Development of Education in The New Socio-Investment Model of Russia's Economic Growth: Imperatives and Governance Mechanisms

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Keywords: economic growth • educational governance • inclusive innovation • higher education • Priority 2030.

Abstract

The purpose of the article is to systematically study the prospects for the development of education in the new socio-investment model of economic growth of Russia, to determine its imperatives and to justify management mechanisms. To achieve this purpose, the authors assess the level of achieving the global imperatives of the development of education в socio-investment model of economic growth: 1) Ensuring proportion of youth enrolled in higher education, 2) Employment of able-bodied population; and 3) Ongoing education. The authors also perform the econometric modelling of the influence of a range of mechanisms of managing the development of education on the achievement of these imperatives, using the method of regression analysis based on the official statistics for 2000-2022. The paper's contribution to the literature consists in determining the level of application of the standard mechanisms of managing the development of education in Russia – to what extent they support the achievement of the imperatives of the development of education in Russia. Due to this, this study clarifies the essence and specifics of implementing the socio-investment model of economic growth in Russia. The practical contribution of the paper is its strengthening of the scientific and theoretical framework and methodological support, as well as identifying targets for the successful realisation of the programme of strategic academic leadership "Priority 2030" and the national programme of the development of education in Russia for the period until 2025.

1 Introduction

The strategic development of society and the economy of Russia involves the reliance on an educated and progressive society, highly qualified personnel and the effective work of the education market and labour market (Fahim et al., 2023; Ji et al., 2023). This determines the relevance of the transition to a new socio-investment model of economic growth in Russia, but the problem is that this model is not formed (Dreval et al., 2022; Qi et al., 2022). Despite the existence of regulatory documents defining the conceptual basis for the transition to a new socio-investment model of economic growth in Russia, these documents are disparate, which leads to the lack of a holistic model (the presence of only its general outlines) (Popkova et al., 2018a; Popkova et al., 2018b).

The development of general education is regulated by the Decree of the Government of the Russian Federation No. 1642 of December 26, 2017, on the approval of the state program "Development of Education" for the period up to 2025. Issues of the development of science and higher education are regulated by the programme of strategic academic leadership “Priority 2030” (Bogoviz et al., 2018a; Bogoviz et al., 2018b; Bogoviz et al., 2020; Khakimova et al., 2020; Khakimova and Kayumova, 2022). There is also uncertainty about the mechanisms for the development of education, which leads to a suboptimal combination of formal and non-formal education, paid-for students and state-funded education, and higher, secondary, and secondary vocational education (Filho et al., 2023; Hackett et al., 2023; Omotosho et al., 2023; Zheng et al., 2023).

In practice, to achieve continuity at all levels of education and to benefit from synergies in the form of accelerating economic growth, it is necessary to formulate common imperatives for the development of the education market (at all levels) and the labour market, as well as to define mechanisms for the management of these markets to achieve imperatives (Alam et al., 2023; Guo et al., 2023; Shu and Wang, 2023).

The global imperatives of social investments are as follows: 1) mass availability of higher education for the youth; 2) fight against unemployment; 3)

lifelong learning. However, the experience of placing social investments in Russia has been poorly studied, due to which is it uncertain whether the above imperatives are implemented in Russia, and due to which mechanisms this is achieved. Based on this, the following research question (RQ) was posed in this paper: What are the imperatives of the development of education in the new socio-investment model of Russia's economic growth and which governance mechanisms allow reaching these imperatives?

This predetermined the goal setting in this paper, which lies in the systemic study of the prospects for the development of education in the new socio-investment model of economic growth of Russia to determine its imperatives and to justify management mechanisms.

The originality of this paper is the substantiation of the three key imperatives of the development of education in the new socio-investment model of Russia's economic growth (1) ensure the fullest possible enrolment of young people 17-25 years old in higher education; 2) fighting unemployment and increasing employment; 3) mass participation of the population in ongoing education) and the most effective mechanisms for regulating universities' activities, which allow reaching the set imperatives.

The scientific novelty and applied value of the results obtained also consist in the discovery (forecasting up to 2025) of the prospects for achieving the set imperatives with the help of a set of authors' recommendations on the increase in the effectiveness of university management in Russia. The practical contribution of this paper is its strengthening of the scientific and theoretical basis and methodological support, as well as determination of targets for the successful realization of the programme of strategic academic leadership "Priority 2030" and the national programme of the development of education in Russia for the period until 2025.

