International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 13 Issue: 01 | Jan 2026 www.irjet.net p-ISSN: 2395-0072

Human Capital Development and Economic Growth in Tajikistan

Mahmudov Dalerjon[1], Yoqubjoni Saivali[2]

[1,2] *College of Environmental Science and Engineering, Institute of Environment and Sustainable Development (IESD), Tongji University, 1234 Siping Road, Shanghai 200092, China*

Abstract - *A robust interdependence exists between economic growth and human capital development, with the latter acting as a core driver for advancing national knowledge, health, and welfare, profoundly shaping economic paths. Human capital-encompassing acquired skills, education, health, and innate abilities-transforms individual potential into societal progress, posing universal challenges in fostering socio-economic advancement, especially in health, education, and living standards. This study explores the interplay between Tajikistan's economic expansion and human capital cultivation, amid its shift from traditional roots to modernization under President Emomali Rahmon's reforms. Grounded in foundational theories from Theodore Schultz and Gary Becker, it positions human capital as the engine of industrial and post-industrial economies, dominating national wealth in advanced nations. Employing the World Bank's Human Capital Index and UNDP's Human Development Index, the analysis reveals Tajikistan's medium development status and consistent gains in longevity, schooling, and income. Findings affirm strong links between human capital investments and growth, per studies like Boztosun et al. and Azam et al., while highlighting hurdles such as underqualified workforces limiting technology adoption (Sacerdoti et al.). Targeted recommendations for Tajikistan include bolstering education funding (top global rank by UNESCO), tackling non-communicable diseases (a leading mortality cause), and leveraging foreign investment for global integration. Ultimately, human capital enhancement is essential for Tajikistan's sustainable progress, regional convergence, and improved livelihoods, via education reforms, demographic strategies, and resource optimization.*

Keywords: **human capital development, economic growth, Tajikistan, Human Development Index (HDI), Human Capital Index (HCI), education investment, health capital, socio-economic progress, foreign direct investment, sustainable development**

1. Introduction

In the framework of a market economy, it is widely recognized that the earnings of economic actors are not assured and are not uniformly allocated across different segments of the population. This is because a notable advantage of the market system is the increase in returns from property and entrepreneurial ventures, even when these benefits are concentrated among a minority. Disparities in income per person signify economic inequality.

Recent decades have marked a period of profound change for the Republic of Tajikistan, situated in the heart of Central Asia. Guided by the reform-oriented leadership of President Emomali Rahmon, the nation is moving beyond a history rooted in tradition and advancing toward modernization and enhanced engagement on the global stage. It is increasingly apparent that unlocking Tajikistan's potential to become a focal point for regional economic activity hinges on the development of its most valuable resource: its human capital (HC). Human capital is formally integrated into Tajikistan's strategic planning and is consistently defined in the national policy discourse. In its comprehensive articulation within the country's scientific and economic theory, HC is understood as the aggregate of an individual's knowledge, skills, abilities, and health. This conceptualization views HC not as a mere social input, but as an essential, investable asset. The paramount importance of HC is reflected in the highest levels of political leadership.

President Emomali Rahmon has repeatedly emphasized that the development of the economy and the strengthening of its competitiveness are fundamentally «Impossible without the contribution of human capital». The President's Addresses to the Majlisi Oli have positioned HC development as one of the main factors necessary for the country's progress, specifically requiring increased scientific knowledge through the training and retraining of personnel. HC development is treated as a key factor in raising the quality and effectiveness of social sectors, including education, healthcare, science, and innovation (https://www.president.tj).

This elevation of HC is grounded in compelling economic analysis. Studies conducted by international financial institutions, such as the World Bank, have demonstrated that in countries undergoing economic transition-a group that includes Tajikistan-the majority of economic growth, specifically up to 64%, is derived from human capital. This contribution substantially outweighs the roles played by physical capital (such as infrastructure and equipment, contributing approximately 16%) or natural capital (land and natural resources, contributing around 20%). This analysis underscores

that HC is the most significant independent variable influencing Tajikistan's potential for future economic expansion. (WORLD BANK. *The Human Capital Project 2018)*. Recent strategic documents reinforce this, with the National Development Strategy (NDS) to 2030 dedicating chapter four to HC objectives, linking it to food security, productive employment, and the third phase of economic development focused on science, technology, and innovation (NDS 2030).

