

UDC 004.94 :: 37.09

## KNOWLEDGE-BASED ADAPTIVE MANAGEMENT OF MODERN EDUCATION IN CRISIS TIMES

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**Abstract.** *The modern education system operates in conditions of high dynamics of socio-economic development, global challenges and frequent crisis situations. This necessitates the introduction of new approaches to educational management that can ensure the sustainability, flexibility and innovation of educational systems. One of such concepts is the knowledge-based paradigm, which considers knowledge as a key strategic resource that determines the effectiveness of management processes in the field of education.*

*The knowledge-based paradigm is based on the position that knowledge is not only a set of information resources, but also the basis for the formation of competencies, decision-making, innovative activity and organizational development. Within this paradigm, knowledge is the main factor of production, a source of competitiveness and a driver of change in the educational sphere.*

*The knowledge-based paradigm in adaptive and anti-crisis management of education is a management approach that focuses on using knowledge as a key resource for making effective decisions in conditions of change, instability or crisis situations.*

*Knowledge-based paradigm constitutes an effective methodological basis for the implementation of adaptive and anti-crisis management in the field of education. Its implementation contributes to increasing the flexibility, efficiency and innovative potential of educational institutions, ensures systemic transformation of management practices in accordance with the requirements of modernity. In the context of global challenges, knowledge becomes not only a management tool, but also a means of ensuring the sustainable development of educational systems.*

**Key words:** *management of education, adaptive management, crisis management, knowledge-based technologies, hybrid technologies*

### Introduction.

1. Modern management methodology and practice is undergoing significant transformations under the influence of globalization processes, digitization, socio-cultural and political-economic changes [1]. These changes require a radical revision of approaches to management [2], since in the conditions of high dynamics and uncertainty, modern management must be based on the principles of strategic management, flexibility, innovation and orientation to sustainable development [3].

The above-mentioned trends are also characteristic of the modern education system, which is also experiencing a qualitative transformation under the influence of rapidly developing innovative processes. The forms, methods, and goals of education

are changing, and along with them, approaches to management. Innovations become a key factor in increasing the effectiveness of educational management, ensuring flexibility, adaptability, personalization and stability of the educational environment. In the conditions of digitalization, globalization and increasing challenges (social, economic, environmental), management of education is impossible without strategic implementation and support of innovations.

2. In addition, modern education increasingly functions in crisis situations of various natures — economic, political, social, environmental, and military. These circumstances require the education management system to be able to adapt, sustain and transform in accordance with new challenges. Effective management of educational institutions in crisis conditions becomes a key factor in preserving the quality and availability of education, as well as ensuring the continuity of the educational process. Crisis management (anti-crisis management) in the field of education is a set of management actions aimed at preventing, minimizing or overcoming the negative consequences of emergency situations. The scientific understanding of modern crisis management is based on the theories of organizational stability, risk management, adaptive leadership and change management [4].

3. Crisis situations, such as economic shocks, pandemics, armed conflicts, and man-made disasters, create conditions of high uncertainty and turbulence in which traditional management methods become ineffective [5]. In such conditions, special importance is acquired by adaptive management — an approach based on flexibility, speed of reaction, and the ability to learn and self-organize in a changing external environment [6]. Adaptive management is a dynamic decision-making system in which organizational structures, processes and strategies are adjusted in response to changing conditions [7]. The basis of this approach is the ideas of system theory, synergy, the theory of organizational learning and change management.

4. The modern education system functions in the conditions of constant changes caused by digital transformation, globalization, socio-economic and political crises. Such circumstances require a transition from traditional, hierarchically organized management models to more flexible and sensitive to external changes approaches.

One of these approaches is the adaptive management of education, which ensures the stability and development of educational institutions in conditions of uncertainty and risk. Adaptive management of education is a dynamic management process based on the ability of an educational organization to quickly respond to external and internal challenges, to change strategies and management practices in accordance with current conditions. It is based on the principle of flexibility, openness to innovation, as well as active participation of all subjects of the educational process.

### **The Main Part.**

Modern education faces unprecedented challenges associated with crisis phenomena of a global scale - pandemics, military conflicts, economic and climatic upheavals. Effective management in such conditions requires a transition from intuitive and reactive models to systems based on knowledge [8]. In this regard, knowledge-based technologies (intellectual technologies based on knowledge [9]), which provide ADAPTIVE intellectual support for management decisions in anti-crisis situations, are becoming increasingly important.

Knowledge-based technologies are a set of methods, tools and software solutions that use systematized knowledge [10] (expert bases, decision-making algorithms, machine learning, artificial intelligence) to automate and improve the quality of management processes [11]. In the context of educational management, they are aimed at: intellectual analysis of educational data; forecasting risks and scenarios of the development of events; support of decision-making in the conditions of uncertainty; accumulation and translation of managerial experience.