2 Literature Review

The theoretical basis of this research is the concept of managing the development of education in the socio-investment model of economic growth (Bachnik et al., 2023; Martin et al., 2023). Within this concept, three global imperatives of the development of education in the socio-investment model of economic growth are distinguished: ensuring the proportion of youth enrolled in higher education (Fatima, 2023; Saleem, 2023), employment of able-bodied population (Acheampong et al., 2023; Nazir, 2023) and ongoing learning. (E.U. Khan, 2023).

Within this concept, the existing literature (Abdulaal et al., 2023; Li and Chu, 2023; Unni, 2023; Yang and St. John, 2023) also describes standard mechanisms of managing the development of education in the socio-investment model of economic growth, which facilitate the achievement of these imperatives. According to this concept, social investments, which are performed through education, support the growth and development of the economy (Carstensen and Emmenegger, 2023). In each economic system, a socio-investment model of economic growth has its specific features (Busemeyer and Guillaud, 2023).

The first global imperative of the development of education in the socio-investment model of economic growth, which is distinguished in the literature, is the proportion of youth (17-25 years) enrolled in higher education (Biancardi et al., 2023). The mechanisms of managing the development of education in the socio-investment model of economic growth that facilitate the achievement of this imperative are government financing of the activity of universities and allocation of state-funded places and an increase in the production capacity of universities during the provision of paid educational services (Mehmetaj and Xhindi, 2022; Tongkachok et al., 2023).

Global imperatives for the development of education are formulated and investigated in the works of Jamaludin et al. (2020), Kennedy and Birch (2020), Menon and Suresh (2020), Saqib et al. (2020). International experience with the use of various mechanisms for managing the development of education has been

studied in the works of Bentley-Gockmann (2020), Hale et al. (2020), Heiling (2020), Leal Filho (2020), Pallegedara and Sisira Kumara (2020).

The second global imperative (distinguished in the literature) of the development of education in the socio-investment model of economic growth is ensuring the employment of able-bodied population for unlocking human potential (Plavgo, 2023). The mechanisms of managing the development of education in the socio-investment model of economic growth that facilitate the achievement of this imperative are the employment of the population: 1) with higher education; 2) with secondary vocational education in middle-level training programs; 3) with secondary vocational education under training programs for skilled workers, employees (Cordón-Lagares et al., 2022; Unni, 2023).

Some features of the development of education in Russia are disclosed in the publications of Babieva et al. (2022), Masalimova et al. (2022), Novikov (2022), Salakhova et al. (2022). Bisht and Pattanaik (2021), Dereli (2022), Enache et al. (2020) and Hermannsson et al. (2020) give state expenditure on higher education at current prices as the main factor of the proportion of youth (17-25 years) enrolled in higher education.

The third global imperative (distinguished in the literature) of the development of education in the socio-investment model of economic growth is ongoing education (life-long learning) (Naveed et al., 2023). The mechanisms of managing the development of education in the socio-investment model of economic growth that facilitate the achievement of this imperative are formal education, non-formal education and self-education (Eppler-Hattab, 2022; Mejía-Manzano et al., 2022).

Köpsén (2022), Maxyutova et al. (2022), Silliman and Virtanen (2022) and Vermeire et al. (2022) state that education of all levels, including secondary vocational education in middle-level training programs, facilitates the fight against unemployment. Bahl et al. (2022), Ludolph (2023), Müller et al. (2022), Stenberg (2022) and Stracke et al. (2022) see formal education as the main factor in the involvement of the population participating in ongoing education.

Nevertheless, the imperatives and mechanisms for managing the development of education in the new socio-investment model of Russian economic growth remain unclear, which is the gap filled in this article. The global imperatives are universal, but it is unknown to which extent they are relevant for each country separately, and which mechanisms help achieve these imperatives given the unique experience and specifics of the economic system.

