Value of people – human capital in Serbia through the prism of educational attainment of young population

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ABSTRACT

Human capital is an important determinant of individual and overall socio-economic development. In addition to economic parameters, human capital is significantly influenced by the level of formal and informal education attained. Previous research in this area has focused on formal education and the skills acquired concerning better positioning in the labor market. Accordingly, the main objective of the conducted research is to determine the state and level of educational attainment as prerequisite for the development of human capital in Serbia. This analysis is based on a set of indicators that represent the achieved educational attainment with special focus on the young population. It is conducted for the territory of Serbia, on municipal level, which enabled the categorization of municipalities according to educational attainment. Most municipalities in Serbia are characterized by insufficient educational attainment in the local context, or in general. For the purpose of the regional disparities identification, the coefficient of human capital utilization was created, in order to identify the mismatch between education attainment and labor market demand. The research shows that it is crucial to change the general perception of demographic problems and challenges, which will allow the development of applicable and more realistic public policies in the future.

KEYWORDS

human capital, education attainment, labor market, coefficient of human capital utilization, Serbia

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1 INTRODUCTION

Human capital represents a result of complementary and interconnected components of health, education, and training (Psacharopoulos 1996). Some authors pointed out that demographic components, such as migration, fertility, and aging, are essential for human capital building (Lutz and Sanderson 2001; Lutz and Goujon 2001; OECD 2001). Lutz and Sanderson (2001) point out that human capital formation has become another essential force that is affected by rapid population growth and aging, as they are directly related to changes in productivity and age structure.

Gary Becker in Human Capital (Becker 1964) defines human capital as various activities that increase business opportunities while developing the most critical resource – people. Human capital is often defined as the combination of education and health of a population. In economic literature, it is analyzed through the aspect of the achieved level of education (Lutz and Kc 2010), the aspect of investment and return investments (Dae-Bong 2009; Laskowska and Borsiak 2016), and the aspect of the labor force projections (Lutz et al. 2007; Lutz et al. 2018).

Considering these aspects, in 1998, the OECD expanded the definition of human capital: "knowledge, skills, competencies and other characteristics possessed by an individual" (OECD 1998). After that, the definition was upgraded, referring not only to economic but also to social well-being (OECD 2001). The OECD has continued with the further improvement of the definition, including skills and knowledge acquired through learning and experience and characteristics acquired at birth (Liu 2011). The most widely accepted OECD definition proposes that "Human capital represents the knowledge, skills, and competencies that an individual acquires during formal and informal education and which enable him to create personal, social and economic well-being" (OECD 1998: 10).

The achieved educational level of the population is an indicator of the available population potential recognized as the bearer of future development. Education is considered a crucial driver of socio-economic development and a source of diversity, which significantly affects the pace of growth and development (Pecelj 1963). Education could be reflected in better health quality and economic opportunities and as a prerequisite for prosperity, both for the individual and for society (Lutz and Goujon 2001). More precisely, people with better education have lower risk of unemployment and poverty and economies which are characterized by a high quality labor force are considered more competitive (Đekić 2015).

In today's scientific and professional literature, education is widely represented as a decisive factor of demographic development in the twenty-first century (Lutz et al. 2019). Indicators for education assessment are a mandatory part of the analysis of demographic and economic development, as well as the quality of human capital. Observing changes in educational attainment is an important part of monitoring demographic changes, considering the influence on the natural and migratory movement of the population (Đurđev 1999). A particular focus should be on harmonizing the education and the labor market demand, which is considered necessary for a balanced development.

Serbia is characterized by educational attainment that is not fundamentally

satisfying, which is reflected through the mismatch between the offer of educational opportunities and the real demand of the labor market. In general, there is a partial approach to solving educational issues in Serbia, which indicates that education is not the primary focus, although there are some efforts to overcome these shortcomings. In Serbia, from the period of the first modern population census in 1948 until today, there are few studies related to educational structure analysis. An important segment presents the quality of the acquired education, as well, and therefore, the qualification of the individual on the labor market. The discrepancy between the offer of educational profiles and the needs of the economy becomes a problematic issue in Serbia since the majority of the labor force lacks the knowledge and competencies that would meet the needs of the labor market (Kokotović Kanazir, Panić and Drobnjaković 2024). During the last twenty years, in the context of human capital analysis, a highly educated labor force, in total and for the young population, has been an indispensable part of the various methods and models. According to the "Europe 2030" Strategy guidelines, networking between stakeholders and the economy on the one hand and Universities on the other was required, with the aim of increasing employment and productivity. This would contribute to the profiling of realistic labor market demands, and more narrowly, the development of tertiary education (Andrejević Panić, Ješić and Vukadinović 2014).

Strategy for the development of education and upbringing in the Republic of Serbia until 2030 (2021), indicates that the education system in Serbia has recently been more significantly focused on the development of competencies,

however the quality of the evaluation system still does not prioritize the competencies' evaluation. The general conclusion could be that in Serbia, the assessment and evaluation of education is fragmented as well as the reform of the educational system, which means that primary and secondary education is seen separately from the reform in tertiary education. One of the key reasons for the low quality of the tertiary education in Serbia is recognized in the funding system, based on the number of enrolled students, which leads these institutions to strive toward quantity instead of quality (Đekić 2015). Also, the reduction of the 'brain drain' i.e. emigration of the young, educated population, requires special attention (Andrejević Panić, Ješić and Vukadinović 2014).

The scope of this research is related to educational attainment in Serbia, which is recognized as a crucial determinant of human capital. The main premise of the research is that the young population with tertiary education in a certain territory represents a potential for human capital building, and its degree of utilization is measured through further positioning on the labor market. In this regard, research is divided into two parts. The first one is related to the creation of educational profiles in Serbia, which implies the educational attainment assessment conducted at the municipality level for the period 1981–2022, and regional disparities identification. The second part is focused on the young population through educational attainment and economic structure. The utilization of the human capital in Serbia was observed through the Coefficient of the utilization, with determination of the mismatch between the job offers and job demand on the local labor market.

1.1 THEORETICAL BACKGROUND

Education as a determinant of human capital. Today, education, or more precisely, the strengthening of human capital, has become the main priority of national strategies (social and economic). This issue has been highly processed in international literature and, to a somewhat lesser extent, in domestic scientific and professional literature. Nevertheless, this issue is still considered insufficiently processed, which could be explained by the lack of adequate data or the problem of their comparability, as well as the differences in educational systems between countries. Quality education has various positive impacts, e.g., on economic development, better health, lower fertility and maternal mortality, and greater life expectancy (Bella and Belkachla 2010). Introducing education as a significant factor for future demographic development enables a more comprehensive view of possible future scenarios than the conventional demographic projections could present. The relationship between education and demographic development could be recognized as a 'two-way', where education affects various population patterns, however education will be influenced by them in a longer period (Bella and Belkachla 2010). In the Lisbon Strategy (European Parliament 2000), education is recognized as one of the most important drivers for achieving the defined goals. The European Union supports the fact that increased competitiveness and productivity are based on knowledge. Also, in the Europe 2020 strategy, formal education and training represent the basis of the strategy and stand out as the main resources of development and progress (out of seven initiatives, three are directly related to education). Also, the education level has become one of the important factors for determining the social position of an individual. First of all, it determines the quality of the labor force, and consequently, it affects the socio-economic development of a certain area (Avramović 2005). The future labor force will probably be smaller but better educated, which could contribute to economic growth (Lutz et al. 2019).

In the latest research, human capital is seen through the achieved educational level because it can be measured more easily and consistently, which provides comparability, as well. The OECD report defined three approaches for measuring capital: (i) costs of acquiring formal education (schooling and training costs); (ii) human competence testing; (iii) productivity based on indicators such as wages, job security, workplace status, etc.

The most common indicators used to monitor and measure human capital are: (i) educational structure of the workforce aged 25 and more; (ii) number of students per 1000 inhabitants; (iii) share of the population (25–64); (iv) working population (25–64); (v) the share of employees in the Research & Development sector of innovative technologies. The basic instrument for human capital measuring is the Human Capital Index, directed toward increasing the labor force productivity in the future based on human capital, however, with limited usage in less developed countries where a significant part of the labor force is not actively employed (World Bank 2020a). In 2020, the Utilization-Adjusted Human Capital Indices (UHCIs) were designed as a supplement to the HCI index toward a more accurate picture on the human capital utilization (World Bank 2020b).

