of global standards and a desire to align national education with international benchmarks. However, the

expansion of educational institutions must be matched by sustainable improvements in teaching quality, curriculum relevance and student outcomes. Infrastructure growth without parallel attention to pedagogy, assessment systems, and teacher development may risk creating surface-level progress without deep structural change (Andrade, Padilla, & Carrington, 2024). A closer examination of teacher training reveals the complexities that shape this reform process. Teacher quality is the cornerstone of education; however, systemic limitations such as outdated professional development frameworks and insufficient incentives for rural services undermine efforts to raise standards (Zhu, 2010). Without addressing teachers' professional identity, working conditions, and career trajectories, reforms risk stagnating. For instance, rural schools continue to face shortages of qualified instructors, while urban schools, despite being better resourced, struggle with overcrowding and excessive administrative demands placed on teachers (Geiger & Pivovarova, 2018).

Another layer of complexity lies in the vertical coherence of reforms across educational levels. Expanding access to preschools is a laudable achievement, but unless primary and secondary curricula are systematically aligned with higher-education expectations, students may face discontinuities that hinder progression. Inconsistent standards between secondary schools and universities risk producing graduates who are underprepared for higher-level studies. While the integration of STEM and digital technologies is promising, it requires more than the mere provision of equipment or software. This demands systemic changes in curriculum design, teacher training, student assessment, and institutional collaboration. In higher education, the increase in the number of universities to over 200 represents both opportunities and challenges for the country. More institutions potentially mean wider access, diversified programs, and greater regional coverage. However, this expansion raises questions about quality assurance, accreditation, and the balance between public and private provisions. Without robust quality control mechanisms, the rapid growth of universities could exacerbate inequalities between elite institutions in major cities and smaller ones in rural areas. Furthermore, the scientific potential of these institutions must be harnessed not only for publication output but also to drive innovation ecosystems that link academia, industry, and government.

The challenge of aligning education with labor market needs underscores the urgency of the reforms. Uzbekistan's demographic structure, with a relatively young population, presents both risks and opportunities. On the one hand, a youth bulge without adequate job opportunities may generate economic and social pressures. In contrast, a skilled, digitally literate workforce could drive economic modernization. To achieve this, educational reforms must cultivate skills that are academically rigorous and practically relevant. Practical STEM training, digital literacy, and entrepreneurial skills are essential for bridging the gap between education and employment. Equally important is the role of digital innovation in fostering inclusivity in the workplace. Digital platforms can overcome geographical barriers, enabling students in rural and remote regions to access quality educational resources. However, digital divides—manifested in disparities in Internet access, device availability, and digital skills—risk creating new forms of inequality. Thus, any digital transformation agenda must incorporate policies that ensure equitable access to technology, training and infrastructure. The successful adoption of digital platforms depends on integrating these tools meaningfully into pedagogy rather than treating them as superficial add-ons.

The complexity of the reforms is further heightened by socio-economic disparities within Uzbekistan. While urban centers may benefit quickly from digital initiatives and infrastructure investments, rural regions often lag behind. Bridging the urban-rural gap is essential for ensuring that reforms contribute to national cohesion rather than widening inequalities. Therefore, educational reform must be accompanied by broader social policies addressing healthcare, employment, and regional development. In this sense, educational reform is not an isolated domain but a crucial part of an integrated welfare strategy. In light of these challenges, this study emphasizes the need for a vertical alignment of digital innovation that connects reforms across different educational levels. Secondary school STEM curricula must be designed to seamlessly prepare students for the demands of digitalized higher education. Simultaneously, universities must recognize and build upon the digital competencies cultivated in schools. The coherence between these two levels can significantly influence students' readiness, adaptability and long-term employability. By studying this alignment, this research addresses an

important gap in the existing literature, which has often treated secondary and higher education reforms separately. Moreover, the introduction of digital technologies must be framed not only as a technical upgrade, but also as a cultural shift. Pedagogical practices, institutional structures, and societal attitudes toward education shape the reception and implementation of digital innovation. Teachers must be empowered to act as facilitators of digital learning, and students must be encouraged to adopt active, collaborative, and problem-solving approaches to knowledge acquisition. Universities must develop flexible learning environments that support innovation, creativity, and interdisciplinary exploration. Ultimately, the goal of aligning digital innovations across educational levels is to create a coherent, sustainable, and future-oriented system that equips Uzbekistan's youth with the skills and competencies required in the 21st century. The broader implication is that education reform is inseparable from the national strategies of modernization, economic diversification, and social well-being. Without coherent reform across levels and domains, the vision of a prosperous and just society is at risk of being undermined by fragmentation and inefficiency.