The literature gap is that the imperatives and mechanisms of managing the development of education in the socio-investment model of economic growth in Russia are still unclear. In particular, it is unclear whether the global imperatives are relevant in Russia and to what extent the mechanisms of managing the development of education facilitate the achievement of these imperatives. The need to fill this gap is explained by the fact that because of it, the essence of the socio-investment model of Russia's economic growth remains unclear, and the manageability of the model is reduced. The research gap is the uncertainty of whether the global imperatives of social investments in Russia are achieved, and due to which governance mechanisms this is done.

This paper strives to fill this gap. This leads to the following research question (RQ): what are the imperatives of the development of education in the new socio-investment model of Russia's economic growth and which governance mechanisms allow reaching these imperatives? Based on the existing literature, the following hypotheses are proposed:

H_1: Mass availability of higher education for the youth is ensured in Russia due to the paid educational services of universities. This hypothesis was offered according to the works of Andronova and Ryazantsev (2023) and Dianovaa et al. (2023), which note that, in the conditions of market relations in the system of higher education, it develops under the influence of private investments;

H_2: The fight against unemployment is achieved in Russia due to the employment of people with higher education and secondary vocational education through the programmes of training of skilled workers and civil servants. This hypothesis was offered according to the works of M. Khan (2023) and Nabi et al.

(2023), which note that the socio-investment model of economic growth implies the domination of social investments in the highest levels of education;

H_3: Lifelong learning is achieved in Russia due to informal education and self-education. This hypothesis was offered according to the works of Aqib and Zaman (2023) and Yankovskaya et al. (2023), which note that social investments require a flexible approach to learning and, in particular, the development of information education.

To search for an answer to this research question, the factor analysis of the development of higher education in Russia is performed in this paper. In this paper, the authors assess the level of achievement of the global imperatives of the development of education в socio-investment model of economic growth and perform the econometric modelling of the influence of the range of mechanisms of managing the development of education on the achievement of the appropriate imperatives of the development of education in Russia.

This paper's contribution to the literature lies in determining the applicability of the standard mechanisms of managing the development of education in Russia – to what extent they support the achievement of the imperatives of the development of education in Russia. Due to this, the paper clarifies the essence and specifics of implementing the socio-investment model of economic growth in Russia. This paper contributes to the literature through substantiation of the idea that global imperatives of social investments are completely achieved in Russia and proves the most effective governance mechanisms for achievement of these imperatives in Russia.

3 Materials and methodology

The imperatives of the development of education in the new socio-investment model of economic growth in Russia are determined using the method of content analysis and the method of systematization of the provisions of regulatory documents that determine the conceptual foundations of this model. Mechanisms for managing the development of education in the new socio-

investment model of Russian economic growth to achieve imperatives are determined using the regression analysis method.

Unlike cross-panel data techniques which are disclosed, in particular, in Zaman (2023), according to which regressand of one country depends, at the same time, on regressor of many other countries, which is true for commercial investments (e.g., direct foreign investments), when studying social investments with a non-commercial nature it is expedient to dwell on the experience of a specific country, regardless of other countries. Due to this, the method of regression analysis was selected in this paper, for it allowed receiving the most precise and correct results for social investments in Russia without a margin of error caused by cross-panel data techniques.

For each imperative, the most likely factors for its achievement are selected and regression relationships are established between these factors and the degree of achievement of each imperative (separately). To obtain the most reliable results, regression statistics are estimated using the Fisher F-test and only those regression equations that meet this criterion are selected.

The research sample includes the data on Russia (as the research object in this paper) for 2000-2022. Thus, the sample contains 15 observations. This allows covering the entire newest history of Russia, over which it has been implementing its socio-investment model of economic growth. That is, the sample is complete and detailed as much as possible.

The sample contains 15 observations, i.e., it has 14 degrees of freedom. This guarantees the representativeness of the sample and its sufficiency for obtaining high-precision, reliable, and correct results of the regression results given the fact that the number of factor variables does not exceed 3 in each compiled regression model. During the research, we used the following formulas (research models) to calculate regression dependencies.

Model 1: $y_1=a_1+b_{11}x_{11}+b_{12}x_{12}$, where a – constant, and b – regression coefficient at the corresponding factor variable, which characterizes the change in the resulting variable under the influence of this factor variable. The model shows

how the change in government expenditures for higher education (x_{11}) and 2) the volume of paid services of higher education, provided to the population (x_{12}), influences the share of youth (aged 17–25) who obtain higher education (y_1).

