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ABSTRACT
Of the dissertation for the degree of Doctor of Philosophy

INCREASING THE EFFICIENCY OF UTILIZING THE HUMAN FACTOR IN THE NATIONAL ECONOMY

Speciality: 5307.01 – Economic theory

Field of Science: Economics

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INTRODUCTION

Relevance and degree of development of the topic. The human factor refers to the aggregate of characteristics such as knowledge, skills, professionalism, health, motivation, value system, creativity, and social behavior in the activities of society and the economy. This concept characterizes not only the participation of humans in the production process but also their influence in decision-making, innovation, management, social relationships, and the institutional environment. In this regard, the effective use of the human factor has been a fundamental condition for economic development throughout history.

As science, technology, and knowledge have advanced, the role of the human factor has significantly changed. The sustainability and productivity of economic and social development throughout human history have been directly dependent on the level of utilization of the human factor. Thus, research on the role of the human factor in the development of the national economy has consistently maintained its relevance and importance.

In the modern context, the focus of the state, society, and business on the efficient use of the human factor is of particular significance. No matter how advanced technology may be, it still relies on the human factor. Investments in the human factor not only contribute to the improvement of quality indicators but also ensure the sustainability, efficiency, and productivity of the country's socio-economic development, leading to better welfare.

The human factor serves as a strategic resource for national economic development, playing a decisive role in achieving successful outcomes, higher labor productivity, and realizing goals aimed at increasing competitiveness. Existing problems in the development of the national economy indicate the need to enhance the efficiency of human factor utilization. This, in turn,

requires a systematic approach to the study and evaluation of the effectiveness of investments in the human factor. Therefore, the study of the systematic nature and efficiency of human factor utilization in the country's economic development has gained particular relevance.

Support by the state for enhancing the efficiency potential of the human factor creates favorable conditions for a transition to inclusive economic growth and sustainable development. This, in turn, enables the maintenance of continuity and resilience in a country's economic development. In the 21st-century economy, the growing importance of concepts such as the "knowledge economy," "artificial intelligence," and contactless technologies once again highlights the relevance of addressing issues related to the effective utilization of the human factor.

Numerous studies have been conducted in areas such as the human factor, human potential, human capital, and labor resources. Prominent Azerbaijani thinkers, including N.Ganjavi, A.Khagani, I.Nasimi, M.Fizuli, and N.Tusi, put forward valuable ideas regarding the human factor. They incorporated the moral and qualitative values of human beings into systems of philosophical, political, social, and literary thought. In doing so, they regarded these values as integral elements for understanding the economic situation, as well as for its restructuring and development.

Among classical economists, W.Petty viewed the human factor in terms of "monetary value," while A.Smith and D.Ricardo described it as "the useful qualities of individuals" and "the most essential component of productive forces in relation to human beings and knowledge." K.Marx, F.Engels, and others interpreted it as "the sum of lifetime maintenance costs and investments made in an individual." These studies significantly contributed to the recognition of the human factor

as the primary driver of efficient production and national economic development.

Subsequently, J.B.Say, J.Mill, F.List, and C.S.Walsh conceptualized the human factor as "a form of capital embodied in the qualities and skills of individuals." I. Fisher and V. Pareto defined the human factor as "an individual's own capital." A.Marshall, J.M.Keynes, P.Drucker, J.Tobin, M.Blaut, L.Dublin, F.Cram, I.Fisher, S.H.Forsyth, L.Walras, J.M.Clark, J.McCulloch, H.D.Macleod, and J.H. von Thünen emphasized the importance of developing and broadening the concept of the human factor, leading to its understanding as "human capital." T.Schultz and G.Becker regarded human capital as a form of investment, while E.C.Dolan, D.E.Lindsey, and J.Coleman defined it as the aggregate of all income-generating abilities, skills, and knowledge possessed by an individual.

Azerbaijani economists have also conducted extensive research on issues related to the human factor, human potential, labor resources, population, and human capital, thereby making significant contributions to the development of the national economy. Among them are A.S.Sumbatzadeh, Sh.M.Muradov, R.Sh.Muradov, S.S.Khalilov, A.K.Alasgarov, Sh.S.Gafarov, T.A.Guliyev, T.S.Valiyev, G.Z.Yuzbashiyeva, J.B.Guliyev, S.A.Ibadov, Y.H.Hasanov, A.N.Farrukhov, Kh.Sh.Karimov, G.A.Azizova, S.S.Samandarov, A.N.Muradov, S.M.Seyidova, R.J.Afandiyev, F.Q.Musayeva, R.Q.Talibov, E.N.Karimov, B.O. Osmanov, and others.

According to Sh.M.Muradov, *"individuals who possess certain physical and intellectual capacities—namely physical development, health, education, skills, moral qualities, specialization, professional training, culture, and civic position—and who constitute both the foundation and the subject of the social production process, act, regardless of the economic formation, as a necessary condition of social production in all*

societies and as a crucial factor determining the volume of a country's national wealth."

Among Russian scholars who have examined the human factor are I.Y.Zadorozhnyuk, Q.X.Shingarov, V.Pshetinin, A.I.Dobrynin, S.A.Dyatlov, Y.D.Tsyrenov, R.I.Kapelyushnikov, S.A. Kurganskiy, and others.

A review of these studies demonstrates that, despite the existence of various approaches to the development of human potential and the efficient utilization of the human factor in economic processes, the topic continues to retain its relevance. This is because all socio-economic processes are inherently and inseparably linked to the human factor, and under the current conditions of global uncertainty, there is a growing need to enhance the efficiency of its utilization. In this regard, a number of issues negatively affect the qualitative components of the human factor, which, in turn, are reflected in the qualitative indicators of a country's economic growth and development. All of the above considerations underscore the relevance of conducting research on the topic of "Enhancing the Efficiency of the Utilization of the Human Factor in the National Economy." From this perspective, the subject of this dissertation is considered to be of particular importance and relevance.

