Czech University of Life Sciences Prague

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Diploma Thesis

**Impacts of human capital, with a
focus on education and the economy in Belarus.**

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Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

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Impacts of human capital, with a focus on education and the economy in Belarus

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Objectives of thesis

This study aims to comprehensively analyze the relationship between human capital factors and economic growth, assess their mutual influence, and explore the potential for enhancing human capital with a focus on education as a financial tool in the contemporary economy of the Republic of Belarus. The primary focus is on the object of economic growth.

Methodology

The research methodology involves analyzing and modeling economic growth using the production function, testing hypotheses, and constructing models through software.

Questionnaires will be used, which will allow for gathering a large amount of data in a short period of time which we can analyze quantitatively.

The information in this thesis rests upon the analysis of the available data from scientific databases, mainly in the form of scientific periodicals and papers in the English language. The used databases include Web of Science, Science Direct, and Google scholar. A systematic literature review is also performed using relevant information from the databases of the Belarus ministries, UNESCO, and ILO.

The proposed extent of the thesis

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Keywords

HUMAN CAPITAL, EMPLOYMENT, EDUCATION, ECONOMIC GROWTH.

Recommended information sources

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Declaration

I declare that I have worked on my diploma thesis titled ***"Impacts of human capital, with a focus on education and the economy in Belarus"*** by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break any copyrights.

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Impacts of human capital, with a focus on education and the economy in Belarus

Abstract

This thesis investigates the relationship between education, human capital development, and economic performance, focusing on Belarus as a case study. The study begins with a comprehensive literature review, exploring the theoretical framework of human capital theory and its implications for higher education. It examines the connection between education and human capital development, emphasizing the impact of different levels of education, including primary, secondary, and tertiary education, on the economy and employment. Additionally, the literature review explores the concept of the knowledge economy and its relationship with economic performance.

The practical part of the thesis involves analysing selected data sets related to GDP per capita, unemployment rates, internet usage, literacy rates, educational indices, and educational expenditures as a percentage of GDP in Belarus from 2005 to 2022. The approach to modelling involves verifying the chosen model, assessing autocorrelation, multicollinearity, and the normality of residuals. Furthermore, a SWOT analysis is conducted to identify the strengths, weaknesses, opportunities, and threats associated with education and human capital development in Belarus.

Overall, this thesis aims to contribute to the understanding of the role of education in human capital development and its implications for economic performance, with practical insights derived from the analysis of data specific to Belarus.

Keywords: Human capital, employment, education, economic growth.

Dopady lidského kapitálu se zaměřením na vzdělávání a hospodářství v Bělorusku

Abstrakt

Tato práce zkoumá vztah mezi vzděláním, rozvojem lidského kapitálu a ekonomickou výkonností, přičemž se zaměřuje na Bělorusko jako případovou studii. Studie začíná obsáhlým přehledem literatury, který zkoumá teoretický rámec teorie lidského kapitálu a její důsledky pro vysokoškolské vzdělávání. Zkoumá souvislost mezi vzděláním a rozvojem lidského kapitálu, přičemž klade důraz na vliv různých úrovní vzdělání, včetně základního, středního a vysokoškolského, na ekonomiku a zaměstnanost. Kromě toho se přehled literatury zabývá konceptem znalostní ekonomiky a jejím vztahem k ekonomické výkonnosti.

Praktická část práce zahrnuje analýzu vybraných datových souborů týkajících se HDP na obyvatele, míry nezaměstnanosti, využívání internetu, míry gramotnosti, indexů vzdělanosti a výdajů na vzdělávání v procentech HDP v Bělorusku v letech 2005 až 2022. Přístup k modelování zahrnuje ověření zvoleného modelu, posouzení autokorelace, multikolinearity a normality reziduí. Dále je provedena SWOT analýza, jejímž cílem je identifikovat silné a slabé stránky, příležitosti a hrozby spojené se vzděláváním a rozvojem lidského kapitálu v Bělorusku.

Celkově si tato práce klade za cíl přispět k pochopení úlohy vzdělávání v rozvoji lidského kapitálu a jeho důsledků pro ekonomickou výkonnost, a to s praktickými poznatky získanými na základě analýzy dat specifických pro Bělorusko.

Klíčová slova: Lidský kapitál, zaměstnanost, vzdělání, hospodářský růst.

Table of content

1. Introduction

The thesis is focused on analyzing how educational attributes might impact the development of economy. The advent of the knowledge economy has elevated as a gateway to exploring the nexus between education, human capital, and economic performance, with a particular focus on Belarus as a case study.

Chapter 3 delves into the theoretical underpinnings of human capital theory and its implications for higher education. A preview of the "Human Capital" theory and its essence sets the stage for understanding the pivotal role of education in nurturing human capital. It explores the connection between higher education and human capital development, highlighting the human capital approach and the impact of education on the economy across different levels, including primary, secondary, and tertiary education.

Furthermore, the chapter delves into the specific roles of primary, secondary, and tertiary education in shaping human capital and contributing to economic growth. It examines the significance of making secondary education a goal of the state and elucidates the role of tertiary education in fueling the knowledge economy.

Chapter 3 also delves into the intersection of education and employment, particularly within the context of the knowledge economy and its implications for economic performance. It underscores the importance of education in enhancing productivity and fostering innovation, thereby driving economic growth and job creation.

Moving beyond theoretical foundations, Chapter 4 delves into the practical aspect of the study. It involves an analysis of selected datasets pertaining to GDP per capita, unemployment rates, internet usage, literacy rates, educational indices, and educational expenditures as a percentage of GDP in Belarus from 2005 to 2022. The chapter outlines the approach to modelling, including model verification, assessment of autocorrelation, multicollinearity, and the normality of residuals. Additionally, it includes a SWOT analysis to identify the strengths, weaknesses, opportunities, and threats associated with education and human capital development in Belarus.

Chapter 5 presents the results of the analysis and provides a platform for discussion and recommendations based on the findings. It offers insights into the relationship between education, human capital, and economic performance in Belarus, and proposes recommendations for policymakers and stakeholders to leverage education as a driver of economic growth and prosperity.

Chapter 6 draws the conclusion of the whole thesis.

2. Objectives and Methodology

2.1 Objectives

This study aims to comprehensively analyze the relationship between human capital factors and economic growth, assess their mutual influence, and explore the potential for enhancing human capital with a focus on education as a financial tool in the contemporary economy of the Republic of Belarus. The primary focus is on the object of economic growth.

2.2 Methodology

The methodology for this master thesis involves collecting yearly data from 2005 to 2022 in Belarus to investigate the relationship between education and economic development. Six factors are analyzed overall, focusing on a hypothesis of a positive correlation between Gross Domestic Product (GDP) and the following indicators:

1. B_1 – Unemployment % labor force
2. B_2 – Using internet of total population %
3. B_3 – Literacy rate of population %
4. B_4 – Educational Index
5. B_5 – Educational Spendings as a % of total GDP

Multiple regression model is employed. Assumptions such as autocorrelation, multicollinearity, normality of residuals, and heteroskedasticity are checked. Regression analysis is conducted using statistical software to estimate coefficients and assess significance. Results are interpreted, conclusions drawn, and limitations discussed, all documented within the thesis.

3. Literature Review

This chapter explores the examination of the impact of human capital on the economy and the wider implications of education for economic growth.

The productivity of a nation's economy improves as the percentage of educated workforce rises, since educated people are better equipped to do occupations that involve reading and critical thinking with more efficiency. Nevertheless, pursuing a more advanced degree of study comes with an associated expense. The country may achieve economic advancements by implementing fundamental literacy initiatives, without the need of establishing a comprehensive network of colleges or institutions. those that have a higher proportion of their people attending and completing their education in schools have more rapid economic development compared to those with a less educated workforce. Consequently, several nations use financial resources to enhance economic performance by investing in basic and higher education. Education may be seen as a kind of investment in human capital, just as investing in improved equipment. As per UNESCO and the United Nations Human Development Program, advanced countries have a higher enrolment percentage of children of official secondary school age compared to developing nations (Bhattarai et al., 2015). The concept of "Primary education", "Secondary Education", "Tertiary Education" are discussed in the following chapters.

3.1 Preview Of "Human Capital" Theory and Its Essence

The foundation of human capital theory is predicated upon the notion that formal education plays a crucial role in enhancing the productive capabilities of a society. Human capital theory places significant emphasis on the role of education in enhancing the efficiency and productivity of individuals in the workforce. This is achieved via the augmentation of cognitive resources, which are essential for generating revenue from human capabilities. These capabilities are influenced by both intrinsic talents and investments made in human development. The allocation of resources towards formal education is seen as a strategic investment in human capital, a concept that advocates of this theory have deemed to be as valuable, if not more so, than investments in physical capital (Woodhall, 1997).

The Human Capital Theory (HCT) arrives at the conclusion that investments in human capital will result in higher economic outputs; nevertheless, the validity of the theory may be difficult to verify and even contradictory at times. In the past, a nation's economic might was mostly determined by the actual physical assets it had, such as land, factories, and other types of machinery and equipment. Although human labour was an essential component, the value of the company increased mostly as a result of investments made in fixed assets such as machinery and equipment. According to Becker (1975), contemporary economists appear to be in agreement that education and health care are the keys to enhancing human capital, which will eventually result in increased economic outputs for the country.

It's possible that in the emerging global economy, investing in human capital is going to be more vital than buying physical assets. In his phenomenally popular book published in 2007, ***"The World Is Flat",*** Thomas Friedman devotes a significant amount of space to discussing the significance of education in the context of the emerging global information economy. Friedman is a journalist, and should not be confused with the renowned economist Milton Friedman. Although the word "human capital" is not defined anywhere in the book, several examples and explanations are provided to show why it is so important to a country's economic growth to invest in its people and its educational system.

Education has lately been re-theorized as an economic tool, principally in accordance with the human capital theory, all over the western world's nations Becker (1975). The human capital theory has been an extremely prominent economic theory in western schools since the early 1960s, when it was developed. It is responsible for providing the foundation for government policy. It is becoming increasingly accepted as a critical factor that determines the functioning of the economy. A vision of persons as human resources and many economic metaphors, such as advancements in ***technology***, ***research***, ***innovation***, ***efficiency***, ***schooling***. and competitiveness, have been used as major strategies in determining economic success. One of the most important of these strategies is the former. However, economic factors by themselves have not been the determining factor in schooling in the past.

The foundation of the field of human capital was established by Smith (1976). During the course of the next two centuries, two distinct schools of thought emerged. The first school of theory made a clear distinction among gained abilities that were categorized as capital and human beings themselves, who weren't included in this classification. According to the second perspective, it was argued that individuals essentially had the features of capital. Modern human capital theory posits that all human behaviour is driven by the economic self-interest of people who participate in freely competitive marketplaces.

The Organization for Economic Cooperation and Development (OECD, 2018) claims that internationalism serves as a mechanism for enhancing the quality of education. In accord with the theory of human capital, it has been stated that the general economic performance of the OECD nations is growing more directly dependent upon their knowledge stock and their learning capacity. The OECD is actively seeking to redefine the role of education in relation to the essential human capital skills needed in globally interconnected organizations.

The achievement of a country in relation to human growth is mostly contingent upon the accumulation of physical and human capital resources. Therefore, contemporary social research places emphasis on the study of human behaviour within the context of economic production. In broad terms, human capital refers to the resources that individuals acquire to augment their economic production. Moreover, human capital pertains to the comprehensive implementation of education and development strategies.

Human capital theorists claim that a population's productivity is positively influenced by its level of education. Human capital theory places significant emphasis on the role of education in enhancing the productivity and efficiency of individuals in the workforce. This is achieved via the augmentation of cognitive resources, which are essential for economically productive human capabilities. These capabilities are influenced by both inherent abilities and investments made in human development. The allocation of resources towards formal education is seen as a valuable investment in human capital, a concept that proponents of this idea believe to be as, if not more, significant than physical capital.

Babalola (2003) suggests that the rationale for investing in human capital may be attributed to three main considerations:

- It is essential to provide the next generation with the requisite body of information that has been amassed by preceding generations.
- It is important to provide the next generation with education on the use of current information for the purpose of developing novel goods, introducing innovative procedures and manufacturing techniques, as well as enhancing social services.
- It is essential to foster an environment that promotes the development of novel ideas, products, processes, and methodologies by means of innovative approaches.

According to Fagerlind and Saha (1997), the concept of human capital theory offers a fundamental rationale for substantial public investment in education, regardless of whether a country is classified as developing or already developed. The idea aligns with the democratic beliefs and liberal progressivism prevalent in the majority of Western cultures. The attractiveness of education was founded on the perceived economic benefits it offered, both at the broader societal level and on an individual scale. The implementation of strategies aimed at fostering investment in human capital has been seen to provide significant economic development for societies. The investment in question was believed to provide benefits for people, namely in terms of their economic prosperity and accomplishments. The prevailing consensus among economists is that the human resources of a country, rather than its capital or tangible assets, are the primary factors that shape and dictate the kind and rate of its economic and social progress (Kedir & Bani, 2012: 15). The human resources of a country are considered to be the fundamental foundation of its riches. Capital and natural resources are considered passive elements of production, since they do not possess agency or the ability to act independently. In contrast, human beings are the active agents responsible for the accumulation of capital, the exploitation of natural resources, the establishment of social, economic, and political institutions, and the advancement of national growth.