The question, which is recognized as essential for human development research, refers to the importance and

degree of involvement of the human capital theory in educational policy creation. Most policies refer to the knowledge and the importance of education for personal and collective prosperity. At the global level, the economic importance of education became one of the most important questions for OECD research. In their annual reports (Education at a Glance), they indicate trends in education, quality of education, investments, and returns on investments (OECD 2018). In this regard, it is important to take a look back to the 18th century when Adam Smith (Smith 1937) emphasized that the education of the "ordinary" population deserves public attention, rather than that of the category of higher-status population. In that way, with small investments, education, and the acquisition of basic literacy through reading, writing, and arithmetic, the state can facilitate its population to later find easier employment and positioning on the labor market. Due to technological development, education has become necessary in all areas of work. Differences in education are largely influenced by social and economic development (Galeković 2011).

Education represents an aspect of socialization and implies the acquisition of knowledge, skills, and competencies through the process of formal and informal schooling. Education has a direct impact on increasing the productivity of each individual and thus on his personal income (Vukašinović 2017). It can be concluded that the development of human capital implies a cost in the present and, at the same time, a benefit in the future. Accordingly, the current situation in the educational structure of a population represents the result of education during the past decades and, at the same time, determines what the human capital will be like in the future. Since education is acquired chiefly at a young age, changes in the human capital of the adult population have enormous momentum.

Recent data indicate that the labor force in Europe has a higher educational level and that this trend will probably continue. The labor force will be more educated, more qualified, and, therefore, more adaptable to changes in the labor market. As Lutz et al. (2019) point out, regardless of changes in the population age structure and the size of the labor force, it can be expected that the human capital of future workers will be higher than it is today.

Is human capital more than learning? As indicated in the previous text, education is one of the key components of human capital. However, it is not the only component. In addition to education, health is also an important part of human capital. Quality health care, as well as the good health of an individual, represent a significant contribution to the quality of human capital. All the elements that make up human capital are interconnected and overlapping, so an increase in the quality of one component usually affects the increase in the quality of another, which ultimately affects the quality of human capital quality and, indirectly, the prosperity of the entire economy (OECD 2007).

Education in the context of economic potential. The educational structure of the population is a good indicator for studying and determining the economic and social "strength" of a country. In this context, researchers talk about human capital as the element that most clearly and directly determines the economic potential of the state (Goujon 2003; Lutz, Sanderson and Sherbov 2004; Kc et al. 2010; Dondur, 2014). Economists

believe that investing in early education is a prerequisite for economic savings in later educational cycles and provides a basis for the overall development of an individual (Šuković 2013). The importance of education for individual and collective social growth and development is significant. However, some authors point out that it can be useless if the education of the population on a territory (municipality, region, or state) does not meet the needs of the labor market of the given area. In that case, even the most qualified workforce cannot be included in the labor market if it does not meet the requirements of the labor market, which results in an increase in the unemployment rate (Speringer 2012). The effects of education are significant in the long run, and the level of education achieved for each individual means better opportunities for higher standards, productivity, and easier integration into the society. A higher level of education achieved for the individual, as well as for society, creates the possibility of improving the standard of living, improving the state of health and quality of life, and facilitating easier employment.

Although the time duration of formal education is shortened, lifelong learning and improvement gain importance (Karaman Aksentijević 2012). In order to enable the prosperity of economic development, there are several segments that the educational system must fulfill: providing quantitative and qualitative knowledge that contributes to the ability for further work; following changes in the modern economy; organizing education that is aligned with rapid economic changes, primarily in the labor market. In the last few years, European countries have been striving to find ways to quickly adapt to new working conditions.

The population is increasing in mobility in terms of daily circulation and retraining as a result of inadequate education.

In 2000, the European Union set the strategic goal that by 2010, Europe would become the most competitive and dominant world economy based on knowledge, capability of sustainable economic growth, and offering better jobs (Sundać and Krmpotić 2009). The Europe 2020 strategy confirmed this goal, according to which the European Union must ensure economic growth based on knowledge, which includes all social groups. The previously mentioned definition of human capital, according to the OECD, precisely includes all the mentioned components that influence its formation and development. In today's knowledge economy, one of the indicators of the quality of human capital is the acquired level of education (Sundać and Krmpotić 2009). The authors Barro and Sala Martin (1995) proved that the level of education of the labor force (measured by years of schooling) and the allocation of the public sector to education directly affect and determine the growth rate of income per capita.

2 METHODOLOGICAL FRAMEWORK

2.1 SPATIAL AND TEMPORAL DIMENSION

This research was performed at the municipality level to identify spatial disparities. To simplify the interpretation of the results, the authors summarized them and presented them at a regional level. Evaluation, mapping, and visualization of human capital and existing spatial disparities were conducted in the software package QGIS 3.16.5.

Table 1 Indicators of educational structure of population in Census, 1948–2022

	Population Census								
	1948	1953	1961	1971	1981	1991	2002	2011	2022
Completed schooling	+	+	+	+	+	+	+	+	+
Number of completed grades	-	+	+	+	+	+	+	+	+
Literacy	+	+	+	+	+	+	+	+	+
Degree of school education	-	-	-	+	+	+	+	+	+

Source: Statistical Office of the Republic of Serbia 2023.

The temporal dimension of the conducted research implies long-term trend analysis, encompassing the 1981–2022 period. The educational change index was calculated, and comparative analysis was conducted for two census years of 1981 and 2022. This provides continuity in observing the trends and changes in educational attainment over a more extended period, detecting structural changes and the impact of various social processes on the genesis and development of the human capital in Serbia.

2.2 DATA AND DATA SOURCES

Recently, educational attainment data have become increasingly involved in demographic research. These features have been continually present in the Census of Population from 1948 to 2022 (Table 1). However, some features have undergone methodological changes and adjustments that have produced certain limitations regarding the analysis of educational attainment. In the context of the educational structure, there were no significant methodological changes. Issues related to the acquired level of education, or completed schooling, were included in the Census for the first time in 1971 and have been retained until today (2023) (Table 1).

The research is based on the implementation and cross-referencing of different data and various data sources for thorough analysis and deeper understanding of the researched phenomenon.[1] The used data sets encompassed:

- Data on educational attainment (Sources: Statistical Office of the Republic of Serbia 1981, 2023, the 2022 census database);
- Data regarding the unemployment issue (Sources: databases of the Statistical Office of the Republic of Serbia and the National Employment Service);
- Data on job offers (Sources: databases of the National Employment Service and Infostud).

2.3 METHODS

In order to gain a complete insight into the trends and the changes in the educational structure, absolute and relative indicators were used, while educational change index and coefficient of utilization of human capital were derived.

[1] The data used are not publicly available. They were provided by the Statistical Office of the Republic of Serbia, the National Employment Service and Infostud based upon specially created requests by the authors.

The trend analysis was conducted for different levels of education by calculating the *Index of change* as an indicator for the observation of inter-census changes. For an overview of structural changes according to educational attainment, an analysis of education by age (five-year age groups) was made for the 1981 and 2022 censuses at the municipality level in Serbia, and a descriptive analysis of the results was made. This served to establish educational profiles.

The research focus is on the young population. The age threshold is determined in accordance with the Eurostat official statistics, where the category of the young population, aged 25–34, is especially distinguished in the field of educational structure and economic activity (Eurostat 2024). A new approach in official European policy is that the attained level of education is analyzed according to the age of 25 and over, which is largely a consequence of the longer period of education (Bobić, Vesković Anđelković and Kokotović Kanazir 2016). According to the National Youth Strategy (2023), in Serbia, young people are considered to be persons aged 15 to 30. The category defined in this way can be considered inadequate (Bobić, Vesković Anđelković and Kokotović Kanazir 2016), and it was modified in this research. The analysis of the potential in the context of human capital is aimed at the young population that has left formal education, but has tertiary education and is competitive in the labor market.

An analysis of the basic characteristics of the young population (25–34) determined their scope, structure, and potential 'surplus' in relation to the local labor market demand. Determining the degree of utilization of human capital was carried out by applying the coefficient of utilization. It is derived from a specific employment rate, which includes three dimensions: age, education, and economic activity. The coefficient is created in order to assess the current human capital of a certain municipality and its position in the labor market. The coefficient represents the relation between the employed young population aged 25–34 with tertiary education and the total number of young population with tertiary education of the same age. It was calculated based on a special data processing for 2011 as the last available data set.

$$K_{ILjk} = \frac{P_{A25-34TER}}{P_{25-34TER}} \times 100$$

After that, toward a more granulated picture of the coefficient and deeper insight into caused spatial disparities, the additional calculation was performed for two groups of municipalities:

- municipalities with more than 1,000 young people with tertiary education who are working and
- municipalities with less than 100 young people with higher education who are employed.

Descriptive statistics were used to assess the degree of human capital utilization. In order to provide deeper insight into the human capital utilization, a mismatch assessment was carried out between job offers and job demand. It is expressed through the relation between the unemployed population (total and young) and total job offers among regions and municipalities. For this purpose, two data sources have been used. Unemployment data (total and age-structured) was derived from the National Employment Service for 2019. This year was observed as relevant for representing the labor market

before the economic stagnation and the pandemic crisis. The data regarding job offers for 2019 were obtained from the National Employment Service, which is an official national statistic derived from the local level. As an additional source that is more visible and familiar to the young population, the Infostud database has been used.