Object of the research – the organizational and economic mechanisms for the utilization of the human factor in the formation and development of the national economy;

Subject of the research – the economic relations associated with enhancing the efficiency of the utilization of the human factor within the framework of these mechanisms.

Purpose of the research: The main objective of the study is to examine the theoretical foundations of the utilization of the human factor within the context of the national economy, to analyze and assess the current level of its utilization in Azerbaijan based on demographic, educational, and labor market indicators, as well as to scientifically substantiate directions for

improving the efficiency of the utilization of the human factor and to develop practical recommendations.

To achieve this objective, the following tasks are envisaged:

−to systematize and generalize the evolution of theoretical approaches to the role and essence of the human factor in economic development;

−to systematize and generalize the theoretical foundations of the utilization of the human factor and human resource management;

−to examine the theoretical bases of state regulation of the efficient utilization of the human factor;

−to assess the impact of demographic processes and changes in the labor market on the utilization of the human factor;

−to analyze and evaluate the role of education and its impact mechanisms in the efficient utilization of the human factor;

−to assess the organizational and economic mechanisms through which the efficient utilization of the human factor contributes to economic growth;

−to identify directions for improving the efficiency of human capital utilization;

−to evaluate the impact of digitalization on the efficiency of the utilization of the human factor;

−to analyze the role of investments in increasing the efficiency of the human factor and to determine priority directions;

−to develop scientifically grounded conclusions and practical recommendations for the efficient utilization of the human factor in the national economy based on the conducted analyses.

Research methods: The study employs methods such as mathematical-statistical analysis, analysis and synthesis,

historical-logical approach, comparative generalization, and others.

Main provisions submitted for defense:

–The human factor is not merely a simple labor resource; rather, it has evolved into a complex category that integrates knowledge, skills, motivation, and social behavior, and has become a key driving force of economic growth and sustainable development. At the present stage, the human factor acts as a strategic determinant of the competitive advantages of the national economy.

–While human resource management is largely limited to the quantitative and qualitative organization of labor, the approach to the utilization of the human factor reflects a broader methodological framework that integrates human behavior, motivation, creativity, and socio-cultural characteristics into the economic decision-making process.

–The efficient utilization of the human factor cannot be ensured solely through market mechanisms; it requires a coordinated regulatory role of the state in areas such as education, healthcare, innovation, employment, and the institutional environment.

–A weak relationship has emerged between economic growth and employment, which can be explained by the structural transformation of the economy and a productivity-driven growth model. Under such conditions, increasing the efficiency of the human factor is primarily associated with qualitative and institutional factors.

–The education system, as the main institutional mechanism for the efficient utilization of the human factor, influences economic development through the quality of education, its alignment with labor market demands, and the level of development of innovative skills.

–In the context of modern economic growth, the efficient utilization of the human factor is ensured not by the quantitative

expansion of employment, but by increasing labor productivity, innovation activity, and qualitative indicators of human capital.

–The efficiency of human capital utilization is determined not by the volume of financial resources allocated to education, but by the extent to which these resources are aligned with labor market requirements, institutional management mechanisms, and the innovation environment.

Scientific novelty of the dissertation research consists of the following:

- Classical, neoclassical, Keynesian, institutional, and contemporary approaches to the human factor in economic theory have been systematized within a unified evolutionary framework, and it has been scientifically substantiated that the human factor acts not only as a factor of production, but also as a complex agent generating innovation, institutional transformation, and social value in economic development.

- The concepts of human resource management and the utilization of the human factor have been methodologically differentiated. It has been justified that human resources are primarily based on quantitative and functional approaches, whereas the human factor is characterized by qualitative aspects grounded in behavior, motivation, creativity, and socio-cultural components.

- The impact of state regulation on the efficient utilization of the human factor has been structured according to direct and indirect mechanisms.

- It has been substantiated that the efficiency of the human factor is determined not only by individual skills, but also by the alignment of the quality of the institutional environment, digital infrastructure, and innovation-oriented public policy.

- The interrelations between demographic processes, quantitative and qualitative indicators of the labor market, wage dynamics, vocational training expenditures, and the relationship

between employment and GDP have been identified and explained.

- Based on stages of educational development, international education indices, and knowledge economy indicators, the main factors limiting efficiency have been identified, including low quality of education, the mismatch between higher and vocational education and labor market demands, and weak integration among education, innovation, and production.

- The organizational and economic mechanism for the transition of the Azerbaijani economy from a resource-based development model to an innovation-driven development stage has been determined.

- The importance of managing investments in education through the chain of quality–productivity–institutional alignment has been substantiated as a decisive factor in increasing the efficiency of human capital utilization in Azerbaijan.

The theoretical and methodological basis of the research consists of the works of classical economists, as well as studies by domestic and foreign scholars on the development of the human factor. Scientific works of the staff of the Institute of Economics of Azerbaijan have also been utilized. Scientific works, monographs, articles, and materials from scientific and practical conferences by both local and foreign researchers addressing issues related to the development of the human factor in the country's economic development have been studied.

The information and empirical base of the research comprises official materials of local and international organizations, statistical compilations, publications in the field of economics, as well as materials from the United Nations Human Development Programme. Methods such as comparison, generalization, cause-and-effect analysis, and economic-statistical analysis have been applied.

