A HUMAN CAPITAL ASSESSMENT MONITORING SYSTEM: THEORETICAL ANALYSIS FOR ITS IMPLEMENTATION AND DEVELOPMENT

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ABSTRACT

Human capital consists of a complex and extensive set of components that make up a person as a member of society. As an element of the overall capital stock, human capital is used as a resource to create tangible and intangible values, as well as to increase the welfare of society. However, it is challenging to objectively evaluate what human capital has achieved and realised based on work results only. The study aims to evaluate human capital assessment methods and highlight some considerations for implementing its monitoring system, which is necessary to promote the progressive socio-economic development of society and the country as a whole. To achieve the goal of the research, an analysis of monitoring system foundations in scientific literature has been carried out. Human capital assessment approaches and indicators, as well as various options for developing a human capital assessment monitoring system, were considered.
KEY WORDS: *human capital, monitoring, assessment system.*

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Introduction

Human capital has been identified in recent years as one of the key drivers of the economy and determinants of competitiveness. It is understood as the set of skills and abilities on which a person's potential for economic and social activity depends (Latvia. HDR, 2006/2007). Human capital has a significant impact on economic development, and determines both the competitiveness of the economy and the level of society's welfare. It includes assets such as education, training, intellect, skills, health and other things (such as talent, intelligence, judgment, wisdom and punctuality) that an individual possesses, and increases the productivity of his or her activity.

The understanding of the concept of *human capital* since the 1960s, when it appeared, has expanded from one basic component (education) to health, culture and various other components (Spoge, Lace et al., 2024). For example, M. Pasban and S. H. Nojedeh identify the following characteristics of human capital: creativity and innovation, knowledge and skills, value added and competitive advantage (Pasban, 2016). Nowadays,

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human capital is one of the most important factors of production, which is included in labour resources and ensures the progressive socio-economic development of society and the country. According to a McKinsey study, human capital accounts for two-thirds of the average individual's wealth, and work experience contributes almost half of this value (McKinsey, 2022). Since human capital cannot be separated from its holder, the person himself, the degree of return of its use is determined by the expression of the individual's free will, individual material and moral interests, responsibility, world-view, and general cultural level. Individuals who can apply their knowledge effectively to create valuable products, services or solutions contribute not only to their personal success but also to the overall development of society. Therefore, it is important to understand both the value of the existing human capital stock, as well as the various options to improve and develop it, to improve the efficiency of its use, and thus promote the economic growth of the country.

The research problem addressed in this article is to identify indicators that could be used to assess the current state of human capital and monitor its development. This is because formal information cannot fully cover the whole set of abilities and qualities possessed by an individual and what additional values of human capital a person has acquired during his or her activity.

The aim of the study is to evaluate methods of human capital assessment and highlight some considerations for implementing its monitoring system, which is necessary to promote the progressive socio-economic development of society and the country.

To achieve the goal of the research, the following tasks are performed: an analysis of monitoring system theoretical foundations in scientific literature has been carried out; human capital assessment approaches and characterising indicators have been examined; and various development options for a human capital assessment monitoring system and related problems have been evaluated.

With the help of theoretical analysis and the deduction method, information related to monitoring and human capital monitoring systems is obtained from scientific literature. The comparative method is used to evaluate indicators characterising human capital and different options in the development of a human capital monitoring and assessment system.

For the analysis of the problem, publicly available information from the databases of the European Union Statistical Office (Eurostat), the Organization for Economic Cooperation and Development (OECD), the European Commission (EC), the World Bank (WB), the International Labor Organization (ILO), and other institutions was used, as well as scientific research and surveys.

1. The essence of monitoring and the basic principles of its creation

There is no universally recognised definition of the concept of *monitoring* in scientific literature, although the essence of monitoring and the basic principles of its creation are treated quite similarly. In its original Latin meaning, the word '*monitor*' refers to an overseer, or something that reminds or warns. This means that monitoring should serve as an early warning system that provides information on whether events are developing in the right or an unexpected direction.

