Longevity as a Factor of Human Capital Quality

تطوير مقياس جتمان لاتجاهات المعلمين نحو توظيف الذكاء الاصطناعي في التعليم وفقاً لنظرية الاستجابة للفقرة

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Abstract:

This research aims to analyze the role of longevity as a critical factor in enhancing the quality of human capital, and to explore its impact on socio-economic development. The study employs a descriptive-analytical approach, involving a review of theoretical literature concerning the concepts of human capital and longevity, alongside an analysis of demographic and economic statistical data for Russia (covering the period 2019–2023). These findings are then compared with indicators from leading nations, such as Japan, Sweden, and Norway.

The findings indicate that longevity positively influences the quality of human capital through four key factors: health, education, productivity, and social engagement. It contributes to the accumulation and intergenerational transfer of experience, enhances productivity, and improves lifestyles. However, the results also show that an increase in life expectancy presents significant challenges, most notably: the growing financial burden on healthcare systems, an aging population accompanied by declining birth rates, and the need to restructure social security systems and the labor market to accommodate older age groups.

Keywords: longevity, human capital, quality of human capital, health, education, productivity, social engagement, aging population.

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طول العمر كعامل من عوامل جودة رأس المال البشري

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الملخص

يهدف هذا البحث إلى تحليل دور طول العمر كعامل حاسم في تحسين جودة رأس المال البشري، واستكشاف مدى تأثيره على التنمية الاجتماعية والاقتصادية. واعتمدت الدراسة على المنهج الوصفي التحليلي، من خلال مراجعة الأدبيات النظرية المتعلقة بمفاهيم رأس المال البشري وطول العمر العامل، بالإضافة إلى تحليل البيانات الإحصائية الديموغرافية والاقتصادية (للفترة 2019-2023) في روسيا، ومقارنتها بمؤشرات دول رائدة مثل اليابان والسويد والنرويج.

وقد توصلت النتائج إلى أن طول العمر يؤثر إيجاباً على جودة رأس المال البشري من خلال أربعة عوامل رئيسية: الصحة، التعليم، الإنتاجية، والنشاط الاجتماعي، حيث يسهم في تراكم الخبرات ونقلها بين الأجيال، وزيادة الإنتاجية، وتحسين نمط الحياة. ومع ذلك، أظهرت النتائج أن ارتفاع متوسط العمر المتوقع يفرض تحديات كبيرة، أبرزها: العبء المالي المتزايد على أنظمة الرعاية الصحية، شيخوخة السكان وما يصاحبها من انخفاض في معدلات المواليد، والحاجة إلى إعادة هيكلة أنظمة الضمان الاجتماعي وسوق العمل لاستيعاب الفئات العمرية الأكبر.

الكلمات المفتاحية: طول العمر، رأس المال البشري، جودة رأس المال البشري، الصحة، التعليم، الإنتاجية، النشاط الاجتماعي، شيخوخة السكان.

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Introduction:

Human needs are steadily increasing, which entails a corresponding need for the continuous modernization and advancement of technology and science. This circumstance underscores the relevance of research on the quality of human capital.

The aim of the study is to examine the role of longevity and the extent of its influence on the quality of human capital.

Before addressing the subject, it is first necessary to clarify the terminology, namely, to examine the concepts of "longevity" and "human capital" and their principal aspects.

The concept of human capital has been developed in the works of such world-renowned economists as T. Schultz, G. Becker, J. Kendrick, Y. Ben-Porath, E. Denison, B. Chiswick, and others. Among Russian scholars, particular mention should be made of the works of S.A. Dyatlov, A.I. Dobrynin, M.M. Kritsky, and others. [1]

According to O.N. Kalachikova, A.V. Korolenko, and L.N. Natsun, "...active longevity is understood as a social phenomenon involving the dissemination among the population of values and behavioral practices aimed at maintaining health and well-being throughout life..." [2].

Theoretical and Methodological Foundations of the Study

Human capital may be defined as the continuum of education, professional skills, and related attributes that serve to meet the needs and demands of society.

The main elements of human capital include the following:

-education;

-professional skills;

-work experience;

-individual health;

-work culture (motivation to work).