Approbation of the research and implementation of the results: Certain provisions of the research, the obtained results, as well as the proposals and recommendations put forward in the study have been published in reputable domestic and international journals, as well as in the proceedings of national and international conferences, in the form of 25 scientific articles and theses with a total volume of 11.25 printed sheets. Conference contributions include: "The Impact of Digitalization on Increasing the Efficiency of the Human Factor" (19–22 June 2025, Warsaw, Poland); "The Evolution of Scholars' Views on the Role and Importance of the Human Factor in the Economic Development of a Country" (8–12 November 2025, Dubai, UAE); "Investments in Increasing the Efficiency of the Human Factor" (20–22 June 2025, Ankara, Turkiye); "Assessment of the Impact of the Education Sector on the Economic Development of a Country" (2025, Georgia); "Improving the Utilization of the Human Factor in Production Management under Globalization" (15 September 2013); and "Analysis of the State of Scientific Personnel Training in the Formation of the Human Factor" (18–19 May 2012).

Institution where the dissertation was conducted: The dissertation was carried out at the Institute of Economics of the Ministry of Science and Education of the Republic of Azerbaijan.

Structure and volume of the dissertation: The dissertation consists of three chapters, with Chapter I comprising 77,459 characters, Chapter II 63,779 characters, and Chapter III 52,551 characters. Including the introduction, conclusion and recommendations, and the list of references, the total volume of the dissertation amounts to 234,063 characters.

CONTENTS

MAIN CONTENT OF THE RESEARCH

In the introduction of the dissertation, the relevance of the topic is substantiated, and the object and subject of the research, its purpose and objectives, methods, and the main provisions submitted for defense are explained. The scientific novelty, theoretical and practical significance, as well as the approbation and implementation of the research findings are also presented.

The first chapter of the dissertation, entitled **"Conceptual foundations of the efficient utilization of the human factor,"** examines the evolution of theoretical approaches to the role and essence of the human factor in economic development and generalizes key theoretical propositions. It also investigates the theoretical foundations of the utilization of the human factor and human resource management, as well as the theoretical bases of state regulation of the efficient use of the human factor.

Theoretical studies indicate that representatives of the classical school of economics, such as Adam Smith and David Ricardo, primarily assessed the human factor through the prism of the division of labor and functional participation in the production process, considering the growth of labor productivity as the main source of economic development. Within this framework, the human factor was largely treated as a quantitative labor resource.

In Eastern economic and philosophical thought, including the works of Azerbaijani thinkers, broader and value-oriented approaches to the human factor were developed. Nizami Ganjavi and Nasir al-Din Tusi regarded human beings not only as agents of material production but also as morally responsible actors whose knowledge and behavior significantly influence societal development. These perspectives demonstrate that the social and moral dimensions of the human factor are closely interconnected with economic processes.

At a later stage, in neoclassical and Keynesian theories (A. Marshall, J.M. Keynes), the human factor was interpreted within the context of employment, income distribution, and the role of the state in economic processes. In the institutional approach (T. Veblen, D. North), emphasis was placed on human behavior, social norms, and the role of institutions in economic development. These approaches substantiate that the human factor is not merely a factor of production, but also a carrier of economic decision-making and institutional change.

In classical economic theory, the emphasis placed by Adam Smith, David Ricardo, and Karl Marx on the leading role of human beings in the production process, and subsequently the evaluation by Alfred Marshall of human knowledge and skills as factors generating economic value, constituted the theoretical foundation for the formation of the concept of the human factor.

In the 20th century, as a continuation of these approaches, the works of Hasan bey Zardabi and Ali bey Huseynzade advanced the idea that enlightenment, knowledge, and professional training of individuals are fundamental conditions for economic progress. These views revealed the direct link between the development of the human factor and the sustainability and modernization of the national economy.

The study demonstrates that, against the background of the evolution of economic theory, the human factor has moved beyond the notion of a simple labor resource and has been conceptualized as a complex economic category integrating knowledge, skills, motivation, and social behavior. Particularly in the modern era, the human factor serves not only as the main driving force of economic growth but also as a strategic determinant of the competitive advantages of the national economy.

Under conditions of contemporary transformation, digitalization, and uncertainty, the importance of the efficient utilization of the human factor has increased significantly. This

factor has intensified the nature of economic development by enhancing labor productivity, facilitating the implementation of innovations, and contributing to overall economic progress. By ensuring flexibility, coordination, and the advancement of information technologies within management processes, the human factor continuously strengthens a country's competitiveness. In the approaches of scholars such as Pierre Bourdieu, Francis Fukuyama, Anthony Giddens, and Margaret Archer, the human factor is viewed as the interrelation of physical, intellectual, cultural, and activity-based components. These scholars substantiate the necessity of transitioning from an "economy of individuals" to a "systemic economy," highlighting the importance of this shift for inclusive and sustainable development.

Among Azerbaijani economists, Sh.Muradov has evaluated human potential as the leading force of social production and the primary factor in the formation of national wealth, while J.Guliyev has emphasized that assessing the outcomes of economic reforms through the prism of the human factor is a necessary condition. From this perspective, it has been scientifically substantiated that the human factor is not only a factor of production but also a subject of economic management and development.

In recent years, human resource management has been implemented based on a program-targeted approach. This approach is carried out through several blocks: scientific-analytical, normative-legal, and organizational-managerial. Specific objectives are set for each block, which are realized through corresponding management mechanisms (see Figure 1).