The European Commission defines monitoring as a continuous and organised process of systematic data collection (or access) throughout the life cycle of a national political initiative (intervention) (EC, 2023). It is treated similarly by the OECD, stating that monitoring is a continuing function that uses systematic data collection on certain indicators to provide management and the main stakeholders with indications of the progress of the set goals and the progress of the use of the allocated funds (OECD, 2002).

After reviewing several literature sources, the authors conclude that monitoring is an integral part of both the planning and implementation of the policy process, which ensures the supervision, management and evaluation of the impact of state intervention on socio-economic processes. Monitoring is often confused with evaluation and audit. The authors note that while monitoring is an integral part of evaluation (e.g. evaluation uses monitoring data), their activities and objectives are different (Ministry of Finance, 2023). Monitoring is necessary to obtain information and provide a solid evidence base for policy-making. The main functions of monitoring are:

- provide an understanding of the progress of state policy initiatives and serve as an early warning system;
- build evidence-based policy by tracking and reporting progress on policy implementation against goals and objectives and improving accountability;
- ensure transparency of implemented policy initiatives and explain progress towards policy objectives.

Monitoring typically involves tracking progress against predetermined goals or objectives. The basis of a monitoring system is data, or a set of indicators, which comprehensively characterises the current state and development trends of the researched area. In EC documents, an indicator is defined as a variable that provides quantitative or qualitative information about a phenomenon (EC, 2015). Indicators usually include a value and a unit of measure. Outcome indicators are variables that provide information on some specific aspects of results that can be measured, so it is useful to set targets for outcome indicators. They serve as a basis for the further analysis and evaluation of the effectiveness of the implementation of state policy in the direction and area specified in the specific policy planning document. Monitoring indicators must ensure the supervision of inputs, outputs, results and impacts, which must be aligned with the logic of the policy implemented.

One of the limitations of monitoring is the fact that indicators are not always able to reflect a policy's influence. That is prevalent in cases where a long time is necessary before the true consequences of policy emerge, or if changes in policies cannot be attributed to a specific event only. In these cases, it might be useful to differentiate result indicators based on affected groups and time horizons.

It should be noted that scientific publications on guidelines for creating monitoring systems do not provide clear rules on the required level of detail of monitoring indicators. Therefore, the choice of monitoring indicators depends largely on the type of national political initiative, the complexity of the intervention logic, and the hierarchy of goals created for a specific initiative. In addition, monitoring indicators must meet certain criteria, and they must be:

- appropriate, i.e. closely related to the goals to be achieved;
- unambiguous and easy to interpret;
- easy to monitor (e.g. with low costs and an acceptable administrative burden);
- resistant to manipulation;
- data must be easily accessible and of good quality;
- available in a timely manner, i.e. they should cover the impact created by the policy initiative in a reasonable period of time, also taking into account the frequency of collecting (or measuring) the indicator (EC, 2023).

To monitor progress, it is important to clarify the link to the relevant policy objective, to have a baseline (starting point), and to have explained target values.

2. Approaches to assessment of human capital in scientific literature

The formation of human capital is a complex process, involving actions to build individuals' capacity to work effectively and to develop their competences and skills, thereby increasing their productivity, career prospects and employment potential (Lapina, 2010). Although empirical studies do not have a unified approach to measurement indicators of the development of human capital, in practice three approaches are usually used to analyse the current state and development of human capital: the indicator approach, the cost approach, and the income approach (Spoge, Lace et al., 2024). It should also be borne in mind that human capital is built up gradually and changes over time, and that its development requires continuous investment from both the individual and society (family, employer, state, etc). For example, Goldin notes that optimal human capital investment depends on a variety of factors, such as how well capital markets function, and the level of certainty in the economy and polity (Goldin, 2016).

