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Artificial neural networks & big data in contemporary social pedagogy

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Introduction. Modern pedagogy operates with large volumes of educational information, covering the results of educational activities, behavioral and assessment indicators of students, electronic resources and digital educational platforms. Modern pedagogy is faced with growing volumes of educational data, a variety of educational materials and individual needs of students. However, it is known that Big Data creates NOT only new opportunities, but also significant challenges for management [1], [2], since traditional methods of analysis often turn out to be insufficiently operational and flexible for effective processing of large amounts of information [3], [4].

However, classical methods of data analysis and analytics often turn out to be insufficiently flexible for effective adaptive management and a personalized approach [5].

It is artificial neural networks (ANN) that provide tools for deep analysis of educational data. They allow to identify hidden patterns in students' educational behavior, predict learning outcomes, classify knowledge levels and optimize pedagogical strategies. The use of such networks contributes to the automation of data processing, personalization of learning and increasing the efficiency of management decisions in the field of education.

Modern architectures of neural networks [6] (including convolutional, recurrent and transformer) demonstrate high accuracy, allow analyzing both structured and unstructured data [7], processing large amounts of information in real time and in an automated mode [8], and generating well-founded recommendations.

Main Part. Modern social pedagogy, as a scientific and practical field aimed at the comprehensive development of

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students, support for socially vulnerable categories and optimization of educational and socio-pedagogical processes, works with large volumes of heterogeneous data. Such data include educational results, socio-behavioral characteristics of students, information about the family and social environment, data from digital educational platforms and interactive systems. Processing these large amounts of information using traditional methods is often laborious and does not always allow us to identify complex relationships between educational, social and behavioral factors.

Artificial neural networks (ANN) provide powerful tools for deep analysis of big data in social pedagogy. They allow us to identify hidden patterns in student behavior, predict social risks, assess the effectiveness of pedagogical and social programs, and generate personalized recommendations to support the development of individual students or groups. Hybrid ANN architectures, including convolutional networks (CNN), recurrent networks (RNN) and transformers, allow processing both structured and unstructured data, integrating disparate information sources and working with large data sets in real time.

The application of ANN in social pedagogy opens up new prospects for automating routine processes, increasing the accuracy of forecasts and assessing the effectiveness of social and pedagogical strategies. This allows creating adaptive student support systems, optimizing social and pedagogical activities, and increasing the effectiveness of preventive measures and educational programs. Overall, the integration of ANN with big data analytics provides a systematic approach to the development of educational and social processes, making social pedagogy more dynamic, flexible and focused on the individual needs of students.

Conclusions. 1. Artificial neural networks in modern pedagogy provide effective prediction of learning outcomes, classification of knowledge levels and adaptation of learning strategies to individual needs of students. They allow to automate assessment, analyze large amounts of educational information and increase the efficiency of educational process management.

Integration of neural networks into modern pedagogy increases the accuracy, scalability and productivity of educational processes, contributes to the personalization of learning, optimization of resources and creation of adaptive education management systems. Thus, ANNs become a key tool

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for the modernization of pedagogical science and intellectual support of the educational process.

2. The use of artificial neural networks and big data analytics in social pedagogy provides a comprehensive assessment of student behavior, prediction of social risks and the effectiveness of educational activities. ANNs allow you to automate the processing of large information arrays, increase the accuracy of assessing the effectiveness of social and pedagogical activities and form individual student support programs. The integration of neural networks and big data into social pedagogy increases the flexibility, adaptability and scalability of educational and social systems, contributes to improving the effectiveness of social and pedagogical work and creating intelligent support systems for students and teachers. The use of ANNs is becoming a key tool for the modernization of social pedagogy, the development of innovative technologies and the formation of progressive strategies for managing educational and social processes in modern society.

Discussion. As mentioned above, the modern education system operates in conditions of high instability and crisis challenges caused by economic, social and technological changes. However, traditional approaches to education management often turn out to be insufficiently flexible to respond promptly to such challenges, which emphasizes the need to use intelligent technologies. Therefore, it is hybrid neural networks that combine different architectures of artificial intelligence [9] that provide new opportunities for anti-crisis management. They allow analyzing large data sets, predicting the development of crisis situations, identifying hidden patterns and supporting the adoption of informed management decisions.

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