

Development of Continuing Education in the Context of Digitalization and Global Educational Trends

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ABSTRACT:

The article examines the processes of transformation of education in the context of globalization and digitalization, in particular, trends in the development of lifelong learning and the introduction of digital educational technologies. It examines modern strategies for the formation of competencies in different countries of the world, including the USA, Canada, the countries of the European Union and Japan, and also analyzes Ukrainian realities in the context of integration into the global educational space. It is shown that digitalization, personalization of educational trajectories, development of open educational resources and introduction of innovative technologies are becoming key factors determining the effectiveness of continuing education. The importance of creating a national digital educational ecosystem integrated with European certification systems, which allows ensuring mutual recognition of qualifications, expanding academic mobility and adapting curricula to the needs of the global labor market, is substantiated. A theoretical and analytical model of the development of lifelong learning is presented, reflecting the complex interaction of global trends and national characteristics, allowing to predict future transformations of educational systems and optimize strategies for their development. The article emphasizes the practical significance of the results for higher education institutions, education management bodies and educational platforms, as they form an analytical basis for planning educational programs that meet the modern requirements of the knowledge economy and global society. Thus, the study demonstrates that the transformation of education in a global context contributes to the formation of competencies necessary for effective participation in modern society and creates conditions for the development of lifelong, flexible and inclusive learning.

Keywords: globalization, lifelong learning, digitalization, transformation of education, competency-based approach

1. Introduction

In the twenty-first century, globalization has become a determining factor in the socio-economic, cultural and technological development of humanity. It has led to the integration of national economies, the openness of information borders, and the intensive exchange of knowledge and innovations. In these conditions, education appears not just

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as a social institution, but as a strategic resource that determines the competitiveness of the state, the development of human capital, and the level of social cohesion.

Education, as a fundamental component of civilizational progress, is undergoing profound transformations under the influence of global processes, digitalization, automation, and the increasing mobility of knowledge. These changes highlight the need to transition from the traditional learning paradigm, based on the transfer of ready-made knowledge, to a model focused on the development of competencies, critical thinking, communication, and digital skills.

The problem of adapting educational systems to new realities lies not only in the introduction of technologies or updating curricula, but also in a deep rethinking of the role of education as a tool for sustainable development, social integration and personal self-realization. Educational institutions should perform the function not only of transmitting knowledge, but also of creating conditions for creative self-realization, the formation of civic responsibility, ethical culture and readiness for life in a rapidly changing global world.

The transition from knowledge transfer to competence development is based on harmonizing the principles of their formation, measurement, and ensuring comparability between educational institutions. Current practice relies on national and supranational qualification frameworks that define educational outcomes through the integration of knowledge, skills, and values. Maintaining individualized educational trajectories requires a modular approach and the use of micro-qualifications as tools for recognizing outcomes. These processes legitimize the achievements of non-formal and informal learning in various contexts. Comparability is ensured through standardized level descriptors, digital portfolios, and universal competency assessment tools. Thus, the transformation of education in the era of globalization is not just a technological update, but a civilizational challenge that requires a reorientation of educational policy, teaching methodology, and public perception of knowledge as a dynamic, continuous process of human development.

2. Theoretical Background

The issue of transforming education in the context of globalization and the development of lifelong learning has gained particular relevance in recent decades. The conceptual foundations of the idea of lifelong learning were formed in the works of Regmi (2015), Richards (2018) and Poquet and De Laat (2021), who emphasized the importance of self-education, experience and self-development as key factors in the formation of a person. Molenaar (2022) views education as a process of continuous experience that does not end at school or university, but continues throughout a person's life.

In the second half of the twentieth century, the ideas of lifelong learning were institutionalized in international documents of UNESCO (2023), OECD (2023; 2024; 2025). UNESCO reports formulated the concept of "lifelong learning" as a universal human right and a basic condition for sustainable development. These provisions became the basis for the creation of lifelong education policies in most developed countries of the world.

At the beginning of the twenty-first century, the emphasis shifted towards the integration of digital technologies into education. According to research by Cybal-Michalska (2023), Cillo et al. (2022), Makedon et al. (2025a) globalization has led to a

rethinking of the role of knowledge, in particular, the transition from knowledge as a static resource to knowledge as a process of constant updating, exchange and adaptation. The emergence of open educational platforms (MOOCs), online universities and mobile learning applications has created the conditions for the democratization of access to knowledge and the emergence of new forms of informal learning.

