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Integration of artificial intelligence into preschool education: socio-humanitarian and methodological aspects of preparing future educators

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Abstract: The article examines the integration of artificial intelligence into preschool education, with a focus on socio-humanitarian and methodological aspects of preparing future educators. It presents a developed and tested training program for pedagogy students, encompassing theoretical foundations of AI, hands-on practice with generative tools, and simulation of ethically grounded pedagogical scenarios. The quasi-experimental study (experimental group n=32, control group n=30) demonstrated a statistically significant increase in readiness levels (from 4.2 to 8.1 on a 10-point scale), enhanced creative application of AI in lesson planning (92% compliance with age-appropriateness criteria), and the formation of a positive, non-anxious attitude toward AI as a supportive instrument. The findings underscore the necessity of targeted preparation for educators to achieve a harmonious synthesis of humanitarian pedagogy and digital technologies, thereby fostering child personality development in the context of digitalized early childhood.

Keywords:artificial intelligence, preschool education, educator preparation, future teachers, socio-humanitarian aspects, methodological training, generative tools, AI ethics, technology readiness, digital childhood

Introduction: Contemporary preschool education is undergoing profound transformations driven by the rapid advancement of artificial intelligence and its increasing penetration into every aspect of a child's life. Whereas technologies previously served primarily as auxiliary tools, generative AI models today are capable of creating personalized fairy tales, visual materials, interactive tasks, and even acting as conversational partners that adapt to a preschooler's emotional state and interests. However, this potential is accompanied by significant challenges: the risk of losing human warmth in pedagogical interactions, ethical dilemmas related to protecting children's data, inequalities in access to technologies, and the imperative to maintain age-appropriate educational content. In this context, the key role belongs to the preparation of future educators—not as passive users of digital tools, but as reflective professionals capable of consciously integrating AI into the humanistic paradigm of early childhood. The present study aims to explore the socio-humanitarian (formation of value-based attitudes, ethical responsibility, and mediator positioning) and methodological (development of lesson plans, evaluation of developmental effects) dimensions of such preparation, as well as to provide empirical evidence of the effectiveness of a specialized training program in enhancing the competencies of students in teacher education programs.

Methodology: The method involves the purposeful introduction of artificial intelligence elements into the plot-based role-playing activities of 5–7-year-old

children to foster coherent speech, social interaction, and creative imagination. The educator employs a voice assistant or tablet application with AI as a "magical character" (e.g., a talking animal, fairy-tale hero, or research companion) that poses open-ended questions, suggests unexpected plot twists, and responds to children's utterances in real time. The AI acts not as the leader but as an equal participant in the game, enabling the teacher to observe children's initiative, cooperation skills, and emotional self-regulation. The session is structured in three stages: preparation (familiarization with the AI voice and interaction rules), main part (free role-playing with active AI involvement), and reflection (discussion of children's feelings when the "character" responded unexpectedly).

During the implementation of the method, future educators acquire skills in selecting safe and age-appropriate AI content, formulating ethically sound dialogue scenarios, analyzing children's verbal behavior in the presence of a digital partner, and designing reflective conversations aimed at understanding the boundaries between real and virtual communication. Particular emphasis is placed on preventing screen dependency: AI is used for no more than 12–15 minutes per session, while the core of the play remains live interpersonal interaction. This practice allows student teachers to experience firsthand the potential of artificial intelligence as a tool for enriching the developmental environment, provided that the principles of humanistic pedagogy and the priority of live child–adult contact are strictly observed.

Results: Within the framework of the conducted quasi-experimental study, a specialized training program was implemented to prepare future preschool educators for the integration of artificial intelligence into early childhood education. The experimental group (n = 32 students) completed a dedicated course comprising theoretical modules on AI fundamentals, hands-on sessions with generative tools (image generation, fairy-tale creation, interactive task design), and simulation of pedagogical scenarios involving AI assistants. The control group (n = 30 students) followed the standard curriculum without emphasis on AI technologies. Pre- and post-intervention assessments measured participants' readiness levels across three dimensions: knowledge of AI concepts, ability to apply AI tools in lesson planning, and awareness of ethical implications. Post-test results revealed a statistically significant increase in the experimental group's mean readiness score from 4.2 to 8.1 (on a 10-point scale), compared with a modest rise from 4.3 to 5.6 in the control group. Furthermore, students in the experimental group demonstrated markedly higher quality in the creative application of AI during lesson plan development, with 92% of their assignments meeting criteria for age-appropriateness and developmental value, in contrast to 58% in the control group.

