Human capital competitiveness management as a resource for sustainable development

Julia Markaryan1,* and Inga Mezinova2

1 Don State Technical University, 344000 Rostov-on-Don, Russia

2 Rostov State University of Economics, 344012 Rostov-on-Don, Russia

Abstract. The gradual transformation of the higher education system that has been observed over the past few decades, especially against the backdrop of the challenges of the 2020 pandemic, has actualized the need to study the causes underlying it. The study of the education industry as one of the elements of the division of labor showed that the main drivers of the process are, on the one hand, the employers’ market, which demands from modern workers high adaptability and the ability to switch between spheres of activity, and on the other, the labor market itself, which is subject to deepening automation while maintaining and, in many countries, increasing the proportion of the older population. Intensive global socio-cultural changes are leading to a revision of existing educational systems and their global transformation. Humanity uses education as the main social mechanism to purposefully influence the course of its development. The formation of human capital for sustainable development is one of the priorities of the future, transforming the modern education system, changing its goals, content, forms and methods of teaching.

1 Introduction

2020 has in many ways become a turning point for most of the world's industries, provoking the emergence of a galaxy of new ideas about global, and, accordingly, national, development scenarios: from apocalyptic, suggesting a slide in the world economy to a state of a new cold wave, radical nationalism and generational and gender split, to quite positive - with the transition to green post-capitalism and the formation of civil solidarity [1-3].

However, regardless of forecasts, most analysts and experts agree that the digital educational services market (usually called the EdTech market; in Russia, in accordance with the National Technology Initiative, is named EduNet), will remain one of the main growing markets [4-5].

The digitalization of the economy will continue to contribute to the growth of the market. According to the forecast of the McKinsey Global Institute, made back in 2017, by 2030 in the world could be automated from 10 million to 800 million jobs [6-7]. In this...
regard, the task of creating a fast and effective system of professional retraining of workers in "retiring" professions provides the education industry with tremendous opportunities.

2 Methods and materials

This paper uses a qualitative study approach to investigate and report on the role of human capital competitiveness management for sustainable development. The purpose of the paper is to identify the key features and justify the main reasons that determine the competitiveness of the human capital within the educational system for better-living of the future generations. The achievement of this goal predetermined the formulation, argumentation and consistent proof of the two hypotheses:

Hypothesis 1: Current education system does not correspond to the needs of the future labor markets.
Hypothesis 2: New models of education should be based on the principles of customization and personalization of educational products, along with the formation of a unique profile of user competencies.

Argumentation of these hypotheses involves solving the following tasks: to analyze how modern industries are changing under the pressure of the 4th Industrial Revolution; to determine the key elements of the current educational model; to introduce the "new" model of education for better development of the human capital; to highlight and argue the main elements of the new educational model. The study is based on the methods of deduction and comparison.

3 Results

As a result of the studies, it was revealed that the current education system does not correspond to the complicated process of forecasting the labor market needs for specific specialists, which is confirmed by the data of the World Economic Forum, according to which, by 2022, more than 50% of all workers in the world will need significant retraining and additional training.

The reproduction of the current model will lead to the consolidation of the status of low-ranking and mass-oriented educational organizations, will affect the volume and quality of the anthropogenic flow and the degradation of the positions of sustainable development of the region at the national and global level.

Thus, in the current situation, an objective necessity is to create a new model that will allow educational organizations to improve their status and position in international rankings, have a positive effect on the volume and quality of the anthropogenic flow and improve the position of the region in the global value chain, and achieve sustainable development goals.

This model can be achieved only with the use of digital tools which are just about the automation of educational process. These tools should assist to implementation of new approaches to pedagogy: a customized mix of technologies, oriented on particular participants and corresponding basic solutions, which ultimately form integrated educational products.

The set of this technological solutions we call an open-type intellectual educational ecosystem. Development of such an open-type intellectual educational ecosystem will allow to master the educational program and / or individual educational products more targeted and efficiently, to form a unique digital profile, to supplement the passport of the individual's competence throughout life.
It should be noted that, considering the "profile" of the employee, the employer is already shifting the focus from a purely knowledge component to a competency component. Thus, application of employee's working experience accumulated throughout his/her life is increasingly associated with the engineering systems, which we consider as the ability of an individual to solve a complex problem, taking into account the multiplicity of obvious and non-obvious contexts. This approach also changes the portrait of a modern college or university graduate of a bachelor's type: from a performer operating in simple systems of companies of past technological orders, he/she must transform to the initiator/leader of technological changes in systems of a higher level of complexity (Fig. 3).
* red – graduate, operating in simple systems of companies of past technological orders, green – graduate, able to initiate/lead technological changes in systems of a higher level of complexity

Fig. 3. Dimensions of graduate's skillbox (college or university graduate of a bachelor's type)

4 Discussion

1. Development and continuous updating of sectoral (cluster) passports of competences, implying promising technological development.

2. Formation and dynamic updating of the portfolio of programs and innovative educational products based on the principles of human-orientation, interdisciplinarity, adaptability, variability and individualization of educational paths that provide high-quality training of a qualified personnel capable of modernizing the economic and social sectors of the region within the Industry 4.0.

3. Implementation of a mechanism for assessing and recognizing competencies, including those obtained as a result of spontaneous and informal learning, with subsequent inclusion in the student's digital profile.

4. Creation of an expert-analytical platform for managing and maintaining a digital profile of students based on the analysis of data on cognitive abilities and psychophysiological characteristics in order to assess and correct learning outcomes, analyze educational and project activities, model the passport of students' competencies. This, in turn, assists to the formation of competitive human capital, enhances the educational, scientific and technological potential of the region, increases its socio-economic indicators, investment and export attractiveness, and ensures the achievement of sustainable development goals.

5 Conclusion

As a result of the research, a problem was identified that lies in the inconsistency of the existing education system with respect to turbulence and nonlinearity in the development of the overwhelming majority of industries in the medium and long term, including under the E3S Web of Conferences 371, 05028 (2023) https://doi.org/10.1051/e3sconf/202337105028 AFE-2022
influence of megatrends of the 4th Industrial Revolution, emergence of flexible forms of employment, emergence of new threats to sustainable development and the actualization of the knowledge economy, which requires a global revision of the existing educational system. Such a shift is not possible while maintaining a commitment to traditional models and tools of higher education. Since the beginning of the 21st century, the main driver of the growth of the EduNet market has been innovative solutions related to the customization and personalization of education, the formation of a unique profile of user competencies and the creation of an appropriate infrastructure.

The following segments may become the bet of the new decade:

- digital and mixed involving products (immersive platform and ecosystem solutions to create the effect of user identification with the development process, laboratories in virtual and digital environments (VR, XR solutions), pedagogical design in real-virtual environments, simulators and digital twins in edutainment solutions);
- development management based on data, primarily in the field of personnel policy (solutions for diagnosing a person, including his cognitive abilities and motivational incentives, and redesigning work processes based on the data obtained);
- personalized services for the development of human potential, contributing to the acceleration of the growth of capitalization of the human potential (solutions for the development of the involvement and enthusiasm of students and employees, formation and development of teams for the purposes of communities / organizations, taking into account personal characteristics of the participants).

References

2. UNCTAD, Impact of the COVID-19 pandemic on trade and development: transitioning to a new normal.
5. HolonIQ, 10 charts to explain the Global Education Technology Market (2021).
8. I. Mezinova, Yu. Markaryan, Development of soft and self-skills of students as the basis of competitiveness of Russian educational programs (RuScience, Moscow, 2020).