Modern research by OECD (2025) emphasizes that lifelong learning has become an important factor in competitiveness in the labor market. In the context of automation and digital transformation of the professional sphere, not only basic education is relevant, but also regular updating of skills (retraining, advanced training). According to the World Economic Forum (2023), by 2030, more than 60% of workers will need advanced training to meet new technological challenges.

A significant contribution to the development of the theory of lifelong education was made by European scholars, in particular Mlambo *et al.* (2021), Saracho (2023) and Sharma and Morton (2025), who linked the concept of “lifelong learning” with the concepts of “educational society” and “knowledge economy”. In their opinion, modern education should be aimed at developing the ability to self-learn, reflect and intellectual flexibility, which allows the individual to adapt to dynamic social and professional changes.

Ukrainian researchers also pay considerable attention to the problem of the transformation of education in a globalized world. In particular, Petrenko *et al.* (2021) and Kozhevnikova and Kozhevnikov (2025) emphasize the need to transition to a model of education focused on the development of a person as a subject of culture, capable of creative activity and responsible decision-making. Kuznietsova (2023) and Ostanina (2023) consider continuing education as a moral and value category that forms the spirituality and self-awareness of the individual. Shamanska (2022) and Tamozhska and Kulish (2023) in their works analyze the trends in the development of adult education in Ukraine and identify key areas for the modernization of the system of training pedagogical personnel in the context of “lifelong learning”.

Domestic and foreign studies (Schiff, 2022; Mohamed Hashim, 2022; Tkachuk, 2021) show a common trend: lifelong education is interpreted as a leading strategy for social and economic development, aimed at improving the quality of human capital and reducing educational inequality. At the same time, the digitalization of education is gaining importance, which creates conditions for individualization of learning, distance interaction, and the formation of global educational communities.

Thus, the analysis of scientific sources shows that the transformation of education in the era of globalization is taking place under the influence of three key factors: the intellectualization of society and the transition to a knowledge economy, the technological revolution that promotes the digital integration of the educational environment and changes in social expectations, the focus on the development of competencies and the continuous updating of knowledge. Thus, modern scientific literature confirms that lifelong education is not only a pedagogical paradigm, but also a strategic response of humanity to the challenges of globalization, digitalization and dynamic transformations of the modern world.

3. Methods

The study of the transformation of education in the context of globalization and the development of lifelong learning is interdisciplinary in nature, as it combines the approaches of pedagogy, sociology, economics, cultural studies and information sciences. Currently, there is a need to identify patterns and trends in the modernization of educational systems in the context of global social and technological changes, as well as outline the prospects for implementing the principles of the concept of “lifelong learning” in modern educational policy.

The methodological basis of the study was the systemic, comparative-analytical, structural-functional, and prognostic approaches, which allowed us to reveal the relationship between the processes of globalization, digital transformation, and the evolution of educational practices.

The systems approach has made it possible to consider education as a holistic, open social system that interacts with other subsystems of society – economic, cultural, technological. In this context, lifelong learning is analyzed as a mechanism for ensuring the adaptability of the educational system to the rapid changes in the global environment.

The comparative-analytical method was used to study the strategies for the development of continuing education in the countries of the European Union, the USA, Canada, and Japan, as well as to compare them with Ukrainian realities. Particular attention was paid to the documents of UNESCO (2023), OECD (2024), European Commission (2022) and World Economic Forum (2023), which determine modern guidelines for educational policy in the field of continuing education.

The structural-functional method allowed us to reveal the internal structure of educational transformation processes, to identify functional connections between different levels of the educational system – from state policy to institutional practice of adult education. Thanks to this, it was possible to trace how the principles of lifelong learning are implemented in formal, non-formal and informal education.

The predictive method was used to assess the prospects for the development of continuing education and possible scenarios for its integration into national education systems. It allowed us to outline trends in the further digitalization of the educational environment, the personalization of educational trajectories, and the strengthening of the role of non-formal education.