3.1.1 Connection between Higher Education and Human Capital Development

The relationship between higher education and the development of human capital has been associated with the residual impact of globalization, beneficial outside effects, and the promotion of innovation and creativity (Makiw et. el. 1992: 34). Tertiary education has a

crucial role in enabling countries to stay on par or bridge the gap with advanced technological communities in a knowledge-based economy. Higher education graduates are more likely to possess an increased understanding and enhanced ability to use emerging technology. Additionally, they are more prone to independently acquire new tools and abilities. Enhancing one's knowledge may also enhance their talents, while the increased confidence and expertise acquired via higher education can foster entrepreneurship, resulting in favorable impacts on employment generation. In terms of residual impact, postsecondary education also yields indirect advantages for economies (Weil et. el. 1992: 12). By cultivating highly skilled educators, it elevates the quality of elementary and secondary educational institutions and provides secondary school graduates with enhanced prospects for economic progress. Through the education and training of doctors and other healthcare professionals, it enhances the overall health of a population, hence increasing workplace productivity (Romer et. el. 1992: 14). In addition, by fostering leadership and management abilities, it may provide nations with the skilled professionals necessary to create a policy framework conducive to economic expansion. Establishing resilient and equitable legal and political institutions and integrating them into the social framework of a nation, as well as fostering a culture of entrepreneurship and economic growth, require the application of sophisticated expertise and competent decision-making abilities. The skills provided by higher education are crucial in tackling environmental issues and enhancing security against both internal and external concerns.

In addition, higher education (HE) has a spillover effect, where students may use their newly acquired expertise and skills to enhance the abilities and comprehension of their non-graduate colleagues. The concept that schooling has beneficial external effects is not a novel one. A number of classical economists advocated for government intervention in education, citing the positive externalities that society would benefit from via a better educated workforce and population (Van-Den-Berg, 2016: 34). Advocates of this perspective on education highlight the strong connection between the creation of new products and educational attainment. According to Van-Den-Berg (2016: 35), nations leading in technology also have the highest levels of education among their people.

3.1.2 Human Capital Approach

The development of the field of economic of education within the framework of neo-classical economics and its continued significance in contemporary policy-making may be linked to the principle of human capital. The area's prominence was further solidified by the awarding of two Nobel prizes to individuals who made significant contributions to the development of the human capital idea and its importance within the economy, as previously indicated. The correlation between human capital theory and the Nobel Prize in Economics is notably remarkable (Sweetland, 1996). Theodore Schultz (1960) and Becker (1964) are widely recognized as the foremost researchers who made significant contributions to the advancement of the human capital theory. It might be argued that Friedman and Kuznets (1945) also made significant contributions. The growth models that were established during the 1980s played a significant role in establishing the connection between education and the overall production function, as elucidated by the theory of endogenous growth. These models also contributed to our understanding of economic growth. In his analysis of "development as freedom," Nobel Laureate in Economics, Hausman (2017) emphasized the essential importance of education within the ability approach.

Becker (1964) used the neoclassical economic concept of optimization to comprehend different elements of household choices, the most notable of which remains that of spending resources for education. Becker did this in order to understand multiple facets of household choices. Spending money on an individual's education is regarded as a financial investment because doing so necessitates a sacrifice of resources for what are likely to be no immediate benefits, but does carry the prospect of potential acquires as a result of higher compensation collecting to the person as compared to what would not have been the case with a lower level of education. At the national level, the significance of education and, more specifically, the production of human capital, has increased in order to stimulate growth. Education has assumed the dominant position in policy debate.

The following is an explanation of the logic for the introduction of the idea of human capital and its definition that may be found in Schultz (1960), but it is only in a few lines:

"I suggest that education be seen as an investment in people, and that the outcomes of that investment be regarded as a sort of capital. As a result of the fact that education is absorbed

into the individual who receives it, I will refer to it as Human Capital...If anything contributes productive service value to the economy, then that thing qualifies as a kind of capital" – Schultz (1960: 45).

According to the human capital idea, investments in individuals and society provide significant economic advantages. According to Schultz (1960: 46), the main principle of this theory is that people allocate their resources towards self-investment, driven by the expectation of future benefits, both monetary and non-monetary, rather than only for immediate gratification. An educated populace serves as a valuable asset for fostering productivity, creativity, and innovation, so contributing not just to individual advancement but also to the attainment of comprehensive and inclusive development. This implies that the development of human capital, including both formal and informal education, on-the-job training, and experiential learning, together contributes to the improvement of individuals' economic capacities. Schultz (ibid.) identified five primary investment areas that have the potential to enhance human capacities. The five main factors that contribute to human capital development are:

1. Access to healthcare facilities and services, which includes physical health, energy, and overall vitality.
2. On-the-job training, which can be in the form of traditional apprenticeships.
3. Formal schooling at the primary, secondary, and tertiary levels.
4. Adult education programs, such as extension programs in agriculture.
5. Migration of individuals and families to adapt to new job opportunities. Furthermore, people allocate their time towards job hunting or invest resources in acquiring knowledge on work prospects (Schultz (1960: 77).

Education might be perceived both, as a usual consumer good and also as a capital good. In the first case, it yields satisfaction from all processes thru which a student goes, such as: socialization, learning processes, school campus, participation in extra – curricular activities and simply enjoying and exposure to various knowledge experience. Education is a tool that workers use to create commodities and services. In addition to the manual dexterity and knowledge gained via formal education and training, the ever-increasing productivity of physical capital today is mostly the result of novel concepts, original ways

of thinking, and extensive scientific investigation. Education and training lead to improvement in skills, which in turn transforms capital and labour in terms of the production function. Additionally, it has the potential to cause societal and economic shifts. Both strictly defined economic growth and more generalized notions of development need it. Health and nutrition improvements, reduced population growth, better living conditions for all, more informed citizens who actively engage in democratic and legal processes, more thoughtful choices for communities as engaged members of society, more private and public pursuit of principles like equality, unity, and freedom, and less bribery are all possible outcomes. A nation's prosperity is built on its human resources, and the key to unlocking those riches is an educated populace.

A groundbreaking addition to the notion of human capital (HC) was made by Becker (1964) referencing the calculational rationality of human people, he offered a theoretical and empirical study of human capital development, specifically focusing on schooling. Adapted from Neoclassical theory, the rational choice model states that people are hardwired to compete for the best possible outcomes. One way to look at the core problem about human resources and wage growth is as a series:

Human Capital: A person's cognitive ability is enhanced via education and training, leading to higher output. As a result, the wages of an educated and competent person are usually higher, and this rise in earnings represents a metric of human capital. To sum up, the following is how education becomes a metric for human capital:

Education > cognitive capacity > higher productivity > earnings > a measure of HC.

The human capital approach to education may be summarized by three assertions, as articulated by Grant (2017):

1. The concept of human capital is a complementary idea to the concept of physical capital development.
2. Allocating resources towards education is an act of investment.
(i) Decision makers in education who undertake choices regarding investments may be compared to investors in the capital market.
(ii) The many possibilities available in education are equivalent to the different investment options in other sectors.
(iii) The concept of the "choice rule" in education is comparable to the goal of maximizing returns in the regular capital market.

3. Education or learning process is similar to production carried out by a firm: Input - output analysis.

3.1.3 Impact of Education on Economy

The enrolment ratio and the calculation of education expenditure as a percentage of gross domestic product (GDP) are different measures. The indicator does not consistently reflect the level of education among a country's population. Gross Domestic Product (GDP) is a measure of the total value of goods and services produced by a country. Hence, allocating a significant amount of a country's GDP on education does not guarantee a higher level of education among its people. In the context of enterprises, an employee's intellectual capacity might be seen as a valuable asset. This asset has the potential to be used for the production and provision of marketable goods and services. The greater the number of highly skilled employees hired by a company, the higher the potential production capacity of that company. A knowledge-based economy is characterized by companies seeing education as a valuable resource (Grant, 2017). Investing in higher education, like anything else, incurs an opportunity cost for the worker. The more time one spends in the classroom, the less time one has available for job and generating revenue. Employers provide increased remuneration when work responsibilities need a greater degree of education. Consequently, although an employee may experience a temporary decrease in pay to pursue education, their salaries are likely to increase in the future after completing the training.

The availability and cost of talents in the labor force play a crucial role in determining a country's performance in the international marketplace. With the increasing complexity of services and industrial processes, there is a growing need for professionals who possess advanced levels of education. In order to recruit and retain highly trained personnel, society must find the optimal equilibrium between promoting general fairness and providing compelling financial rewards. Enhancing educational achievement in the population, improving job opportunities, and the subsequent rise in income that accompanies greater educational attainment may together foster economic development and prosperity in OECD nations. Labor income increase in GDP by educational divisions serves as a straightforward indicator to demonstrate the shift towards higher skills and its influence on economic development (OECD, 2012).

The significance of higher education in fostering sustainable economic and social development is progressively growing and is expected to persist in the next decades. Higher education is regarded as a central hub for information and its practical implementation. It is an establishment that significantly contributes to economic growth and development by promoting innovation and improving advanced skills. It is seen as a means of improving the standard of living and tackle significant social and international problems. Higher education is widely recognized as a significant catalyst for economic development, wealth, and competitiveness. According to UNESCO, its social role serves as a connection between the intellectual and pedagogical functions of universities and the advancement of society. Improving a person's abilities is crucial for achieving improved living standards and overall well-being. The crucial factor in generating well-paid jobs and promoting increase in productivity is to invest in the development of information and facilitate its distribution (Bhattarai et al., 2015).

An economy having a workforce that is more highly educated may also excel in these aspects, just as a company with higher-skilled employees. Obtaining skills leads to the development of further abilities and innovative approaches to doing business. Employees gain knowledge from each other, and companies adjust their technology and capital utilization based on the abilities possessed by the workforce. The advantages of having a highly educated workforce are beneficial to everybody, extending beyond the specific firm in which these persons are employed. Moreover, these types of secondary (or overflow) impacts on the company or the economy at large may have particular significance in a progressively competitive global market. Imagine an economy without of individuals with the skills to comprehend instructions, operate an advanced photocopying machine or a computer, or grasp the current social standards. Even if one firm in the economy managed to acquire or acquire certain capabilities, other companies would still face uncertainty in investing in specific equipment or enterprises, since there would be no guarantee of profitability (Dumciuviene, 2014). In addition, a workforce which is more educated is likely to result in a reduction of crime rates and healthier environments, along with more efficient civil agencies. These improvements have several advantages for the business sector. The future expansion and well-being of society depend on industries and services that need a high level of education. In this scenario, an increased number of occupations will need a greater level of educational attainment (Bloom et. el, 2006: Fagerlind & Saha, 1997: Mankiw

et. el, 1992). It is crucial to establish the connections between educational initiatives and other policies, such as research and technology development, as well as the social and economic growth of the nation (De Muro & Burchi, 2007). The essay examines human capital as a productive component that people acquire via education and its influence on increased productivity. The further crucial concern is to the significant influence of education on research, advances in technology, and overall productivity boost.

3.1.4 Primary Education

During the last four decades, a substantial body of research has been accumulated regarding the favorable economic impacts of completing basic school, particularly for those employed in the agricultural sector (UNESCO, 2010). Research conducted by Hanushek et al. (2008) analyzed the effects of educational achievement in fifty nations from 1960 to 2000. The analysis revealed that each extra year of schooling is associated with a 10% rise in an individual's wages and a 0.37% yearly increase in average GDP. According to separate international research, it was said that each extra year of schooling leads to a 10% rise in income (Psacharopoulos and Patrinos, 2004).

According to UNESCO (2010), the economic returns on investment in basic education are often greater in low-income countries compared to high-income nations. Additionally, the returns are also higher for elementary education when compared to secondary or tertiary education. According to the findings of the Commission on Growth and Development (2008), the benefits to society from educated persons are likely to be greater than the benefits they get individually. In 1980, Lockheed, Jamison, and Lau conducted a foundational research study exploring the influence of primary education on agricultural productivity across 13 nations. Their findings demonstrated a noteworthy annual production increase of 8.7% associated with a four-year educational program. A more recent investigation by de Muro and Burchi (2007) delved into the correlation between elementary education and food insecurity across 48 nations. The results revealed that doubling attendance rates in primary schools for rural communities could lead to a substantial 20% to 24% reduction in food insecurity levels. Numerous studies, including one by (Hanushek, 2008) have indicated that the impact of school quality on income surpasses previous estimations.

The occurrence of poverty among families is strongly correlated with educational achievement (UNESCO, 2010). For instance, research discovered that in Papua New Guinea, over 50% of the impoverished population resides in households led by individuals lacking formal education. Similarly, in the Republic of Serbia, households with uneducated members have an income level three times higher than the national average (UNDP, 2010a).