The most significant asset and precious resource of any society is its human capital, which also acts as the principal benchmark for socio-economic progress. The examination of human development, the accumulation of human capital, the amalgamation of inventive characteristics and competencies, and the allocation of resources into human capital represent a major area of inquiry in global science. Consequently, the study of human capital and its advancement remains highly relevant in the 21st century.

Over the last half-century, human capital has played an indispensable role in socio-economic development. Its rapid accumulation is, in fact, surpassing the growth of other factors and progressively accounting for a larger share of the Gross National Product structure. In developed nations, it now constitutes approximately 80% of the national wealth. This composition stood at 48% in 2020, with natural resources at 20% and physical capital at 32%. According to World Bank estimates, the total global value of human capital at the close of the 20th century reached 550 trillion USD, a figure that exceeds eight times the world's GDP at the time (https://www.worldbank.org/). As of 2024, Tajikistan's Human Capital Index (HCI) underscores the urgency for action, with ongoing investments in health and education positioned as strategic imperatives for future prosperity.

A United Nations analysis from 1978 in the field of international statistics identified 12 principal indicators for evaluating population living standards, one of which is population income. Concurrently, metrics such as per capita gross domestic product, gross national product, the human development index, along with coefficients measuring stratification across specific population groups (quintile, decile groups) are also routinely applied in practice. The 2025 Human Development Report (HDR), launched in Dushanbe, emphasizes expanding choices through responsible AI governance to enhance HC outcomes.

The prospective socio-economic development trajectory of Tajikistan is intrinsically linked to the qualitative enhancement of human creative capacities, which is evolving into the central element of economic progress. A nation's human capital represents one of the core constituents of its societal wealth. Therefore, a pressing necessity exists to investigate the challenges associated with human capital development, to broaden the avenues for its further growth, and to formulate scientifically-grounded recommendations for its formation and more complete realization, which underscores the significance of this research. Republic of Tajikistan’s overarching strategic documents, which formally establish the necessary nexus between human capital investment and sustainable development goals. Human capital development is a formalized and non-negotiable pillar of the NDS 2030. The continuing strategic priority of HC is confirmed by the directive that the draft Medium-Term Development Program for 2026-2030 must give «primary attention» to the issue of human capital development (NDS 2030).

2. Literature Review

The term «Human Capital» was first introduced in 1961 by Theodore Schultz, with Gary Becker further developing the concept from 1965 onward, demonstrating the efficacy of investing in human capital and articulating an economic perspective on human behavior. Schultz played a monumental role in establishing the theory of human capital during its formative years, securing its recognition within the academic community, and promoting its widespread adoption. He was among the pioneers to conceptualize human capital as a factor of production. Moreover, he made substantial contributions to comprehending the role of human capital as the primary engine and cornerstone of industrial and post-industrial economies. From Schultz's viewpoint, the principal outcomes of investing in an individual are the preservation of health, the capacity for productive labor, and the ability to contribute effectively to society as a creative force. He believed that human capital inherently possesses productive qualities and has the potential for accumulation and self-regeneration. The theory of human capital is built upon contributions from institutional theory, neoclassical theory, Neo-Keynesianism, and other specialized economic theories. It emerged as the response of economics and related disciplines to the demands of the real economy and everyday life. A significant challenge was to achieve a comprehensive understanding of the individual's role and the aggregate impact of their intellectual endeavors on the pace and quality of societal and economic advancement.

Initially, Adam Smith in «The Wealth of Nations» (A. Smith, 1776) laid the groundwork for the study of human capital. While he did not employ the specific term, he identified the acquired and useful capabilities of all citizens as a fundamental source of a country's prosperity and economic development. Writing more than a century later, Alfred Marshall notes in

his «Principles of Economics» (Marshall, 1920) the long-term nature of investments in human capital and the family's role in undertaking them. However, Marshall is also credited with delaying the study of human capital due to his reluctance to put it on the same footing as physical capital.