3 RESULTS

The population's educational structure, as viewed through the census data, represents the most comprehensive analysis. The development of education is expressed through the state and tendencies in the educational structure of the population, which during the second half of the twentieth century resulted in positive effects in Serbia, captured in the 2011 and 2022 censuses. It served as an educational profile assessment.

3.1 EDUCATIONAL PROFILE OF THE POPULATION IN SERBIA

The analysis of the educational profile in Serbia includes the analysis of educational attainment (Table 2). The basic characteristics of the educational structure throughout the observed period (1981–2022) indicate two basic trends

in the two final categories of education. Over the years, there has been a significant decrease in the share of the population without educational attainment, or with incomplete primary education, and the population with tertiary education has increased several times, especially in the last two decades. The share of the population without educational attainment decreased by 95%, and the share of the population with tertiary education increased four times (Table 2).

The Census 2022 recorded a significant improvement in the quality of education in all categories (Table 3). The share of the population without educational attainment was 1.1%, and the population with incomplete primary education was 5.2%. This pointed out that both categories make up 6.3% of the total, which is approximately 7% less than in the 2011 Census. Also, the share of the population with primary education is lower by almost 4%, while the share of the population with secondary education is 53.08%. There is an evident increase in the number of people who have completed high and higher education (22%), approximately +6% compared to the Census 2011.

Analysis conducted on the regional level showed that the South and East Serbia Region (SESR) is distinguished by

Table 2 Index of population change according to educational attainment, 1981–2022.

	Without educational attainment	Incomplete primary education	Primary education	Secondary education	High education	Higher education
1991/1981	73.7	80.0	114.0	136.0	159.0	179.0
2002/1991	69.0	76.0	114.0	147.0	134.0	155.0
2011/2002	43.8	62.0	82.0	112.0	112.0	159.0
2022/2011	34.9	44.2	79.2	100.9	98.7	143.0
2022/1981	5.4	14.2	58.5	174.0	197.2	406.0

Source: Authors' own calculations based on the data from the Statistical Office of the Republic of Serbia 2023.

Table 3 Educational attainment according to the 2022 Census

Area	Without educational attainment (%)	Incomplete primary education (%)	Primary education (%)	Secondary education (%)	High education (%)	Higher education (%)
Republic of Serbia	1.0	5.3	17.8	53.1	6.0	16.4
Belgrade Region	0.5	1.5	10.6	51.0	8.1	27.4
Vojvodina Region	1.2	4.9	18.8	55.0	5.4	14.3
South and East Serbia Region	1.4	7.7	21.4	51.6	5.5	12.0
Šumadija and West Serbia Region	1.0	7.1	20.6	54.3	5.1	11.6

Source: Statistical Office of the Republic of Serbia 2023.

a slightly higher share of the population with incomplete primary education, while on the other hand, the Belgrade Region (BR) and Vojvodina Region (VR) have a significantly higher share of high or higher education (Table 3). The BR recorded the highest values in all categories of educational attainment in Serbia (Table 3). The most significant differences were recorded in two categories: a decrease in the population without educational attainment and incomplete primary education (6.4%) and an increase in the highly educated population (35.5%). The VR is also characterized by a smaller share of the population with incomplete education (4.9%) and a relatively high share of the population with tertiary education (19.7%). The values for all education categories are similar in the SESR and the Šumadija and West Serbia Region (ŠWSR); however, they are slightly less favorable.

Without educational attainment – In the overall educational structure, this category represents the extreme one. In Serbia, from the first post-war census in 1948 until the last one in 2022, this

category has been decreasing. The educational change index for this category in the period 1981–2022 is 21, which indicates a reduction of this category of 94.6% (from 874,216 to 57,667 people) (Table 2). This is predominantly recorded in the traditionally underdeveloped municipalities in the SESR (Đorđević and Panić 2007; Drobnjaković, Panić and Đorđević 2015). In 1981, 76 municipalities recorded values above the average for this education category, most pronounced in Tutin (30.2%), Kuršumlija (30.7%), Merošina (30.9%), Crna Trava (32.9%), Bojnik (36.5%). In 2022, all municipalities in Serbia recorded a decrease. The highest share of this category is in the municipalities Kostolac (5.5%), Bojnik (3.8%), Nova Crnja (3.3%), and Žabalj (2.7%). In 71 municipalities, the share is below 1%, while the lowest values are recorded in the BR (Novi Beograd, Vračar, Stari Grad).

Incomplete primary school – In the period 1981–2022, this category decreased by 85% to 299,739 persons (Table 2). This is most pronounced in all municipalities in the BR (up to 90%), while the highest educational change

index was recorded in the municipalities of Kladovo (65%) and Kostolac (63%). In more than 50 municipalities in Serbia, the share of the population with incomplete primary is above 10%, e.g., Osečina (20.2%), Žagubica (20.2%), Ražanj (19.2%), which are characterized by unfavorable age structure and dominance of the elderly.

Primary education – For the category of population with the completed primary school, the educational change index in the period 1981–2022 is 66.6, which means that the decrease in the share of this category is approximately 3% on average (Table 2). According to the data for 1981, almost 50 municipalities recorded values above the average, mostly in the Vojvodina region: Opovo (36%), Kovačica (40.9%), and Bački Petrovac (42.7%). The decrease in the share of the population with primary education in 2022 occurred in most municipalities in Serbia. The highest share values were recorded in the municipalities of Malo Crniće (46%), Žabari (42.2%), and Tutin (34.2%). In most Belgrade municipalities, the share decreased below 10%. The educational change index showed the largest decrease in the municipalities of Loznica and Mionica (decrease of over 90%), while the smallest decrease was recorded in the municipalities of Lučani and Ada (2%).

Secondary education – This is the most common category of educational attainment in Serbia. The educational change index 1981–2022 is 170; more precisely, the number of persons with secondary education in 1981 was 1,771,028 (24.6%), while in 2022 was 3,020,958 (53.08%). The municipalities in the BR recorded the lowest values of the educational change index (70). More than 150 municipalities recorded

an increase in this category, e.g., Novi Pazar and Tutin. In 1981, 72 municipalities had an above-average share of the population with secondary education; the largest was recorded in BR (Rakovica 44.9%, Novi Beograd 44.1%), Novi Sad (42.3%), Niš (36.4%), and the smallest in municipalities in the SESR. In 2022, more than half of the municipalities in Serbia (70) recorded a share of this category above the national average (53.1%). The greatest regional heterogeneity is detected in the BR, with municipalities with the highest values (Barajevo 64.6%, Grocka 62.9%) and the municipalities with the lowest values (Vračar 32.2%, Stari Grad 33.5%).