The economic sense of this model is to show the connection between youth obtaining higher education and state-funded places in universities and to demonstrate the value and investment attractiveness of obtaining paid higher education for the youth.

Model 2: $y_2=a_2+b_{21}x_{21}+b_{22}x_{22}+b_{23}x_{23}$, where a – constant, and b – regression coefficient at the corresponding factor variable, which characterizes the change in the resulting variable under the influence of this factor variable. The model shows how employees with higher education (x_{21}), employees with secondary vocational education with mid-level training programmes (x_{22}), and employees with secondary vocational education with training programmes for qualified workers and public officers (x_{23}) influence the employment level (y_2).

The economic sense of this model is to show the differences in the level of employment among the economically active population (able-bodied population that presents offers in the labour market) with different levels of education. In particular, the model allows determining whether higher education provides advantages during employment for university graduates in the labour market.

Model 3: $y_3=a_3+b_{31}x_{31}+b_{32}x_{32}+b_{33}x_{33}$, where a – constant, and b – regression coefficient with the corresponding factor variable, which characterises the change in the resulting variable under the influence of this factor variable. The model shows how the share of the population that obtains formal education (x_{31}); the share of the population that obtains informal education (x_{32}), and the share of the population with self-education (x_{33}) influence the share of the population that obtains life-long education (y_3).

The economic sense of this category is to reflect the preferences of the subjects of life-long learning as to the forms of education. In particular, the model shows the level of popularity of traditional (formal, university) education and the prospects and demand for the modern new forms of education (informal, self-

education), which are implemented, in particular, through remote education that received new impulse for development during the lockdown against the background of the COVID-19 pandemic.

Using the simplex method, based on the selected reliable regression models, recommendations are made on the management of factors in order to achieve the imperatives of the development of education in the new socio-investment model of economic growth of Russia for the period up to 2025. Empirical data for the research is given in Table 1. The research was performed based on the dynamics of the period of 2000-2022.

[INSERT TABLE 1 HERE]

The first resulting variable is the proportion of youth (17-25 years) enrolled in higher education (y_1). Factor variables that potentially influence it are as follows: 1) state expenditure on higher education at current prices (x_{11}) and 2) the volume of paid higher education services to the population, million rubles (x_{12}). The second resulting variable is the employment rate (y_2). Factor variables that potentially influence it are as follows: 1) employed with higher education (x_{21}); 2) employed with secondary vocational education in middle-level training programs(x_{22}) and 3) employed with secondary vocational education under training programs for skilled workers, employees (x_{23}).

The third resulting variable is the percentage of the population participating in ongoing education (y_3). Factor variables that potentially influence it are as follows: 1) the proportion of the population receiving formal education (x_{31}); 2) the percentage of the population receiving non-formal education (x_{32}) and 3) the proportion of the population choosing self-education (x_{33}). The answer to the research question posed is the selected factor variables of state regulation (x), the connection between which and the resulting variables (y) is positive, as well as the forecasted growth rate of the resulting variables (y) due to the optimisation of the impact of factor variables (x) on them.

4 Results

The content analysis and systematization of the provisions of regulatory documents that determine the conceptual foundations of the new socio-investment model of Russian economic growth made it possible to formulate its three imperatives. Imperative 1: Ensure the fullest possible enrolment of young people (17-25 years old) in higher education. In 2022, according to Table 1, only 32.5% of youth were enrolled in higher education. The regression dependence of youth enrolment in higher education on potential factors in Russia is reflected in Formula 1.

$$y_1=30.28-0.0008x_{11}+0.00001x_{12} \quad (1)$$

According to Figure 1, youth enrolment in higher education (y_1) is insignificant (regression rate 0.00001) as higher education fees increase (x_{12}). The multiple determination (R^2) is moderate and equals 0.4311. Significance F equals 0.2911 – therefore, equation (1) conforms to the level of significance of 0.3. The calculated value of F was 1.3700, and the table value of F for 2 variables and 11 observations at the level of significance 0.3 is 1.3333. Since the calculated F is smaller than the F Table, the Fisher test was not passed, and the resulting regression equation was not statistically significant at the significance level of 0.3. Due to insufficient reliability, it will not be considered further in this research.