The information base of the study consisted of: international analytical reports and programs (UNESCO, 2023; OECD, 2024; World Economic Forum, 2023), scientific publications of foreign and domestic researchers (Tamožhska & Kulish, 2023; Schiff, 2022; Kuznietsova, 2023; Kozhevnikova & Kozhevnikov, 2025) and national legislative and conceptual documents, in particular the Law of Ukraine “On Education” (2017) and the Digital Strategy for the Development of Education of Ukraine (MESU, 2022).

To ensure scientific reliability, a content analysis of scientific sources and strategic documents was carried out, aimed at identifying key categories (“globalization”, “continuing education”, “lifelong learning”, “digitalization of education”, “competence approach”). The results obtained were summarized and interpreted within the framework of a theoretical and analytical model that reflects the interaction between global trends and national characteristics of educational development.

The methodological novelty of the study lies in the complex combination of theoretical analysis of international educational policies with a comparison of educational practices in different countries, which allows us to consider the transformation of education not in isolation, but as part of a broader global process of social innovation.

Thus, the use of a combination of these methods provided a deep theoretical understanding of the phenomenon of continuing education and the identification of key areas of its development in the context of globalization.

4. Results

In the twenty-first century, education has become one of the key indicators of the competitiveness of states in the global environment. Its development is increasingly determined not only by internal socio-economic needs, but also by external factors – digitalization, integration of labor markets, mobility of human capital, international quality standards, and global competition for knowledge.

Globalization processes are shaping a new architecture of the educational space, in which transnational educational platforms, hybrid learning models, interdisciplinarity and openness to innovation play a key role. According to reports by UNESCO (2023) and OECD (2024), education is becoming a strategic resource for sustainable development, social justice and technological progress. In terms of scientific discourse, the study is consistent with UNESCO and OECD concepts of continuing education. These international institutions treat lifelong learning both as a fundamental human right and as a means of adapting to labor market transformations. At the same time, the scientific contribution of the work lies in the synthesis of these conceptual foundations with a comparative analysis of national strategies in different countries. Attention should be focused on the Ukrainian context and its specific challenges in the field of continuing education. It is the level-based analytical model that is capable of integrating global trends, national policies, and individual educational trajectories into a coherent explanatory structure (Table 1).

Table 1: Global trends in the transformation of education in the twenty-first century

No.	Trend	Characteristic	Expected impact
1	Digitalization of education	Using online courses, AI platforms, big data for learning management	Increasing access to education, reducing barriers to participation
2	Personalizing learning	Individual learning trajectories, adaptive assessment systems	Increasing student motivation and performance
3	Open educational resources	Free access to educational materials, Creative Commons license	Democratization of knowledge, overcoming educational inequality
4	Global mobility	Increasing the number of international students, partnership programs	Increasing cultural exchange, forming a global identity

5	Lifelong learning	Adult education, online courses, micro-qualifications	Increasing workforce adaptability, supporting employment
6	Inclusivity and equality	Ensuring equal access to education for vulnerable groups	Social integration, expansion of human rights
7	Competency-based approach	Shifting the emphasis from knowledge transfer to skills development	Formation of flexible, creative specialists
8	Education for sustainable development	Focus on environmental, social and economic responsibility	Strengthening a culture of responsible citizenship

Source: UNESCO (2023); OECD (2024)

The analysis shows that educational systems are moving from a paradigm of “lifelong education” to a paradigm of “lifelong learning”, where the development of self-education skills, flexible thinking and interdisciplinary competencies becomes key. This transition leads to the emergence of new forms of learning – microcourses, short-cycle certifications, professional online academies and corporate educational ecosystems.

The integration of artificial intelligence into the education sector is becoming particularly relevant. According to OECD (2024), 35% of universities in OECD countries have already implemented AI tools for adapting educational content, and by 2030 their share may exceed 70%. The dynamics of global educational trends in 2020–2030 is presented in Figure 1.