Higher and high education (tertiary education) – The most important level of education that determines the human capital quality is tertiary education, that is, higher and high education. In the period 1981–2022, a significant increase in this category was recorded. It is most pronounced in the municipalities Barajevo and Sombor. The increase is continuously present. In 1981, the share of the population with tertiary education was 5.7%, and in 2022, it was 22.4%, which is approximately four times more. The spatial distribution of this category showed that the BR stands out in all censuses, especially the central city municipalities (Figures 1 and 2). The lowest values, below 1%, were recorded in some municipalities of the SESR. In more than 30 municipalities, the values were below 2%. In 2022, there was 22.4% of people with tertiary education in Serbia, predominantly in the BR (35.5%), then in VR (19.8%), SESR (17.6%), and ŠWSR (16.7%). The regional distribution is partly caused by the strength of regional and university centers, such as Belgrade, Novi Sad, Niš, Kragujevac, Novi Pazar, etc. (Figure 2).
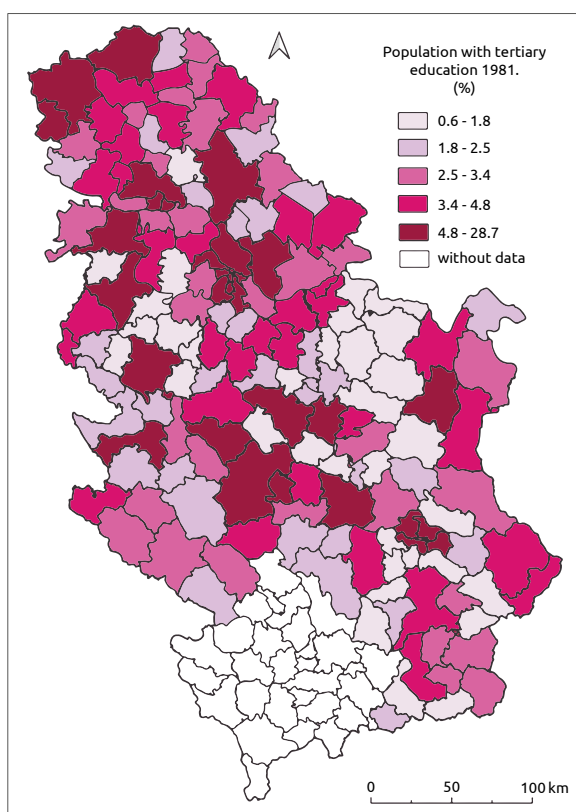
Figure 1 Population with tertiary education, 1981.
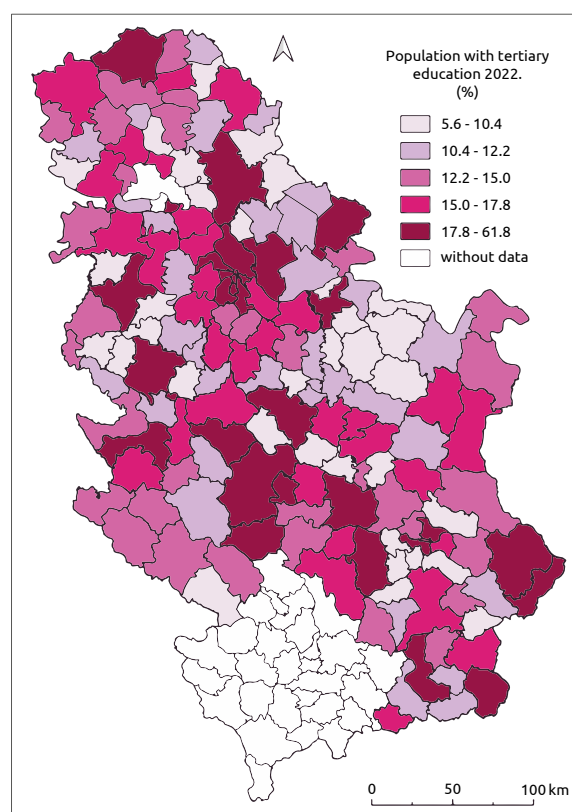*Source:* Statistical Office of the Republic of Serbia 1981.

Figure 2 Population with tertiary education 2022.
Source: Statistical Office of the Republic of Serbia 2023.

3.2 YOUNG POPULATION IN THE CONTEXT OF HUMAN CAPITAL DEVELOPMENT

In the demographic discourse, the emphasis is shifted from the quantity to the quality of a population. In countries that are characterized by emigration, such as Serbia, it is impossible to stop the negative processes of depopulation, aging, and emigration (Panić et al. 2022). Therefore, the focus should be shifted to the qualitative characteristics of the population (Lutz and Gailey 2020). Human capital strengthening is seen as one of the driving mechanisms for further sustainable demographic development, especially through the prism of investment in education (Nikitović 2018).

Modern migration processes have a great influence on the formation of the "capacity" of municipalities in terms of the quality of education, and thus, it is a prerequisite for determining the level of human capital in the observed area. More precisely, a young, highly educated population is a key element of the human capital. Therefore, areas with high shares of young, educated population have significant potential for future socio-economic growth and development. Certain experts in the field of demography (Lutz and Gailey 2020) point out that the most pressing problem for Serbia is the large emigration of young, highly educated persons. The migration of young people to large cities, which are university centers as

well, affects the emptying of smaller and less developed municipalities. This is identified through the results of the 2022 Census. The most pronounced tendency of young people is to stay in the place of education and try to position themselves in the labor market. This results in a small or sometimes negligible return migration (Đukić Dejanović et al. 2018). Recent research indicates that urban centers no longer represent points of attraction for the young population, but are just a step toward further education or employment abroad (Šantić and Antić 2019).

According to Eurostat (Eurostat 2024), the share of young people with higher education in 2022 was 40%, which is the path toward achieving the European Union target of 45%. Serbia is among the lowest-ranked countries in Europe according to the share of the young with tertiary education (32.6%). Also, compared with the countries in its surroundings, Serbia is among the lowest-ranked countries. According to the data of the 2022 Census, the share of young people with tertiary education increased by 10% in the last ten years.

Young population without educational attainment – The average value for this category in Serbia is 0.9%. In 53 municipalities, the values above average were registered. The highest was registered in the municipalities of Kostolac (6.9%), Nova Crnja (4.7%), and Aleksinac (4%), while the lowest was recorded in the central municipalities of the BR (1%), Topola (0.1%), and Čajetina (0.2%).

Young population with incomplete primary education – The average value in this category is 1.8%; above-average values were recorded in 55 municipalities. The highest values of this category were registered in the municipalities of

Vlasotince (11.6%), Kostolac (11.5%), Nova Crnja (8.2%), and Kanjiža (7.7%). In comparison, municipalities in the BR (0.1%), Čačak (0.2%), and Gornji Milanovac (0.2%) recorded the lowest values.

Young population with primary education – The share of the young population with primary education is 9.8% in Serbia. Seventy-two municipalities were recorded above the national average. The highest share was registered in the municipalities of Malo Crniće (26%), Žabari (22.4%), and Osečina (21.5%). Despite the fact that Tutin has been recognized as the municipality with the highest percentage of the young population, the educational attainment is unfavorable, with almost 20% of the young population having primary education. The lowest values (below 1%) are recorded in the inner-city municipalities in the cities of Belgrade and Niš.

Young population with secondary education – The share of the young population with secondary education is the highest of all educational categories (58.4%) in Serbia. According to the 2022 Census, 92 municipalities recorded values above average. The highest share of young people with secondary education is in Čajetina (76.1%), Gadžin Han (71.7%), and Majdanpek (70.2%). The lowest values were recorded in the municipalities in Belgrade (30%), Novi Sad (44.9%), and Niš (50.7%).

Young population with tertiary education – Regional disparities of this category in Serbia are highly pronounced. The share of the young population with tertiary education ranges from 15.8% to 71.5%. In 37 municipalities, values are above the national average. The largest are recorded in the municipalities of the BR and city of Niš (Medijana, Pantelej) (Figure 3).
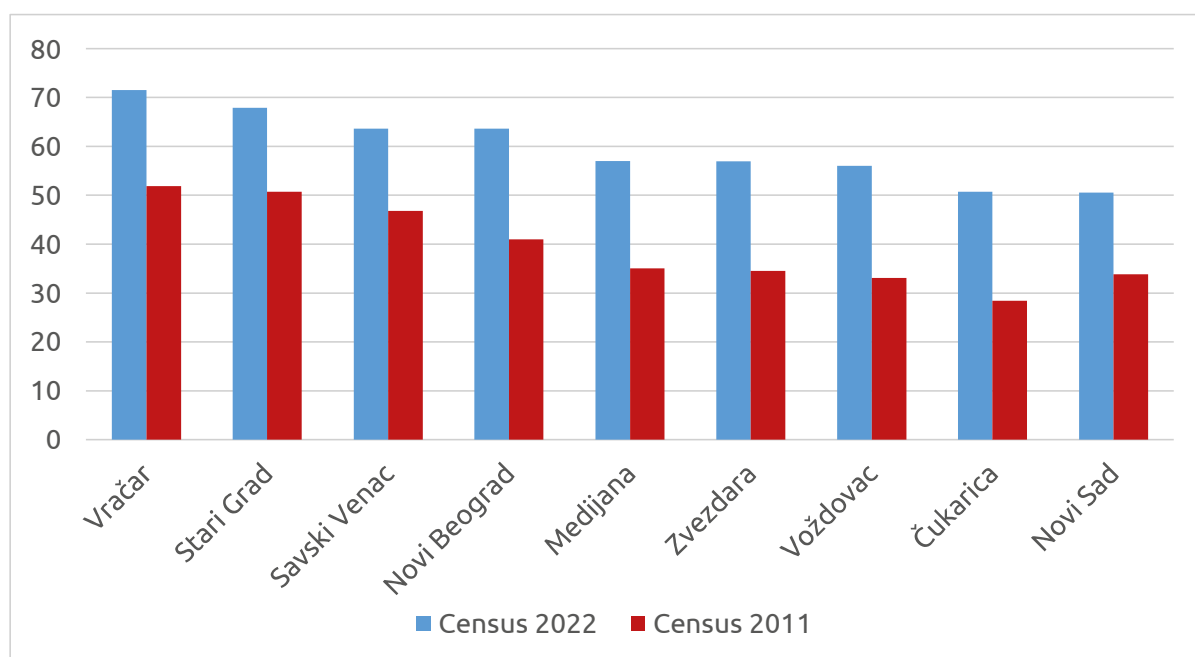
Figure 3 Municipalities with the highest share of young (25–34) with tertiary education
Sources: Data based upon specially created requests by the authors.