Imperative 2: combating unemployment and increasing employment. According to Table 1, in 2022, employment in Russia was only 56.5%. This indicates high unemployment. The regression dependence of employment on potential factors in Russia is reflected in Formula 2.

$$y_2=-0.6993+0.4910x_{21}+0.6619x_{23} \quad (2)$$

According to Figure 2, with an increase in the share of the employed population with higher education (x_{21}) by 1%, the total employment level (y_2) in Russia increases by 0.4910%. With an increase in the proportion of the employed population with secondary vocational education under training programs for skilled workers (x_{23}) by 1%, the total employment level (y_2) in Russia increases by 0.6619%. The multiple determination (R^2) is high and is 0.8568. Significance F

equals 0.0017 – therefore, equation (1) conforms to the level of significance of 0.01. The calculated value of F was 10.1271, and the table value of F for 3 variables and 11 observations at the level of significance 0.01 is 6.2167. Since the calculated F is greater than the F Table, the Fisher test is passed, and the resulting regression equation is statistically significant at a significance level of 0.01, that is, reliable.

Imperative 3: percentage of the population participating in ongoing education, %. According to Table 1, in 2022, only 65.3% of the Russian population is covered by ongoing education. The regression dependence of ongoing education on potential factors in Russia is reflected in Formula 3.

$$y_3=-1.9635-0.3808x_{31}-0.0319x_{32}+1.3972x_{33} \quad (3)$$

According to Figure 3, with an increase in the proportion of the population choosing self-education (x_{33}), by 1%, the percentage of the population participating in ongoing education (y_3), in Russia increases by 1.3792%. The multiple determination (R^2) is very high, equalling 0.9720. Significance F is $3.29*10^{-7}$ – therefore, equation (1) conforms to the level of significance of 0.01. The calculated value of F was 62.8702, and the table value of F for 3 variables and 11 observations at the level of significance 0.01 is 6.2167. Since the calculated F is larger than the F Table, the Fisher test is passed, and the resulting regression equation is statistically significant at a significance level of 0.01, that is, reliable.

Using the simplex method, based on the selected reliable regression models (y_2, y_3), the following recommendations for managing factors were compiled to achieve educational development imperatives in the new socio-investment model of Russian economic growth for the period up to 2025 (Figure 4).

[INSERT FIGURE 1 HERE]

According to Figure 1, the proposed recommendations on the management of factors to achieve the imperatives of the development of education in the new socio-investment model of economic growth of Russia for the period until 2025 include the following:

- Increase in employment among the population with higher education by 34.9%;
- Increase of 49.5% in the proportion of the employed population with secondary vocational education in vocational training programs;
- Increase in the proportion of the population choosing self-education by 29.6%.

Due to the implementation of the proposed recommendations, the employment rate in Russia will reach 90%, which means that unemployment will become structural (not exceeding 10%), and the share of the population receiving ongoing education will increase to 90%.

5 Discussion

This paper contributes to the literature through the description of the imperatives of education development in the new socio-investment model of Russia's economic growth and the specification of governance mechanisms that allow achieving these imperatives. New results that are obtained in this paper are presented in Table 2 and compared to the existing literature from the position of the distinguished imperatives of higher education development.

[INSERT TABLE 2 HERE]

As shown in Table 2, the results obtained helped reconsider the imperatives and governance mechanisms of the development of education in the new socio-investment model of Russia's economic growth. It was determined that, unlike Bisht and Pattanaik (2021), Dereli (2022), Enache et al. (2020) and Hermannsson et al. (2020), the key factor of the proportion of youth (17-25 years) enrolled in higher education is not state expenditure on higher education at current prices but the volume of paid higher education services to the population (in mathematical terms, the coefficient of regression equals 0.00003).

Critical analysis of the results obtained in light of previous works showed that such global imperative as mass availability of higher education for the youth is indeed insured in Russia – but not by means of government investments but by means of private investments, which determines the specifics of the new socio-investment model of economic growth in Russia (hypothesis H_1 was proven in support of Andronova and Ryazantsev, 2023; Dianovaa et al., 2023).

It was determined that, unlike Köpsén (2022), Maxyutova et al. (2022), Silliman and Virtanen (2022) and Vermeire et al. (2022), factors of not all levels facilitate the fight against unemployment: not secondary vocational education in middle-level training programs but only employed with higher education and employed with secondary vocational education under training programs for skilled workers, employees (in mathematical terms, the regression coefficients equal 0.24 and 1.56, accordingly).