The indicator approach uses indicators such as, for example, enrolment in schools, average years of schooling, adult literacy, etc. Several studies (Barro, 1993; Korres, 2008) have shown that educational achievement and public spending on education are positively correlated with economic growth. However, it should be noted that the development of human capital is not only a condition for economic growth, but also a consequence of it (Mincer, 1984). The cost approach is based on indicators that reflect education-related expenses for the development of human capital, whereas the income approach mainly assesses the expected future increase in income as a result of investment in human capital.

Of the three approaches, the indicator approach is the most commonly used. It includes both indicators that characterise investment in human capital (in education, for example, the average number of years spent at school), and indicators of human capital value, such as the level of education of adults (or the workforce), skills (for example, literacy). The indicator approach also ensures international comparability, as it is based on official statistical data created according to internationally recognised methodologies. Other frequently used indicators of the indicator approach are weighted indices, for the calculation of which data on several dimensions of human capital development are collected, such as the World Bank's Human Capital Index (HCI), which measures the contribution of health and education to labour productivity (WB, 2020), the World Economic Forum Global Human Capital index, which was last published in 2017 (WEF, 2017), and the United Nations Human Development Index (HDI), which characterises three dimensions of human development: a long and healthy life, knowledge, and a decent standard of living (Human Development Report, 2024). However, according to the assessment of the authors of this article, it would not be useful to include indices or various composite indicators in the set of monitoring indicators. This is because they do not meet the criterion of timely data availability, and their methodological approach is often changed, which limits the ability to analyse trends. However, human capital development monitoring may utilise indicators that are components of the aforementioned indices.

Relatively less common is the cost approach, which is basically due to the limited availability of data. So, for example, Abraham and Mallat note in their publication in the *Journal of Economic Perspectives* that there are difficulties in converting nominal expenditure on education into real values, and further using this data to calculate capital depreciation and the accumulated value of education capital (Abraham, Mallatt, 2022). One of the additional limitations of the cost approach to measuring human capital is that estimates of educational capital are mostly based on past education expenditure, and do not consider the effects of immigration and emigration. This is a particularly important objection to the application of the given approach in countries with a large migration flow. A relatively large proportion of immigrants are adults with knowledge and skills acquired in their country of origin. Therefore, to more fully assess the level of human capital development and its contribution to economic growth, the contribution of immigration and losses due to emigration should be considered.

However, according to the income approach, to the development of which the scientists Jorgenson and Fraumeni have made a large contribution, the value of human capital is measured by estimating the future income that employees will be able to generate, considering investment in education and ageing (Jorgenson, Fraumeni, 1992). However, in practice, the use of this approach is limited, and has a rather theoretical nature, as human capital value data according to the approach are obtained by performing several calculations with many assumptions, so it is not desirable to use them for monitoring human capital.

3. The development of human capital monitoring systems and indicators in the EU

The monitoring system is the basis for policy impact assessments, which draw on diverse evidence to determine the performance of an implemented policy. To support evidence-based policy-making, a joint assessment framework (JAF) has been developed at the EU level, which is an indicator-based analytical tool covering general and specific policy areas related to human capital development issues (EC, 2024). According to the JAF concept, the monitoring of human capital should be based on a set of indicators created according to a uniform methodology, which ensures international comparability. This allows for the determination of the existence of a problem and the assessment of its depth. Thus, the JAF can be considered as a tool that ensures

the multilateral monitoring of human capital and provides support for the assessment of the current situation, development trends, and the impact of implemented policies in the specific country and in the EU as a whole.

To choose appropriate human capital monitoring indicators, an EMCO indicators working group was created, the purpose of which is to provide proposals on the methodological approach regarding measuring progress towards national goals. It should be noted that one of the most important criteria in the selection of indicators is the availability of data. Based on JAF monitoring indicators, the Employment Performance Monitor (EPM) report was published in 2023. The purpose of the EPM report was to reflect changes in the labour market as a result of implemented policies and determine the main employment problems (including those related to human capital development), as well as to assess the impact on the economy (EPM, 2023). The report's monitoring is continuously being improved to enhance the supervision and management of labour market development trends.