In crisis conditions, the knowledge-based approach in adaptive management of education allows [12] to quickly identify threats based on data analysis and previous situations; form reasonable solutions based on expert systems and scenario modeling; support training and professional development of personnel taking into account identified deficits and competence gaps; to ensure continuity of management in the event of a change in personnel through digital knowledge bases; to adapt management strategies to changing conditions using learning algorithms and predictive analytics [13].

Examples of the application of knowledge-based technologies in educational management: expert systems for risk assessment (for example, digital consultants for the school director in the event of an emergency/accident/disaster); Data Mining systems for predicting the number of students, academic performance, level of involvement; semantic bases of knowledge about anti-crisis strategies in education; information platforms supporting management decisions, integrated with state and regional monitoring systems.

Advantages of using a knowledge-based approach in crisis adaptive management of education: increasing the quality and validity of management decisions; acceleration of analysis and response processes in emergency situations; preservation and scaling of institutional memory; ensuring continuity of management in case of loss of personnel or transition to a remote format; the possibility of individualization and point support is established on the basis of knowledge and data.

Limitations and risks of using the knowledge-based approach in crisis adaptive management of education: the need to create and constantly update the knowledge base; high cost of system implementation and maintenance; the need for a high level of digital and management literacy among personnel; the danger of excessive automation, which reduces the creativity and critical thinking of managers.

### **Summary and conclusions.**

1. Management of modern education is a complex, multi-component and dynamic process that requires management subjects to have high professional training, strategic thinking and the ability to make decisions in conditions of uncertainty. Effective management of educational systems and institutions becomes a key factor in the development of human capital and ensuring sustainable social and economic growth.

2. Management of modern education in the conditions of a crisis is a complex, multifaceted process that requires the ability of the education system for sustainable development, flexibility, digital maturity and humanistic orientation. Overcoming crisis challenges is possible only under the condition of integration of strategic thinking, innovative technologies and emphasis on human capital. The formation of effective anti-crisis management becomes an integral element of the modernization of

educational policy and practice.

3. Adaptive management is an effective management approach in crisis conditions, providing organizational stability, the ability to quickly respond and strategic renewal. The introduction of adaptive principles requires not only changes in the structure and processes, but also the transformation of management culture, focused on training, cooperation and constant improvement. In the long-term perspective, adaptive management becomes an integral part of the sustainable development of organizations in the conditions of an unstable world.

4. Adaptive management of education is a necessary condition for sustainable functioning and development of educational institutions in the XXI century. It allows not only to cope with crises, but also to use them as opportunities for renewal and growth. The transition to an adaptive model requires the transformation of organizational culture, the development of managerial competencies, the digitalization of processes and the active participation of all interested parties in the management of the educational environment.

5. Adaptive management of education in crisis conditions is not just a reaction to external circumstances, but a strategic approach to sustainable and flexible development of the education system. It requires a change in management paradigms, the development of new competencies and the creation of such conditions under which education becomes not vulnerable, but capable of renewal and growth even in the most difficult periods. The future of education belongs to those systems that can learn, adapt and act proactively.

6. Knowledge-based technologies open up new horizons in anti-crisis management of education. They allow not only to react promptly to crises, but also to form strategic advantages in conditions of instability. The implementation of such systems requires a systemic approach, investments in digital transformation and the development of a new management culture focused on knowledge, data and intellectual resources. In the long term, it is the knowledge-based approach that will determine the sustainability and effectiveness of educational management.

## Discussion.

As a promising direction of his future research, the author puts forward the following debatable thesis: hybrid technologies of adaptive management of education represent a promising direction in crisis conditions, providing flexibility, stability and inclusiveness of the educational environment. Such an approach ensures stability, continuity and adaptability of management in crisis conditions [14]. Thus, hybrid educational management technologies are the integration of digital solutions (information and communication technologies, analytical platforms, online management tools) with classical methods of strategic and operational management of an educational organization. This approach does not exclude traditional forms of management, but strengthens them due to digitalization, increasing the effectiveness of decision-making, monitoring and interaction with participants in the educational process. Their implementation requires a systemic transformation of management culture, investment in digital infrastructure, as well as the development of new competencies among all participants in the educational process. In the conditions of uncertainty and instability, it is hybrid management models that become the basis of sustainable and progressive development of the education system.

So, this is promising part of the author's future scientific R&D will be reflected in future publications.

## References:

1. Mykytenko V.V., Hryshchenko I.S. (2008). Adaptivna systema upravlinnia innovatsiinymy protsesamy na pidpriemstvakh [Adaptive management system of innovative processes at enterprises]. *Problems of science*, (4), pp. 32-37.
2. Liavynets , H. (2024). Вплив інновацій на антикризовий менеджмент у готельно-ресторанному бізнесі. *Collection of Scientific Papers «SCIENTIA»*, (September 20, 2024; Bern, Switzerland), 27–35. Retrieved from <https://previous.scientia.report/index.php/archive/article/view/2070>
3. Maksym Naumenko (2024). Modern concepts of innovation management at enterprises. *Scientific innovations and advanced technologies* No. 6(34) (2024).