Critical analysis of the results obtained in light of previous works showed that such global imperative as the fight against unemployment is indeed ensured in Russia – but not by means of a lower level of post-secondary education but by means of higher levels of post-secondary education, which determines the specifics of the new socio-investment model of economic growth in Russia (hypothesis H_2 was proven in support of M. Khan, 2023; Nabi et al., 2023).

In contrast to Bahl et al. (2022), Ludolph (2023), Müller et al. (2022), Stenberg (2022) and Stracke et al. (2022), it was proved that the main factor of the percentage of the population participating in ongoing education is not formal education but non-formal education and self-education (in mathematical terms, the regression coefficients equal 0.19 and 0.70, accordingly).

Critical analysis of the results obtained in light of previous works showed that such global imperative as lifelong learning is indeed ensured in Russia, but not by means of formal education but by means of informal education and self-education, which determines the specifics of the new socio-investment model of economic growth in Russia (hypothesis H_3 was proven in support of Aqib and Zaman, 2023; Yankovskaya et al., 2023).

The limitation of this paper is the discovered absence of a statistically significant contribution of the generally accepted mechanisms of managing the development of education – government financing of the activity of universities and allocation of state-funded places, as well as an increase in the production capacity of universities during provision of paid educational services – to the achievement of such global imperative of the development of education as the proportion of youth (17-25 years) enrolled in higher education in Russia.

On the whole in Russia, this global imperative of the development of education is implemented moderately: the proportion of youth (17-25 years) enrolled in higher education in Russia was 32.5% in 2022. The results obtained allow concluding that this imperative is not fully achieved in modern Russia, and the manageability of this imperative with the help of standard mechanisms in Russia is reduced. It also remains unclear to what extent the imperative of receiving higher education by youth is needed for the implementation of the socio-investment model of economic growth in Russia, and what alternative (specific for Russia) mechanisms of education management are peculiar to Russia.

6 Conclusion

Therefore, all three proposed hypotheses were proven. Three imperatives for the development of education were identified in the new socio-investment model of Russian economic growth. Imperative 1: ensure the fullest possible enrolment of young people (17-25 years old) in higher education. In 2022, only 32.5% of young people were enrolled in higher education, therefore, the imperative has not been achieved, but, as regression analysis showed, it does not lend itself to the operation of standard governance mechanisms.

Imperative 2: fighting unemployment and increasing employment. In 2022, employment in Russia was only 56.5%. To achieve the imperative by 2025 (to bring employment to 90%), it is recommended to increase the level of employment among the population with higher education by 100% and increase the share of the

employed population with secondary vocational education under training programs for skilled workers by 61.7%.

Imperative 3: mass participation of the population in ongoing education. In 2022, only 65.3% of the Russian population is covered by ongoing education. In order to achieve the imperative by 2025 (bringing the proportion of the population receiving continuing education to 90%), an increase in the proportion of the population choosing self-education by 29.6% is recommended.

The scientific novelty of the paper lies in the disclosure of previously unknown cause-and-effect relationships of the implementation of social investments in Russia. Due to this, the paper ensured the practical development and specification of the new socio-investment model of economic growth in Russia. The paper clarified and specified the imperatives of social investments, which were previously known from international practice but were not determined in Russia. The paper also offered optimal governance mechanisms for each imperative of the socio-investment model of economic growth in Russia. The paper specified the most preferable sources of social investments and the most promising levels of education and forms of learning for the placement of social investments in Russia.

The theoretical significance of the paper lies in the specification of the cause-and-effect relationships of the development of education in the new socio-investment model of Russia's economic growth. The practical significance of the paper is that the recommended most prospective governance mechanisms allow the most effective development of education in the new socio-investment model of Russia's economic growth in its key imperatives.

Short-term policy implications consist in the creation of a favourable institutional environment in the system of education for receiving paid services of higher education, receiving education at the higher levels of post-secondary education, and lifelong learning based on informal education and self-education. Mid-term policy implications consist in stimulation for social investments in higher education in Russia. Long-term policy implications are connected with the

reduction of government financing and control over the system of post-secondary education in Russia, i.e., deregulation in favour of market self-governance.