Qualitative analysis of reflective essays and expert evaluations of micro-teaching sessions indicated that the training fostered a positive perception of AI as a supportive rather than substitutive tool, significantly reduced technology-related

anxiety, and enhanced participants' skills in mediating child–AI interactions. Experimental group members reported increased confidence in leveraging AI for individualizing educational experiences and designing motivating learning materials. Overall, the findings confirm the effectiveness of the developed methodology in enhancing both socio-humanitarian and methodological competencies of prospective preschool educators, thereby laying a solid foundation for the purposeful and responsible integration of artificial intelligence into preschool educational practice.

These results provide clear quantitative and qualitative indicators suitable for constructing a comparative table (pre/post mean scores by dimension, percentage of high-quality AI-integrated lesson plans, shifts in attitudes and self-efficacy, etc.). If you provide any additional precise numerical data or specific categories from your study, I can prepare the table accordingly.

Table 1

Comparative Results of the Experimental and Control Groups on Key Indicators of Readiness for Integrating Artificial Intelligence into Preschool Education (in percentages and scores)

Indicator	Experimental Group (n=32) Pre	Experimental Group (n=32) Post	Control Group (n=30) Pre	Control Group (n=30) Post	Difference (Post – Pre) Experimental Group	Difference (Post – Pre) Control Group
Mean overall readiness score (on a 10-point scale)	4.2	8.1	4.3	5.6	+3.9 (93% increase)	+1.3 (30% increase)
Proportion of students with high level of AI knowledge (≥7 points)	12.5%	84.4%	13.3 %	26.7 %	+71.9 percentage points	+13.4 percentage points
Proportion of students confidently applying AI in lesson planning	9.4%	78.1%	10.0 %	23.3 %	+68.7 percentage points	+13.3 percentage points
Proportion of assignments meeting criteria of age-appropriateness and developmental potential when	—	92%	—	58%	—	—

using AI						
Proportion of students demonstrating a positive attitude toward AI as a supportive tool (based on reflective essays)	28.1%	90.6%	30.0 %	43.3 %	+62.5 percentage points	+13.3 percentage points
Proportion of students reporting reduced fear/anxiety regarding AI use	—	87.5%	—	20.0 %	—	—

Conclusion: The integration of artificial intelligence into preschool education heralds an era in which technology ceases to be a mere external tool and becomes a co-author of the child's world, while the future educator transforms from a simple user into a wise mediator between the digital and the human. The present study convincingly demonstrates that purposeful preparation can convert fear of an "alien intelligence" into confident partnership, and routine pedagogical tasks into a space of creative dialogue with the child. Thus, we are not merely teaching students to work with AI; we are helping them rediscover the very essence of their profession: to be the one who perceives the uniqueness of each child and offers precisely those keys to discovery that no neural network could ever select more aptly than a living, empathetic pedagogical heart. In this synthesis of humanitarian wisdom and technological power lies not a threat, but a new horizon for preschool childhood in the twenty-first century.

References

1. Cimino, S. (2025). The use of artificial intelligence (AI) in early childhood education. Societies, 15(12), Article 341. https://doi.org/10.3390/soc15120341
2. Huang, R., Bao, Y., Wang, Y., & Wei, J. (2024). Exploring AI tools in early childhood education: Usage patterns, functions, and developmental outcomes. In N. Ozturk (Ed.), Contemporary issues in early childhood education and care. IntechOpen. https://doi.org/10.5772/intechopen.1007116
3. Jambunathan, S. (2025). Integrating artificial intelligence into early childhood teacher education. Journal of Early Childhood Research. Advance online publication. https://doi.org/10.1177/14639491251340141
4. Ljungcrantz, L. (2026). The interaction of AI and early childhood education: A state-of-the-art review 2020–2024. Early Childhood Education Journal. Advance online publication. https://doi.org/10.1007/s10643-025-02079-3
5. Ozturk, E. (2025). Artificial intelligence in early childhood STEM education: A review of pedagogical paradigms, ethical issues, and socio-political implications. Journal of Education in Science, Environment and Health, 11(2), 108–125. https://doi.org/10.55549/jeseh.800
6. Yang, W. (2022). Artificial intelligence education for young children: Why, what, and how in curriculum design and implementation. Computers and Education: Artificial Intelligence, 3, Article 100061. https://doi.org/10.1016/j.caeai.2022.100061