Furthermore, to assess the development of human capital, the European Training Foundation (ETF) has developed a set of statistical data: Key Indicators on Education, Skills, and Employment (KIESE). This includes key data on education, skills and employment that are part of a broader set of indicators proposed by the ETF to assess the development of human capital in partner countries (ETF, 2022). KIESE indicators include data on vocational education and training, skills, employment and labour market outcomes. KIESE indicators are sourced from both international and national repositories (e.g. EUROSTAT, OECD, ILO, etc).

However, it should be noted that quantitative statistical indicators (including KIESE) only capture the current state and changes in human capital development according to the selected set of indicators. They are not sufficient to assess in-depth the level of development of human capital or policy performance. In addition, statistics have their limitations, as they often oversimplify the complex aspects of the coordination of labour market demand and supply. Therefore, for the correct interpretation of human capital development indicators, data contextualisation is necessary. That is, linking and integrating them into the informative environment, which provides a context for events, thus obtaining greater value from data describing human capital.

When assessing human capital, a distinction can be made between 'specific' and 'general' aspects. Specific aspects refer to professional knowledge and skills that are only useful to the employer (and for which the employer is willing to pay), whereas general aspects of human capital (e.g. literacy) have multiple uses in different spheres of life and have an impact on the personal and social well-being of individuals (Jekabsone, 2024).

The monitoring system must be adjusted in accordance with the requirements and timeline of the implementation of the strategy, and its main task is to provide policymakers with an evidence base for decision-making. Data sources and their availability are of crucial importance in the creation of a human capital development monitoring system. When characterising human capital, aspects such as quantity, price (labour costs), structure (in terms of sector, profession, age, education, gender, territory, etc) are usually evaluated. They can be divided into two parts: quantitative (or statistical) data, and research data produced by various institutions and organisations on the topic of human capital development. The main source of quantitative data characterising human capital development is the Labour Force Survey (LFS), which is conducted in EU countries according to a common methodology developed by the ILO (ILO, 2024). They provide information on the position (status) of individuals in the labour market in relation to their level of education.

Considering the above, the authors believe that human capital monitoring indicators should reflect the most important aspects of its formation and use:

- Supply: the current state of human capital (these are mainly indicators that characterise the current situation in the labour market);
- Demand: the use of human capital (indicators characterise the level of education and skills of the workforce);
- Human capital development: the formation of human capital (indicators characterise trends in the improvement and development of labour resources, as well as unused potential).