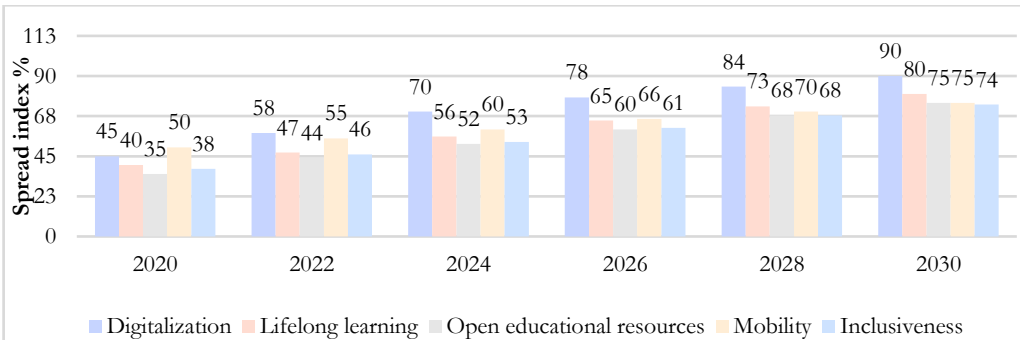


Figure 1. Dynamics of development of global educational trends in 2020–2030

Source: summarized by authors based on data from the UNESCO (2023), OECD (2024; 2025)

Digitalization creates conditions for overcoming traditional barriers to access to knowledge, but at the same time it increases challenges – information inequality, the threat of losing the humanistic content of education and the risks of technological dependence. The development of digital technologies has become a key driver of the transformation of the educational space in the twenty-first century. Digitalization changes not only the form of knowledge presentation, but also the structure of the educational process, methods of communication between the teacher and the student, and criteria for assessing learning outcomes. In the context of globalization, it becomes a determining factor in the competitiveness of both

educational systems and individual specialists in the global labor market. Based on the results of the analysis of international documents – European Commission (2020), OECD (2023), US Department of Education (2022), Government of Canada (2023) and Ikeda (2024) – a number of common patterns have been identified. (Table 2).

Table 2: Comparative analysis of continuing education development strategies in leading countries of the world

Country	Basic strategy	Key features of the digital model	Implementation features	Level of integration with the labor market
EU	European Skills Agenda (2020)	Single digital platform for micro-qualifications; recognition of non-formal learning	Partnership with business and universities; funding through Erasmus+ programs	High – alignment of educational programs with professional standards
USA	National Education Technology Plan (2022)	Using big data, AI, and learning analytics	Strong emphasis on individualization of educational content	Very high – certification platform system (Coursera, Udemy)
Canada	Future Skills Framework (2023)	Modular educational programs, integration of soft skills	State support for corporate training and reskilling	High – close cooperation with industrial sectors
Japan	Society 5.0 Education Initiative (2024)	Education as part of the digital ecosystem of a “smart society”	Combining technological and humanistic education	Medium – focus on innovative industries
Ukraine	Concept for the development of digital competencies (2021)	Implementation of e-learning, EdTech platforms, open online courses	Active participation of the state and public initiatives; support for the platforms “Diya.Osvita”, “All-Ukrainian School Online”	Moderate – the process of integration with the EU continues

Source: European Commission (2020), US Department of Education (2022), Government of Canada (2023), OECD (2023), Ikeda (2024)

It is proposed that future empirical efforts focus on testing whether increasing digital integration and micro-skills actually increase people's mobility and employment, rather than just the number of certificates they hold. Long-term longitudinal comparisons combining data on educational attainment and economic returns will provide an evidence base for humanistic-oriented continuing education policies. The current source base mainly contains analytics from international organizations and strategic policy texts, so the voices of students, teachers, and employers are heard only sporadically.

From Table 2 it is clear that the digitalization of continuing education is a universal trend that unites all developed countries of the world, forming a new paradigm of learning based on openness, mobility and innovation. However, its implementation models depend on the socio-economic context and strategic priorities of the states. In the USA and Canada, the digital transformation of education is based mainly on market mechanisms and competition between educational providers, where private universities, technology

companies and online platforms (Coursera, Udemy, EdX) play a leading role. The European Union, on the other hand, implements a model of regional coordination that combines state support, integration of national education systems and funding through intergovernmental programs, in particular Erasmus+ and the European Skills Agenda.

In Japan, the digitalization of continuing education is closely linked to the concept of “society 5.0”, where the emphasis is on a harmonious combination of technological innovations and humanistic values. The educational process is considered as part of a broader digital ecosystem designed to ensure a balance between technical knowledge, ethical development and social responsibility. In Ukraine, the digitalization of education is developing intensively within the framework of adaptation to European standards. A characteristic feature is the preservation of the social orientation of education – accessibility, humanistic orientation and state quality control, simultaneously with the active involvement of public initiatives and EdTech platforms (“Diya.Osvita”, “All-Ukrainian School Online”, Prometheus).