Future scientific studies should elaborate on and shed light on the place and role of the imperative of the proportion of youth enrolled in higher education in the realisation of the socio-investment model of economic growth in Russia and to identify the alternative mechanisms of education management that are specific for Russia. Further research in continuation and based on this paper should be devoted to this.

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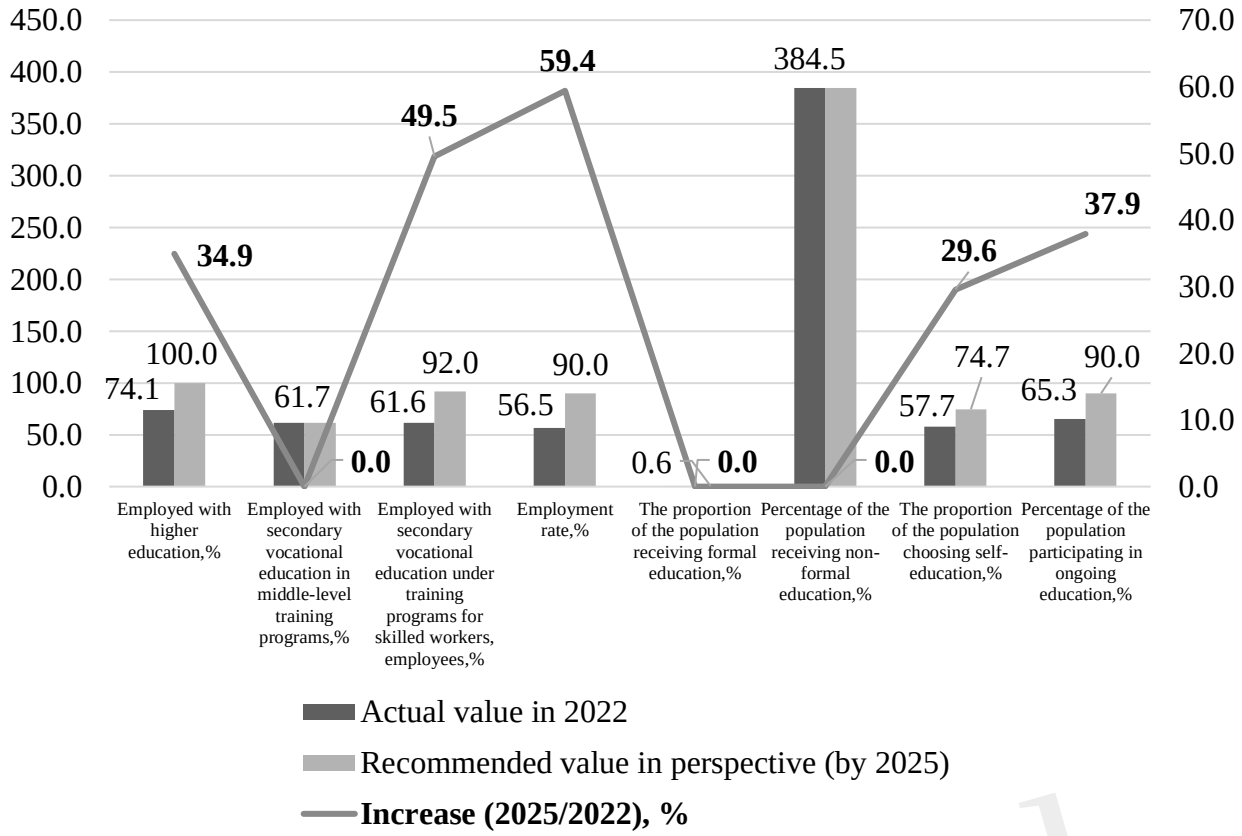

Figure 1. Recommendations on the management of factors to achieve the imperatives of the development of education in the new socio-investment model of economic growth of Russia for the period until 2025

Source Calculated and built by the authors.

Table 1. Imperatives and potential factors of education development in the new socio-investment model of Russia's economic growth in 2000-2022.

