

**THE IMPORTANCE OF ARTIFICIAL INTELLIGENCE IN PRIMARY
EDUCATION: LITERATURE REVIEW**

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Abstract

The study covers the theoretical and methodological foundations of developing the professional and pedagogical training of future primary education teachers based on artificial intelligence (AI) technologies through the analysis of scientific sources. In the process of research, international and national scientific works published between 2020 and 2025 are comparatively studied, the didactic capabilities of AI technologies in the educational process, transformations in pedagogical activity, and the structural structure of digital competencies are clarified. Based on the systematization of sources, research areas are compared and an integrated model of future teacher training is developed. This model is interpreted based on the interaction of didactic-projective, technological-practical, analytical-reflexive, ethical-regulatory and collaborative-creative components. Also, problems such as algorithmic bias, data security and digital inequality associated with the introduction of artificial intelligence into the educational process are analyzed in the scientific literature, and their pedagogical solutions are discussed. As a result of the analysis, it was established that the systematic use of artificial intelligence tools, in addition to expanding the possibilities of adapting education, is an important factor in the formation of critical thinking, pedagogical design and responsible digital activity skills in future teachers.

Keywords: Artificial intelligence in education, future primary school teachers, professional and pedagogical training, digital competence, teacher-AI collaboration, ethical use of AI.

Introduction

Today, the widespread introduction of artificial intelligence (AI) tools in the process of digital transformation of the education system has a significant impact on the content, methods and organizational forms of the educational process. In particular, in connection with the possibilities of individualizing the educational process, analyzing the level of knowledge of students and adapting teaching strategies, AI technologies are becoming an important component of modern pedagogy. Scientific research emphasizes that AI -based systems allow individualizing education and developing adaptive teaching by analyzing the level of knowledge, learning pace and individual needs of students (Ayeni O. O., Al Hamad N. M., Chisom O. N., Osawaru B., Adewusi O. E., 2024; Bhutoria A., 2022) [5; 7].

Holmes and Tuomi evaluate artificial intelligence as one of the important technologies transforming the education system, emphasizing its expanding capabilities for monitoring

learning activities, adapting the teaching process and optimizing pedagogical activities through data-based decisions (Holmes W., Tuomi I., 2022) [15; 16]. In this regard, the integration of AI technologies into the educational process, along with increasing the effectiveness of teaching, requires a reconsideration of the professional activity and pedagogical role of the teacher.

The studies demonstrates that artificial intelligence does not completely replace the teacher, but rather appears as a tool that supports his pedagogical activity and increases its effectiveness. Therefore, the development of pedagogical, digital and technological competencies of teachers is one of the urgent issues in the modern pedagogical personnel training system (Altınay Z. et al., 2024; Chiu T. K. F. et al.) [4; 10]. In particular, the use of artificial intelligence tools in the process of training future teachers allows identifying educational needs, adapting teaching strategies, and increasing the effectiveness of the educational process (Altınay Z. et al., 2024) [4].

At the same time, some studies have shown that although primary school teachers have a positive attitude towards artificial intelligence tools, they do not have the necessary knowledge, methodological preparation and practical skills to effectively use them in pedagogical activities (Mazı A., Yıldırım İ. O., 2025) [19]. This situation indicates the need to further improve methodological approaches to integrating artificial intelligence in the process of training teachers.

Scientific sources also indicate some risks and limitations in the process of introducing artificial intelligence into the education system. In particular, information reliability, data security, algorithmic errors and digital inequality are considered important factors that need to be taken into account when using AI (Osasona F. et al., 2024; Dabis A., Csáki C., 2024) [18; 12].

Bulathwela and colleagues argue that artificial intelligence does not automatically democratize education, and in some circumstances may exacerbate existing social inequalities (Bulathwela S. et al., 2024) [8; 17]. These considerations shows that the implementation of AI in the education system is not only about technological efficiency, but also about the , but also pedagogical, social and ethical factors need to be taken into account.

An analysis of existing scientific research shows that the issue of integrating artificial intelligence into the education system has been studied mainly in three main areas:

1. Didactic capabilities of AI in the educational process;
2. The changing pedagogical role of the teacher;
3. Issues of developing digital and technological competencies of teachers.