Primary education also has a significant effect on the decrease of poverty and ease of hunger. Providing feeding and body weight tracking in early childhood programs may immediately decrease starvation. Research based on the International Adult Literacy Survey has demonstrated that adult literacy programs can increase earnings potential at a rate comparable to an extra year of schooling (UNESCO, 2010). The example of China over the last two decades has demonstrated that it is feasible to actively address illiteracy and may motivate governments to guide the population into more economically productive industries (UNESCO 2010).

The advancement of excellent learning opportunities for everyone is crucial for both social transformation and long-term economic development opportunities. Promoting fairness in both educational enrollment and the quality of schools across all demographic groups would lead to a more balanced distribution of wealth and diminish socioeconomic disparities as a whole (UNESCO 2010). According to UNESCO 2011, if every student in low-income countries acquired basic reading abilities, it might result in lifting 171 million people out of poverty. This would correspond to a decrease of 12% in the population living on less than $1.25 a day.

3.1.5 Secondary Education

Schultz and Becker, who first introduced the hypothesis in 1960, advocate the notion that education should be viewed as a form of investment. Their primary concern revolves around individuals evaluating both immediate and potential educational investments in light of the anticipated benefits (Grant, 2017: 13). Human capital, as defined by Lameck (2016), encompasses the inherent abilities and talents of individuals that enable them to contribute to economic growth, increase income through skill acquisition, and gather information. According to Grant (2017: 13-14), Human Capital Theory encompasses a range of attributes including knowledge, skills, habits, and social and psychological qualities, such as creativity,

which are demonstrated through labor engagement and economic value generation within a country, however, in his opinion, governmental actors should pay close attention to the context of education, especially from the perspective of governmental expenditures on education and payouts to teaching staff. In this context, Belarus demonstrates effective promotion of education with support from governmental entities.

Even thought, education is a crucial tool for fostering national development and prosperity. This is because investing in the growth of human capital inside a country directly contributes to its economic growth. Consequently, the skills acquired throughout secondary school are anticipated to improve efficiency and the information provided to foster and encourage innovation across a country. According to Human Capital Theory, an increase in the ability and expertise level of the workforce leads to an enhancement in industrial capacity and overall economic performance of a country. Grant (2017: 13-14) believes that the impact of secondary education to national economic expansion happens via its potential to raise the efficiency of an existing work force.

Flora (2019), UNESCO (2017), and Chanksenlian et al. (2020) drew from the work of several experts, including those who contended that without providing education to the population, progress within a nation is unattainable by whatever means. Consumers, who are individuals, want visibility of income increase resulting from education. Sakmurzaeva (2019), in a study examining the impact of education on economic growth in South Korea and Kyrgyzstan, agreed with other scholars in saying that a nation cannot achieve sustained economic growth without a well-educated workforce. According to these scholars Chanksenlian et al. (2020) and Sakmurzaeva (2019), education enables individuals to gain self-awareness and comprehend the world around them. It enhances the quality of their daily existence and steers people and society towards wider societal advantages. Hence, schooling plays a crucial role in enhancing individuals' efficiency and fostering advancements in technology.

The research was done by Pavlova (2014) who cited (WEF, 2014) and UNESCO (2012). Pavlova demonstrated a strong correlation between the secondary education and economic growth in the following countries: Laos (93rd), Cambodia (95th), Myanmar (125th).

The International Competitive Index and secondary enrolment level were considered. The picture – 1, highlights the relationship of economic growth and secondary enrollment.

Picture: 1: Economic and education growth in five countries, with similar results, in 1970 to 2010.
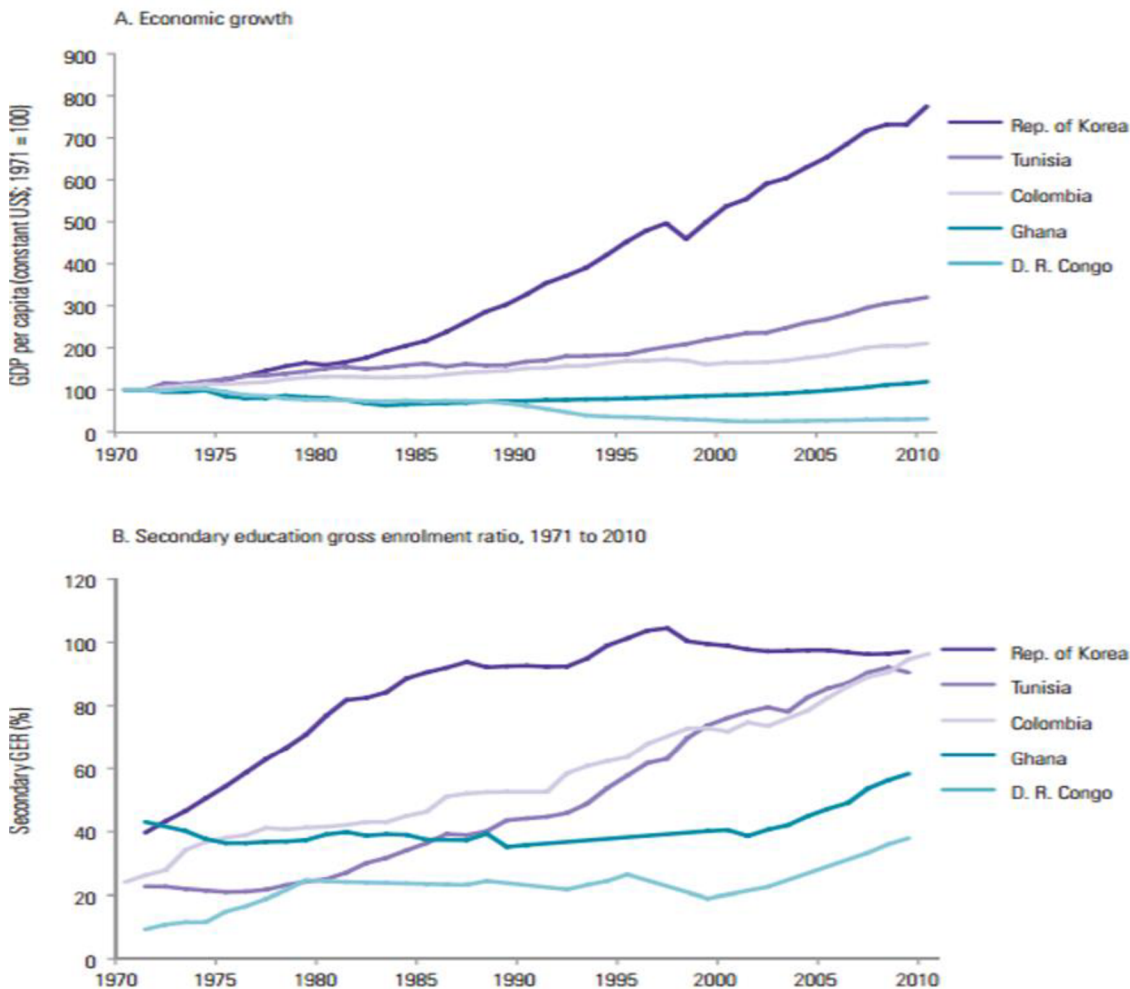
Source: UNESCO (2012).

3.1.5.1 Make secondary education as a goal of a state

In the year 2000, during a summit in New York, global leaders introduced the United Nations Millennium Development Goals (MDGs), which notably included the aim of achieving universal primary education by 2015 as a major goal. The Sustainable Development Goals (SDGs) were subsequently introduced, maintaining the emphasis on education. The objectives were established to guarantee that by 2030, every girl and boy will successfully finish secondary and primary schooling that is accessible, fair, and of high standards, resulting in meaningful and efficient learning results. This signifies an increased acknowledgment of the significance of secondary education. Since 1999, most of the 94 poor

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and middle-income nations that have data on the subject have passed laws to provide free education for secondary school levels. Out of these countries, 66 have included these protections in their constitutions, while 28 have taken additional legislative measures. In 2015, only a small number of countries still charged fees for secondary school students. These countries include Botswana, Guinea, Papua New Guinea, South Africa, and the United Republic of Tanzania (UNESCO 2015).

However, in 2015, a significant proportion of teenagers in poor and middle-income countries had not achieved their secondary education achievement, amounting to around one-third of the population (UNESCO 2015). The fact that government should be involved is accurate, and if the governmental support is present the economic development increases in the long – run. Hance, it is relevant to consider both types of schools, such as private schools and public schools. It is quite clear that the support is of public schools is a mandatory step for government.

Still, private schools should receive more attention from government and monetary allocation (Moschetti and Verger, 2020). NGO[1]s played a key role in enhancing adult education centers in Belarus, the Republic of Moldova and Ukraine (Lukyanova and Veramejchyk, 2017).

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[1] Non – Governmental Organization

Picture 2: Percentage of students attending public or private schools that receive more than 80% of their funding from government, 2018
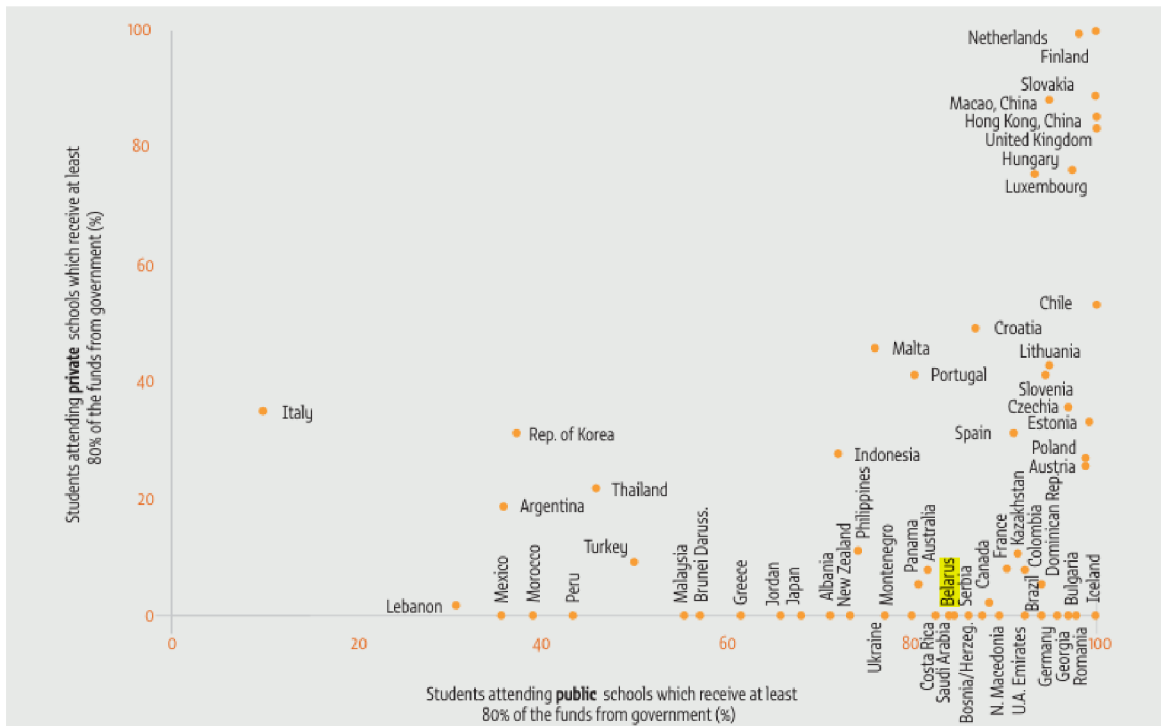
Source: UNESCO (2021).

3.1.6 Tertiary Education

HEART has published a Higher Education Topic Guide that investigates the contribution of higher education in promoting economic development (Power et al., 2015). Historically, the evaluation of how the educational system influences economic development has focused on the correlation between educational attainment and income, as well as the rates of return, which represent the link between lifetime incomes and educational costs. The evaluations of the community and individual benefits gained by investing in basic education are of great importance, with secondary education following closely behind. In contrast, the expected gains from investing in higher education (HE) are somewhat diminished. This information was extensively used to discourage government funding in higher education during the 1980s and 1990s, leading to a predominant emphasis on elementary education (Power et al., 2015).

Recent data indicates that HE may provide both societal and individual advantages (Power et al 2015). The Table 1 displays the estimates of regional average social and private

rates of return, sourced from the HEART subject guide. Despite variances in return rates across different nations, it is generally observed that investing in higher education (HE) leads to higher rates of return for both individuals (19%) and society (10%) (Psacharopoulos & Patrinos, 2017).

Table 1: Returns of Higher Education.

Region	Social (%)	Private (%)
Asia	11.0	18.2
Europe/Middle East/Africa	9.8	18.7
Latin America/Caribbean	12.3	19.5
OECD	8.5	11.6
Sub-Saharan Africa	11.3	27.6
World Average	10.3	18.8

Source: (Psacharopoulos & Patrinos, 2017).