Contemporary research on human capital aligns with two parallel developments within economics. The first was a renewed interest in identifying the drivers of economic growth. Researchers observed that the growth rate of national output significantly outpaced the combined growth rates of traditional inputs-land, labor, and physical capital (Denison, 1962). The second development complemented the first-the emergence of extensive datasets that enabled the exploration of worker productivity and earnings, and their correlation with attributes such as educational attainment and age.

Amid a surge of theoretical and empirical work in the late 1950s and early 1960s, three authors are particularly noteworthy. Jacob Mincer (1958) catalyzed a vast body of literature dedicated to measuring the returns on education. Utilizing census data, he documented the now-classic finding that the relationship between years of education and the rate of earnings growth follows an inverted U-shape. Theodore Schultz concentrated on the function of education and general human capital investments in explaining the rising productivity of labor. His monograph «The Economic Value of Education» positioned education as a subject warranting concentrated study by economists, thereby founding the field of the economics of education. Gary Becker (1964) synthesized the emerging strands of empirical and theoretical work into a coherent framework that provided a guidebook for future research (E.R. Eide, M.H. Showalter, «Human Capital». International Encyclopedia of Education (Third Edition), 2010).

The primary objectives are to leverage human capital (HC) to influence economic growth and elevate living standards in Tajikistan, while refining HC to attain high levels and sustain regional economic development. Elena Pelinescu (2015) argues that human capital-encompassing skills, knowledge, and values-is a pivotal growth factor, emphasizing that slow investments in HC directly impede sustainable development, particularly in the context of the EU's smart, inclusive growth strategies. Her panel data analysis underscores HC's superior role over traditional inputs in fostering long-term productivity and innovation (Elena Pelinescu, «The Impact of Human Capital on Economic Growth», Procedia Economics and Finance 23 (2015): 584-589). Similarly, Sabiha Oltulular (2025) highlights the vital dynamics of HC as the cornerstone of future economic value, demonstrating through vector autoregressive (VAR) models that education-driven HC accumulation complements physical capital, drives innovation, and exhibits a stable long-run relationship with GDP per capita growth (Sabiha Oltulular, «Human Capital Dynamics Are the Key to Economic Growth: Source of Value of the Future», Economies 13, no. 8 (2025): 235).

However, contextual challenges can diminish HC's efficacy. Mulugeta Bekele et al. (2024) examined Sub-Saharan African economies and found that HC development-proxied by schooling years and education returns-exerts a negative and significant impact on economic sustainability, attributing this to pervasive issues like brain drain, skills mismatches, graduate unemployment, and a disproportionate focus on educational access over quality. Their augmented mean group (AMG) estimation across 30 countries reveals that without targeted reforms in teacher training and vocational alignment, HC fails to outperform physical investments in promoting growth (Mulugeta Bekele, Maria Sassi, Kedir Jemal, and Beyan Ahmed, «Human capital development and economic sustainability linkage in Sub-Saharan African countries: Novel evidence from augmented mean group approach», Heliyon 10, no. 3 (2024): e25123).

Furthermore, the composition of HC emerges as a critical determinant of growth trajectories. Mario F. Carillo (2024) analyzes cross-country data to show that balancing higher education (for innovation) and basic education (for technology adoption) resolves trade-offs that otherwise perpetuate stagnation and income disparities. Adopting a unified growth framework, the study employs empirical techniques to confirm that optimized HC structures accelerate the transition to sustained growth, with technology adoption amplifying innovation effects in modern economies (Mario F. Carillo, «Human capital composition and long-run economic growth», Economic Modelling 137 (2024): 106–120). These insights suggest that less developed nations, like Tajikistan, can converge toward affluent economies by prioritizing qualitative HC enhancements relative to per capita GDP levels