The use of digital technologies in lifelong learning contributes to the development of intellectual mobility, improving the quality of educational services and the emergence of new forms of certification, including micro-qualifications, digital badges and electronic portfolios. These tools allow for a flexible combination of formal, non-formal and professional education, creating conditions for continuous updating of competencies in accordance with the requirements of the global labor market.

For Ukraine, the creation of a national digital educational ecosystem integrated with European certification systems – Europass, MicroHE and EBSI is particularly relevant. Its implementation will contribute to the formation of a single digital space for the recognition of qualifications, simplify academic mobility and strengthen the positions of Ukrainian educational institutions in the international educational environment. At the same time, it is important to ensure proper training of teaching staff to work with digital platforms, develop the digital literacy of the population and expand access to Internet infrastructure in the regions.

The comparative and forecast dynamics of the development of digital models of continuing education (2020–2030) are presented, which demonstrates the growth of the level of digital integration of educational systems in leading countries of the world (Figure 2).

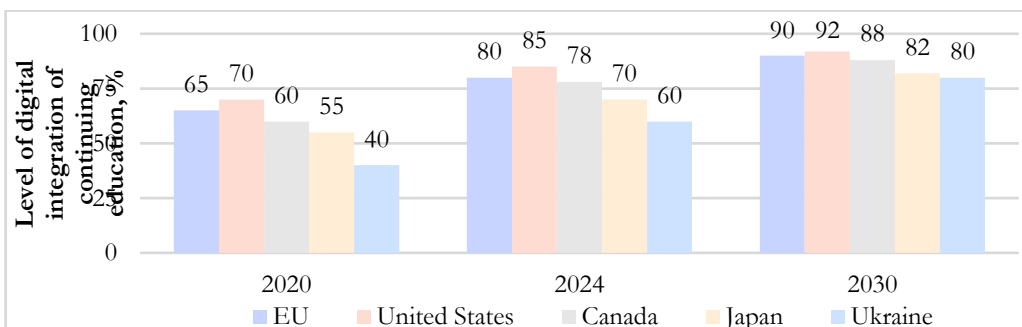


Figure 2. Comparative dynamics of digital integration of continuing education in selected countries of the world (2020–2030)

Source: summarized by authors based on data from the European Commission (2022), OECD (2023) and Ikeda (2024)

According to the summarized data, in 2020, digital integration indicators ranged from 40% in Ukraine to 70% in the USA. By 2024, there is a significant increase in the level of digitalization in all the countries studied, in particular in the EU – up to 80%, in Canada – up to 78%, in Japan – up to 70%, and in Ukraine – up to 60%. The forecast for 2030 predicts further convergence of indicators: the USA will reach the level of 92%, the EU – 90%, Canada – 88%, Japan – 82%, and Ukraine – 80%. Such dynamics indicate the gradual integration of Ukraine into the global educational space and the approximation of its digital capabilities to the level of developed countries.

Therefore, the digitalization of continuing education appears not only as a technological, but also as a socio-cultural phenomenon that defines a new quality of human capital, forms a culture of lifelong learning, and contributes to the development of an inclusive, accessible, and innovative educational environment. The results obtained are summarized within a comprehensive theoretical and analytical model that reflects a multi-level system of interaction between global, national, and individual factors of educational development in the era of globalization.

The model is based on the concept of nonlinear relationships between elements of the educational ecosystem, where changes in one subsystem cause adaptive transformations in others. At the top level are global trends – digitalization, internationalization, sustainable development, knowledge economy and social mobility. They form strategic guidelines for national education policies, in particular through participation in international programs (UNESCO, OECD, Erasmus+), development of open educational resources and integration of digital learning platforms.

At the second level of the model, the national context is defined, which includes state policy, institutional management of education, human resources, legislative framework and socio-economic conditions. It is at this level that global principles are adapted to local realities. An important element is the mechanisms for ensuring the quality of education, digital infrastructure, availability of educational resources and support for lifelong learning. The Ukrainian education system is presented as a dynamic subsystem undergoing a process of gradual harmonization with the European higher education space, while maintaining its own identity and social orientation.