3.3 COEFFICIENT OF UTILIZATION OF THE HUMAN CAPITAL (CUHC)

Based on the established characteristics of the young population (25–34) highly educated in Serbia and their spatial disparities, the next challenge was to determine the degree of utilization of human capital. Starting from the previously stated premise that the young population with a tertiary level of education in a certain territory represents a potential, its degree of utilization is measured through further positioning on the labor market. The obtained results were determined by the scope and size of the contingent of the young population, which required an additional classification of municipalities according to the population size, with the aim of accurately assessing utilization.

The average value of the CUHC for the Republic of Serbia is 69.9%. The lowest value is registered in Sjenica (53.3%), where out of 548 people, 292 are actively employed; in Doljevac (52.2%) out of 163, only 90 are actively employed; in Priboj (58.2%) out of 641 persons, 373 are actively employed; in Aleksinac (58.8%) out of 893 persons, 525 are actively employed. The BR is characterized by high values of the coefficient (Novi Beograd – 76.5%, where of 17,281 young people, 13,220 are actively employed; Zemun – 75.3%; Zvezdara – 75%). Also, high values are recorded in Subotica (76.1%) and Novi Sad (74%), but also in less populated municipalities such as Čoka (79.8%), Senta (78.5%), and Bečej (78%).

The CUCH was calculated for two different municipality groups. The population size showed that there are 41 municipalities with more than 1,000 employed young people with higher education and 20 municipalities with less than 100 employed young people with higher education. In the group of municipalities with more than 1,000 employed and highly educated youth, the average

Table 4 Municipalities with a high coefficient of utilization of the human capital, 2022.

Municipality	Young population with tertiary education (%)	CUCH	Ranking according to the CUCH
Vračar (Belgrade)	61.8	72.8	50
Medijana (Niš)	43.4	67.7	112
Novi Sad	50.5	74.3	29
Užice	41.2	69.6	98
Kragujevac	38.2	70.4	92

Source: Authors' own calculations based on the data from the Statistical Office of the Republic of Serbia 2023.

value of the coefficient is 70.6%, of which the highest is in the municipality of Novi Beograd (76.5%) and the lowest in the city of Vranje (60.2%). The average value of the coefficient in the group of municipalities with less than 100 young persons employed and highly educated is 68.1%, of which the highest is in the municipality of Osečina (75%) and the lowest in Doljevac (55%).

3.4 UNEMPLOYMENT AND LABOR MARKET

Areas with a larger participation of young and qualified labor are a precondition for achieving economic prosperity (OECD 2020). A skilled labor force usually determines the economic potential of a country (Bartlett and Aranderenko 2012; Lutz, Sanderson, and Scherbov 2004). Areas with low labor utilization are characterized by working-age population emigration, which is reflected through the lack of labor force, or the mismatch of the education system with the development of the labor market (Bartlett and Aranderenko 2012; Bartlett, Johansen, and Gatelli 2012; Pantelić, Stojanović, and Stojsavljević 2014).

In Serbia, the average employment rate of young people aged 25–34 is 69% according to the data from the national databases obtained from specially cre-

ated requests by the authors, which is significantly lower than in Europe (85%) (Eurostat, 2024). The employment of young people in the world differs from country to country. However, certain studies have shown that the employment of young people who have gained some work experience during their studies is higher (OECD 2020). Although unemployment among young people with tertiary education in Serbia is lower compared to other education levels, however, it is four times higher than the European average (Eurostat 2024).

One of the factors that determines the utilization of the labor force is the compliance of the job offer with the demand on the labor market, expressed through the structure and qualifications of the population (Kokotović Kanazir, Panić and Drobnjaković, 2024). The results of analyses underpins the significant uneven spatial distribution in youth unemployment, long-term unemployment, highly educated unemployed labor force, etc. The labor market is not in accordance with the changes in the economic structure and educational capacities, which cause a mismatch between a labor force and labor market demand (Drobnjaković et al., 2022). In Serbia, it is noticeable that municipalities with the largest labor force potential have the most job offers (Table 5) and vice versa.

The municipalities of Zemun, Novi Beograd, and Novi Sad stand out with the most extensive job offer, as well as other larger centers (Prokuplje, Kruševac, Kraljevo, Čačak, Kragujevac, Zrenjanin, Subotica) (National Employment Service 2019a, 2019b). However, it is necessary to catch job offers at a local level. By comparing the number of employees by municipality with the number of the jobs offered, a more complete picture is obtained (Kokotović Kanazir, Panić and Drobnjaković, 2024). In this regard, two sources of data were used.

A mismatch between job offers and job demand is significant in Serbia, with more than five unemployed per one offered job (Table 5). However, an imbalanced distribution of job offers among regions is noticeable. The highest mismatch is registered in the SESR (11.1) and ŠWSR (10), while in the BR, the mismatch is indistinguishable. The relationship between the job offers and demand in VR is at the national level. These facts imply a high polarization of job offers, where jobs are concentrated in the most developed municipalities and towns of the BR and VR (Table 5). In 2019, according to the data by the National Employment Service, the

municipalities of Stari Grad, Novi Beograd, Zemun, Senta, and Obrenovac had a balanced supply and demand for work, while in 34 municipalities 2–5 unemployed per one offered job were registered, which could be considered moderately favorable. The most pronounced difference between the job offers and the demand was registered in the municipalities of Bela Crkva (309), Medveđa (268), Kovačica (124), and Bojnik (123). On the other hand, more than 20 unemployed per one offered job were recorded in 35 municipalities (Kokotović Kanazir, Panić and Drobnjaković, 2024).

A broad Infostud's base for job offers implies a less pronounced mismatch at the national level (2.9) as well as among regions (Table 5). The most pronounced mismatch is registered in the ŠWSR (4.2) despite the high job offers. The highest discrepancies were identified in the municipalities of this Region (Novi Pazar – 25.8; Tutin – 13.4) as well as in the SESR (Leskovac – 12.8; Aleksinac – 9). The most favorable conditions in the labor market characterized the VR, where the most job offers have been registered, and in this regard, low to undistinguished mismatch (Table 5).

Table 5 Mismatch between the job offers and the demand on the labor market, 2020.

		Republic of Serbia	Belgrade Region	SES Region	ŠWS Region	Vojvodina Region
Unemployed population (UP)		476467	66301	128935	179276	101955
Job offer	NES	90263	40814	11635	17987	19827
	Infostud	166489	33450	34245	43034	55760
UP mismatch	NES	5.3	1.6	11.1	10.0	5.1
	Infostud	2.9	2.0	3.8	4.2	1.8
Young unemployed (YU)		105315	15220	28385	39987	21723
YU mismatch	NES	1.2	0.4	2.4	2.2	1.1
	Infostud	0.6	0.5	0.8	0.9	0.4

Sources: Data based upon specially created requests by the authors.

A positive to balanced relationship between the job offers on the Infostud and the demand in the labor market has been identified in municipalities that are small in population size, or have underdeveloped local labor markets.

In order to determine the position of the young population in the labor market, the relation of the young unemployed per job offer has been observed. According to the NES data on job offers, significant disparities among regions are noticed (Table 5). The demand for unemployed youth is equal to job offers. The most favorable relation is identified in the BR, where four young unemployed persons could choose between ten offered jobs, or each young unemployed could apply to 2–3 offered jobs. Balanced labor market and job offers in favor of the young unemployed population characterized the VR. Municipalities in these regions (Savski Venac, Obrenovac, Senta, Stara Pazova, Zrenjanin, etc.) registered two or three young unemployed per ten offered jobs. It induces youth in these two regions to have more opportunities to get a job and be included in the work process. On the other hand, youth of the SESR (2.2) and ŠWSR (2.4) are limited in gaining jobs. In this regard, the most endangered are small in population size and underdeveloped municipalities with more than ten young unemployed persons per one offered job (Medveđa – 58.8; Bojnik – 23.2; Tutin – 14.5; Osečina – 14.4; Trgovište – 13.4; etc.). Infostud's data on job offers provide a less pronounced mismatch at the national level and among regions (Table 5). However, the distribution of the job offers is still in favor of the BR and VR. The labor market is unfavorable in the other two regions, where the mismatch is higher (0.8 or 0.9)**.**

4 DISCUSSION

Population viewed through the human capital prism is one of the most applicable approaches today, and it intrigues all subjects in the human society. For this reason, it is understandable why the issue of human capital represents the central theme of almost all strategic development documents in Europe (European Union, 2010). Its identification and assessment are highlighted as a primary task, which is largely guided by political and economic norms. More precisely, it implies its quantification and mapping of spatial disparities, i.e., measurement, which is difficult due to the complexity of the problem and the diversity of different approaches. Educational attainment directly affects the formation of a contingent of future labor force qualified to perform better-paid jobs; more precisely, a greater number of years spent in school offers the possibility of adequate employment and thus enables the individual to realize their full potential (Keeley, 2007).