The impetus for the development of human capital theory originated from statistical data showing that the economies of developed countries were growing faster than predictions based on classical growth factors would suggest. Through an analysis of actual development and growth processes under contemporary conditions, human capital has been recognized as the primary productive and social factor in the evolution of a modern economy and society. The concept of human capital represents a natural extension of the ideas surrounding the human factor and human resources, culminating in a more comprehensive economic category. The initial boundaries of the economic category known as «human capital» were defined by an individual's knowledge and capacity for work, and this understanding developed progressively. Furthermore, from the standpoint of economic theory, human capital was for a long time perceived merely as a social development factor, essentially a cost component. Expenditures on education and upbringing were once considered

unproductive and burdensome. Throughout the latter half of the 20th century, perspectives on education and human capital underwent a steady transformation. An individual's potential to generate income is quantified by their human capital. Human capital encompasses not only education and acquired qualifications but also innate talents and aptitudes.

The extent of human capital development is increasingly critical for determining both the level and the rate of economic development in every country worldwide. As a result, enhancing the quantity and quality of human capital has become a priority in the economic policies of numerous nations. The modern conception of human capital is founded on specific historical preconditions as well as unique, distinct, and universal patterns of emergence. Taking the aforementioned into account, we posit that human capital comprises labor, education, health, and the overall quality of life.

3. Methodology

The principal strategic aim for Tajikistan is to integrate into the global community of developed nations and ensure a high standard of living for its populace. The country is executing a clear, meticulously conceived plan of action, where the institutional, legal, practical, consistent, and systemic measures adopted robustly support the implementation of democratic, political, and economic reforms, alongside social transformations designed to create ample opportunities for the full realization of the professional, intellectual, and spiritual potential of every citizen and society collectively.

The Human Capital Index (HCI) is a composite index that describes the level of human capital development in countries and regions around the world. It is published by the World Bank Group and used as a component of the Human Capital Project. The project was initially led by a group of economists who proposed measuring human capital using Global Learning Data surveys. The index is intended for use by countries to diagnose complex issues in their socio-economic policies and to assess their readiness to transition to a sustainable development model. The index quantifies the level of human capital development expected for the next generation and includes the following three components. (Figure 1):