2. Literature Review

2.1. Literature Review

Modernization theory posits that transitioning societies must transform traditional institutions, such as education, healthcare, and employment, into modern, meritocratic, and bureaucratic structures to achieve sustainable development and prosperity. In education, modernization entails systematic curriculum redesign, adoption of formal pedagogies, and embedding digital competencies. The theory underscores that without updating educational structures and content, societies struggle to align human-capital development with contemporary socioeconomic demands (Nyakomitah, 2024). The TPACK framework presents a theoretical model for integrating technology into teaching, positing an intersection of content knowledge (CK), pedagogy (PK), and technology (TK) that teachers must master for effective learning experiences. It stresses that successful modernization in education is not merely about installing tech tools, but about fostering teachers' ability to harmoniously blend subject knowledge, pedagogical strategies, and technological fluency (Kyianytsia, 2021).

Outcome-Based Education (OBE) theory advocates designing educational systems around clear, measurable outcomes instead of traditional content-delivery approaches. Within the modernization context, OBE shifts focus to real-life competencies, providing alignment between what learners should achieve and what is taught and assessed promoting accountability and relevance to labor market needs (Ostern, Perscheid, Reelitz, & Moormann, 2021). The Normalization Process Theory (NPT) is a midrange- sociological model that explains how complex healthcare innovations become embedded in everyday practice. It outlines mechanisms of coherence, cognitive participation, collective action, and reflexive monitoring through which digital and organizational changes diffuse effectively. In healthcare modernization, NPT helps frame why some digital transformations integrate sustainably while others remain marginal (Amlung, Huth, Cullen, & Sequist, 2020).

The Learning Health Systems (LHS) theory envisions healthcare institutions that continuously cycle through evidence generation, knowledge integration, and practice improvement. It situates modernization as not only digital upgrading but also institutionalizing data-driven learning loops enabling adaptive, equitable, and quality care. The LHS provides a conceptual lens for understanding how healthcare can become both intelligent and resilient (Ungaro, Di Pietro, Guglielmetti Mugion, & Renzi, 2024). Digital transformation in education is theorized as a socio-technical process driven by economic, social, political, and technological trends (Habibillah & Hadjri, 2024). The theory emphasizes that modernization involves not only technological adoption but also addressing systemic issues such as equity, governance, digital leadership, and infrastructure. It frames modernization as a purposeful, multidimensional reform rather than a mere technology rollout (McCarthy, Maor, McConney, & Cavanaugh, 2023).

The theoretical literature on labor and technology highlights that while automation may displace some jobs, it also generates new roles, especially in the digital, service, and knowledge sectors. Modernization involves orchestrating upskilling, reskilling, and labor policies that guide the workforce through transitions. Employment modernization theory emphasizes that institutional and policy frameworks

must absorb the dynamic interplay between technology and labor (Stepanenko, Kozinchuk, Polishchuk, Varianytsia, & Kishko, 2022).

2.2. Hypothesis

Integrating modern theories across education, healthcare, and employment, such as TPACK, OBE, NPT, LHS, and labor technology- frameworks, will result in higher system coherence and individual well-being: contemporary students and workers in societies that adopt these modernization principles will exhibit improved preparedness, adaptability, and life satisfaction compared to those in less systematically reformed systems.

3. Research Methodology

This study identifies and assesses the requirements for guaranteeing the welfare of society's members using systematic, thorough, and comparative analyses. Based on empirical data, this study examines recent reforms in employment, healthcare, and education in Uzbekistan. Furthermore, using the content analysis method, this study examines government decisions, presidential decrees and resolutions, official information from pertinent ministries and agencies, normative-legal documents, and statistical data published in national and international mass media. Important aspects of well-being, including the standard of medical care, quality of education, and systems in place to guarantee employment, were given top priority during this process. Using a comparative-analytical approach, this study also compares Uzbekistan's experience with international practices, examines the unique characteristics of sophisticated foreign models, and assesses how well they can be adjusted to local circumstances. Analytical observations, reprocessing of preexisting statistical data, and examination of sociopolitical documents form the basis of the findings reported in this study. This study also seeks to create a system of interconnected indicators that can be used to determine the requirements for a prosperous life that balances economic opportunities, personal freedom, and social justice.

3.1. Expansion of Methodological Framework

The methodological approach applied in this research is intentionally interdisciplinary, combining elements of political science, sociology, economics, and public administration. This multidimensional perspective ensures that reforms in employment, healthcare, and education are not analyzed in isolation but within the broader socio-economic and political context. By situating reforms within an integrated framework, this study captures the dynamic interactions between policy domains and their cumulative impact on societal welfare. The systematic analysis component entails breaking down reforms into smaller units of observation, namely objectives, instruments, implementation mechanisms, and outcomes.