The HEART Topic Guide provides an evaluation of a work authored by Tilak. This study determined that the impact of higher education on economic growth can also be quantified using a simple regression equation. Tilak (2013) conducted a study analyzing data collected from 49 nations in the Asia Pacific area. The study revealed a noteworthy impact of higher education (measured by gross enrolment ratio and HE attainment) on the degree of economic growth, as shown by GDP per capita. Tilak (2013) anticipated the argument that there is just a correlation between the two variables by considering a time delay for higher education to have an impact on economic growth. Specifically, the study regressed the GDP per capita in 2009 on the enrolment ratio around 1990. This implies that immediate measures must be implemented to enhance higher education in order to enable sufficient time for its impact on economic progress. In addition, only a small number of economically disadvantaged nations have greater levels of higher education (HE), while economically prosperous countries might not excel in the advancement and dissemination of HE.

Tilak (2013) demonstrated that the percentage of adults with higher education (HE), a proxy for the quantity of human capital, is a significant indication of a nation's growth level. This statistic indicates the aggregate endeavours of a nation in the advancement of higher education across time. According to Tilak (2013), there is a positive correlation between the size of the adult population with higher education and the possibility for growth

in the economy. Tilak (2013) stressed that the *"Tertiary education"* is important factor which boosts economy" by 1.5 – 3 % in a period of 2-3 years.

Another study of *"Tertiary education"* and its impact on economic growth was done in India. India's rise to the global economic arena is credited largely to its sustained and effective attempts over many years to educate a substantial portion of its population with top-notch, technology-focused higher education Bloom et al. (2006). The research conducted by Bloom et al. (2006) provides evidence to support the notion that increasing higher education opportunities may facilitate rapid technological advancement and enhance a nation's ability to optimize its economic productivity. The results indicate that the present production level of SSAs is about 23% lower than its production potential threshold. The rise in the HE stocks for a single year would result in the growth rate of GDP per capita increasing by 0.24 percentage with African production growth increasing by an additional 0.39 percentage points in the first year. According to Bloom et al. (2006), a one-year increase in HR stock is associated with a 3% income rise after five years with a total increase of 12% in the long run.

Recent studies have explored the complex processes related to economic development, specifically in the setting of universities. These research investigations have examined the political and socio-economic environment in which universities function, as well as the internal structures and patterns inside these institutions. Furthermore, they have examined the interaction between national and institutional environments in this field. Pillay (2011) conducted a preliminary assessment that examined worldwide studies on the correlation between higher education (HE) and economic development. Pillay (2011) conducted a study on economic development efforts in three prosperous systems—Finland, South Korea, and the state of North Carolina in the US—that have successfully used educational institutions to gain valuable ideas that may be applied to African countries. The achievement of these approaches relies heavily on the interconnection between economy and educational policy. It requires the supply of excellent public schooling, greater enrollment in tertiary education with diverse organizational frameworks, alignment with employment requirements collaboration and networking, and a shared recognition of the significance of higher education for both learning and growth.

Nevertheless, Hanushek et. el. (2007) posits that the essential factor is the level of fundamental abilities, and that pursuing higher education without possessing strong basic skills does not provide significant benefits. According to his research, higher education has resulted in significant financial benefits for people in terms of their own income. Primarily driven by the potential influence on productivity and economic development, governments have advocated for the extension of higher education, although partly due to this justification.

However, when considering knowledge capital as assessed by international mathematics and scientific assessments, there is no direct relationship between academic achievement (or years of education) and economic development. Adding years of university education does not have a higher effect than adding years of previous schooling. The significance of higher education lies in its ability to prepare individuals for skilled occupations. However, it is worth noting that colleges that admit students with superior skill sets are more likely to generate highly competent professionals. When comparing different nations, it seems that countries with more knowledge capital tend to have more skilled engineers, which in turn has a noticeable effect on variations in economic development. One possible reason why the influence of higher education attainment is not reflected in Hanushek's (2017) development models is the absence of reliable indicators for university quality. Consequently, diverse results are viewed as equal. However, the academic performance of students at a younger age seems to serve as an indicator of the overall abilities of the students by the time they complete their education, since each level of education builds upon previous knowledge.

Teles et. el. (2004) concluded that primary education had a significant impact on individuals' decision-making throughout their lives. The study discovered that the impact of the correlation between public expenditure on education and economic development is modified by variations in the allocation of government funds specifically towards primary and tertiary education. This association may be inconsequential in the absence of a promotion of higher education.

3.1.6.1 The role of tertiary education in the knowledge economy

Educational attainment at the postsecondary level has become far more ubiquitous in the knowledge economy than it was in past generations Teles et. el. (2004). As a result of the emergence of a new category of workers, economies and labor forces are undergoing significant transformations. Because of the growing prevalence of electronic gadgets and computers that are capable of doing human jobs, the need for routine skills, including both cognitive and physical abilities, is declining Pillay (2011). On the other hand, the demand for knowledge and communication skills of all types is rapidly increasing. An increase in the requirement for analytical and integrative abilities in even the most fundamental activities is being brought about by the necessity of comprehending and interacting with data and illustrations. As a result of this occurrence, educational and organizational institutions are stretched to their limits since they include both specialized and generalized abilities.

3.2 Education and Employment

Sparreboom and Staneva (2014) argue that raising the education level of the new population in developing countries will not automatically lead to an easy integration of highly trained workers into secure employment. Continuing to send unqualified and underkilled young people into the labor market is detrimental for both the individuals, who are likely to face low-paying and unstable jobs, and the economy as a whole, which does not benefit from increased labor productivity. Earnings often increase based on employees' professional achievements, with those holding advanced credentials or more experience likely to earn greater salaries. Differences in the returns to education are substantial between employees, who often see increased income with each additional year of study, and self-employed individuals, who do not always get considerable financial benefits from more education.

As was said previously, a portion of this dispute arises from the fact that it is impossible to precisely quantify the portion of economic development that is contributed by educational institutions such as colleges and universities (Flora, 2019). Traditional economic foundation analysis is capable of doing a decent job of accounting for the financial contributions that an educational institution makes to the community in terms of paychecks, expenditure, and employment; but it is dependent on estimations of economic factors in

order to evaluate the additional advantages that are brought about by university activities. Research has resulted in the production of a variety of multipliers, which vary from one to three, and estimations of the economic advantages are quite sensitive to the multiplier that is selected. The most troubling aspect of these research is that they are unable to produce any kind of assessment on how much this is the most effective way to use financial resources for a particular area (Bloom et. el., 2006: Tilak, 2013). If the institution had not been located in the town, the same property and assets could certainly have been utilized for another purpose, which may have resulted in an economic growth rate that was comparable to or even greater than what it is now experiencing. Additional research investigates the impact that the results of institutions have on human capital and technological advancement (Chanksenlian et. el., 2020). The purpose of these research is to investigate the impact that greater salaries obtained by college graduates have on the economy of the local area, as shown by increased tax revenues, increased consumer spending, and increased personal savings. Naturally, in order for college towns to reap the advantages of such a situation, graduates are required to remain in the places in which they received their education.

The results also highlight the fragmentation of the labor market in emerging countries, namely between professionals operating in non-vulnerable labor (employers and employees) and employees operating in vulnerable employment (own-account workers and contributing family workers). The greater levels of credentials mismatches and the much lesser degrees of academic achievement that are present in precarious employment situations simultaneously provide a significant disadvantage to this group of employees (Van – Den – Berg, 2016). Underqualification, which is a consequence of a lack of education, is also more widespread in nations with poor incomes. Employees who are employed by a company, for whom an extra year of schooling often results in a greater pay, and those who freelance themselves, for whom significant benefits are far less assured, have quite different experiences when it comes to the benefits that they get from their education. Last but not least, the data indicate that educational attainment beyond the elementary level is becoming an increasingly important factor (Starreboom and Staneva, 2014).

When compared to persons who are employed in non-vulnerable positions, those who are employed in vulnerable positions are more likely to have credentials at the secondary or tertiary level (on average, 83 percent of young people who had completed their tertiary

education were employed in non-vulnerable positions). This pattern is consistent across the board in every country. On the other hand, the proportion of young people who have no education beyond basic school or just primary school is greater among those who are employed in vulnerable positions. According to Starreboom and Staneva (2014), people with a lower degree of education are more inclined to find job in agriculture. On the other hand, those with greater degrees of education are more likely to find jobs in services and industry, that are often linked with greater degrees of productivity.

The successful completion of secondary schooling is not sufficient on its own to propel young people in low-income communities (LICs) toward improved results in the labor market. The percentage of young people who had graduated from secondary school who worked in non-vulnerable positions was just 40 percent in low-income nations, but in lower middle-income nations, the percentage was seventy-two percent. When compared to young people who are employed for a salary, those who are working for themselves see a lower return on their investment in school. This appears to be in accordance with the concept that working for one's own account is a last-ditch alternative, that is less motivated by economic prospects, and also with the fairly substantial amounts of credentials mismatch that are present in insecure employment. There is a correlation between the amount of schooling and the unemployment rate in nations with low incomes. According to Starreboom and Staneva (2014), comparatively substantial rates of unemployment for young people with higher levels of education indicate that young people are not adequately preparing one another for occupations which are in demand in the labor market. Furthermore, these young people are ready to wait for a chance to obtain good employment in the official workforce.

Also, while study of the influence of the knowledge-based economy on job creation and growth remains in its formative stages, attempts have started, especially in industrialized nations, to determine the consequences of the economy based on knowledge. Throughout a timeframe of ten years, Brinkley and Lee (2006) found that the percentages of employment growth in knowledge-based industries and low-knowledge industries in the United States of America and the European Union were significantly different. Knowledge-driven companies were determined to be responsible for the creation of twice as many new employments in the United States of America and four times as many employment opportunities in Europe.

The World Bank (2007) claimed that developed nations, where the concept of *'knowledge economy'* originated, are adapting differently to the changing circumstances. North American countries have rapidly capitalized on new prospects, seeing increased growth rates and efficiency outcomes in the last 15 years. Disparities in income per capita between North America and Europe have widened. Small, dynamic economies like Finland in Europe are increasingly seen as examples of knowledge-based development and competitiveness, whereas bigger continental economies such as France and Germany, who were leaders in technology and industry in the past, are struggling to adapt. Japan has had a challenging decade marked by sluggish development due to several circumstances. However, the country has focused on enhancing its knowledge economy assets via increased investment in fundamental research and has successfully preserved the competitive advantage of its global manufacturing firms. South Korea has aggressively pursued a knowledge-based economy to bounce back from the 1997/1998 financial crisis.

Eastern European economies in transition struggled to adapt to new knowledge-based competitiveness despite previous expenditures in education and research. Smaller countries like Hungary, Slovenia, and Estonia have managed well and benefited from European expansion. Estonia has embraced a proactive knowledge economy strategy. Nevertheless, some new EU members and potential candidates faced a more challenging adaptation process. The Russian Federation and other former Soviet Union nations have not shown the ability to use the significant knowledge capacity they had when the Berlin Wall collapsed, which decreased due to the departure of people with advanced degrees.

As to the World Bank (2007), each government in the 18 mentioned nations had an independent function in the development process. China pursued a path of knowledge-based prosperity by obtaining substantial foreign direct investment (FDI) and then developing a domestic knowledge foundation via significant spending in education and research. India has excelled by effectively using its prestigious educational institutions and taking advantage of worldwide IT-related possibilities, partly by leveraging knowledge assets.

It is abundantly obvious that the information a revolution, together with the technical and financial changes that it entails, necessitates a reevaluation of the general growth methods that nations use. According to the World Bank (2007), regulations that are

associated with understanding and creativity ought to lie at the heart of those methods. These strategies ought to rest on four foundations: the education and training base of the country; the infrastructure of the country's information and telecommunications; the innovation system; and the general structure for business and government. In order for investments in the other three pillars to be successful, the efficacy of the last pillar was determined.

3.2.1   The knowledge economy and economic performance

There need to be a strong connection between the respective degrees of economic growth and levels of knowledge. There is a link of 67% between the levels of economic progress and the obtaining of knowledge, as assessed by the information Exchange Index (KEI). On the other hand, the fact that there is an upward trend connecting the outcomes of the Key Economic Indicator (KEI) and the degree of economic growth does not indicate that there is a causal connection connecting the two. A high KEI (Knowledge Economy Index) does not inevitably result in an elevated degree of economic growth. On the other hand, it is conceivable that high-income nations, due to their larger wealth, are in a position to make bigger investments in education and, as a result, score better on the Knowledge Economy Index (KEI). On the other hand, nations with higher scores on the Key Economic Indicator (KEI) possess greater levels of economic development, and inversely. In point of fact, econometric studies have shown that there is a causal connection that is statistically significant that runs from the amount of acquired knowledge as assessed by the KEI to the possibility of subsequent growth in the economy.

In the scenario that all other parameters remain same, it is obvious that greater KEI scores are linked to greater percentages for subsequent growth in the economy. This lends credence to the idea because greater levels of expertise in a community do, in fact, result in greater rates of GDP, and thus, higher rates of economic development. After taking into consideration the baseline circumstances, a one-unit improvement in the Key Economic Indicator (KEI), which is comparable to advancing up one decile or thirteen ranks in the nation rankings, results in a boost of 0.46 % GDP (World Bank, 2007). The general result showed that the positive impacts of knowledge acquisition are essential at all stages of economic growth. This was determined by stratifying the nations into four different income groups.