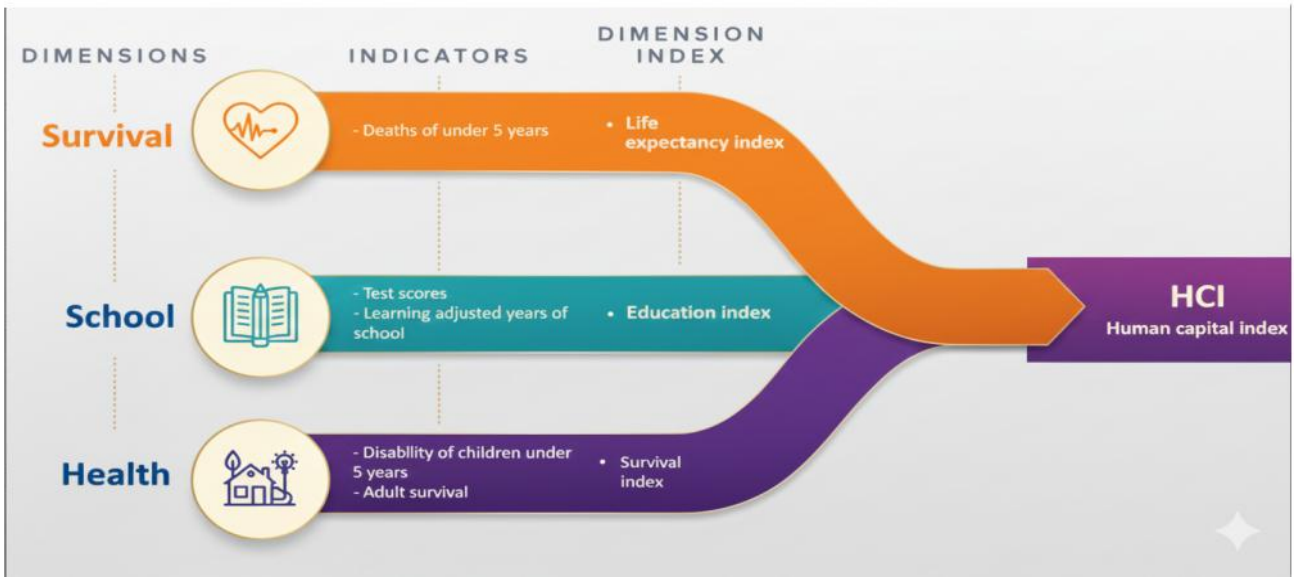

Figure 1. Human capital index indicators

1. **Survival.** This dimension is measured by the under-5 mortality rate. It serves as an indicator of the quality of the country's healthcare system, particularly maternal and child health services.

2. **School.** This component integrates data on the quantity of education a child is likely to receive by age 18 with metrics on the quality of learning. Quality is assessed by the successful performance of students on standardized tests that align with international benchmarks. Aggregating this information yields the expected years of education, adjusted for learning quality. This adjustment reveals that children in some countries effectively receive fewer years of learning than those in other countries, even with identical nominal years of schooling.

3. Health. This aspect employs two indicators to evaluate the overall health status of the population:

1). The rate of stunting among children under five years of age, reflecting early childhood health and nutrition; and

2). The adult survival rate, defined as the proportion of 15-year-olds who are expected to survive until age 60, indicating the longevity and health of the working-age population.

4. Result and Discussion

The methodology for aggregating the Human Capital Index is based on the following calculation:
The components of the HCI are combined into a single index by first converting each into a measure of its contribution to productivity relative to a benchmark of complete education and full health. Multiplying these productivity contributions together yields the overall HCI score:

HCI = Survival × School × Health

According to the 2020 report produced by the United Nations Development Program (UNDP), the Human Development Index features a classification termed «High level of human development», which includes countries that can be considered developed, where populations enjoy a high standard of living. According to this report, the nations with the highest human development index scores are Norway (0.957), Ireland (0.955), and Switzerland (0.955). Tajikistan was positioned 125th in this ranking with an index value of 0.668 in 2019, reflecting a status of medium human development. Key indicators for the country include a population of over 10 million, a literacy rate nearing universal, and strategic prioritization of education funding, with UNESCO ranking it 21st among 183 countries for the share of public expenditure allocated to education.

In the contemporary global context, the Human Development Index evaluates three fundamental dimensions to gauge a country's achievements in human development. The first is longevity and health, assessed by life expectancy at birth, indicating whether a country possesses adequate health services to ensure a long and healthy life for its citizens. The second dimension measured is knowledge and education. This is evaluated through indicators of adult literacy rates and the expected years of schooling for children. The third dimension is the standard of living, reflecting the material well-being of the population. This is measured by Gross National Income (GNI) per capita, adjusted for purchasing power parity (PPP) in constant international dollars.

Tajikistan's HDI value for 2019 is 0.668, which placed the country in the medium human development category, positioning it at 125 out of 189 countries and territories. Between 2000 and 2019, Tajikistan's HDI value increased from 0.569 to 0.668, an increase of 17.4 percent. Table 1 reviews Tajikistan's progress in each of the HDI indicators. Between 1990 and 2019, Tajikistan's life expectancy at birth increased by 8.2 years, mean years of schooling increased by 3.5 years and expected years of schooling increased by 4.9 years. Tajikistan's GNI per capita increased by about 119.3 percent between 1990 and 2019.

Table 1: Key socioeconomic indicators for Tajikistan

Indicators	Tajikistan
Population	10.5 million
Per capita GDP	US$ 1,424
Literacy	99.8%
Services within economy	48.0% of GDP
Income level	Lower-middle income
Human Capital Index (HCI)	0.50
Female economic activity level	33–35%

Source: World Bank, UNDP, Agency on statistics under the President of the Republic of Tajikistan (2022–2024)

However, attracting foreign capital offers several potential advantages for Tajikistan's economy. Research on developing economies suggests that foreign direct investment can bring technology transfer and enhance productivity. Over the last decade, Tajikistan has seen considerable economic improvements. Key elements of the national development strategy

have included importing modern equipment and exporting natural resources such as minerals and hydropower. However, because the nation's economy is not yet fully integrated into global value chains, it has been somewhat shielded from the immediate impacts of recent international financial crises.