Management Block	Management Objective	Management Effects	Management Subject
Scientific-Analytical	Systematic analysis of the situation	Development of recommendations and proposals	Information-analytical center, individual specialists, experts
Normative-Legal	Creation of normal socio-economic conditions for the workforce	Guidelines, instructions, norms	Management authority, Board of Directors
Organizational-Managerial	Implementation of the main directions of social development within the workforce	Orders, directives	Manager and assistants, heads of production complexes, heads of individual workshops and departments
Resource	Implementation of socio-economic objectives	Budget and other funding sources	Financial and accounting services

Figure 1. Socio-economic structure of human resource utilization

Source: Compiled by the author [33,36,40,54,78].

As observed, in order to increase the efficiency of human resource utilization in economic entities, it is essential to plan social development. It should be noted that the use and management of human resources primarily occur at the microeconomic level. This is because microeconomics, due to its specific weight and coverage within the economy, can integrate households, enterprises and organizations, market participants, and each individual involved in the reproduction phases of the economy.

The key role in ensuring the efficient utilization of the human factor is played by the regulatory and system-forming functions of the state. This is because the development of human potential, enhancement of labor productivity, and provision of the necessary conditions for professional self-expression are primarily created by state institutions. From this perspective, the

efficient utilization of the human factor is not limited to market mechanisms but is realized through both direct and indirect regulatory mechanisms of the state.

In the dissertation, the directions of state regulation of the human factor have been systematized within the context of education and vocational training, healthcare, the stimulation of science and innovation, support for employment and entrepreneurship, labor legislation, the institutional environment, and the development of digital infrastructure. It is demonstrated that regulatory policies implemented in these areas should serve to improve the quality of human capital, ensure alignment with labor market demands, and promote sustainable economic growth.

The study also elaborates the theoretical foundations of systematic and integrated approaches to the human factor, highlighting that the individual functions as an element of the socio-technical system in interaction with other components. The systematic approach implies the coordination of human–technology–environment relations, while the integrated approach considers the physiological, psychological, social, and institutional characteristics of the human being simultaneously. The combination of these approaches provides a necessary methodological basis for enhancing the efficiency of human factor utilization. This framework supports both the realization of human potential and the evaluation of the effectiveness of implemented measures, as illustrated below.

Key directions of state involvement:

Directions	Expected Outcomes
Development of the education system	Accessibility and quality of education at all levels, from pre-school to higher and vocational education.
Support for science and innovation	Funding of scientific research and experimental design work (R&D); establishment of innovative infrastructure (technoparks, incubators, accelerators); promotion of technology-based entrepreneurship.
Creation of an efficient healthcare system	Support for public health as the foundation of labor productivity; promotion of healthy lifestyles, disease prevention; development of psychological support and mental health services.
Formation of labor legislation	Regulation of working conditions and protection of workers' rights; implementation of flexible employment mechanisms, including remote work; support for work-life balance.
Promotion of employment and entrepreneurship	Implementation of employment programs, especially for youth, elderly, and vulnerable groups; support for small and medium-sized enterprises as sources of jobs; reduction of administrative barriers and provision of tax incentives.
Development of digital infrastructure	Ensuring access to the Internet and digital services across all regions; enhancement of digital literacy; creation of online government services facilitating interaction with citizens.
Formation of social policy	Ensuring social justice and reducing inequality; development of the pension system; support for families, people with disabilities, and the unemployed; creation of motivation for self-realization and economic activity through social support mechanisms.

Source: Compiled by the author [195].

In conclusion, the state creates conditions for increasing the efficiency of human factor utilization through both direct and indirect intervention measures. Direct intervention includes education, healthcare, and social protection, while indirect

intervention involves incentives and the creation of a favorable environment for enhancing the efficiency of human capital.

Overall, the efficient use of the human factor is directly linked to active state participation, the quality of the institutional environment, and the comprehensiveness of implemented policies.

In the second chapter of the dissertation, titled **"Analysis and assessment of the current level of human factor utilization in the national economy,"** demographic processes and changes in the labor market in Azerbaijan, the role of education in the efficient utilization of the human factor, and the relationship between human factor utilization and economic growth have been evaluated.

Demographic processes carry strategic significance. In recent years, the global and Azerbaijani trends of declining labor potential and accelerated population aging negatively affect economic development and the labor market, increase the state's social burden, and create shortages of skilled labor.

In Azerbaijan, the slowing population growth rate and accelerating aging process are also observed. The long-term dynamics of natural population growth show a significant declining trend. For instance, in 1970, natural population growth was 116.5 thousand people (22.5 per 1,000 population), whereas in 2024, natural growth amounted to only 43.4 thousand people, or 4.2 per 1,000 population. These indicators demonstrate the long-term and persistent nature of demographic trends.

Changes in the age structure of the population pose risks for the future dynamics of labor potential. Currently, the median age of the population is 33.1 years, with approximately 9% of the population aged 65 and above. Life expectancy at birth increased from 71.8 years in 2000 to 76.9 years in 2024.

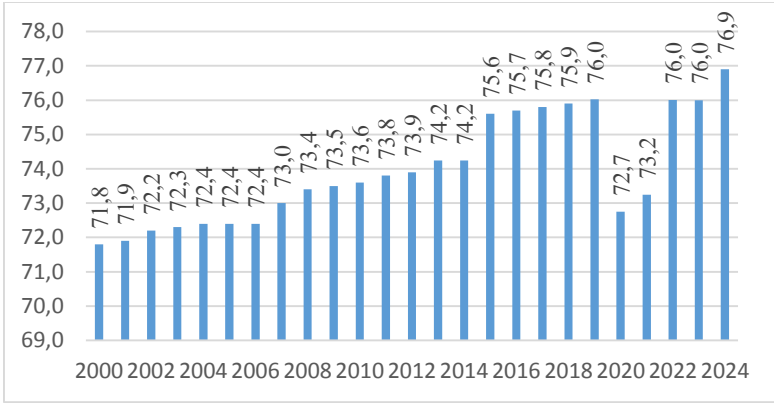


Figure 2.1. Life expectancy at birth (age)

Source: Data from the State Statistical Committee for 2000-2024.