Examining nations that have successfully made the switch to knowledge-based economies can provide valuable insights into the approaches and regulations that have facilitated their economic expansion, even if these actions were initially part of wider growth strategies and the concept of an economy based on knowledge has only been recognized. Various instances worldwide need specific attention. Finland is often regarded as being the most competitive nation in the world among industrialized economies. Canada and Australia have competitive economies. South Korea and Ireland used specific knowledge economy policies throughout the previous several decades, beginning from a low-income level, to attain prominent places in the global economy.

The Asian Development Bank (2007) has established a framework that integrates sustainable development with knowledge management, diverging from the World Bank's predominant focus on the financial aspect of the knowledge-based economy. By extending the knowledge-based economic framework to encompass strategies for fostering a knowledge-based society and promoting sustainable practices, a more comprehensive model known as knowledge-driven prosperity emerges.

Table 2: A model of knowledge-based development (KBD)

Object	Economic (knowledge-based economy)	Social	Natural
Education (development of human capital)	Education for a skilled workforce	Education for total human development	Education for sustainable development
Innovation (development of structural capital)	Systems, processes, and technological innovations	New institutions and protocols for peace, equity and human rights	Environmental technologies, e.g. renewable energy technologies
Building networks (development of stakeholder capital)	Financial and physical networks, e.g. ICT infrastructure	Social networks, social trust, cultural integrity	Agreements to protect and sustain planetary life support systems

Source: Asian Development Bank (2007: 32).

The four key components of a knowledge-based economy that are outlined by the World Bank, together with the area of knowledge measurement method that corresponds to them, were a perfect match for all three types of intellectual property that are applied across the commercial sector (also referred to as the "economic [knowledge-based economy]" in column 2 of Table 2).

- Education for a skilled workforce is development of human capital.
- National innovation systems represent the development of structural capital.
- ICT infrastructure is development of technical aspects of stakeholder capital, while policy and regulatory environment is about the non-technical aspects of stakeholder capital.

Since, Belarus belongs to developing countries, there is a list of advices provided by OECD (2018: 13).

Table 3: Higher education policy requirements for the knowledge economy

Traditional policy orientations	Knowledge economy requirements
• Public Financing • Traditionally separate disciplines • Face-to-face teaching • Inward orientation focused on academic communities • National standards and cooperation with national institutions	• Public-private partnership • New knowledge adapted to social and economic requirements • Mixed modes with distance and e-learning components • Opening to local communities and the business sector • Inclusion in global networks of higher education institutions, with access to related performance evaluations

Source: OECD (2018)

It is imperative that studies and tertiary-level institutes in low-income nations prioritize the development of a pool of specialists who are able to accept science and technology and adapt it to the specific circumstances of their own communities. To be more specific, this entails altering the existing paradigm in order to involve, in addition to research and teaching, a third goal, which is to provide service to the community and to work closely with both the

public and commercial sectors in order to make a contribution to innovation and development. In order for universities to really accomplish their goal of social responsiveness, which is a purpose that has been emphasized in industrialized nations over the course of the previous two to three decades (OECD, 2018: 45), it is vital that universities strive towards achieving their mission.

Another essential shift that must take place in the present educational framework is the desire to draw into worldwide expertise. This may be accomplished via the establishment of geographical groups and areas of practice, poles of excellence, and collaborations between institutions that are both South-South and North-South in nature. Last but not least, in light of the limited resources available, tertiary education and research institutions are required to implement management and financial reform in order to strengthen their autonomy and ensure that they remain competent.

4. Practical Part

Using the time series data approaches that were selected, this chapter applies the model that was previously presented in the theoretical part by different author (Brinkley & Lee, 2007: Chanksenlian et. el., 2020: Tilak, 2013) who used panel data analysis across 135 countries, to see the effect of educational aspects on the economic growth.

Using data pertaining to the state of Belarus, the findings are presented in a manner that is logical in an effort to provide a response to the primary research issue, which poses the topic of what the influence of education is on economic development.

4.1 Chosen data

There are the following indicators shown in the Table – N, and each factor describes each factor and its impact on the GDP.

Table 4: Chosen Indicators

| Factor	Impact on GDP	Source
GDP per capita (current US$)	Reflects the average economic output per person. Higher GDP per capita typically indicates greater economic prosperity.	Bloom et. el. (2006)
Unemployment, total (% of total labor force)	High levels of unemployment indicate underutilization of labor resources, leading to lower productivity and output. Conversely, low unemployment rates suggest more efficient allocation of labor, contributing to higher GDP.	Chanksenlian et. el. (2020)
Individuals using the Internet (% of population)	Higher internet usage rates are associated with increased access to information, improved efficiency, and enhanced productivity, positively impacting GDP growth.	Tilak (2013)
Literacy rate (% total population)	Higher literacy rates are correlated with better educational attainment and a more skilled workforce, contributing to productivity gains and economic growth.	UNESCO (2015)
Educational index	A higher educational index suggests a more educated and skilled workforce, driving productivity gains, technological advancement, and innovation, thereby contributing to GDP growth.	Own proposal
Educational spendings as a % of GDP	Investment in education enhances human capital development, leading to improved labor productivity, higher earning potential, and greater innovation capacity, positively influencing GDP growth.	Bhattarai & Shrestha (2015)

Source: Authors mentioned in the last column.

The considered timeframe of the research is 18 years, from 2005 – 2022.

4.1.1 GDP per Capita, 2005 – 2022

From 2005 to 2008, GDP per capita in Belarus steadily increased from approximately $3126 to around $6376, indicating robust economic growth. However, the global financial crisis in 2009 led to a noticeable decrease in GDP per capita to about $5352, followed by a slight recovery to around $6035 in 2010. Subsequently, from 2011 to 2013, GDP per capita continued to rise, reaching its peak at approximately $7998 in 2013. However, from 2015 onwards, GDP per capita experienced fluctuations, with a drop to around $5967 in 2015 but generally maintained above $6000. Despite occasional downturns, GDP per capita remained relatively stable throughout this period, reflecting certain economic resilience and stability in Belarus, See Figure – 1.

Figure 1: GDP per capita (current US$)
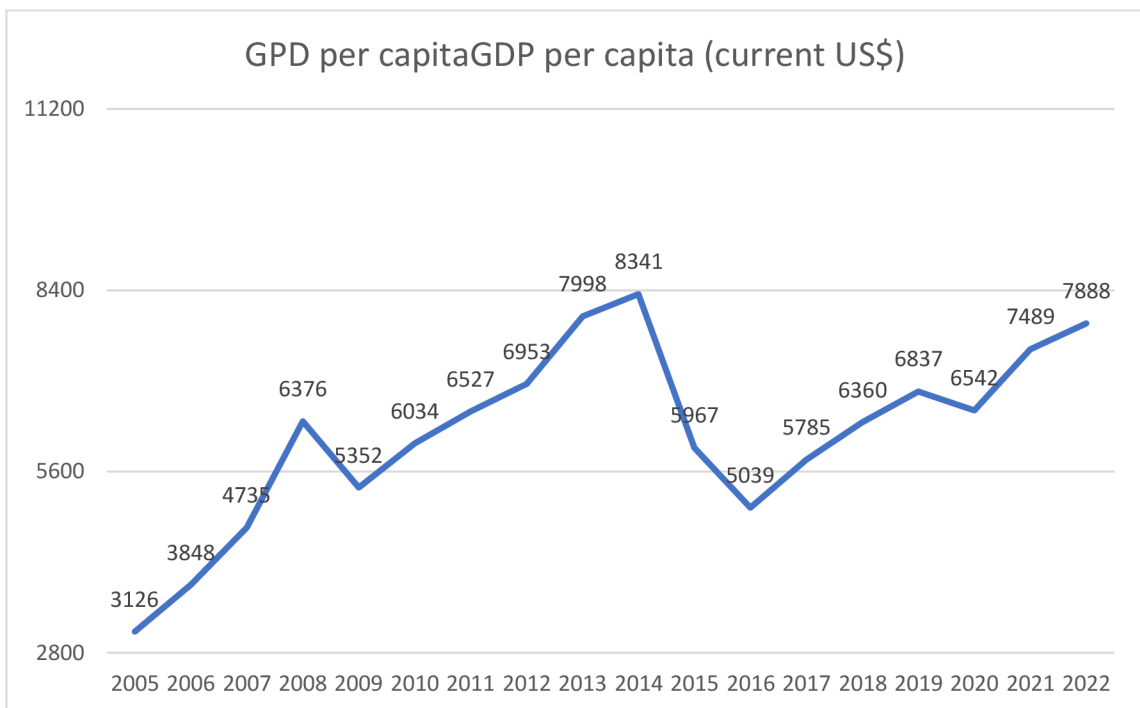
Source: WorldBank (2024)

4.1.2 Unemployment % in Belarus

The total unemployment rate in Belarus showed a consistent decline from 2005 to 2022, as evidenced by the table provided. Initially standing at 9.436% in 2005, the rate gradually decreased over the following years, with occasional fluctuations attributed to global economic events such as the financial crisis of 2008-2009. Despite these challenges,

unemployment continued to decrease steadily, reaching 3.9% by 2022. Factors contributing to this trend include economic growth, government policies aimed at job creation, and investments in education and training programs. Overall, the declining unemployment rate reflects improvements in the labor market and sustained economic progress in Belarus throughout the analyzed period.

*Figure 2: Unemployment, total (% of total labor force)*
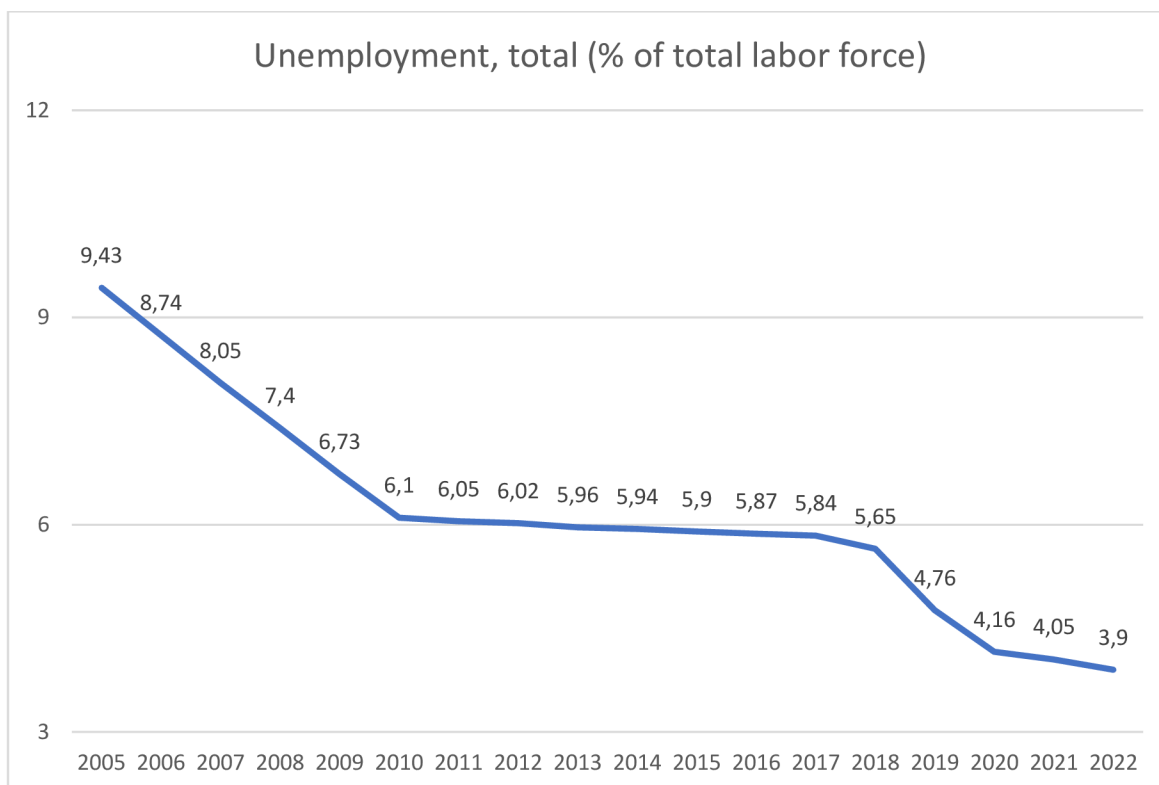
Source: WorldBank (2024)

4.1.3 Individual using Internet (% of population)

The dynamics of individuals using the Internet (% of population) in Belarus from 2005 to 2022 reveal a consistent and significant upward trend. Starting at 12.5 % in 2005, Internet usage gradually increased to 23 % by 2009, reflecting a steady adoption of online connectivity. From 2010 onwards, the rate of Internet usage experienced accelerated growth, with significant annual increases observed. By 2015, the percentage of individuals using the Internet had surged to 59.02 %, indicating widespread access and integration of digital technologies. While the growth rate moderated slightly from 2016 to 2022, the trend remained robust, with Internet usage reaching 86 % of the population by 2022. Overall, these dynamics underscore the increasing importance of digital connectivity and technology in