A positive trend in education is characteristic of most European countries, and the younger cohorts are more educated than the older population. On the age pyramid, the number of highly educated people is increasing, and the older, less educated population is dying – the so-called process of demographic metabolism (UNDP 2020). However, besides primary education, which is mandatory in Serbia, an increase in the population with secondary and tertiary education is a significant improvement in the educational structure (Šobot 2015). The new tendencies are heading toward the reform of the education system, which should rename secondary education as mandatory as well (Nikitović 2015).

The conducted analysis of the human capital in Serbia, viewed through trends in the educational structure, indicated heterogeneity and spatial disparities in terms of the level of educational attainment in terms of overall and young population (25–34) (Kokotović Kanazir, Panić and Drobnjaković, 2024). There has been an increase in educational attainment, especially in the period 2011–2022. From a regional point of view, the BR and the VR have a more favorable educational structure than other regions in Serbia. Within the framework of tertiary education, municipalities in the Belgrade Region (Stari Grad, Savski Venac, Vračar) and municipalities in the immediate vicinity of large cities (Petrovaradin) stand out.

Municipalities with a large proportion of the elderly were characterized by a lower level of education, especially sparsely populated municipalities in the SESR (Crna Trava, Gadžin Han, Bojnik, etc.). In general, Serbia is one of the ten countries in the world with the most intensive population decline (Lutz and Gailey 2020; UNDP 2020), negative reproductive norms (total fertility rate 1.4 equal to the European countries level) (Statistical Office of the Republic of Serbia, 2021), negative trends of natural growth and it is one of the oldest countries in the world (Stojilković Gnjatović and Devedžić 2016). The aging and other aforementioned processes have caused continuous shrinkage of the labor force and have an unfavorable effect on the education of the population (Drobnjaković et al. 2022). These processes particularly tackle the SESR, which is characterized by low educational attainment as a direct consequence of the distinct aging process (Jokić, Dželebdžićand and Petovar 2015) and high mortality. Therefore, municipalities that still record relatively high shares of the population without educational attainment are municipalities with a high share of elderly (65+). The only exception in this Region is the city of Niš, where the municipalities have a high level of educational attainment. On the other hand, in the ŠWSR, the city of Užice, as a regional center, stands out, as well as its immediate surroundings (Čajetina). In this Region, municipalities with a good demographic base, in terms of a high share of young population, such as the municipalities Novi Pazar, Tutin, and Sjenica, do not stand out as municipalities with good educational characteristics. On the contrary, in these municipalities, there is a high share of the population that has primary education.

The results obtained in the cohort of the young population (25–34) indicate slightly more favorable trends in relation to the total observed population. From a regional point of view, the BR and VR recorded more favorable values, although certain municipalities in the VR stand out with slightly less favorable values, especially when it comes to young people with tertiary education (Čoka, Bač, Novi Bečej). It implies that demographically, small municipalities and underdeveloped areas are characterized by a less developed labor market. An unfavorable demographic base and deteriorated age structure do not offer a significant contingent of youth, while in underdeveloped areas, there is a strong emigration of educated young people (Drobnjaković, Panić and Kokotović Kanazir 2023; Šantić and Antić 2019). Also, many employers in Serbia, despite the high unemployment, have difficulties in finding adequate labor force (Đekić 2015). According to the 2022 Census, all municipalities recorded a significant decrease in the young population

without or with incomplete primary education, which indicated a decrease in those who leave school early, or are not involved in formal education. Further analysis in the context of human capital utilization was conducted to determine the young population that is employed. As Dauda (2021) pointed out, it is not enough to observe the performance of a country only according to the human capital scope or structure, its true value is reflected through its actual utilization, seen in the "efficient" use of skilled labor force. The authors tried to find the answer to this question through the building of the coefficient of utilization of human capital.

The results of the obtained coefficient confirmed that municipalities with high shares of young population with tertiary education have a relatively high level of utilization of human capital, more than 70% (Novi Beograd (BR), Novi Sad (VR), Kragujevac (ŠWSR). However, the mismatch between supply and demand can be noted in the larger city centers (Kruševac, Kragujevac, Kraljevo, Leskovac, Čačak) where surpluses of young people who are not employed are approximately 40%, which indicates that their human capital is not sufficiently utilized.

Further analysis relies on examining the relationship between education and the labor market demand on the local level, which became a question of great importance. The findings regarding unemployment indicate a significant mismatch between job offers and job demand in Serbia, with more than five unemployed per one offered jobs. The mismatch between the offer of education and the needs of the labor market has created high rates of unemployment – a surplus of labor and thus significantly determined its underutilization with high regional misbalance (Šuković 2013; Drobnjaković, Panić and Kokotović Kanazir 2023). The most favorable relation is identified in the Belgrade Region, where each young unemployed person could apply for 2–3 jobs offered. Balanced relations are detected in the Vojvodina Region and in those municipalities that are functionally and infrastructurally well connected to large cities (Drobnjaković, Panić and Kokotović Kanazir 2023). However, the young population in the municipalities of the SESR and ŠWSR, which are characterized by weak labor force potential (Drobnjaković, Panić, Kokotović Kanazir and Javor 2022), are limited in gaining jobs. Most endangered are municipalities that are small in terms of population size and underdeveloped, with more than ten young unemployed persons per one offered jobs (Medveđa – 58.8; Tutin – 14.5; Osečina – 14.4; etc.).

5 CONCLUSION

The number of indicators used to analyze the educational structure and examine the level of human capital is increasing, and some of the most commonly used are the distribution of the population according to a certain level of education, level of education according to age, and average duration of schooling. When examining the potential of human capital, the level of education according to age is an extremely important indicator; specifically, in many studies, the number or share of highly educated people aged 25–34 is used. In this context, the creation of the coefficient of utilization of human capital arose from the need to approximately determine the degree of utilization of the established potential in human capital in Serbia. The problems of depopulation in Serbia are most often related to the labor market, family

planning, and education system. The state should simultaneously direct its policy towards slowing down negative demographic trends in the direction of investing in "quantity," i.e., maintaining the total number of inhabitants, as well as the "quality" of the population, i.e., human capital. Measures that could mitigate negative trends relate to the areas of education, health, and population policy (UNDP 2020).

Education is an important segment of progress in human development. Strengthening education through investments, raising the quality of education, and creating adequate educational profiles, which would be harmonized with the needs of the labor market, would significantly contribute to the strengthening of human capital in the territory of the Republic of Serbia. If there are no significant changes in the number of births in Serbia, the trend of reducing the volume of the labor contingent will continue, which is a consequence of negative demographic trends in the past. Therefore, the focus of the policy that deals with demographic "recovery" or development should also be directed toward the balanced development of human capital. Development policies emphasize not only the population but also the human capital that lives in the given area (Speringer 2012). More and more often, it is pointed out that countries like Serbia, which are witnessing a continuous and intensive decrease in the number of inhabitants, can mitigate the negative effects through education and training of the existing population, which will ensure economic growth and development, which would in turn bring a better quality of life, better health care and a better standard of living.

Most often, human capital is measured through the level of education achieved; however, this approach brings reduced results and incomplete insight into the context of the level of human development achieved. To broaden the understanding of human development, the approach to quantifying human capital should include other dimensions, such as demographic, social, health, economic, technological (innovation), etc. Human capital cannot be viewed only through educational attainment because it is obvious that many countries with a similar degree of educational attainment have different levels of social and economic development. Therefore, the breadth of human capital research is crucial in order to determine its real potential and development perspective.

REFERENCES

Andrejević Panić, A., Ješić J., & Vukadinović, S. (2014). Povezivanje visokog obrazovanja i tržišta rada uz primenu inovacionog modela trostrukog heliksa. *Poslovna ekonomija,* 8(1), 217–238.

Avramović, Z. (2005). *Dva veka obrazovanja u Srbiji*. Beograd: Institut za pedagoška istraživanja.

Barro, R. J., & Sala-I-Martin, X. (1995). Technological Diffusion, Convergence, and Growth. *Journal of Economic Growth*, 2, 1–26. http://www.jstor.org/stable/40215930.

Bartlett, W., & Arandarenko. M. (2012). The Labor Market, Skills and Growth in the Western Balkans: An Introduction. In M. Arandarenko and W. Bartlett (Eds.), *Labor Market and Skills in Western Balkan* (pp. 3–5). Belgrade: FREN – Foundation for the Advancement of Economics. https://connecting-youth.org/publications/publikim38.pdf

Bartlett, W., Johansen, J., & Gateli, D. (2012). Skills Gaps and Mismatches in the Western Balkans: A Comparative Analysis. In M. Arandarenko & W. Bartlett (Eds.), *Labor Market and Skills in Western Balkan* (pp. 19–35). Belgrade: FREN – Foundation for the Advancement of Economics. https://connecting-youth.org/publications/publikim38.pdf

Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. Chicago: University of Chicago – Department of Economics.