The third level is micro-individual, which covers educational trajectories, motivational factors, digital competence and professional mobility of the individual. Here, a “feedback” effect is formed, when individual educational needs stimulate the modernization of the system through the demand for new formats of training, micro-qualifications, online platforms and certification systems. Thus, the interaction between the levels creates a complex network of structural and functional relationships, where education appears not as a closed system, but as an open, dynamic network of constant exchange of knowledge, innovations and cultural values (Makedon *et al.*, 2025b).

The model illustrates the interdependence between five key blocks: global trends, national policies, institutional mechanisms, digital technologies and individual educational trajectories. The relationships between the blocks are displayed in the form of multi-vector arrows, indicating both direct and reverse influences. In particular, global trends initiate structural changes at the national level, while institutional innovations and the results of educational practices form a reverse influence – “bottom-up”, contributing to the emergence of new global approaches and standards. At the center of the model is the

concept of lifelong learning as an integrative core of the system that combines economic, technological and humanitarian dimensions of educational development.

The rapid spread of digital and artificial intelligence solutions in education exacerbates the risks of information inequality, algorithmic bias, and the displacement of the humanistic dimension of education. Effective governance frameworks combine algorithm transparency, personal data protection, equal access, and regular auditing of digital tools, preventing technological dependence and the reproduction of social inequalities.

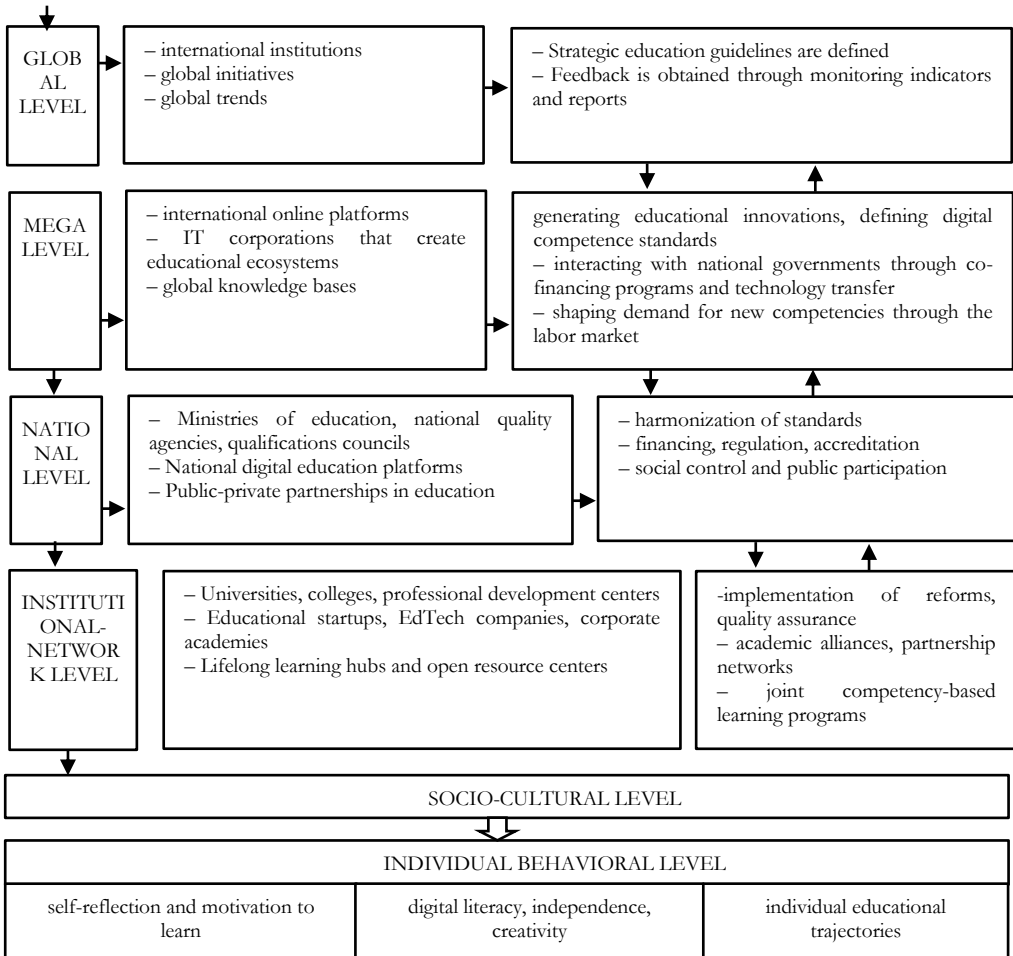


Figure 3. Theoretical and analytical model of education transformation in the context of globalization

Thus, the model demonstrates that successful transformation of education is possible only under the condition of harmonious interaction between global guidelines and local needs of society. Its functioning is based on the principles of openness, innovation, social justice and flexibility of educational systems, which allows ensuring sustainable development and adaptation of a person to the challenges of the twenty-first century.