DOI: [https://doi.org/10.52058/2786-5274-2024-6\(34\)-435-449](https://doi.org/10.52058/2786-5274-2024-6(34)-435-449)

4. Naumenko, M. (2024). Metodolohiia faktoriv-determinativ efektyvnosti diialnosti ta konkurentnoi pozytsii pidpriiemstva na rynku v kryzovykh umovakh. [Methodology of determining factors of activity efficiency and competitive position of the enterprise on the market in crisis conditions]. *Scientific innovations and advanced technologies*, № 7(35) (2024). DOI: [https://doi.org/10.52058/2786-5274-2024-7\(35\)-648-665](https://doi.org/10.52058/2786-5274-2024-7(35)-648-665) [in Ukrainian].

5. Hrashchenko I.S., Khmurova V. V. Innovatsiina polityka yak instrument orhanizatsiinykh zmin. [Innovative policy as a tool for organizational change. Economic development: theory, methodology, management] [*materials of the 4th International Scientific and Practical Conference*]. Budapest-Prague-Kyiv, 28-30 November 2016. 386, p. 361-369. [In Ukrainian].

6. Krasnyuk M., Kulynych Yu., Tkalenko A., Krasniuk S. (2021). Methodology of Effective Application of Economic-Mathematical Modeling as the Key Component of the Multi-Crisis Adaptive Management. *Modern Economics*, 29(2021), 100-106. [https://doi.org/10.31521/modecon.V29\(2021\)-16](https://doi.org/10.31521/modecon.V29(2021)-16)

7. Krasnyuk, M., Kulynych, Y., Krasniuk, S., & Goncharenko, S. (2024). Design of innovative management information system. *Grail of Science*, 36, 237-245.

8. Лявинець, Г., Люлька, О., & Ткачук, Ю. (2024). Інтелектуальні, орієнтовані на знання технології у адаптивному менеджменті готельно-ресторанного бізнесу. *Економіка та суспільство*, (67). <https://doi.org/10.32782/2524-0072/2024-67-91>

9. Naumenko, M. (2024). Modeli biznesovykh znan v systemakh shtuchnoho intelektu dlia efektyvnoho konkurentnoho pidpriiemstva [Models of business knowledge in artificial intelligence systems for an effective competitive enterprise]. *International scientific journal "Internauka". Series: "Economic Sciences"*. № 6. DOI: <https://doi.org/10.25313/2520-2294-2024-6-10010> [In Ukrainian].

10. Kulynych Yu.M., Krasnyuk M.T (2022) Efektyvna intehratsiia oriientovanoi na znannia kontseptsii biznes-pravyl v ramkakh upravliaiuchoi intelektualnoi korporativnoi informatsiinoi systemy [Effective integration of a knowledge-based

business rules concept within a managed intelligent corporate information system]. *Current state and prospects for the development of enterprises in Ukraine : theory, methodology, practice : a collective monograph* / Collective of authors. Poltava: PC «Astraya», 2022. – pp. 73-79 [In Ukrainian].

11. Krasnyuk M.T. (2006). Problemy zastosuvannia system upravlinnia korporatyvnymi znanniamy ta yikh taksonomiia [Problems of applying corporate knowledge management systems and their taxonomy]. *Modeliuvannia ta informatsiini systemy v ekonomitsi - Modeling and information systems in the economy*, vol. 73 [in Ukrainian].

12. Tuhaienko V., Krasniuk S. (2022). Effective application of knowledge management in current crisis conditions. *International scientific journal "Grail of Science"*. 2022. № 16. pp. 348-358.

13. Sytnyk V.F., Krasnyuk M.T. (2002). Polityka upravlinia znanniamy naftohazovoi kompanii yak kliuchovyi faktor pidvyshchennia yii efektyvnosti [Oil and gas company's knowledge management policy as a key factor in increasing its efficiency]. *Problemy formuvannia rynkovoï ekonomiky - Problems of the formation of a market economy*, K.:KNEU, vol. 10, 2002 [in Ukrainian].

14. Naumenko, M., & Hrashchenko, I. (2024). Suchasnyi shtuchnyi intelekt v antykryzovomu upravlinni konkurentnymy pidpriemstvamy ta kompaniiamy [Modern artificial intelligence in anti-crisis management of competitive enterprises and companies]. *Grail of Science*, (42), 120–137. DOI: <https://doi.org/10.36074/grail-of-science.02.08.2024.015> [In Ukrainian].

Article sent: 17.05.2025

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