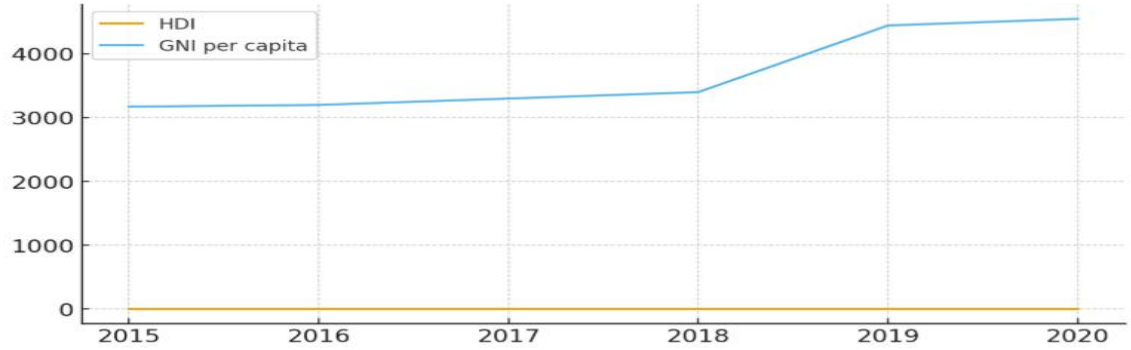

Figure 2. HID and GHI per capital (2015-2020)

Figure 2 shows the trends of Tajikistan's Human Development Index (HDI) and Gross National Income (GNI) per capita from 2015 to 2020. HDI demonstrates a steady but gradual increase, rising from 0.624 to 0.669, reflecting improvements in education, health, and living standards. In contrast, GNI per capita shows stronger growth, especially after 2018, increasing from USD 3,173 to USD 4,550. This indicates accelerated economic expansion. However, the faster rise in income compared to HDI suggests that economic gains are not yet fully transforming into proportional human development outcomes. Overall, the figure highlights moderate progress in human development alongside notable income growth.

Table 2. Rating of Countries of the World According to the Human Development Index

Country ranking	Country	Human Development Index (HDI)
1	Norway	0.957
2	Ireland	0.955
2	Switzerland	0.955
17	USA	0.926
19	Japan	0.919
56	Kazakhstan	0.825
51	Russia	0.824
85	China	0.761
125	**Tajikistan**	**0.668**

Health capital and Demographic policy. Health capital is an indispensable element of human capital, representing investments made to maintain workforce efficiency by reducing illness and extending the productive lifespan. The caliber of health services an individual accesses from birth through old age profoundly impacts their health status. Morbidity and disabilities are manifestations of deteriorating health. Naturally, a population with a lower incidence of disease is healthier and yields a higher return on healthcare investments. Nonetheless, contemporary societies face significant challenges that impede the development of health capital.

Non-communicable diseases (NCDs), such as chronic respiratory conditions, diabetes, cancer, and cardiovascular ailments, represent a major burden. In Tajikistan, diseases including diabetes mellitus, malignant neoplasms, stroke, cardiovascular disease, and chronic respiratory disorders are leading contributors to disability and mortality. These are largely associated with risk factors like hypertension, high blood cholesterol, tobacco and alcohol consumption, obesity, insufficient intake of fruits and vegetables, and physical inactivity.