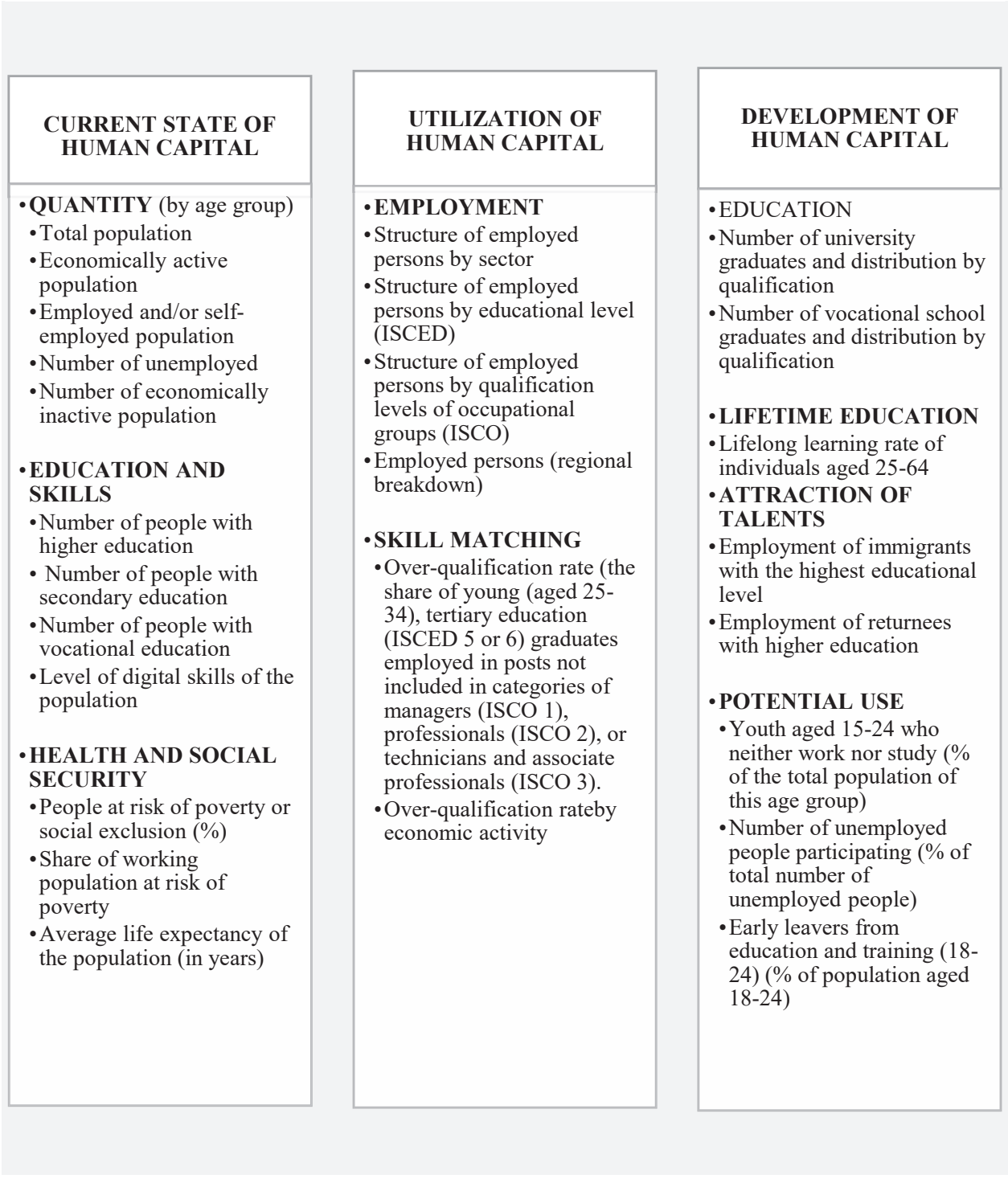

Figure 1. Human capital monitoring indicators

Source: The authors (based on ETF, 2023).

Based on the above, a three-tier monitoring and measurement framework is proposed for monitoring the effectiveness and progress of human capital development policies.

The most important human capital monitoring indicators are summarised in Fig. 1. It should be noted that the indicators presented in Fig. 1 do not reflect several aspects characterising human capital, and mostly de-

scribe the current state of the labour market and its development trends. However, the continuous economic and technological changes nowadays mean that most of the human capital development is increasingly taking place outside formal education, such as adult education or training in the workplace, so it could be important to include data on lifelong learning in a monitoring system. In addition, health and social protection and safety issues are important for the formation of human capital, since they also have a significant impact on productivity.

One of the biggest challenges in creating a monitoring system is the availability, comparability and level of detail of updated data. Outdated and insufficiently disaggregated information limits the level of detail of analysis for any policy issue, and can weaken decision-making processes and policy effectiveness. Therefore, other sources of evidence, such as scientific publications and studies, thematic surveys and expert opinions, should also be used for the analysis and interpretation of monitoring indicators.

Another problem in creating a human capital monitoring system is that neither researchers nor policymakers yet have a unified opinion on the interpretation of the concept of human capital, because human capital and the system of factors affecting it cover a wide range of researchable issues and problems. Similarly, an institutional framework must be provided for comprehensive monitoring. An important aspect of its creation is cooperation between all institutions, partners and other stakeholders responsible for the implementation of the strategy, who often have more detailed and faster information about how the situation changes at the level of a specific company or industry.