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Belarusian society, with implications for communication, information access, economic activity, and social interaction.
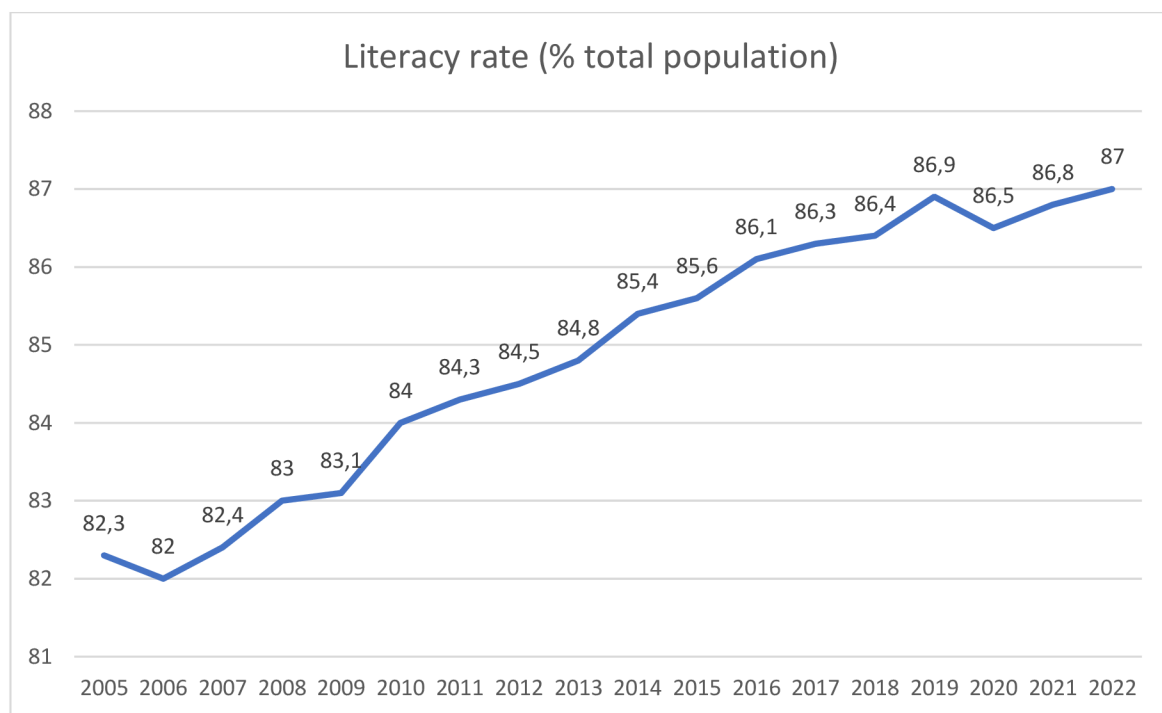
Figure 3: Individuals using the Internet (% of population)
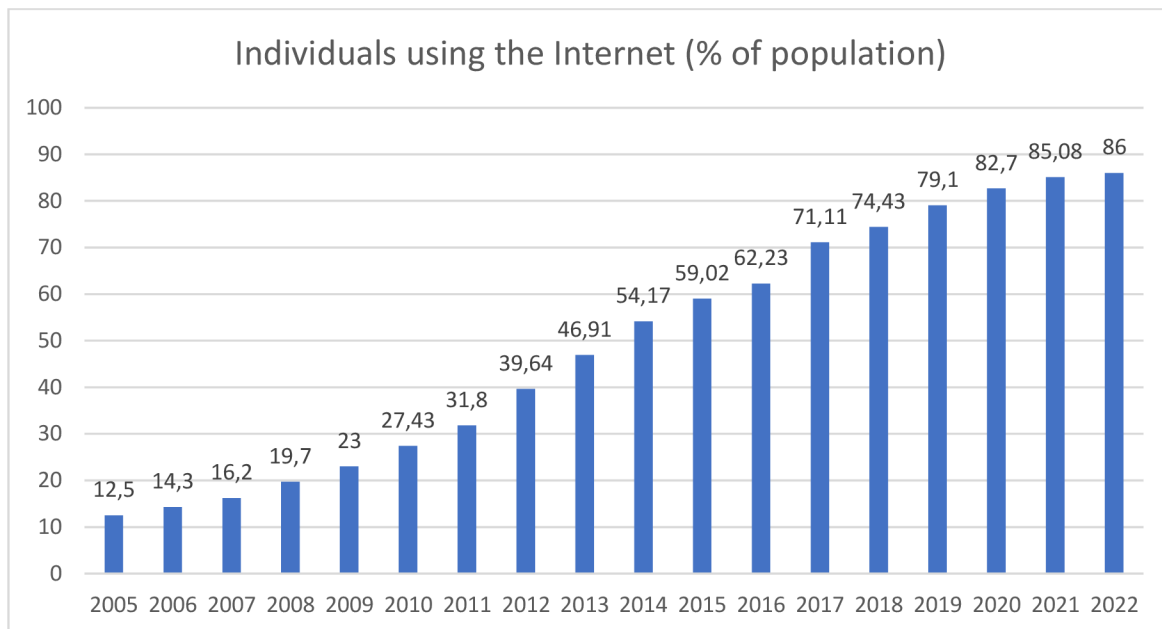
Source: WorldBank (2024)

4.1.4 Literacy rate (%of population)

Figure 4: Literacy Rate (% total population)

Source: WorldBank (2024)

The literacy rate (% of total population) in the provided dataset shows a consistent upward trend from 2005 to 2022. Starting at 82.3% in 2005, the rate experiences moderate fluctuations in the following years, gradually increasing to 84.0% by 2010. From 2011 onwards, the literacy rate demonstrates more sustained growth, with notable increases observed annually. By 2019, the literacy rate reaches 86.9%, indicating widespread educational attainment. From 2020 to 2022, the rate remains relatively stable, hovering around 86.5% to 87.0%. Overall, these dynamics reflect ongoing efforts to improve educational access and quality, resulting in higher literacy levels and enhanced socioeconomic outcomes in the country.

4.1.5 Educational Index

The educational index, representing the overall quality of education, exhibits a consistent upward trend from 2005 to 2022. Starting at 0.769 in 2005, the index gradually increases to 0.828 by 2022. This steady improvement suggests ongoing efforts to enhance educational standards, curriculum development, and teaching methodologies over the years. Despite minor fluctuations, particularly from 2020 to 2022, the overall trend indicates a sustained level of educational quality, highlighting the significance of education in fostering human capital development and societal progress.

Figure 5: Educational index
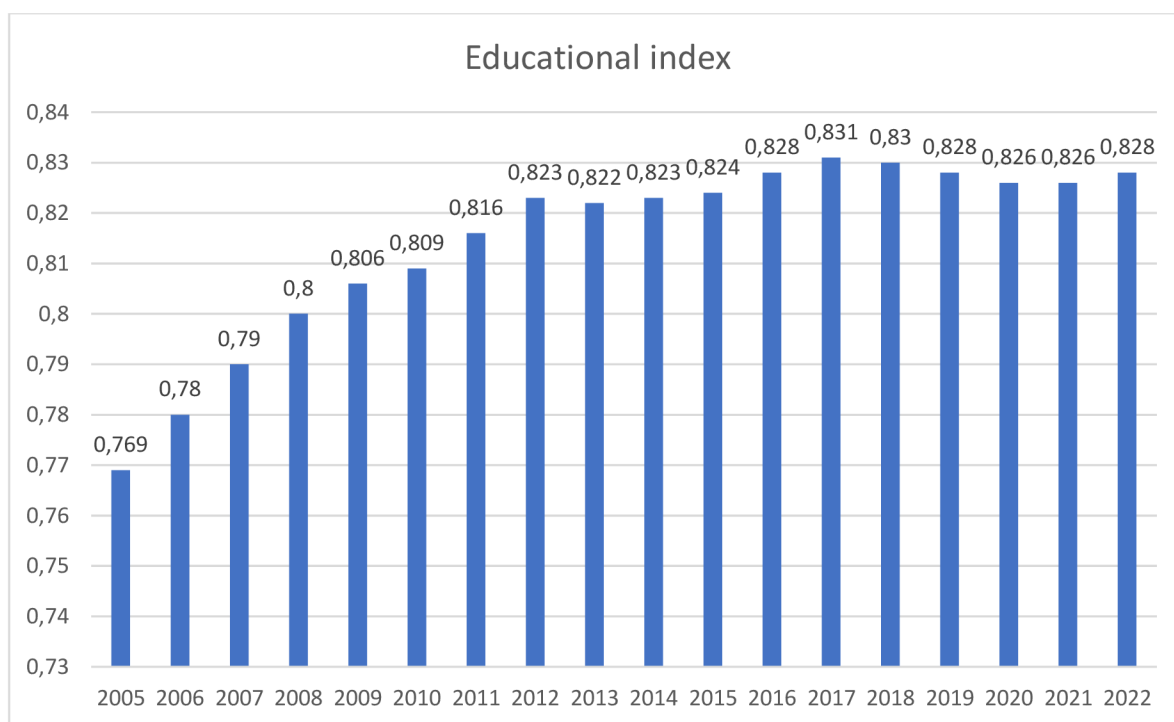
Source: WorldBank (2024)

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4.1.6   Educational Spendings as % of GDP

The dataset on educational spendings as a percentage of GDP from 2005 to 2022 illustrates fluctuations in the allocation of financial resources towards education within the economy. Initially fluctuating moderately between 12.55% and 12.62% from 2005 to 2007, there's a noticeable decrease in 2008 to 10.13% followed by a slight recovery in 2009. From 2010 to 2019, the allocation remains relatively stable, ranging from 8.45% to 13.33%, indicating a consistent commitment to educational investment. However, a significant increase is observed in 2020 and 2021, with educational spendings reaching 16.54% and 16.95%, respectively, possibly reflecting a heightened prioritization of education in response to evolving needs or policy changes. Overall, the data underscores the importance placed on education within the economy, with investment levels varying in response to economic conditions and policy initiatives.

Figure 6: Educational Spendings as % of GDP
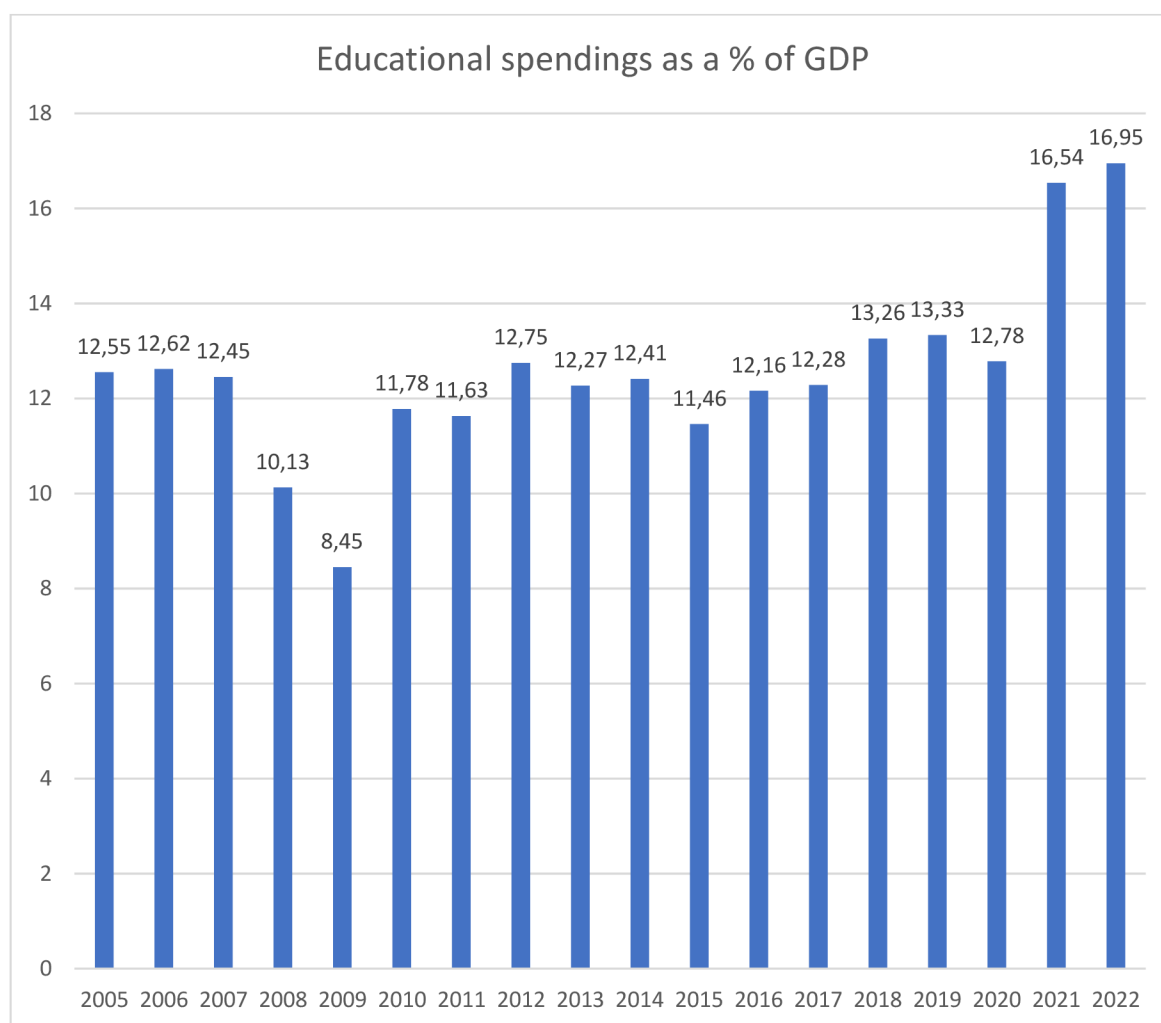
Source: WorldBank (2024)