Analysis of the current labor market situation indicates that between 2010 and 2024, the total labor force in Azerbaijan increased by 15.8%, rising from 4,587.4 thousand to 5,312.1 thousand people. The employed population also grew by 16.2%, from 4,329.1 thousand to 5,029.8 thousand people. At the same time, the number of unemployed increased by 9.3% compared to 2010, reaching its peak during the pandemic in 2020 at 368.7 thousand.

Nominal wage growth has been significant. The average monthly nominal wage increased from 331.5 manats in 2010 to 1,009.4 manats in 2024, approximately tripling over the period. However, the real wage index fell to 96.9% in 2021, indicating that nominal wage growth was partially offset by inflation.

Analysis of human capital quality highlights unstable dynamics in vocational training. In 2010, 4,792 individuals completed vocational training, which fell to 3,478 in 2020 but increased to 5,265 in 2024. Although expenditures on vocational training grew 1.6 times in nominal terms, their share of total labor costs declined from 0.09% to 0.06%, indicating a decreasing relative importance of investments in human capital.

An examination of the parallel dynamics of GDP growth and employment growth shows that economic expansion in Azerbaijan is largely driven by productivity, technology, and capital intensity. For example, during 2005–2007, GDP growth rose to between 120–135%, while employment growth remained at 100–102%, confirming the emergence of a "low-employment growth" model—a trend that persisted in subsequent years. Thus, from a demographic perspective, declining birth rates, population aging, and weak human capital quality in the labor market are key factors limiting the efficiency of human factor utilization. Under these conditions, economic policy priorities should focus not on quantitative employment growth but on improving the quality of human capital, increasing the share of investment in vocational training, and ensuring sustained growth in labor productivity.

Productivity growth is directly linked to education. The analysis shows that, in the modern stage, education not only serves as the main mechanism for the formation of human capital but also acts as a decisive determinant of economic growth quality, labor productivity, and national competitiveness.

International comparisons demonstrate a positive correlation between education level indices and indicators of human development and employment. In 2024, countries such as Germany, Switzerland, Norway, and the United Kingdom have education level indices above 0.90, with human development indices ranging between 0.94 and 0.97. Azerbaijan, however, ranks 76th with an education level index of 0.711. While this represents progress compared to 2014, it indicates that the quality components of education remain relatively weak.

Table 1.

Ranking of countries by education ındex in 2024

Countries	Rank (2024)	Average Years of Schooling (2024)	| Expected Years of Schooling (2024)	Education Index 2020	Education Index 2014	Human Development Index (HDI) 2025	Employment Rate, 2024 Index /Rank
Switzerland	1	14.3	17.3	0.943/1	0.893/7	0.959/5	63/73
Canada	2	13.9	16.6	0.900/14	0.866/14	0.970/2	64/44
USA	3	13.9	16.0	0.894/17	0.874/10	0.939/16	62/63
Estonia	5	13.6	16.4	0.900/15	0.889/8	0.938/17	60/76
Lithuania	6	13.5	15.9	0.882/21	0.874/11	0.905/36	61/65
Israel	7	13.5	16.4	0.898/16	0.868/12	0.895/39	58/92
United Kingdom	8	13.4	15.0	0.883/19	0.861/17	0.919/27	63/55
Norway	9	13.4	17.6	0.928/3	0.885/9	0.946/13	60/75
Finland	12	13.1	18.6	0.930/2	0.907/5	0.970/2	63/50
Georgia	18	12.9	19.2	0.927/4	0.817/26	0.948/12	56/106
Sweden	25	12.7	16.7	0.862/26	0.787/40	0.844/57	55/115
Kazakhstan	26	12.7	19.0	0.918/10	0.842/19	0.959/5	62/62
Russia	33	12.4	14.8	0.830/35	0.798/37	0.837/60	65/38
Belarus	34	12.4	15.7	0.823/39	0.806/32	0.832/64	59/77
Kyrgyzstan	40	12.2	14.0	0.838/32	0.834/20	0.824/65	63/56
Uzbekistan	42	12.0	13.0	0.730/70	0.700/72	0.720/117	63/47
Tajikistan	44	11.9	12.0	0.729/71	0.862/82	0.740/107	54/124
Turkmenistan	59	11.3	10.9	0.682/96	0.658/91	0.691/128	38/175
Ukraine	63	11.1	13.2	0.653/111	0.629/108	0.764/95	46/158
Azerbaijan	64	11.1	13.3	0.799/47	0.799/36	0.779/87	49/148
Switzerland	**76**	**10.6**	**12.7**	**0.711/80**	**0.704/69**	**0.789/81**	**66/31**

https://gtmarket.ru/ratings/education-index (193 ölkə)
https://www.tehsil.biz/news/ru/5793/
https://sites.google.com/site/genkonproject/home/001/002/01

Statistical analysis indicates that literacy levels in Azerbaijan are high by international standards (100% in 2025, ranking 3rd globally); however, according to the Knowledge

Economy Index, the country ranked 100th in 2024 with a score of 42.4. This demonstrates a significant discrepancy between the quantitative and qualitative indicators of human capital. For comparison, Latvia and Lithuania have similar literacy levels to Azerbaijan but rank 31st and 33rd, respectively, on the Knowledge Economy Index.