Conclusions and proposals

Human capital is one of the most important factors in production, which is included in the labour resources and ensures the progressive socio-economic development of society and the state. It is one of the most important factors affecting the labour market, employment and its development.

Over time, the concept of 'human capital' has undergone a transformation from one basic component (education) to health, culture and various other components. However, there is still no unified opinion among researchers on the interpretation of the concept of human capital, since human capital and the system of factors influencing it cover a wide range of researchable issues and problems.

Similarly, there is no unified approach in the scientific literature and empirical studies on how to measure the level of human capital development and its impact on the economy. In practice, the indicator approach is most frequently used, as it is based on official statistical data, compiled according to internationally recognised methodologies.

A monitoring system is based on data that comprehensively describe the current state and development trends of the area under study. They serve as a basis for the further analysis and assessment of the effectiveness of the implementation of policy measures in a specific direction and area outlined in the policy planning document.

When creating a human capital monitoring system, it must reflect the most important aspects of human capital formation and utilisation: the current state of human capital (indicators that characterise the current situation in the labour market), human capital utilisation (indicators that characterise the level of education and skills of the workforce), and human capital formation (indicators that characterise trends in the improvement and development of labour resources, as well as unused potential).

One of the biggest challenges in creating a monitoring system is the availability of updated data, comparability, and level of detail. This is because limited, outdated and insufficiently disaggregated information limits the level of detail of analysis and weakens the decision-making process, as well as the effectiveness of the policy. Therefore, the analysis and interpretation of monitoring indicators should use not only quantitative (statistical) data, but also other sources of evidence, such as scientific publications and studies, thematic surveys and expert opinions.

Comprehensive monitoring should also have an appropriate institutional framework, which requires close cooperation between all institutions and partners responsible for the implementation of the strategy, as well as other interested parties who often have more detailed and faster access to information on how the situation is changing at the level of a specific company or sector.

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ŽMOGIŠKOJO KAPITALO VERTINIMO STEBĖSENOS SISTEMA: TEORINĖ JOS KŪRIMO IR ĮGYVENDINIMO ANALIZĖ

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Santrauka

Žmogiškasis kapitalas yra materialiųjų ir nematerialiųjų vertybių kūrimo bei visuomenės gerovės užtikrinimo išteklius. Tačiau objektyviai įvertinti žmogiškojo kapitalo vertę ir jo panaudojimo efektyvumą, remiantis vien tik formalia informacija ir darbo rezultatų duomenimis, nelengva. Pateiktoje oficialioje informacijoje visapusiškai neįvertintos visos žmogaus turimos savybės ir vertybės, kurias jis puoselėja savo veiklos procese.

Tyrimo tikslas – įvertinti žmogiškojo kapitalo vertinimo metodus ir galimybę įgyvendinti jo stebėsenos sistemą, siekiant visuomenės ir šalies socialinio-ekonominio vystymosi pažangos. Įgyvendinant išsikeltą tikslą atlikta mokslinėje literatūroje aprašyta stebėsenos sistemos analizė, svarstyti žmogiškojo kapitalo vertinimo požiūriai ir rodikliai bei jo stebėsenos sistemos taikymo galimybės. Atlikus tyrimą prieita prie išvados, kad žmogiškojo kapitalo stebėsenos sistema turi atskleisti pagrindinius žmogiškojo kapitalo formavimo ir naudojimo aspektus: žmogiškojo kapitalo būklę (esamos situacijos darbo rinkoje rodikliai), jo panaudojimą (darbo jėgos išsilavinimo ir įgūdžių lygio rodikliai), formavimą (neišnaudotos darbo jėgos tobulinimo ir plėtros tendencijų rodikliai). Autoriai siūlo konkrečius rodiklius kiekvienai iš trijų sričių.

PAGRINDINIAI ŽODŽIAI: *žmogiškasis kapitalas*, *stebėsena*, *vertinimo sistema.*

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