In 2016 alone, NCDs were responsible for 40 million deaths globally, accounting for 70 percent of all deaths worldwide. It is known that in Tajikistan, NCDs cause a significant majority of all deaths annually. Experts note that a substantial proportion of premature mortality from NCDs can be prevented or delayed by mitigating risk factors and enhancing the

organization and delivery of medical care for patients with these conditions. The government of Tajikistan has been implementing consistent measures to prevent, treat, and control this category of diseases, their risk factors, and to reduce premature mortality and morbidity rates.[6]

5. Conclusion

Human capital, constituting a complex of knowledge, competencies, health, and social attributes, is intrinsically linked to the structure and development stage of a society. Its evolution is directly influenced by an individual's consciousness, ethical framework, worldview, and the prevailing socio-economic and political relations, as well as the nature of the social system. As a rational being, a person comprehends events in the tangible world and manages it through scientific thought, labor, and inherent potential. The growth of human capital is consequently shaped by the overarching events and conditions within the surrounding social environment. Therefore, to generate innovative human capital, it is imperative that every family and the children born within them are guided from an early age to acquire knowledge, to have a desire for science and a love for work instilled in their hearts, and to be educated utilizing the latest technologies, world-class textbooks, and teaching aids. Knowledge enables the utilization of all opportunities within society, while skills drive social development and economic expansion. This reality necessitates continuous and sustained funding for the education sector. To achieve the established target parameters, a comprehensive enhancement of the entire education system is required, focusing on both quantitative and qualitative indicators. Despite the array of instruments available to the state, the effectiveness of governmental oversight and quality assurance in education remains an area for improvement. The persistent issue of education quality is yet to be fully resolved. This situation calls for a systemic reform and a fundamental enhancement of the country's education system, elevating the process of training highly qualified personnel who possess contemporary knowledge and high moral and ethical qualities to a new level. Investing financial resources in education is directly correlated with the accumulation of educational capital. It is estimated that a 1 percent increase in investment in education can lead to a more than proportionate increase in the stock of educational capital and subsequent economic output.

References

1. Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. Chicago: University of Chicago Press.
2. Boztosun, D., Aksoylu, S., & Ulucak, Z. Ş. (2016). The role of human capital in economic growth. *Economics*, 4(3), 1–10.
3. Denison, E. F. (1962). The sources of economic growth in the United States and the alternatives before us. *Committee for Economic Development*, New York.
4. Eide, E. R., & Showalter, M. H. (2010). Human capital. In *International Encyclopedia of Education* (3rd ed.). Elsevier.
5. Government of the Republic of Tajikistan. (2016). *National Development Strategy of the Republic of Tajikistan for the Period up to 2030*.
6. Marshall, A. (1920). *Principles of economics* (8th ed.). London: Macmillan.
7. Mincer, J. (1958). Investment in human capital and personal income distribution. *Journal of Political Economy*, 66(4), 281–302.
8. Pelinescu, E. (2015). The impact of human capital on economic growth. *Procedia Economics and Finance*, 23, 184–190. https://doi.org/10.1016/S2212-5671(15)00358-0
9. Sacerdoti, E., Brunschwig, S., & Tang, J. (1998). *The impact of human capital on growth: Evidence from West Africa*. IMF Working Paper No. 98/162. International Monetary Fund.
10. Schultz, T. W. (1961). Investment in human capital. *The American Economic Review*, 51(1), 1–17.
11. Smith, A. (1776). *An inquiry into the nature and causes of the wealth of nations*. London: W. Strahan.
12. United Nations Development Programme (UNDP). (2020). *Human Development Report 2020: The next frontier-Human development and the Anthropocene*. New York: UNDP.

13. United Nations Development Programme (UNDP). (2024). *Human Development Report 2024*. New York: UNDP.

14. World Bank. (2018). *The Human Capital Project*. Washington, DC: World Bank.

15. World Bank. (2018). *The Changing Wealth of Nations 2018: Building a sustainable future*. Washington, DC: World Bank.

16. World Bank. (2024). *Human Capital Index*. Washington, DC: World Bank. https://databank.worldbank.org/source/human-capital-index

17. World Bank. (2024). *World Development Indicators*. Washington, DC: World Bank. https://databank.worldbank.org/source/world-development-indicators

18. Agency on Statistics under the President of the Republic of Tajikistan. (2022–2024). *Socio-economic indicators of the Republic of Tajikistan*. Dushanbe. https://www.stat.tj

19. President of the Republic of Tajikistan. (2024). *Address of the President of the Republic of Tajikistan to the Majlisi Oli*. Dushanbe. https://www.president.tj