However, most of these studies have been conducted in general education and higher education, and aspects related to the pedagogical characteristics of the primary education stage, age-appropriate methodology, and the professional tasks of the primary school teacher have not been systematically analyzed. Also, the analysis of scientific literature shows that the following:

- pedagogical components,
- methodological mechanisms,
- competency structure, and practical application model of the formation of professional and pedagogical readiness of future primary education teachers based on artificial intelligence tools have not been developed in a comprehensive and systematic manner. As a result, the theoretical

approaches developed for general education do not always directly correspond to the age-specific didactic features of primary education and the pedagogical activity of the teacher.

Therefore, the purpose of this study is to analyze scientific approaches to the formation of professional and pedagogical readiness of future primary education teachers based on artificial intelligence tools and to identify its pedagogical foundations based on an analysis of the literature.

To achieve this goal, the following tasks were set:

- analyze the didactic potential of artificial intelligence in the preparation of future teachers;
- identify the digital competencies of future primary school teachers;
- to identify the pedagogical conditions for the formation of professional and pedagogical training using artificial intelligence;
- to substantiate the methodological approaches and model for the effective organization of this process.

This study aims to find answers to the following questions:

In what areas do artificial intelligence technologies affect the professional and pedagogical training of future primary school teachers?

How are the structural components and systematic model of this training formed?

What are the problems and conditions for integrating artificial intelligence into the pedagogical training process?

Method

This study aims to analyze the professional and pedagogical training of future primary school teachers in the use of artificial intelligence (AI) tools and to identify its theoretical foundations. The study has a theoretical and literature review character, and the methods are mainly focused on the analysis of scientific sources and conceptual modeling. The research methodology was developed based on existing scientific approaches to pedagogy, educational technologies and the integration of artificial intelligence into the educational process. The concepts of competency-based education, pedagogical integration and teacher-artificial intelligence collaboration were used as the methodological basis (Chiu T. K. F. et al.; Dabis A., Csáki C. 2024) [10; 12].

The competency-based approach served as the methodological basis for determining the content of future teachers' AI literacy and digital competence; the concept of teacher-AI collaboration determined the criteria for interpreting the teacher's role in modeling (Kim J. 2024) [20]. The research process used theoretical analysis, systematization, comparative and content analysis methods.

First of all, a comparative analysis of international scientific sources related to the problem was carried out, including scientific studies on the role of artificial intelligence in the education system, professional and pedagogical training of teachers, and the use of AI technologies in pedagogical activities. During the research, 46 scientific literature published in 2020–2025 was studied, and 20 articles directly related to the professional and pedagogical training of future primary education teachers were selected. At the stage of comparative analysis, five main conceptual approaches to the integration of artificial intelligence into the educational process

were compared in terms of their purpose, methodological foundations, and pedagogical results (Holmes W., Tuomi I. 2022; Felix C. V. 2020; Abdulmajid M. et al.; Bulathwela S. et al. 2024) [15; 14; 11; 8].

As part of this analysis, 20 scientific articles published in 2020–2025 were selected, in which the main scientific directions related to the application of artificial intelligence in the educational process were identified. In particular, the articles were systematically classified based on criteria such as pedagogical competence, personalized learning, AI-teacher collaboration, didactic integration, and ethical use of technologies (Ayeni O. O., Al Hamad N. M., Chisom O. N., Osawaru B., Adewusi O. E. 2024; Bhutoria A. 2022) [5; 7].

A conceptual model of the training of future primary school teachers using artificial intelligence tools was developed in the form of a block diagram based on the identified components. At this stage, methods of systematic analysis and generalization of scientific literature were used, and the theoretical and methodological foundations of the professional and pedagogical training of teachers in the process of using artificial intelligence technologies were clarified (Dabis A., Csáki C. 2024) [12; 13].