Each of these elements affects labor productivity, determining its contribution to the development of various infrastructures and to the population's standard of living. For example, professional skills and knowledge enable an individual to adapt quickly to innovations in the labor market, which helps them remain competitive. Nevertheless, a person with health problems will be unable to realize his or her ambitions. Hence, longevity can be regarded as an important factor of human capital quality, since it underpins the stabilization and maintenance of health, as well as the extension of physical activity over a period longer than average.

Longevity is a social and biological phenomenon denoting the attainment of ages that substantially exceed the average human life expectancy.

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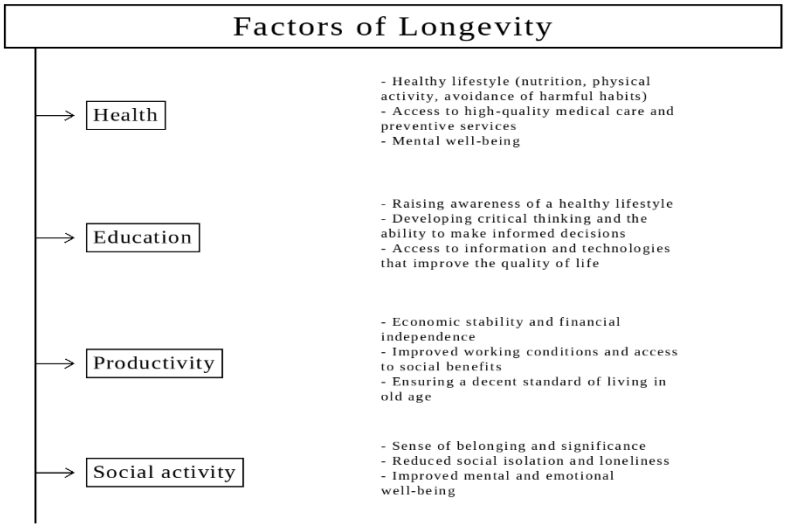
The foregoing contributes to a further increase in human life expectancy. Consequently, longevity, as a factor of human capital quality, is associated with a number of positive effects. First, the level of economic development and labor productivity will increase significantly as the age threshold of the population rises. Second, owing to a longer lifespan, experience and knowledge will accumulate considerably faster, and the older generation will be able to pass this knowledge and experience on to the younger generation. Third, there is the degree of interdependence between longevity and the quality of human capital. However, this process will also give rise to several challenges: the number of older people will increase, which will require additional public funding of the healthcare system, a restructuring of social security, and the adaptation of the labor market and the education system to the new way of life.

There are numerous reasons why longevity is a key factor affecting the quality of human capital. First, raising age thresholds will help people maintain their health and physical activity for a longer period than the current average. This will enable people to remain more productive and useful to society over a longer time span. The second factor is the opportunity to accumulate the experience and knowledge acquired over many years of life, which can subsequently be passed on to the younger generation. The older generation has an advantage in expertise over early-career specialists and can transfer its professional skills, thereby ensuring a qualified workforce in the future. Third, adaptation to the new labor market, which is accompanied by an improvement in the quality of life and considerably faster economic growth.

Figure 1 systematizes the factors of longevity, including health, education, productivity, and social activity. Each factor is examined in relation to longevity and comprises a number of specific dimensions that directly or indirectly affect the quality of human capital [3].



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Source: compiled by the author

Figure 1 – Factors of longevity

Results of the Empirical Study and Their Interpretation

According to current statistical data (Table 1), the demographic structure of the population of the Russian Federation is characterized by the fact that the share of citizens receiving pension payments does not exceed 30% of the country's total population. This indicator reflects the ratio between persons of retirement age and other age groups, including the working-age population and young people. It should be noted that these statistics cover various types of pensions, including old-age, disability, and survivor's pensions, as well as other social benefits provided by the Pension Fund.

Table 1 – Population of Russia and its structure, 2019–2023

Indicator	2019	2020	2021	2022	2023
Population (end of year), thousand people	3,996.4	3,997.7	4,000.1	4,001.6	4,003.0
Natural increase / decrease (-), people	-180	-12,981	-19,173	-1,842	-6,694
Number of pensioners, thousand people	1,146.8	1,132.9	1,110.1	1,110.9	1,094.5
Share of pensioners in the total population, %	29	28	28	28	27

Figure 2 shows the distribution of the population of Russia by age group (at the beginning of the year).