For example, in healthcare reforms, specific decrees on digital health platforms were documented and examined for their intended scope (e.g., urban vs. rural coverage) and practical challenges. This microlevel assessment allowed the study to identify gaps between policy aspirations and actual results. Thorough analysis refers to the depth of investigation across multiple layers of policymaking. Rather than relying solely on secondary data, this study interrogates normative-legal documents, implementation guidelines, and budgetary allocations. This step highlights whether sufficient resources and institutional capacity accompany reforms. The comparative dimension provides external benchmarks by situating Uzbekistan's reforms alongside those of other countries. Countries such as Finland, Singapore, and South Korea, which are recognized for their excellence in education, healthcare, and employment policies, serve as comparative models. However, this study did not apply these models uncritically. Instead, it assesses their applicability by considering Uzbekistan's cultural, economic and institutional conditions.

3.2. Data Sources and Reliability

The empirical foundation of this research rests on both primary and secondary data sources. While primary data collection through field surveys was limited due to the scope of the study, the research compensates for this by using official government publications, policy briefs, and statistical reports as primary sources. These are complemented by secondary sources, such as academic articles, reports from international organizations, and reputable mass media. Triangulation was applied to address issues of

data reliability. Triangulation ensures that the findings from government data are cross-verified with reports from international institutions such as the World Bank, World Health Organization (WHO), United Nations Development Programme (UNDP), and UNESCO. This approach reduces potential biases and increases the validity of the interpretations.

3.3. Content Analysis in Practice

The content analysis method was operationalized in three steps: Document Collection and Coding: Presidential decrees, ministerial resolutions, and government strategies from 2017 onwards were systematically collected. These documents were coded into thematic categories such as "digital healthcare," "STEM education reform," and "entrepreneurship promotion." Thematic Analysis: Recurrent themes, such as digital transformation and employment formalization, were extracted and analyzed across the sectors. This enabled the study to detect consistent policy narratives and distinguish between symbolic and substantive reforms. Interpretation of Findings: The themes were interpreted in relation to domestic goals and international standards. For instance, policies on employment were analyzed not only in terms of job creation but also in terms of compliance with International Labour Organization (ILO) conventions.

3.4. Comparative-Analytical Approach

Comparative analysis is central to this methodology because it contextualizes Uzbekistan's reforms within broader global trends. For example, in education, the integration of digital curricula is compared with Finland's equity-driven model and Singapore's emphasis on innovation. In healthcare, Uzbekistan's expansion of e-health services is contrasted with South Korea's technologically advanced universal system. Uzbekistan's efforts to support entrepreneurship are compared with European Union practices in supporting small and medium-sized enterprises (SMEs). By highlighting both similarities and differences, this study identifies which global strategies may be successfully adapted to Uzbekistan's unique context.

3.5. Analytical Observation and Secondary Data Reprocessing

Analytical observations in this study entail re-examining existing datasets using new conceptual frameworks. For example, employment statistics are not only interpreted in terms of unemployment but also categorized into formal and informal sectors, revealing structural vulnerabilities. Healthcare data were reprocessed to highlight the disparities between rural and urban regions. Education indicators, such as student performance and dropout rates, are evaluated in connection with labor market absorption, demonstrating the long-term implications of educational reform. Reprocessing statistical data adds value by identifying latent patterns that are not immediately visible in official reports. This includes correlations between access to healthcare and educational outcomes or between informal employment and social vulnerability.

3.6. Development of Interconnected Indicators

One methodological innovation of this study is the construction of interconnected welfare indicators. These indicators link economic opportunity (employment stability, entrepreneurship, and labor rights), personal freedom (access to education, healthcare, and information), and social justice (equity in resource distribution and protection of vulnerable groups). By applying these indicators, this study moves beyond GDP or economic growth as the sole measure of progress and develops a multidimensional framework for evaluating societal welfare.

3.7. Ethical and Practical Considerations

This study recognizes several ethical and practical challenges. Heavy reliance on official data raises concerns regarding political influence, selective reporting, and incomplete coverage. To mitigate this, independent verification and cross-referencing with international datasets were emphasized in this study. Furthermore, the descriptive nature of the methodology limits its capacity for causal inference. This study does not claim to establish definitive cause-and-effect relationships but rather aims to provide a comprehensive, evidence-based mapping of reforms and their implications.