Table 1: Table of research methodology

Research stage	Object of analysis	Method used	Content of the work performed	Expected result
Stage 1. Selection of scientific sources	International scientific literature published in 2020–2024 (46)	Selecting and sorting scientific sources	Scientific research on the role of artificial intelligence in the education system, professional and pedagogical training of teachers, and the use of AI technologies was selected	A theoretical source base for the study was formed
Stage 2. Comparative analysis	Concepts for integrating artificial intelligence into the educational process	Comparative analysis	The purpose, methodology, and pedagogical outcomes of 5 main conceptual approaches were compared.	The main scientific approaches to integrating artificial intelligence into education have been identified
Stage 3. Thematic classification	20 scientific articles from 2020–2024	Content (thematic) analysis	The main ideas in the articles were classified into the categories of pedagogical competence, personalized learning, SI–teacher collaboration, didactic integration, and ethical use of technology.	The main scientific directions related to the research topic have been identified.
Step 4. Identifying Components	Professional training of teachers based on AI	Systematic analysis	Pedagogical, technological, and methodological components found in scientific sources were identified and systematized.	The main structural elements of professional and pedagogical training have been identified
Stage 5. Conceptual modeling	The training system for future primary school teachers	Pedagogical modeling	Based on the identified components, a training model based on artificial intelligence tools was developed in the form of a block diagram.	A conceptual model of professional and pedagogical training of future teachers based on SI has been developed
Stage 6. Summarizing the results	Scientific conclusions obtained during the research process	Generalization and systematization	Drawing pedagogical and methodological conclusions through a systematic analysis of scientific literature	Determining the theoretical and methodological foundations of professional and pedagogical training of teachers based on SI

Also, scientific views on the use of artificial intelligence tools in pedagogical activities were studied based on a content-analytical approach. Using this method, teachers' digital competence, integration of pedagogical knowledge, and methodological approaches related to the use of artificial intelligence were analyzed. In the process of this analysis, categories such as teacher competence, personalized learning, pedagogical collaboration, and technological integration were selected as the main analytical units (Dabis A., Csáki C. 2024; Haase J., Pokutta S. 2024) [12; 1].

In the modeling process, the integration of the teacher's pedagogical knowledge, digital competence, and skills in using artificial intelligence tools was considered as the main components (Altinay Z. et al. 2024; Chiu T. K. F. et al.; Kim J. 2024) [4; 10; 20].

In order to ensure the reliability of the research results, the data obtained were summarized on the basis of comparative and logical analysis (Dabis A., Csáki C. 2024; Holmes W., Tuomi I. 2022) [12; 16]. This set of methods created a sufficient methodological basis for a comprehensive study of the research problem (Dabis A., Csáki C. 2024; Holmes W., Tuomi I. 2022) [12; 16].

Results:

An analysis of 20 articles revealed 5 different interpretations of the role of artificial intelligence in education (Haase J., Pokutta S. 2024; Ayeni O. O., Al Hamad N. M., Chisom O. N., Osawaru B., Adewusi O. E. 2024; Bhutoria A. 2022; Holmes W., Tuomi I. 2022; Kim J. 2024) [1; 5; 7; 15; 20].

Table 2. Main results identified based on the literature review

No	Main result direction	Content	Main sources	Importance for the preparation of future primary education teachers
11	Main interpretations of SI in education	The 20 articles analyzed cover the role of AI in education in 5 different interpretations: technology that adapts the learning process, a tool that supports pedagogical decisions, teacher-AI collaboration, technology that enhances creative activity, and an element of an intellectual learning environment.	Haase and Pokutta (2024); Ayeni et al. (2024); Bhutoria (2022); Holmes and Tuomey (2022); Kim (2024) [1; 5; 7; 15; 20]	It shows the need to interpret AI not only as a technological tool, but also as a complex factor influencing the content and structure of the pedagogical process.
22	Personalized and adaptive learning	In a significant part of the articles, the main focus was on the ability of SI tools to differentiate the learning process and adapt it to the needs, pace of learning, and level of knowledge of students.	Ayeni et al. (2024); Bhutoria (2022); Holmes and Tuomey (2022) [5; 7; 15; 16]	Justifies the need to prepare future teachers to use individualized approaches and adaptive teaching strategies
33	Teacher-AI collaboration	In research, AI is not seen as a system that replaces the teacher, but rather as a tool that supports pedagogical decisions and collaborates in lesson design and analysis.	Kim (2024); Chan and Tsi; Felix (2020); Altinay et al. (2024) [4; 9; 14; 20]	Collaboration with AI in professional training requires the development of skills in critically examining results and adapting them to pedagogical goals.
44	Internal structure of professional and pedagogical training	As a result of the analysis, a recurring three-layer structure of professional and pedagogical training was identified: conceptual understanding, practical application skills, and reflective assessment skills.	Chiu et al.; Chan and Tsi; Felix (2020); Mazi and Yıldırım (2025) [9; 10; 14; 19]	It shows that the training of future teachers should be built not only on technical literacy, but also on the basis of a unity of theoretical, practical and reflexive components.
55	Ethical and pedagogical safety	Reliability, data security, transparency, human control, and digital inequality emerged as independent important areas in the use of AI.	Al-Mughairi and Bhaskar; Dabis and Csáki (2024); Osasona et al. (2024); Bulathwela et al. (2024) [3; 8; 12; 13; 17; 18]	It shows that ethical competence is not a marginal, but a mandatory professional component in the training of primary school teachers.