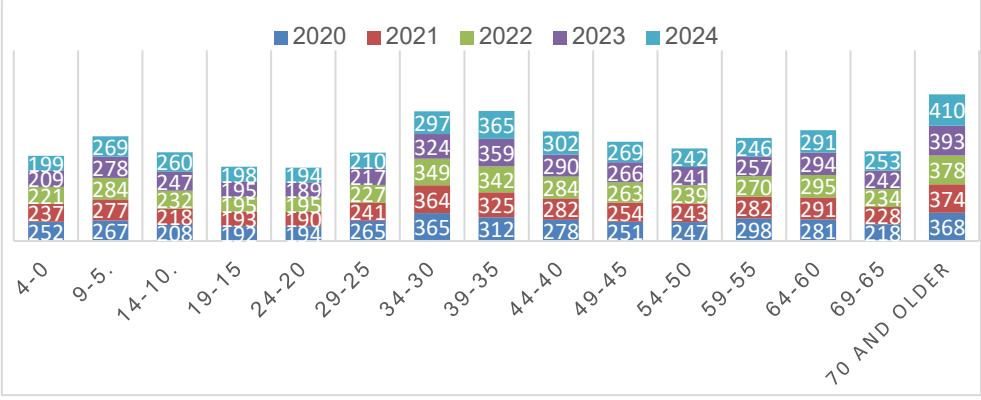

Figure 2 – Distribution of the population by age group (at the beginning of the year)

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Figure 2 depicts the age structure of the population, making it possible to assess the demographic changes that have occurred over the past five years. Notably, the period from 2019 to 2024 saw an increase in the size of the older population. This positive trend can be interpreted as a consequence of improvements in the quality of life and the accessibility of medical services, as well as of the effectiveness of programs aimed at promoting and supporting healthy and active longevity.

There are a number of leading countries with higher levels of longevity, such as Japan and Sweden. These countries presumably place strong emphasis on areas such as healthcare, promote a healthy lifestyle, and concentrate their main efforts on raising the population's standard of living. They also prioritize the development of science and medicine [4]. The governments of these countries are proponents of technological progress, investing in and supporting a wide range of scientific research, which drives the creation of new jobs and professions and increases labor productivity [5].

As noted above, despite the evident advantages of longevity, it also has its drawbacks. For example, numerous diseases emerge with age, requiring more careful, thorough, and costly treatment; consequently, a substantial share of the state budget will be allocated to covering healthcare costs [6-7].

Population aging may constitute a second potential problem. It may lead to a decline in the birth rate, resulting in a deterioration of the country's demographic situation and, most likely, in higher social security contributions [8]. A demographic crisis can be observed in modern countries whose economies are developing year by year and where information technologies are being introduced into production and everyday life.

A third problem may be the restructuring of the established system [9]. As age thresholds rise, the labor market, state social benefits, and various spheres of life will need to be adapted. Moreover, the burden on the budget will increase owing to growing pension expenditures.

For a more detailed examination, Table 2 presents the standard of living, annual income (in US dollars), and average life expectancy.

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Table 2 – Living standards and quality of life in selected countries

Country	Life expectancy		Education level		Annual income ($)	
	Women	Men	Women	Men	Women	Men
1.Norway	81.7	75.8	102	94	23,317	36,043
2.Iceland	81.8	77.5	96	87	23,130	36,799
3.Sweden	82.4	77.4	123	103	19,636	28,817
5.Netherlands	80.9	75.5	99	100	18,846	35,675
7.USA	79.7	74.0	97	90	26,389	42,540
9.Japan	84.7	77.7	82	84	15,617	35,061

Based on the data in Table 2, it can be concluded that longevity is an important factor that undoubtedly affects the quality of human capital, since people's health and activity depend directly on it. However, despite its positive aspects, longevity also entails a number of problems that the state has to confront.

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Conclusion:

In conclusion, longevity should be regarded not merely as a statistical indicator but as a multifaceted phenomenon that exerts a profound influence on all aspects of human capital [10]. From health and education to productivity and social integration, longevity stimulates positive change, provided that society is prepared to invest in appropriate strategies.

Purposeful efforts to improve living conditions, education, and healthcare, as well as to build an inclusive and supportive society for all generations, will pave the way for fully realizing the benefits offered by increased life expectancy.

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معامل التأثير العربي	1.73	1.25	1.55	1.59	1.58