4.2 Approach to Modelling

For the purpose of this study, the author makes use of yearly data spanning from 2005 to 2022, which is equivalent to 18. After carefully examining all of the available data, the author ultimately decided to focus on six different factors. Please refer to Table 1. By using the time period that has been provided for the Republic of Belarus, the purpose of this research is to investigate the connection that exists between the factors of education and economic development. The following hypothesis serves as the foundation for this research: there is a positive correlation between the Gross Domestic Product and the Educational Index in Belarus. For the purpose of this investigation, the regression equation is as follows:

$$\textbf{\textit{Simple regression model:}} \ Y_{1t} = f(x_{1t} \ ; \ x_{2t})$$
$$\textbf{\textit{Multiple Regression Model:}} \ Y_t = \beta_0 + B_1 x_{1t} + B_2 x_{2t} + B_3 x_{3t} + B_4 x_{4t} + U_t.$$

Whereas:

6. Y_t – is the dependent variable, Gross Domestic Product per Capita (in actual \$)
7. β_0 – constant or the intersection of the regression line with Y axis, measuring the value of Y, when values of x equal 0.
8. B_1 – Unemployment % labor force
9. B_2 – Using internet of total population %
10. B_3 – Literacy rate of population %
11. B_4 – Educational Index
12. B_5 – Educational Spendings as a % of total GDP
13. U_t – Random error.
14. T – Time frame 18 years.

The assumptions of the MLRM should be checked before the proceeding with the estimate. The following presumptions will be taken into consideration and tested by the author:

- Model Verification
- The structure of the residuals is something that autocorrelation needs to make sense of. The application of the Durbin-Watson test proceeds in order to check for autocorrelation. In the absence of autocorrelation, the null hypothesis exists. The *d-*

statistic for our situation is equivalent to *1.3.* A positive autocorrelation is indicated by a *d* value that is closer to zero, while a negative autocorrelation is indicated by a *d* value that is closer to four, See Figure – 7. First and foremost, it is necessary for us to ascertain the upper and lower critical values for *d*. These values are contingent upon the number of observations (N = 18) and the number of independent variables (k = 5) to be considered.

Figure 7: Durbin and Watson Test
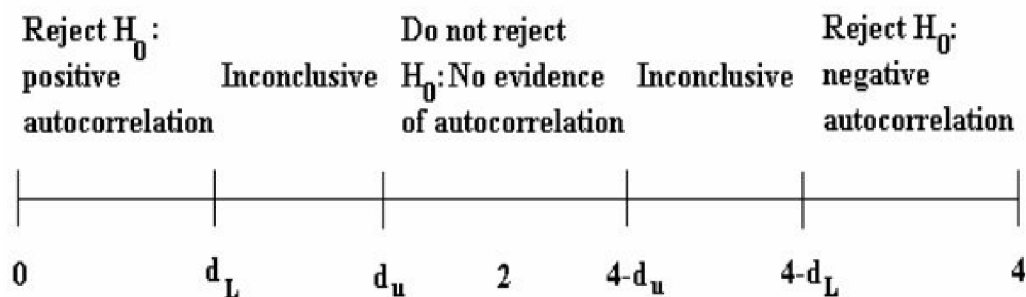
Source: Maxwell and Merran (1985)

- If there are more than one explanation variable that are almost perfect linear combinations with each other, multicollinearity is said to have occurred. (A value of 0.9 indicates that the variables have a strong association with one another)

- In linear regression, it is assumed that the residuals (the differences between observed and predicted values) follow a normal distribution. This assumption is crucial because it allows us to make valid inferences about the regression coefficients and to construct accurate confidence intervals and hypothesis tests.

  1. Histogram: Plotting a histogram of the residuals can give us a visual indication of whether they follow a roughly normal distribution.

  2. Q-Q Plot (Quantile-Quantile Plot): This plot compares the quantiles of the residuals to the quantiles of a theoretical normal distribution. If the points in the Q-Q plot fall approximately along a straight line, it suggests that the residuals are normally distributed.

- Heteroskedasticity, for that the author plans to use White's test for heteroskedasticity, whereas: H0: Homoskedasticity; H1: Heteroskedasticity

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4.2.1 Model Verification

To see the verification, it is important to set – up the significance level, which is 0.05 % in case of this research.

Figure 8: 1st Model

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-4025,751	63195,410		-,064	,050
	Unemployment, total (% of total labor force)	-670,319	400,147	-,728	-1,675	,020
	Individuals using the Internet (% of population)	21,870	50,570	,420	,432	,073
	Literacy rate (% total population)	574,965	968,999	,711	,593	,004
	Educational index	860,246	267,501	,991	1,730	,001
	Educational spendings as a % of GDP	256,650	174,166	,352	1,474	,046

a. Dependent Variable: GPD per capita GDP per capita (current US$)

Thus, it is very important to look at the significance level. It is seen that the *Individuals using the Internet (% of population)* is not statistically significant, with its p – value *0.073 > 0.05* alpha level, meaning that the variable should be excluded from the MLRM model. The further model is listed below. Additionally, there was a high correlation of the variable, See Appendix – 1, the last table of VIF shows a high rate of 8.515, which indicates a high level of multicollinearity.

Figure 9: 2nd Model

Coefficients[a]

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	27997,049	31758,292		,882	,004
	Unemployment, total (% of total labor force)	-819,904	416,366	-,890	-,969	,001
	Literacy rate (% total population)	475,646	350,669	,588	1,356	,048
	Educational spendings as a % of GDP	257,714	141,209	,004	,019	,002
	Educational index	288,227	242,835	,467	1,187	,026

a. Dependent Variable: GPD per capita GDP per capita (current US$)

Source: Own processing in SPSS IBM.

Based on the model above, Figure – 9, it is seen that all variables are statistically significant. Meaning that the model is verified with all the mentioned variables. Based on the Appendix – 2, there is no problem of multicollinearity, based on the VIF column. Based on the Table – N, wee confirm the significance of 4 variables.

Table 5: Model Verification

Variable	P – value	> = <	Alfa	Reject/Accept	Significant/Insignificant
Unemployment, total (% of total labor force)	,001	<	0.05	Accept	Significant
Literacy rate (% total population)	,048	<	0.05	Accept	Significant
Educational spendings as a % of GDP	,002	<	0.05	Accept	Significant
Educational index	,026	<	0.05	Accept	Significant

Source: Own processing in SPSS IBM.

4.2.2 Autocorrelation

Table 6: Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,816[a]	,865	,562	922,1002	,665	6,459	4	13	,004	1,891

a. Predictors: (Constant), Educational index, Educational spendings as a % of GDP, Literacy rate (% total population), Unemployment, total (% of total labor force)

b. Dependent Variable: GPD per capita GDP per capita (current US$)

Source: Own processing in SPSS IBM.

According to Durbin, it is equal to 1.89, which is closed to 2, meaning that the model doesn't indicate an autocorrelation problem.

4.2.3 Multicollinearity

Table 7: Multicollinearity

| Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Unemployment, total (% of total labor force)	,126	1,939
	Literacy rate (% total population)	,137	1,310
	Educational spendings as a % of GDP	,686	1,457
	Educational index	,167	1,504

Source: Own processing in SPSS IBM.

In the provided collinearity statistics for the model, all predictor variables have variance inflation factor (VIF) values ranging from 1.310 to 1.939. These values suggest that collinearity is not a significant issue in the model. VIF values below 5 are generally considered acceptable, and in this case, they comfortably fall within that range. Therefore, the predictor variables are not highly correlated with each other, which enhances the reliability of the regression coefficients and the overall interpretability of the model.

4.2.4 Normality of residuals

By identifying the normality of residuals, it is clear from the Picture – 10, there is a P – P plot which indicates that residuals are normally distributed. However, it is seen that the Histogram is slightly skewed to the left and still acceptable for confirming that the residuals are normally distributed.

Figure 10: P - P plot
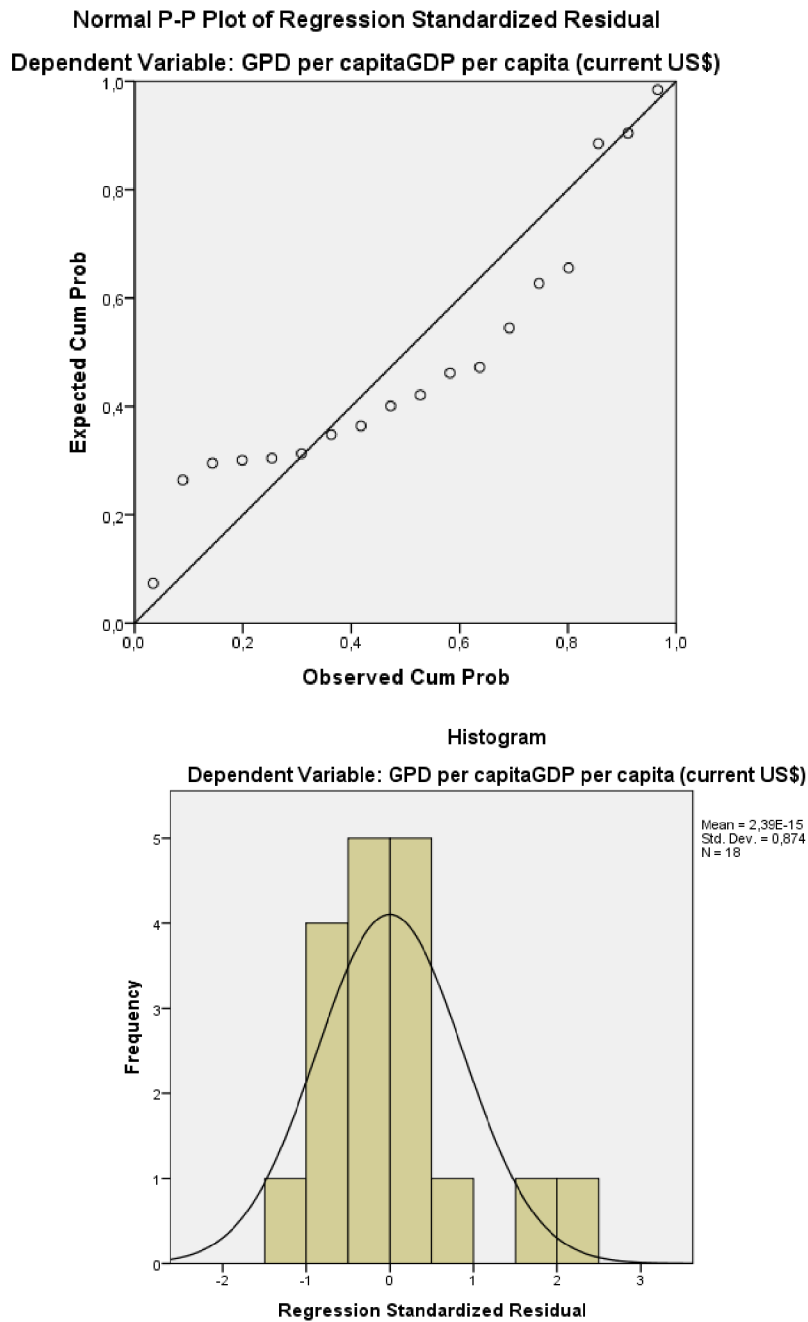
Source: Own processing, SPSS IBM.

4.3 SWOT Analysis

This sub-chapter is devoted to the SWOT analysis in regards of "Educational aspects" in Belarus.

Strengths	Weaknesses
- Governmental spendings on education, increasing dynamics - Enhanced IT sector - Highly-skilled teachers. - Competent teachers. - Diverse educational institutions. - Foreign Language Knowledge - Geographical location. - Practical experience. - Academic exchange products. - Relevant basic education. - Individual work with students. - Increasing trend of Educational Index.	- Lower income of teachers - Age of teachers - Old equipment - Lack of facilitated laboratories - Not enough grants for students in tertiary education - Outdated curriculum - Lack of IT trainings - Limited places for students
Opportunities	**Threats**
- Expand its foreign exchange programs. - Educational technologies - Patents - Educational process automation - Innovative programs and curriculum	- High migration among qualified teachers/students/workers. - Brain drain - Political instability - Low competition of workforce - Lack of qualified personal at workforces.