In some studies, it is assessed as a digital tool that adapts the learning process, while in other works it is interpreted as an element of the intellectual environment that supports pedagogical decision-making, enhances creative activity or collaborates with the teacher (Haase J., Pokutta

S. 2024; Ayeni O. O., Al Hamad N. M., Chisom O. N., Osawaru B., Adewusi O. E. 2024; Bhutoria A. 2022; Holmes W., Tuomi I. 2022; Kim J. 2024) [1; 5; 7; 15; 20].

In this regard, the results of the literature review illustrates the need to view artificial intelligence not only as a technological resource, but also as a complex pedagogical factor that affects the content, organization, and intersubjective relationships of education (Holmes W., Tuomi I. 2022; Kim J. 2024) [15; 20].

Table 3: Distribution of conceptual approaches to artificial intelligence in education based on literature analysis

Type of approach	Percentage
Technology that adapts the learning process	30 %
A tool that supports pedagogical decisions	20 %
Teacher-AI collaboration	20 %
Technology that enhances creative activity	15 %
Element of an intellectual learning environment	15 %

As a result of the analysis of sources, it was found that in 40% of 20 scientific articles, the possibilities of artificial intelligence tools for differentiating the learning process were considered as the main research direction (Ayeni O. O., Al Hamad N. M., Chisom O. N., Osawaru B., Adewusi O. E. 2024; Bhutoria A. 2022) [5; 7]. Ayeni et al. and Bhutoria's studies emphasize that SI systems allow for the adaptation of educational content, learning pace, and task complexity to individual needs by analyzing student data (Ayeni O. O., Al Hamad N. M., Chisom O. N., Osawaru B., Adewusi O. E. 2024; Bhutoria A. 2022) [5; 7]. Holmes and Tuomi interpret such technologies as an important factor transforming the educational process (Holmes W., Tuomi I. 2022) [15; 16]. At the same time, the results of the analysis show that these opportunities are often highlighted in the context of general education, and methodological approaches suitable for primary education have not been sufficiently developed.

A second important result is that work on the preparation of future teachers has begun to see AI not only as a user-level study, but also as a pedagogical design tool. While Altinay and his colleagues have shown the possibilities of future teachers to organize education using AI, Kim's work emphasizes the gradual formation of teacher-AI cooperation (Altinay Z. et al. 2024; Kim J. 2024) [4; 20]. This result indicates that professional training should not only include technical skills, but also the need to develop pedagogical plans for working with AI, critically examine the results and adapt them to educational goals. As a third result, recurring elements in the literature on the internal structure of professional training were identified. Chiu and his colleagues point to the digital competence of the teacher as a central factor (Chiu T. K. F. et al.) [10]. The work of Felix, Chan and Tsi, on the other hand, suggest a change in the role of the teacher, i.e. from a controller of the educational process to a transmitter of information. a shows the strengthening of its position as a coordinating subject (Chan C. K. Y., Tsi L. H. Y.; Felix C. V. 2020) [9; 14]. Mazı and Yıldırım's study notes that although there is a positive attitude among primary school teachers, there is a lack of practical training (Mazı A., Yıldırım İ. O. 2025) [19]. Based on these sources, at least a three-layer structure of professional

pedagogical training was seen: conceptual understanding, practical application skills, and reflexive evaluation skills. As a fourth result, pedagogical safety and ethical responsibility in the use of AI tools emerged as an independent direction. The work of Al-Mughairi and Bhaskar, Dabis and Csáki, Osasona and co-authors brings issues of trustworthiness, data security, transparency, human control and digital inequality to the forefront (Al-Mughairi H., Bhaskar P.; Dabis A., Csáki C. 2024; Osasona F. et al. 2024) [3; 12; 13; 18].