Analysis of education expenditure as a share of GDP shows that in 2015–2024, this indicator in Azerbaijan increased from 2.95% to 3.6%. Despite this increase, the country ranks 130th in international ratings, whereas Sweden (7.6%), Israel (6.5%), and the United States (5.4%) allocate higher shares of GDP to education. This comparison highlights that although funding for education in Azerbaijan has grown, its efficiency in translating into economic outcomes remains low. Indicators of the share of the population with higher education support this conclusion. In 2023, 17.7% of Azerbaijan's population had higher education, compared to 38.6% in the United States, 38.1% in Israel, and 41.4% in Lithuania, reflecting limited availability of highly skilled labor and structural misalignment between education and labor market requirements.

Comparison of Global Knowledge Index subcomponents shows that Azerbaijan performs relatively well in pre-university education (66.75 points), but in higher education, the score is only 32.77, ranking 116th. Low performance in research and innovation further reveals institutional gaps that prevent education from effectively converting human capital into productivity and innovation activity. The calculated education efficiency index decreased from 34.49 in 2015 to 27.81 in 2024, indicating that despite increasing expenditures, the resulting economic outcomes remain inadequate. By contrast, countries such as Germany and Estonia demonstrate higher and more stable education efficiency indices.

In this subsection, the role of the human factor as a decisive condition for economic growth has been examined using both

theoretical-methodological and empirical approaches. The research confirms that the human factor is not merely a labor resource or production input but a complex socio-economic category shaped through interaction with education, health, professional skills, motivation, innovation activity, social behavior, and institutional environment. It has been established that the essence of the human factor encompasses the entire system of reproduction, allocation, and utilization of human resources, which manifests in different functional forms at various levels of the economy. While concepts such as workforce, human resources, labor resources, and human capital are closely related, they are distinct categories, with the human factor representing their integrative content.

Statistical evidence shows that the efficiency of the human factor is determined not only by quantitative employment growth but also by improvements in labor productivity, innovation potential, and institutional adaptation capacity. Although a significant portion of the employed population in Azerbaijan works as salaried employees, the prevalence of informal labor relations remains a key factor limiting human factor efficiency. Comparative international data indicate that in developed countries, only 1.5–4% of workers are employed without formal contracts, whereas in Azerbaijan and many developing countries, this share is substantially higher.

Therefore, effective utilization of the human factor is both a fundamental condition and a sustainable source of economic growth. Economic growth creates financial and institutional opportunities for human development, while qualitative improvements in the human factor ensure that growth is intensive, innovation-oriented, and sustainable. This reciprocal relationship constitutes a key conceptual conclusion, defining the strategic role of the human factor in modern economic development models.

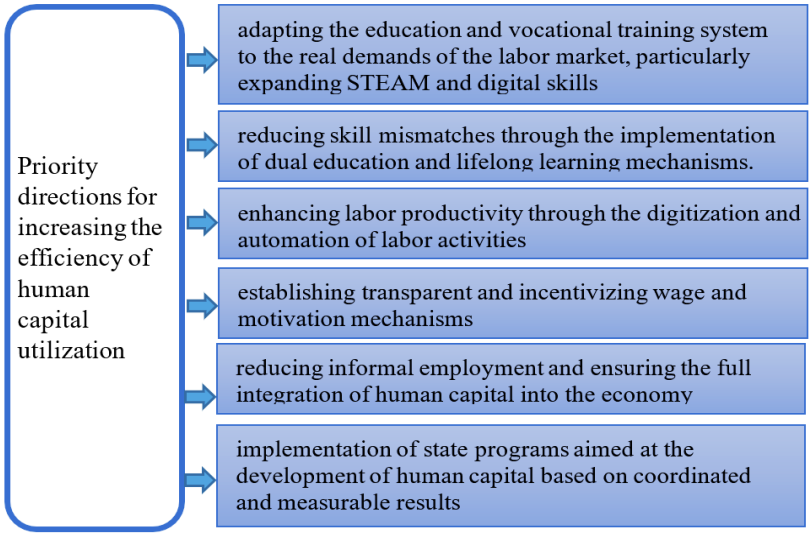
In the third chapter of the dissertation, titled **"Directions for enhancing the efficiency of human factor utilization in azerbaijan,"** the focus is on improving the efficiency of human capital utilization, the impact of digitalization on human factor efficiency, and the role of investments in enhancing human factor productivity.

Statistical observations confirm that not only the volume of investments in human capital but also their efficiency and institutional management are of decisive importance. According to ADCC data, between 2015 and 2022, employment in the education and information technology sectors increased by more than 35%, indicating a structural renewal of human capital, while highlighting the need to strengthen its quality and productivity components.

Based on these analyses, the following directions are considered priorities for increasing the efficiency of human capital utilization:

1. Enhancing investment efficiency in human capital through targeted allocation, linking funding to measurable outcomes, and ensuring alignment with labor market requirements.
2. Strengthening the institutional framework for human capital development, including coordinated policies in education, health, innovation, and workforce management.
3. Leveraging digitalization to optimize human resource deployment, improve productivity, and facilitate knowledge-intensive activities.
4. Promoting professional development and lifelong learning to raise workforce qualifications, foster innovation, and ensure alignment with evolving economic demands.
5. Integrating human capital strategies into economic growth planning, ensuring that improvements in skills, motivation, and productivity translate directly into sustainable national development.

These directions collectively aim to create a comprehensive, strategic approach for maximizing the contribution of the human factor to Azerbaijan's economic growth and competitiveness.



Source: The figure was compiled by the author.