Source: Own processing.

Strengths:

- Governmental spending on education: Increased funding for education indicates a commitment to the sector's development.
- Enhanced IT sector: A thriving IT sector can contribute to technological advancements in education.
- Highly skilled and competent teachers: Quality educators are crucial for effective learning outcomes.
- Diverse educational institutions: Variety in educational institutions provides options for students with different needs and preferences.
- Foreign language knowledge: Proficiency in foreign languages enhances communication and opens up opportunities for international collaboration.
- Geographical location: Strategic location can facilitate cultural exchanges and international partnerships.
- Practical experience: Emphasis on practical learning enhances students' skills and employability.
- Academic exchange programs: Collaboration with international institutions fosters knowledge sharing and cultural diversity.
- Relevant basic education: A strong foundation in basic education sets the stage for further academic and professional growth.
- Individual work with students: Personalized attention can address students' specific learning needs and challenges.
- Increasing trend of Educational Index: A rising educational index indicates progress and improvement in the education system.

Weaknesses:

- Lower income of teachers: Low salaries may demotivate educators and lead to talent retention issues.
- Age of teachers: An aging teaching workforce may face challenges in adapting to modern teaching methods and technologies.
- Old equipment: Outdated infrastructure can hinder effective teaching and learning experiences.

- Lack of facilitated laboratories: Inadequate laboratory facilities may limit hands-on learning opportunities, particularly in scientific disciplines.
- Not enough grants for students in tertiary education: Financial constraints can impede access to higher education for deserving students.
- Outdated curriculum: Irrelevant or outdated curriculum may fail to meet the needs of modern learners and employers.
- Lack of IT trainings: Insufficient training in IT skills may leave students unprepared for the demands of the digital age.
- Limited places for students: Insufficient capacity in educational institutions can restrict access to education, especially for aspiring students.

Opportunities:
- Expand foreign exchange programs: Increasing international collaboration can enrich educational experiences and promote cultural understanding.
- Educational technologies: Integration of technology in education can enhance teaching effectiveness and student engagement.
- Patents: Encouraging innovation and research can lead to the development of intellectual property with commercial potential.
- Educational process automation: Automation can streamline administrative tasks and free up resources for more impactful educational activities.
- Innovative programs and curriculum: Introducing innovative educational programs can attract students and address emerging skill demands.

Threats:
- High migration among qualified teachers/students/workers: Brain drain can deprive the education sector of talent and expertise.
- Brain drain: Loss of skilled professionals to other countries can weaken the domestic workforce and educational institutions.
- Political instability: Political unrest can disrupt educational activities and deter foreign investment in the sector.
- Low competition of workforce: Lack of competition may lead to complacency and hinder innovation and quality improvement efforts.

- Lack of qualified personnel: Shortages of skilled professionals can compromise the quality of education and educational services.
- Overall, while Belarus has several strengths in its education sector, such as government support and skilled teachers, it also faces challenges such as low teacher salaries and outdated infrastructure. By capitalizing on opportunities like technological advancements and international collaboration, and addressing threats like brain drain and political instability, Belarus can work towards enhancing its education system for the benefit of its citizens and the economy.

5. Results and Discussion

5.1 Results of the 2nd model

Since the first model was statistically insignificant and one variable got exclude "Individuals using Internet as a % of population". The re-run model, 2nd model has resulted in the following model:

$$Y_t = 27997 - 819,904 * (x_{1t}) + 475,646 * (x_{2t}) + 257,714 * (x_{3t}) + 288,835 (x_{4t}) + U_t.$$

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	27997,049	31758,292		,882	,004
	Unemployment, total (% of total labor force)	-819,904	416,366	-,890	-,969	,001
	Literacy rate (% total population)	475,646	350,669	,588	1,356	,048
	Educational spendings as a % of GDP	257,714	141,209	,004	,019	,002
	Educational index	288,227	242,835	,467	1,187	,026

a. Dependent Variable: GPD per capita GDP per capita (current US$)

It is seen that the mode impactful variable out of all, is the *"Educational spendings"* with its p – value of .002. That indicates that the spendings of education positively impacts the *"Gross Domestic Product per capita"*. Meaning that if *1 %* change is expected in education the GDP per capita increases by *257,71 $* which supports the studies of (Bhattarai & Shrestha, 2015: 37) however, in their model, the application of 1st time difference was employed and the GDP per capita was present as an annual change.

From the negative perspective, the *"unemployment rate"* negatively impacts on the *"GDP per capita"* which supports the studies of (Van – Den – Berg, 2016: Sakmurzaeva, 2019) which is logical at the same time proving the theory of *"Human Capital"*. So, if the "unemployment rate" increases by 1 %, the GDP per capita would drop by *819,904 $.*

Literacy rate of total population is on the edge of the significance, however, does indicate its importance to the topic, with its $p-value\ of\ .048$. Meaning that if the literacy rate of Belarus population increases by 1 %, the GDP per capita increases by *475, 645 $.*

Educational Index expressed in % indicates, if 1 % change is expected in Educational Index, that boosts the GDP per Capita by *+288,227 $*. There were no previous studies done in regards of Educational Index in relation to GDP. However, as a proxy of "Educational Index" the number of institutions were taken into consideration with the same asymmetric development.

5.2 Recommendations

Investing in Early Childhood Education: Make it easier for kids to get into and improve the level of early childhood education programs so that all kids have a solid base for learning and growing in the future. Make policies and start programs to make primary and secondary education better by focusing on things like developing curricula, teaching teachers, and improving facilities.

Promotion of Tertiary Education: Give kids from low-income family's scholarships, grants, and other forms of financial aid to get more people to go to tertiary education. Encourage partnerships between businesses and colleges to make sure that educational programs match the needs of the job market.

Integration of Technology in Education: Use digital tools to improve teaching and learning, help students and teachers learn how to use computers, and give more people access to online school materials. Spend money on ongoing training and professional development for teachers to stay up to date on new ways to teach, how to use technology in the classroom, and how to teach different subjects. People should be encouraged to keep learning throughout their lives. This can be done by providing adult education programs, vocational training, and skill development initiatives. This will help people get jobs and adapt to a rapidly changing market.

International Collaboration: Build relationships with international groups, schools, and experts so that you can share information, resources, and the best ways to do things so that Belarus's education system keeps getting better.

6. Conclusion

The comprehensive exploration of human capital theory and its practical application in the Belarusian context laid the groundwork for the empirical investigation conducted in this study. By analysing the connection between education and economic development, the study delved into various aspects, including primary, secondary, and tertiary education, as well as their impact on employment and the knowledge economy.

The practical part of the study involved the meticulous selection of relevant data spanning from 2005 to 2022, encompassing GDP per capita, unemployment rates, internet usage, literacy rates, the Educational Index, and educational expenditures as a percentage of GDP.

Through rigorous modelling and analysis, the study verified the chosen regression models, tested for autocorrelation, multicollinearity, and assessed the normality of residuals. Subsequently, the results of the second model revealed significant insights into the relationship between education and economic indicators in Belarus.

Based on these findings, several recommendations were proposed to enhance education quality and its contribution to economic growth. These recommendations include prioritizing early childhood education, promoting tertiary education, integrating technology in educational practices, emphasizing lifelong learning, and fostering international collaboration.

Overall, this study contributes to the understanding of how investments in education can drive economic development and lays a foundation for future research and policy initiatives aimed at optimizing the educational landscape in Belarus.

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8. List of pictures, tables, graphs and abbreviations

8.1 List of tables

8.2 List of Figures

9. Appendix

9.1 Results of the first model

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	-4025,751	6195,410		-,064	,050		
	Unemployment, total (% of total labor force)	-670,319	400,147	-,728	-1,675	,020	,117	8,515
	Individuals using the Internet (% of population)	21,870	50,570	,420	,432	,073	,024	1,439
	Literacy rate (% total population)	574,965	968,999	,711	,593	,004	,015	0,825
	Educational index	860,246	267,501	,991	1,730	,001	,068	1,806
	Educational spendings as a % of GDP	256,650	174,166	,352	1,474	,046	,389	2,574

a. Dependent Variable: GPD per capital GDP per capita (current US$)

Coefficients[a]

| Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	27997,049	31758,292		,882	,004		
	Unemployment, total (% of total labor force)	-819,904	416,366	-,890	-1,969	,001	,126	1,939
	Literacy rate (% total population)	475,646	350,669	,588	1,356	,048	,137	1,310
	Educational spendings as a % of GDP	257,714	141,209	,004	,019	,002	,686	1,457
	Educational index	288,227	242,835	,467	1,187	,026	,167	1,504

a. Dependent Variable: GPD per capitaGDP per capita (current US$)

9.2 Pearson Correlation

Correlations

		GPD per capita GDP per capita (current US$)	Unemployment, total (% of total labor force)	Literacy rate (% total population)	Educational spendings as a % of GDP	Educational index
Pearson Correlation	GPD per capita GDP per capita (current US$)	1,000	-,775	,639	,360	,750
	Unemployment, total (% of total labor force)	-,775	1,000	-,613	-,507	-,700
	Literacy rate (% total population)	,639	-,613	1,000	,559	,784
	Educational spendings as a % of GDP	,360	-,507	,559	1,000	,501
	Educational index	,750	-,700	,784	,501	1,000
Sig. (1-tailed)	GPD per capita GDP per capita (current US$)	.	,000	,002	,071	,000
	Unemployment, total (% of total labor force)	,000	.	,000	,016	,000
	Literacy rate (% total population)	,002	,000	.	,008	,000
	Educational spendings as a % of GDP	,071	,016	,008	.	,017
	Educational index	,000	,000	,000	,017	.
N	GPD per capita GDP per capita (current US$)	18	18	18	18	18
	Unemployment, total (% of total labor force)	18	18	18	18	18
	Literacy rate (% total population)	18	18	18	18	18
	Educational spendings as a % of GDP	18	18	18	18	18
	Educational index	18	18	18	18	18

9.3 System of Education in Belarus
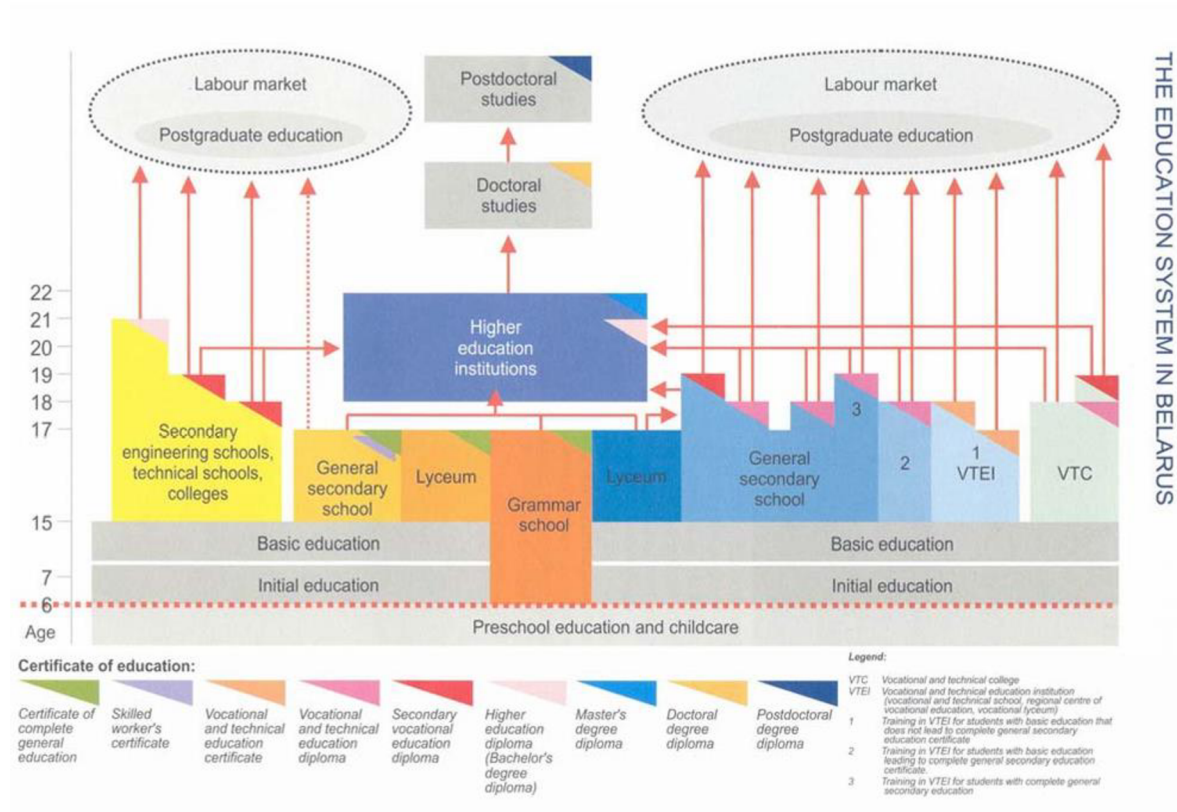
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