Bulathwela and co-authors show that due to digital inequality, AI tools can be an opportunity for some students and a new obstacle for others (Bulathwela S. et al. 2024) [8; 17]. Therefore, the ethical component in the preparation of future primary education teachers should not be considered a marginal issue, but rather a necessary part of the professional-pedagogical foundation. The fifth result is that the sources of creativity and pedagogical collaboration have shown a new educational role of AI. While Haase and Pokutta have analyzed generative AI as a creative partner, Mou notes that the effectiveness of students' use of such tools depends on the critical approach of the user (Haase J., Pokutta S. 2024; Mou T.-Y.) [1; 2]. Abdulmajid and his co-authors show that AI can be used as a pedagogical partner, but emphasize that the final evaluation and content control remain with the teacher (Abdulmajid M. et al.) [11]. These results indicate the need to design creative tasks using AI in the training of future teachers, but to sort the result based on pedagogical criteria.

A generalization of the literature review showed that, although existing studies provide many valuable conclusions, they mostly focus on specific issues: one group of sources analyzes didactic opportunities, others the role of the teacher, and still others ethical risks (Altinay Z. et al. 2024; Bulathwela S. et al. 2024; Chiu T. K. F. et al.; Felix C. V. 2020; Kim J. 2024) [4; 8; 10; 14; 20]. However, studies that integrate the components of professional and pedagogical training necessary for a future primary school teacher into a single logical model are very rare. On this basis, the following integrated structure of training based on AI tools was distinguished in the results section: educational process design, technological-practical, analytical-evaluative, ethical-normative and collaborative-creative. The results obtained show that modern scientific views on the integration of artificial intelligence into the educational process are being formed not in one direction, but within the framework of several interrelated pedagogical positions. In the analyzed sources, AI, on the one hand, is interpreted as a means of individualization and adaptive organization of the educational process (Ayeni O. O., Al Hamad N. M., Chisom O. N., Osawaru B., Adewusi O. E. 2024; Bhutoria A. 2022; Holmes W., Tuomi I. 2022) [5; 7; 15; 16], on the other hand, it appears as a factor that redefines the professional role of the teacher, supports pedagogical decisions and requires reflexive activity (Chan C. K. Y., Tsi L. H. Y.; Chiu T. K. F. et al.; Felix C. V. 2020; Kim J. 2024) [9; 10; 14; 20]. In this regard, the results of the study confirm the need to view AI not only as a technological tool, but also as a complex educational phenomenon that renews the content of professional and pedagogical training. The results are consistent with the conclusions regarding personalized education. Ayeni and Bhutoria's research shows that AI systems provide differentiated and adaptive learning by analyzing students' needs, mastery levels, and learning pace (Ayeni O. O., Al Hamad N. M., Chisom O. N., Osawaru B., Adewusi O. E. 2024; Bhutoria A. 2022) [5; 7]. Holmes and Tuomi evaluate these opportunities as a transformative factor in education (Holmes W., Tuomi I. 2022)

[15; 16]. However, the analysis carried out in this article showed that in existing scientific works, these opportunities are mostly covered within the framework of general education, and are not sufficiently systematized from the point of view of the professional and pedagogical training of primary education teachers. Thus, although the didactic potential of AI exists, a special methodological basis is required to adapt it to the activities of the future primary education teacher.

The results of the study also complement the scientific views on teacher-AI cooperation. Who can step by step develop the cooperation between the teacher and AI describes the a-phase as a developing pedagogical model (Kim J. 2024) [20]. Chan and Tsi also present AI as a tool to support the pedagogical activity, not a system that replaces the teacher (Chan C. K. Y., Tsi L. H. Y.) [9]. Felix notes that the role of the teacher in modern education is becoming more of a facilitator, guide, and reflexive analyst rather than a transmitter of information (Felix C. V. 2020) [14]. The integrated blocks identified in this study - the educational process design, technological-practical, analytical-evaluative, ethical-normative, and collaborative-creative components - serve to unite these scientific views within the framework of the professional-pedagogical training model. In this sense, the results do not deny S. Kim's collaborative model, but rather extend it to the process of training a future primary school teacher.