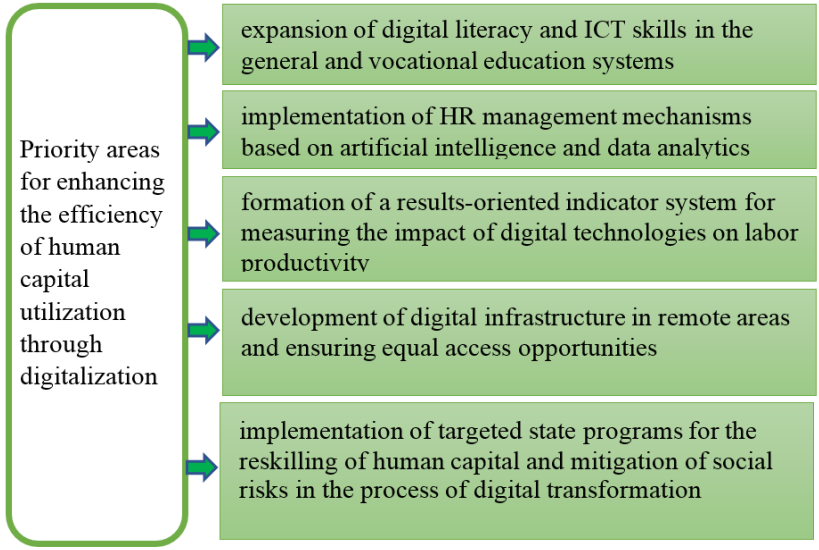
In the Azerbaijani context, enhancing the efficiency of human capital utilization is one of the key conditions for transitioning from the extensive sources of economic growth to an intensive, productivity- and innovation-driven development model. To achieve this, policies targeting human capital should focus not only on increasing expenditures but also on managing them in terms of quality, outcomes, and institutional alignment.

International experience demonstrates that the adoption of digital technologies can increase labor productivity by 20–40%, reduce management and operational costs, and enable more targeted and flexible use of human resources. According to international statistics (ITU), in 2024, Azerbaijan ranked 58th out of 175 countries in the ICT Development Index, with a score

of 80.4 points—a significant improvement compared to previous years. Simultaneously, the ICT sector's revenue reached 3.2 billion AZN in 2023, accounting for 1.8% of GDP, highlighting the growing role of digitalization in the economy and the necessity of transforming human capital through digital skills.

However, analysis shows that the impact of digitalization on the human factor is not unambiguous and is accompanied by certain risks. Intergenerational gaps in digital skills, limited ICT access in remote regions, and the potential obsolescence of certain professions due to digital transformation create additional challenges for inclusive human capital development. The limited volume of digital service exports in Azerbaijan (1.4 thousand USD per capita in 2023) indicates the presence of untapped potential in this area.

Based on these findings, the following directions are prioritized to ensure that digitalization effectively enhances the efficiency of human capital utilization:



Source: The figure was compiled by the author.

Overall, investments directed toward the human factor play a decisive role among the production factors in modern economic development and constitute one of the main sources of sustainable growth. Investments in the education, healthcare, and social protection systems not only enhance the efficiency of the human factor but also contribute to increases in labor productivity, innovation capacity, and competitiveness.

Statistical analysis demonstrates a direct relationship between the level of investment in human capital and economic outcomes. According to World Bank data, the Human Capital Index in Azerbaijan increased from 0.50 in 2010 to 0.58 in 2020, reflecting expanded access to education and improvements in healthcare services. Projections indicate that, in 2024–2050, the average annual growth rate of investments in human capital will amount to 1.7%.

Comparative analysis shows that countries such as Finland, Singapore, and Estonia achieve high levels of the Human Capital Index (ranging from 0.78 to 0.88), which is closely associated with the volume of expenditures on education and healthcare, the quality of services, and results-oriented investment management. In Azerbaijan, however, the share of expenditure on education in GDP remains at 3.3–3.5%, and the high private share of healthcare expenditures (approximately 69%) underscores the need to enhance the effectiveness of investment policy.

Sectoral analysis indicates that investments aimed at increasing the efficiency of the human factor should focus on five main areas: education and professional development, healthcare and preventive measures, labor conditions and motivation, digitalization and technological modernization, and joint development programs of the public and private sectors. In particular, investments in digital technologies and skills upgrading can increase labor productivity by 20–30%, reduce

workforce turnover, and facilitate the more effective integration of the human factor into the economic cycle.

Based on the findings of the study, it is concluded that the investment policy to enhance human factor efficiency should be built on results-oriented indicators, apply HR analytics and measurable efficiency criteria, and strengthen cooperation among the state, business, and education sectors. In particular, expanding investments in lifelong learning, retraining, and the development of digital and “green” skills is deemed appropriate.

RESULTS AND RECOMMENDATIONS

Results

1. Conceptual foundations of the human model in economic theory. In economic theory, the human model is interpreted as the aggregate of individuals' behaviors, motivations, objectives, and decision-making mechanisms within various socio-economic systems. The study demonstrates that, under globalization and institutional transformations, classical approaches to the human model do not fully capture contemporary economic realities. By also considering the pre-classical stage, it is shown that the human model has evolved along six key dimensions, providing a basis for systematizing the theoretical and methodological framework of the research.

2. Economic content and multidimensional character of the human factor. The concept of the "human factor" is not limited to labor capacity; it encompasses knowledge, skills, health, motivation, values, and behavioral traits, representing a complex economic category. The human factor is shaped within social, economic, technological, and institutional systems and has become one of the key qualitative indicators of modern economies.

