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Hybrid intelligent informational technologies in advanced pedagogy

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Introduction. Modern pedagogical science is actively transforming under the influence of intelligent information technologies, which are becoming a fundamental tool for updating educational practice. Their application ensures the formation of individualized learning trajectories, increasing the effectiveness of knowledge acquisition and developing new forms of interaction between the teacher and the student.

Artificial intelligence systems [1] and intelligent analytics [2] allow for a deeper study of students' educational needs, predicting their achievements and adapting educational materials to the personal characteristics of students. Technological solutions based on machine learning [3], expert models [4] and intelligent platforms [5] automate routine processes, freeing up more time for the teacher for methodological and creative activities.

But of particular value are combined, hybrid approaches [6] that integrate traditional technologies with the innovative capabilities of intelligent information systems. They actively contribute to the development of adaptive educational environments, virtual learning platforms, and the application of algorithms for intelligent analysis and Big Data analytics [7].

Main Part. Modern innovative pedagogy is in a stage of deep transformation caused by the introduction of hybrid intelligent information technologies. These solutions are an integration of classical teaching methods with the capabilities of artificial intelligence, machine learning, big data analysis, cloud services and adaptive educational platforms. Unlike traditional digital tools, hybrid intelligent technologies are focused on creating flexible,

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self-learning and personalized educational systems that can take into account the dynamics of the educational environment and the unique needs of students.

The use of hybrid intelligent IT in pedagogy opens up a whole range of prospects:

- individualization of the educational process - building personal development trajectories taking into account the level of preparation, speed of perception of the material and cognitive characteristics of students;
- adaptive educational solutions - the ability to quickly change the content and teaching methods in response to new standards and educational goals;
- interactivity and multi-format - the use of augmented and virtual reality, multimedia platforms and intelligent assistants for the active involvement of students;
- analytics and forecasting - the use of algorithms for intelligent data processing, deep learning and neural network models to assess knowledge, identify hidden patterns and predict academic results;
- new formats of interaction - the development of virtual and blended educational spaces, the introduction of gaming technologies, chatbots and intelligent learning support systems.

The key aspect is the synergy of pedagogical science and intelligent technologies, which forms new educational concepts. They are focused not only on the transfer of information, but also on the development of critical thinking, creativity, communicative competences and self-study skills, which is especially relevant in the conditions of a digital society.

Conclusions.

1. Hybrid intelligent IT becomes the basis of digital modernization of pedagogy, facilitating the transition to innovative models of education.

2. Their use enhances the personalization, flexibility and adaptability of the educational process, increasing its productivity and motivational component.

3. The combination of artificial intelligence technologies and big data analysis with traditional pedagogical practices allows creating new-generation educational ecosystems capable of continuous improvement.

4. The integration of intelligent solutions contributes not only to improving the quality of education, but also to the formation of modern pedagogical strategies aimed at the

development of personality, digital competencies and competitiveness of graduates.

5. In the future, hybrid intelligent technologies will play a key role in creating an innovative educational environment, where traditional and digital approaches will interact on the basis of synergy, ensuring the sustainable development of pedagogy in the digital age.

Discussion. The modern economic and social sphere (including pedagogical practice) operates in conditions of constant challenges, uncertainty [8] and crisis factors, which requires the introduction of innovative tools to support the sustainability and development of relevant systems [9]. The leading direction of such transformation is the use of hybrid intelligent information technologies that combine the potential of artificial intelligence, machine learning, big data analysis and classical pedagogical approaches. In these conditions, a special role is played by the synergistic effect [10] that arises when integrating pedagogical science with intelligent IT. It is expressed not in a simple sum of opportunities, but in a qualitatively new result: increasing the resilience of education to crises, the formation of adaptive learning trajectories and the emergence of innovative models of interaction between teachers and students.

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