Bella, N., & Belkachla, S. (2010). Impact of demographic trends on the achievement of the Millenium Development Goal of Universal Primary Education. Paris: UNESCO

Bobić, M., Vesković Anđelković, M., & Kokotović Kanazir, V. (2016). *Study on external and internal migration of Serbia´s Citizens with particular focus on Youth*. Belgrade: International organization for migration (IOM). https://serbia.iom.int/resources/study-external-and-internal-migration-serbias-citizens-particular-focus-youth-0

Dae-Bong, K. (2009). Human Capital and its measurement. The 3rd OECD World Forum on *Statistics, Knowledge and Policy* Charting Progress, Building Visions, Improving Life, Busan, 27–30 October, 2009. https://www.oecd.org/site/progresskorea/44109779.pdf

Đekić, I. (2015). Unapređenje ljudskog kapitala u Srbiji. *Ekonomika,* 61(3), 133–150. https://doi.org/10.5937/ekonomika1503133D

Dondur, V. (2014). Zalog za budućnost. *Glas*. Beograd: Odeljenje društvenih nauka Srpske akademije nauka i umestnosti.

Đorđević, J., & Panić, M. (2007). Underdeveloped Areas – South Morava Region. *Journal of the Geographical Institute "Jovan Cvijić" SASA, 56*, 39–57.

Drobnjaković, M., Panić, M., & Đorđević, J. (2015). Traditional undeveloped municipalities in Serbia as a result of regional inequality. *European Planning Studies,* 24(5), 926–949. https://doi.org/10.1080/09654313.2015.1129396

Drobnjaković, M., Panić, M., & Kokotović Kanazir, V. (2023). Prostorni i strukturni dispariteti radne snage u Srbiji. *Kritika*, 4(1), 167–187. https://doi.org/10.5281/zenodo.7983791

Drobnjaković, M., Panić, M., Kanazir Kokotović, V., & Javor, V. (2022). Spatial aspects of labor force formation: the interrelation of cohort turnover and net migration in Serbia. *Eurasian Geography and Economics, 63*, 543–559. https://doi.org/10.1080/15387216.2022.2052136

Đukić Dejanović, S., Bjelobrk, G., Jovanović, N., & Đorđević Lj. (2018). *Migracije studenata*. Beograd: Kabinet ministra bez portfelja zaduženog za demografiju i populacionu politiku.

Đurđev, B. (1999). Problemi regionalnog demografskog rasta Srbije. *Glasnik Srpskog geografskog društva*, 79 (2), 21–32.

European Parliament (2000). *The Lisbon Strategy 2000–2010. An analysis and evaluation of the methods used and results achieved.* https://www.europarl.europa.eu/thinktank/en/document/IPOL-EMPL_ET(2010)440285

European Union (2010). Project Europe 2030 – Challenges and opportunities. A report to the European Council by the Reflection Group on the Future of the EU 2030. https://www.consilium.europa.eu/media/30776/qc3210249enc.pdf

Eurostat (2024). *Population by educational attainment level, sex and age (%) – main indicators.* Eurostat database. https://ec.europa.eu/eurostat/databrowser/view/EDAT_LFSE_03__custom_853513/bookmark/table?lang=en&bookmarkId=773e39a3-bc1e-4a65-a24e-39e48f0bfb31

Galeković, S. (2011). Promjene u obrazovnoj strukturi ženskoga stanovništva u Republici Hrvatskoj od 1961. do 2006. godine. *Kroatologija*, 2(1), 42–58. https://hrcak.srce.hr/75493

Goujon, A. (2003). *Education as a dimension in forecasting: Multi-state population projections by education and future Literate Life Expectancy – Methodology, applications, and results.* Vienna: University of Vienna.

Jokić, V., Dželebdžić, O., & Petovar, K. (2015). Human Capital and its Spatial Distribution as Limiting Factors for Balanced Development of Serbia. *Spatium* 34, 46–55. https://doi.org/10.2298/SPAT1534046J

Karaman Aksentijević, N. (2012). *Ljudski potencijali i ekonomski razvoj.* Rijeka: Sveučilište u Rijeci, Ekonomski fakultet Rijeka.

Kc, S., Barakat, B., Goujon, A., Skirbekk, V., Sanderson W., & Lutz, W. (2010). Projection of populations by level of educational attainment, age and sex for 120 countries for 2005–2050. *Demographic Research*, 22, 383–472. https://doi.org/10.4054/DemRes.2010.22.15

Keeley, B. (2007). *Human Capital How what you know shapes your life.* Paris: OECD Publishing.

Kokotović Kanazir, V., Panić, M., & Drobnjaković, M. (2024). Spatial Distribution of Human Capital in Serbia: Empirical Analysis with Special Reference to Education. In K. N. Zafeiris, B. Kotzamanis, & C. Skiadas, C. (eds.), Population Studies in the Western Balkans. European Studies of Population, vol 26 (pp. 179–210). Cham: Springer. https://doi.org/10.1007/978-3-031-53088-3_8

Laskowska, I., & Dańska-Borsiak, B. (2016). The Importance Of Human Capital For The Economic Development Of EU Regions. *Comparative Economic Research*, 19(5), 63–79. https://doi.org/10.1515/cer-2016-0038

Liu, G. (2011). *Measuring the stock of human capital for comparative analysis: an application of the lifetime income approach to selected countries.* Paris: OECD Publishing (OECD Statistics Working Papers 41). http://ina.bnu.edu.cn/docs/20140604162202045374.pdf

Lutz, W., & Gailey, N. (2020). *Depopulation as a Policy Challenge in the Context of Global Demographic Trends.* UNFPA, UNDP.

Lutz, W., & Goujon, A. (2001). The World's Changing Human Capital Stock: Multi-State Population Projections by Educational Attainment. *Population and Development Review*, 27(2), 323–339. http://www.jstor.org/stable/2695213

Lutz, W., & KC, S. (2010). Dimensions of global population projections: what do we know about future population trends and structures? *Philosophical Transactions of the Royal Society B*, 365(1554), 2779–2791. https://doi.org/10.1098/rstb.2010.0133

Lutz, W., & Sanderson, W.C. (2001). *Toward a Concept of "Population Balance" Considering Age-Structure, Human Capital, and Intergenerational Equity.* IIASA Interim Report. Laxenburg: IIASA (IR-01-003). https://pure.iiasa.ac.at/id/eprint/6517/7/IR-01-003.pdf

Lutz, W., Amran, G., Bélanger, A., Conte, A., Gailey, N., Ghio, D., … Stonawski, M. (2019). *Demographic Scenarios for the EU – Migration, Population and Education.* Luxembourg: Publications Office. https://dx.doi.org/10.2760/590301

Lutz, W., Goujon, A., KC, S., & Sanderson, W. C. (2007). Reconstruction of populations by age, sex and level of educational attainment for 120 countries for 1970–2000. *Vienna Yearbook of Population Research*, 5, 193–235. https://doi.org/10.1553/populationyearbook2007s193

Lutz, W., Goujon, A., Kc, S., Stonawski, M., & Stilianakis, N. (2018). *Demographic and Human Capital Scenarios for the 21st Century: 2018 assessment for 201 countries*. Luxembourg: Publications Office of the European Union. https://doi.org/10.2760/41776

Lutz, W., Sanderson, W. C., & Scherbov, S. (2004). *The End of World Population Growth in the 21st Century: New Challenges for Human Capital Formation and Sustainable Development*. London – Sterling: Earthscan.

Lutz, W., Sanderson, W., & Scherbov, S. (2001). The end of world population growth. *Nature*, 412(6846), 543–545. https://doi.org/10.1038/35087589

Nikitović, V. (Ed.). (2015). *The population of Serbia at the beginning of the 21st century*. Belgrade: Statistic Office of the Republic of Serbia (in Serbian).

Nikitović, V. (2018). Značaj političkog odgovora za demografsku budućnost Srbije. In V. Kostić, S. Đukić Dejanović & M. Rašević (Eds.), *Ka boljoj demografskoj budućnosti Srbije* (pp. 210–221). Belgrade: Srpska akademija nauka i umetnosti.

OECD (1998). *Human Capital Investment: An international Comparison*. Paris: OECD.

OECD (2001). *Human Capital: How what you know shapes your life. OECD Insights*. Paris: OECD.

OECD (2007). *Education at a Glance*. Paris: OECD. https://www.oecd.org/education/skills-beyond-school/39313286.pdf

OECD (2018). *Education at a Glance 2018: OECD Indicators*. Paris: OECD Publishing.