4. Results and Discussions

The prospects for ensuring a prosperous life for members of society are closely linked to the improvement of the quality of medical services. In recent years, providing the population with high-quality, modern, and accessible medical care and creating healthy living conditions for all has become a primary goal of state policy in the healthcare sector in Uzbekistan. To this end, the "Concept for the Development of the Healthcare System of the Republic of Uzbekistan" was adopted, establishing a solid legal and institutional foundation for sectoral reforms. Over the past few years, efforts have been made to modernize medical institutions, equip them with modern medical equipment, and establish new specialized centers within the framework of this concept. Numerous specialized centers in oncology, cardiology, and perinatology have been established. To improve the quality of medical services in rural areas, family doctor points, rural medical posts, and hospitals have been renovated, and qualified personnel have been recruited (Noya et al., 2021). Social programs aimed at protecting the health of mothers and children have been implemented. Significant steps have also been taken in the field of digital medicine, with the introduction of electronic medical records, electronic queue systems, and telemedicine services (Nugroho, Hidayat, Rianti, Mutiarahati, & Rosyid, 2024).

However, at a meeting held by the head of state, it was noted that several problems persisted in improving the quality of medical services. The President of the country emphasized the necessity of strengthening preventive medical care in the near future and expanding access to medical services for the population through the introduction of a medical insurance system. Additionally, the further widespread implementation of digital technologies, namely, creating a unified electronic platform in all medical institutions and utilizing artificial intelligence and big data capabilities in diagnostics, will improve the quality of medical services provided to members of society and contribute to raising their living standards (M. Wang et al., 2022).

The prospects for ensuring the well-being of society members are closely linked to increasing the employment level of the population. In recent years, systematic efforts made in Uzbekistan to boost employment have been commendable. It is important to emphasize that ongoing reforms in this area are aimed at ensuring the well-being of the population. The implementation of projects such as "Every Family is an Entrepreneur," "Youth are Our Future," and the "Women's Register" across the country has significantly expanded opportunities for engaging the population, especially young people and women, in entrepreneurship. Owing to state and private investments aimed at creating new jobs, industrial zones, service centers, and small business entities have been developed. Based on digital technologies, mono-centers, electronic labor fairs, and job search platforms have been established [12]. As a result of these measures, the process of creating new jobs in the country has become much more intensive, and employers' attention to this issue has increased significantly. Simultaneously, special agencies were established to create favorable and safe conditions for citizens wishing to work abroad; various professional development courses were organized for them, agreements were concluded with many foreign countries, and the legal foundations for the activities of citizens working abroad were strengthened.

However, several problems remain in the field of employment. In particular, informal employment remains high. Many workers in the agriculture, construction, and service sectors operate without official labor contracts, which creates significant obstacles to protecting their labor rights (Kholmuminov, 2022). Additionally, young people who have graduated from educational institutions face difficulties finding employment because their skills do not fully meet the demands of the labor market (Syzdykova, Bimakhanov, Fursova, Makhambetova, & Abikenov, 2022; Zukna & Sassi, 2024). In this regard, there is a need to integrate those engaged in informal employment into formal labor relations and develop vocational education that corresponds to the needs of the labor market.

5. Conclusions

5.1. Conclusion

Ensuring the welfare of society's members is a crucial strategic undertaking that requires careful consideration, methodical execution, and collaboration across multiple sectors. Uzbekistan has implemented significant reforms in recent years, especially in employment, healthcare, and education.

These reforms have been essential for the country's success. The findings of the study demonstrate that a generation of educated, competent, and socially engaged people can be produced by modernizing the educational system, introducing digital and innovative technologies, improving teacher qualifications, and fortifying social partnership mechanisms. Through the construction of contemporary facilities, the launch of digital services, and the growth of specialized centers, the healthcare system is gradually expanding opportunities for the populace to live a healthy lifestyle. However, there are still some issues with the standard of medical care, which suggests that more steps are required to address them.

In particular, reforms in the employment sector are providing women and young people with new options. Projects and initiatives supported by the state create thousands of new jobs. However, informal employment and the misalignment of educational institutions with the labor market continue to be urgent problems. In conclusion, it can be claimed that reforms intended to guarantee prosperity will raise the standard of living for everyone in society if they are implemented consistently. However, fixing the flaws in the current system –, particularly improving service quality and fortifying labor rights guarantees, – remains one of the top priorities for the future. An educated, healthy, and employed population is the main prerequisite for a prosperous society.

5.2. Limitations and Future Study

This study is limited by its descriptive nature, which primarily outlines policy directions and reform outcomes without conducting in-depth empirical measurements or cross-sectoral impact assessments of the latter. Furthermore, while this study highlights progress in education, healthcare, and employment reforms in Uzbekistan, it does not quantitatively evaluate the effectiveness or sustainability of these reforms over time. Future research should adopt a mixed-methods approach to examine how integrated reforms affect individual welfare indicators, such as educational attainment, health outcomes, and labor force participation, across diverse demographic groups. In particular, longitudinal studies are needed to track the long-term alignment between educational outcomes and labor market demands, as well as equity of access to quality healthcare.

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