Year	Imperative 1 and its factors			Imperative 2 and its factors				Imperative 3 and its factors			
	The proportion of youth (17-25 years) enrolled in higher education,%	State expenditure on higher education at current prices, RUB billion	The volume of paid higher education services to the population, million rubles	Employment rate,%	Employed with higher education,%	Employed with secondary vocational education in middle-level training programs,%	Employed with secondary vocational education under training programs for skilled workers, employees,%	Percentage of the population participating in ongoing education,%	The proportion of the population receiving formal education,%	Percentage of the population receiving non-formal education,%	The proportion of the population choosing self-education,%
	y_1	x_{11}	x_{12}	y_2	x_{21}	x_{22}	x_{23}	y_3	x_{31}	x_{32}	x_{33}
2000	23.0	1,376.4*	41,530.0	58.5	79.0	72.5	68.1	22.4*	4.5*	8.0*	17.4*
2005	32.3	1,376.4	152,670.0	61.3	81.3	75.0	75.5	22.4	4.5	8.0	17.4
2010	35.4	2,259.1	326,100.0	62.7	81.2	73.3	72.3	21.7	1.3	6.7	17.8
2011	34.8*	2,633.5	352,515.5*	63.4*	81.4*	73.5*	72.5*	24.5*	2.0*	10.0*	20.1*
2012	34.3*	3,002.1	378,931.0	64.1*	81.6*	73.6*	72.8*	27.3	2.7	13.3	22.4
2013	33.7	3,339.8	449,233.0	64.8	81.8	73.8	73.0	31.0	2.5	12.4	28.5
2014	32.9	3,518.4	486,543.0	65.3	82.2	73.8	72.8	27.0	2.3	13.8	24.6
2015	32.1	3,557.3	539,685.0	65.3	77.7	72.8	72.1	24.0	8.3	11.4	20.4
2016	31.8	3,550.3	567,312.0	65.7	81.5	72.6	72.0	29.5	7.9	15.6	25.5
2017	32.1	3,757.9	613,294.0	65.5	81.5	72.0	71.0	26.0	4.6	10.3	22.2
2018	32.7	3,668.6	655,472.0	59.8	77.7	66.7	66.7	22.9*	2.7*	6.8*	19.3*
2019	32.2	4,050.7	696,769.0	59.4	77.1	66.4	65.1	22.9*	2.7*	6.8*	19.3*
2020	32.3	4,324.0	646,303.0	58.4	76.1	64.8	63.9	43.2	1.6	26.1	27.8
2021	32.4*	4,615.7*	599,492.2*	57.4*	75.1*	63.2*	62.7*	53.1*	0.9*	100.2*	40.0*

2022	32.5*	4,927.2*	556,071.8*	56.5*	74.1*	61.7*	61.6*	65.3*	0.6*	384.5*	57.7*

* due to the absence of initial data in these cells, the data obtained during the author's evaluation is given to avoid gaps in the data system.

Source: compiled by the authors based on the materials of the Institute of Statistical Research and Knowledge Economics of the National Research Institute; HSE, Ministry of Science and Higher Education of the Russian Federation, Ministry of Education of the Russian Federation, Federal State Statistics Service (2022).

Table 2. News results, obtained in the paper, compared to the existing literature from the position of the distinguished imperatives of higher education development.

Imperative and the logic of its reflection in the literature	**Existing literature**		**News results that were obtained in the paper**	
	Treatment of the imperative in the literature	**Literature sources**	**Qualitative treatment of the imperative in the paper given the new obtained results**	**The mathematical expression of the factor's contribution to the implementation of the imperative (value of the regression coefficient)**
Key factor of the proportion of youth (17-25 years) enrolled in higher education	State expenditure on higher education at current prices	Bisht and Pattanaik (2021), Dereli (2022), Enache et al. (2020), Hermannsson et al. (2020)	The volume of paid higher education services to the population	0.00003
Factors of employment that facilitate the fight against unemployment	Employed with the education of all levels, including secondary vocational education in middle-level training programs	Köpsén (2022), Maxyutova et al. (2022), Silliman and Virtanen (2022), Vermeire et al. (2022)	Only Employed with higher education and Employed with secondary vocational education under training programs for skilled workers, employees	0.24 and 1.56
Factors of percentage of the population participating in ongoing education	Formal education	Bahl et al. (2022), Ludolph (2023), Müller et al. (2022), Stenberg (2022), Stracke et al. (2022)	Non-formal education and Self-education	0.19 and 0.70

Source: authors.