OECD (2020). *OECD International Migration Database. OECD Stat*. https://stats.oecd.org/Index.aspx?DataSetCode=MIG

Panić, M., Drobnjaković, M., Stojiljković, G., Kokotović Kanazir, V., & Doljak, D. (2022). Nighttime lights – innovative approach for identification of temporal and spatial changes in population distribution. *Journal of the Geographical Institute "Jovan Cvijić" SASA, 72*(1), 51–66. https://doi.org/10.2298/IJGI2201051P

Pantelić, M., Stojanović, V., & Stojsavljević, R. (2014). Unemployment as a major issue in Vojvodina Province: A case study of Kikinda municipality. *Geographica Timisiensis,* 23(2), 51–61.

Pecelj, G. (1963). Nivo školskog obrazovanja stanovništva Jugoslavije. *Stanovništvo* 1(2), 186–223.

Psacharopoulos, G. (1996). Economics of Education: A Research Agenda. *Economics of Education Review*, 15(4), 339–344.

Smith, A. (1937). *The Wealth of Nations*. Random House, Inc.

Statistical Office of the Republic of Serbia (1981). *Educational attainment and literacy*. Belgrade: Statistical Office of the Republic of Serbia.

Statistical Office of the Republic of Serbia (2021). *Municipalities and Regions in the Republic of Serbia 2020*. https://publikacije.stat.gov.rs/G2020/Pdf/G202013047.pdf

Statistical Office of the Republic of Serbia (2023). *2022 Census of population, households and dwellings. Educational attainment, literacy and computer literacy – Data by municipalities and cities*. https://publikacije.stat.gov.rs/G2023/PdfE/G20234006.pdf

Speringer, M. (2012). *Survival of the Fittest!? Multi-State Population Projections by Education for the EU and the European "Newbies" – Croatia, Macedonia, Montenegro and Turkey*. Wien: Universität Wien.

Stojilković Gnjatović, J., & Devedžić, M. (2016). Certain characteristics of population ageing using a prospective approach: Serbia as a case study. *Vienna Yearbook of Population Research*, 14, 89–106. https://doi.org/10.1553/populationyearbook2016s089

Strategy for youth in the Republic of Serbia for the period from 2023 to 2030 (2023, January 26). https://mto.gov.rs/extfile/sr/1829/EN%20Youth%20Strategy%20in%20the%20 Republic%20of%20Serbia%20for%20the%20period%20from%202023%20to%202030.pdf

Strategy for the development of education and upbringing in the Republic of Serbia until 2030 (2021, June 23). https://pravno-informacioni-sistem.rs/eli/rep/sgrs/vlada/ strategija/2021/63/1/reg (in Serbian).

Sundać, D., & Krmpotić, I. (2009). Vrijednosti ljudskog kapitala u Hrvatskoj – usporedba sa ostalim Evropskim zemljama. *Ekonomski pregled*, 60 (7–8), 315–331. https://hrcak.srce. hr/40480

Šantić, D., & Antić, M. (Eds.). (2019). *Istraživanje stavova i namera stanovništva o preseljavanju i utvrđivanje uticaja migracija na demografsko starenje u četiri jedinice lokalne samouprave, s ciljem formulisanja preporuka za kreiranje mera populacione politike*. Beograd: Univerzitet u Beogradu – Geografski fakultet. http://www.mdpp.gov.rs/doc/Geografski-fakultet-ISTRAZIVANGE-MIGRACIJA-2019.pdf

Šobot, A. (2015). Educational characteristics of the population. In V. Nikitović (ed.), *Population of Serbia at the beginning of the 21st century* (pp. 168–191). Belgrade: Statistical Office of the Republic of Serbia (in Serbian).

Šuković, D. (2013). Reforma penzionog sistema i problem starenja populacije. *Stanovništvo*, 51(1), 90–102. https://doi.org/10.2298/STNV1301091S

UNDP (2020). *Human Development Report 2020. The Next Frontier: Human Development and the Anthropocene*. New York: United Nation Development Programme. http://hdr.undp.org/en/ content/human- development-report-2020

Vukašinović, A. (2017). *Utjecaj ljudskog kapitala na kvalitetu obrazovnog sustava* (disertacija). Osijek: Sveučilište Josipa Jurja Strossmayera u Osijeku, Ekonomski fakultet u Osijeku. https://urn.nsk.hr/urn:nbn:hr:145:82150

World Bank (2020a). The Human Capital Index 2020 Update: Human Capital in the Time of COVID-19. Washington, DC. http://hdl.handle.net/10986/34432

World Bank (2020b). The Utilisation-Adjusted Human Capital Index (UHCI). Policy Research Working Papers. https://doi.org/10.1596/1813-9450-9375

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Data are available from the authors upon request.

Coauthor contributions

Vlasta Kokotović Kanazir: Conceptualization, Investigation, Methodology, Data Curation, Formal Analysis, Writing – Original Draft). **Milena Panić**: Conceptualization, Visualization, Writing – Review & Editing, Validation. **Marija Drobnjaković**: Conceptualization, Data Curation, Formal Analysis, Writing – Review & Editing, Validation.

Ljudski kapital u Srbiji sagledan kroz prizmu dostignutog nivoa obrazovanja mladih

PROŠIRENI SAŽETAK

Dostignuti nivo obrazovanja stanovništva je pokazatelj ljudskog kapitala prepoznatog kao nosioca i jednog od presudnih pokretača društveno-ekonomskog razvoja, kao i izvora raznolikosti, što značajno utiče na tempo rasta. Srbiju karakteriše nivo obrazovanja opterećen brojnim problemima i nedostacima, koji se ogledaju kroz neusklađenost između obrazovanja i potražnje na tržištu rada. Većini radne snage nedostaju kompetencije koje bi bile u skladu sa tržištem rada. Ovo istraživanje je sprovedeno na nivou opština za period 1981-2022. Utvrđeni su obrazovni profili i urađena je analiza trenda za obrazovna postignuća izračunavanjem indeksa promene obrazovnih karakteristika. Utvrđivanje stepena iskorišćenosti ljudskog kapitala sprovedeno je primenom koeficijenta iskorišćenosti za mladu populaciju od 25-34 godine.

Tokom godina došlo je do značajnog smanjenja udela stanovništva bez obrazovanja ili sa nepotpunim osnovnim obrazovanjem, ali stanovništvo sa visokim obrazovanjem beleži višestruko povećanje, posebno u poslednje dve decenije. Popis stanovništva 2022. godine pokazao je značajno poboljšanje kvaliteta obrazovanja. Udeo stanovništva sa srednjim obrazovanjem iznosio je 53,08%, a evidentan je porast stanovništva sa visokim obrazovanjem (22%). Mlada visokoobrazovana populacija prepoznata je kao ključni element ljudskog kapitala. Udeo mladog stanovništva sa visokim obrazovanjem kreće se od 15,8% -71,5%, koje je pretežno locirano u Beogradskom regionu i Regionu Vojvodine. Mlada populacija sa tercijarnim stepenom obrazovanja na određenoj teritoriji predstavlja svojevrstan potencijal, a stepen njegove iskorišćenosti je rezultat pozicioniranja na tržištu rada. Prosečna vrednost koeficijenta iskorišćenja za Republiku Srbiju iznosi 69,9%. Najniže vrednosti registrovane su u Sjenici (53,3%), Doljevcu (52,2%), Priboju (58,2%), itd, dok Beogradski region karakterišu visoke vrednosti koeficijenta. Podaci o nezaposlenosti ukazuju na značajnu neusklađenost ponude poslova i potražnje u Srbiji, sa više od pet nezaposlenih na jedan ponuđeni posao. Najpovoljniji odnos je identifikovan u Beogradskom regionu, gde je svaki mladi nezaposleni mogao da konkuriše na 2-3 ponuđena posla. Uravnoteženi odnosi se detektuju i u Regionu Vojvodine, dok je mlada populacija u Regionu Južne i Istočne Srbije i Regionu Šumadije i Zapadne Srbije ograničena u zapošljavanju. Najugroženije su demografski male i nerazvijene opštine sa više od deset mladih nezaposlenih lica po jednom ponuđenom radnom mestu (Medveđa – 58,8; Tutin – 14,5; Osečina – 14,4; itd.).

U cilju temeljnog sagledavanja ljudskog razvoja, pristup kvantifikaciji ljudskog kapitala treba da obuhvati i druge dimenzije, kao što su demografska, društvena, zdravstvena, ekonomska, tehnološka (inovacija) itd. Stoga je širina istraživanja ljudskog kapitala ključna, kako bi se odredili njen stvarni potencijal i perspektiva razvoja.

KLJUČNE REČI