5. Discussion

In the twenty-first century, the transformation of education is becoming not only a response to the challenges of globalization, but also a catalyst for socio-economic changes in society. The results of the study confirm that global trends – digitalization, personalization, the development of open educational resources and the formation of a culture of lifelong learning – form the basis of modern educational strategies in developed countries and influence national policies. In this context, it is important to realize that the transformation of education is a complex process that combines technological innovations, cultural values and social needs.

Comparative analysis showed that different countries apply different models of implementing digital technologies in lifelong learning. The USA and Canada focus on market mechanisms and competitive development of educational platforms, while the EU prefers coordination at the level of states and regions, integration of educational programs and support for interstate initiatives. In Japan, digitalization is combined with cultural traditions, which ensures the harmonious development of educational practices. The Ukrainian education system is on the path of integration with European standards, while maintaining social orientation and state support.

The results also highlight the importance of multi-level connections between global trends, national policies, and individual educational trajectories. The theoretical and analytical model demonstrates that the success of transformation depends on the ability of the education system to adapt global practices to local conditions and ensure the integration of individual needs into educational development strategies. Particular attention is paid to the development of digital infrastructure, the formation of twenty-first century competencies, and the creation of a national digital educational ecosystem that ensures compatibility with international certification standards.

One of the key challenges is the imbalance between the speed of global change and the readiness of national systems to implement it. This problem is manifested in uneven access to digital resources, insufficient digital literacy of teachers and students, as well as regulatory barriers. At the same time, the active use of innovative learning formats, including micro-qualifications, online platforms and electronic portfolios, creates the prerequisites for increasing the flexibility of educational trajectories and mobility of specialists. The development of national digital education ecosystems, aligned with European certification systems, will require carefully considered steps towards their implementation. These include defining minimum requirements for digital infrastructure, systematically improving the digital and pedagogical competence of teachers, and creating mechanisms to ensure the quality of micro-qualifications. An important condition is the implementation of inclusive policies that prevent the exclusion of vulnerable groups in the process of accelerated digital integration.

The results of the study confirm that the transformation of education in the context of globalization cannot be effective without a comprehensive approach that takes into account the interaction of technologies, social structures, cultural characteristics and individual educational needs. The perspective of the development of lifelong learning lies

in the formation of an open, integrated and adaptive system capable of ensuring the sustainable development of man and society in conditions of constant change.

6. Implications and further research

The study found that globalization and digitalization are becoming key factors in the transformation of education in the 21st century. Educational systems are increasingly focused on lifelong learning, personalization of educational trajectories, implementation of open educational resources, and integration of innovative technologies.

A comparative analysis of the development strategies of continuing education in the USA, Canada, EU countries, Japan and Ukraine has shown different approaches to digitalization, determined by the socio-economic and cultural context. The USA and Canada prefer market mechanisms and competition of educational providers, the EU focuses on coordination and state support, Japan emphasizes a harmonious combination of technologies and cultural values, and Ukraine seeks to integrate with European standards while maintaining the social orientation of education.

The use of digital technologies in lifelong learning contributes to the development of intellectual mobility, improving the quality of educational services and the emergence of new forms of certification, such as micro-qualifications, digital badges and electronic portfolios. For Ukraine, it is especially important to create a national digital educational ecosystem integrated with European certification systems, which will increase the mutual recognition of qualifications and expand the possibilities of academic mobility.

The theoretical and analytical model of the development of continuing education demonstrates the complex interaction between global trends and national characteristics, taking into account technology, social structures, cultural aspects, and individual educational needs.

The prospects for the development of education in the context of globalization lie in the formation of an open, integrated and adaptive system of continuous learning, capable of ensuring the sustainable development of the individual and society, increasing the mobility of specialists and meeting the challenges of the modern labor market.

Acknowledgment: Not applicable.

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