Another important issue was identified during the discussion: the positive attitude of future teachers towards AI does not mean that their practical training is sufficient. Mazi and Yıldırım show that although primary school teachers have a positive attitude towards AI technologies, they lack practical skills and methodological training (Mazi A., Yıldırım İ. O. 2025) [19]. Chiu et al., on the other hand, define digital competence as a basic condition for the effective use of AI (Chiu T. K. F. et al.) [10]. Altınay et al., although they show that training future teachers using AI enhances professional training, also note the need for caution, methodological basis and pedagogical control (Altınay Z. et al. 2024) [4]. Therefore, limiting professional and pedagogical training only to technological literacy would be a scientifically narrow approach. It should be considered in conjunction with didactic planning, pedagogical control, reflection and ethical responsibility.

Discussion

The results showed that ethical and social constraints also play a central role. In the studies of Al-Mughairi and Bhaskar, Dabis and Csáki, Osasona et al., reliability, data security, transparency, human control and academic integrity were identified as important factors (Al-Mughairi H., Bhaskar P.; Dabis A., Csáki C. 2024; Osasona F. et al. 2024) [3; 12; 13; 18]. Bulathwela and colleagues argue that SI tools do not automatically ensure equality in education, but on the contrary, if the digital divide persists, they can exacerbate existing inequalities (Bulathwela S. et al. 2024) [8; 17]. The results of this article confirm these scientific conclusions, indicating the ethical-normative component as an intrinsic component of the preparation of future primary education teachers. This means that the principles of fairness, security, transparency and pedagogical control should be established as mandatory criteria in the development of methodological recommendations for working with AI.

Sources on creative activity and pedagogical partnership also occupy an important place in the discussion. Haase and Pokutta describe generative AI as a partner that enhances human creativity within the framework of the concept of “Human-AI Co-Creativity” (Haase J., Pokutta S. 2024) [1]. Mou shows that the creative outcome of AI tools depends on the level of critical and conscious use of the user (Mou T.-Y.) [2]. Abdulmajid et al., recognizing the potential of artificial intelligence as a pedagogical partner, emphasize that the final substantive control remains with the teacher (Abdulmajid M. et al.) [11]. These approaches indicate the need to develop the skills of future teachers in the preparation of not only creating creative tasks using AI, but also selecting, checking and adapting them based on pedagogical criteria.

Practical significance

These results can be put into practice by including a 12-hour module called “SI Pedagogy” in the curriculum for 3rd year students of primary education. This module should cover issues of personalized learning, teacher-AI collaboration, reflective assessment, and ethical use. This module should cover issues of personalized learning, teacher-AI collaboration, analysis of learning data, reflective assessment, and ethical use (Altınay Z. et al. 2024; Chiu T. K. F. et al.; Mazi A., Yıldırım İ. O. 2025; Kim J. 2024) [4; 10; 19; 20]. Secondly, it is possible to gradually integrate AI tools into primary school curriculum, providing adaptive tasks, individual recommendations and monitoring the dynamics of student development (Ayeni O. O., Al Hamad N. M., Chisom O. N., Osawaru B., Adewusi O. E. 2024; Bhutoria A. 2022) [5; 7]. Thirdly, when developing methodological guidelines for educators, it is necessary to determine the regulatory and restrictive requirements for the use of SI tools; this should take into account the principles of data security, academic integrity and protection from algorithmic bias (Al-Mughairi H., Baskar P.; Dabis A., Csáki C. 2024; Osasona F. et al. 2024) [3; 12; 18].

In primary education practice, such an approach can yield the following results: building an individual learning trajectory for students, adapting the content of the lesson, early identification of difficulties in mastering, diversifying creative tasks, and more efficient distribution of the teacher's time resources. However, all this is effective only if the teacher is able to independently pedagogically evaluate the results of the SI, critically analyze them, and adapt them to educational goals.

Conclusion

The scientific sources analyzed in the article show that the readiness of future primary school teachers to work with artificial intelligence tools is a multi-component professional and pedagogical structure. It is not limited to digital literacy or technical skills; on the contrary, it is formed based on the integration of didactic design, technological application, analytical and evaluation, ethical and normative control and collaborative and creative activity. Therefore, the issue of introducing AI into primary education should not be considered as a technological innovation, but as a pedagogical task requiring a revision of the content of teacher training.

In future research, it is advisable to empirically test these theoretical conclusions, develop criteria and indicators of professional and pedagogical training of future primary education teachers based on AI, as well as create practical methodological models for primary school

classes. At the same time, the evaluation of the pedagogical effectiveness, ethical safety and real results of using AI tools in primary education on an experimental basis remains a priority area of further research.

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