3. Role of the human factor in economic growth. It has been established that the human factor plays both objective and subjective roles in production processes. Traditional physical-capital-based growth models have demonstrated their limitations in contemporary conditions, while scientific-technological progress and innovation have elevated the human factor to the primary driving force of economic growth. Human development is a prerequisite for economic growth, while economic growth serves both as a means and an end of human development.

4. Transition from "Economics of Individuals" to "Systemic Economics". The analysis indicates that, at the modern stage, the "economics of individuals" approach is

insufficient to explain economic development. The systemic economics model, based on principles of wholeness, consistency, sustainability, and institutional coherence, positions the human factor as a key systemic characteristic of economic development.

5. Historical development stages of the human factor. The study generalizes the evolution of the human factor into four main stages: the passive role of humans in pre-industrial production; the formation of institutional foundations of human capital during the mass education stage; recognition of educational investments as a key driver of economic growth in the second half of the 20th century; and, in the 21st century, the transformation of human capital into the concept of "human potential."

6. Findings for Azerbaijan. While positive dynamics are observed in investments in human capital in Azerbaijan, regional disparities and the quality and accessibility of education and healthcare limit the efficiency of human factor utilization. With a Human Capital Index of 0.789, the findings indicate underutilization of existing potential and the necessity for structural reforms.

7. Human factor and economic diversification. In the context of economic diversification, the development of the human factor is a critical condition for Azerbaijan's long-term competitiveness. Enhancing quality education, digital skills, and the innovation environment accelerates the transition to a knowledge-based economy.

8. Role of the human factor in post-industrial society. The transition to a post-industrial society is accompanied by the development of knowledge-intensive sectors and information technologies. In this stage, human intellect, creativity, and high-skilled labor become the main sources of productivity and management efficiency.

9. Existing challenges and institutional constraints. Weak linkages between education and the labor market, limited integration of scientific-innovation activities with education, and insufficient institutional coordination constrain the quality of the human factor. Additionally, ecological and psychological risks and the rapid obsolescence of knowledge increase the risk of human resource degradation.

Recommendations

Enhancing the efficiency of the human factor requires a comprehensive and systemic approach as a key priority of modern economic development. This includes aligning educational programs with current and future labor market demands and creating an attractive institutional environment for human capital investments.

Quality-oriented reforms in education, healthcare, and professional development, along with strengthened lifelong learning and retraining mechanisms, can facilitate the effective integration of human capital into the real economy. Strengthening linkages between the education system, the labor market, and the innovation ecosystem is a crucial condition for this process.

The interdependence between human development and economic growth should be explained through the sequence "human development – economic growth – new development opportunities." Directing revenues from natural resources toward human capital can accelerate the transition to a knowledge- and innovation-based economic model.

In the context of digitalization and technological transformation, promoting innovation-driven human capital development, strengthening the regulatory and incentive roles of the state, expanding public-private partnerships, and establishing regional competence centers are recommended.

Overall, improving the efficiency of human factor utilization is a decisive institutional element that ensures

Azerbaijan's transition from a resource-based development model to a knowledge- and innovation-based economy.

The main content and provisions of the dissertation are reflected in the author's following published works (total number of publications: 25):

1. Mirzabeyova, J.S.The Human Factor in the Scientific Sphere // Materials of the Scientific-Practical Conferences Dedicated to the Memory of National Leader Heydar Aliyev. May 2008–2009, pp. 94–96.
2. Mirzabeyova, J.S.The Concept of Human Capital in the History of Economic Thought // Proceedings of the Azerbaijan National Academy of Sciences (Economics Series), No. 2, 2011, pp. 203–206.
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4. Mirzabeyova, J.S.Improvement of the Use of the Human Factor in Production Management under Globalization // Economic Science, No. 15, 2013, Ukraine, pp. 1122–114.
5. Mirzabeyova, J.S.Investigation of the Formation Factors of Human Capital in Economic Literature // Proceedings of the Azerbaijan National Academy of Sciences (Economics Series), No. 5 (September–October), 2015, pp. 52–59.
6. Mirzabeyova, J.S.Human Capital, Labor Resources, and the Socio-Economic Foundations of the Formation of Production Relations in the Modern Era // Proceedings of the Azerbaijan National Academy of Sciences (Economics Series), No. 1, 2015, pp. 30–35.
7. Mirzabeyova, J.S.Methods of Evaluating Human Capital in Contemporary Economic Literature // Scientific Works of the Institute of Economics of ANAS, No. 2, 2015, pp. 27–32.

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9. Mirzabeyova, J.S.The Impact of Digitalization on Improving the Efficiency of the Human Factor // 1st International Warsaw Scientific Research and Innovation Congress, 19–22 June 2025, Warsaw, Poland, pp. 190–194.
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11. Mirzabeyova, J.S.Assessment of the Influence of the Education Sector on the Country's Economic Development // Ekonomisti: International Scientific–Analytical Journal, No. 3, 2025, pp. 122–131.
12. Mirzabeyova, J.S.Evolution of Scholars' Views on the Role and Importance of the Human Factor in the Country's Economic Development // ISARC, 12th International Scientific Research and Innovation Congress, 08–12 November 2025, Dubai, UAE, pp. 129–135.
13. Mirzabeyova, J.S.The Problem of Competition in Higher Education in Azerbaijan and Its Solutions, pp. 201–222. In: Collective Monograph Improvement of the Mechanism for Regulating Sustainable and Competitive Economic Growth, Baku, 2025, p. 292.

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The dissertation can be reviewed at the library of the Institute of Economics of the Ministry of Science and Education of the Republic of Azerbaijan.

The electronic version of the abstract is available on the official website of the Institute of Economics of the Ministry of Science and Education of the Republic of Azerbaijan (https://economics.org.az/).

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