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# AIGC Empowering Preschool Education Normal Students' Digital Intelligence Literacy: Realistic Dilemmas and Development Pathways

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**Abstract:** Against the backdrop of digital and intelligent transformation, AIGC technology offers brand-new possibilities for cultivating the digital and intelligent literacy of preschool education normal students. As the core force driving the digital transformation of early childhood education in the future, the digital and intelligent literacy of these normal students is directly linked to the advancement of preschool education informatization and the improvement of educational quality. Based on the industry standard *Teachers' Digital Literacy* and the laws of pre-service teacher training, combined with the technical characteristics of AIGC, this paper systematically analyzes the current realistic dilemmas in AIGC, empowering the enhancement of digital and intelligent literacy of preschool education normal students. The paper puts forward targeted development paths from four dimensions: technology integration, curriculum reconstruction, practical innovation, and evaluation optimization, providing theoretical reference and practical guidance for normal universities to construct a preschool education talent training system in the AIGC era.

**Keywords:** AIGC; Preschool education normal students; Digital and intelligent literacy

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## 1. Introduction

With the successive issuance of policy documents such as *Teachers' Digital Literacy*, improving the digital and intelligent literacy of normal students has become a core task of teacher education in the new era [1]. Preschool education normal students have a dual identity as "learners" and "future educators." Their digital and intelligent literacy not only includes digital technology knowledge and skills, but also covers professional dimensions such as digital teaching application and digital social responsibility. At present, the cultivation of digital and intelligent literacy in preschool education majors of normal universities still faces problems such as insufficient integration of technology and teaching, single practical scenarios, and lagging evaluation systems, and the empowering value of AIGC technology has not been fully released [2]. Therefore, systematically exploring the

realistic dilemmas and optimization paths of AIGC, empowering the improvement of digital and intelligent literacy of preschool education normal students, is of great practical significance for promoting the digital transformation of preschool education and cultivating high-quality early childhood education talents.

## 2. Realistic dilemmas of AIGC empowering the digital and intelligent literacy of preschool education normal students

### 2.1. Insufficient depth of technology integration and ambiguous training orientation

Poor adaptability between the curriculum system and AIGC technology: At present, the digital and intelligent literacy courses for preschool education majors in normal universities mainly focus on general information technology teaching, lacking in-depth integration with the technical characteristics of AIGC and the professional needs of preschool education. The curriculum content emphasizes the explanation of technical theories, ignoring the specific application of AIGC tools in early childhood teaching scenarios, resulting in normal students' difficulty in transforming the learned knowledge into teaching practical ability. For example, the courses only introduce basic concepts of artificial intelligence, but do not involve the practical application of AIGC in scenarios such as early childhood language teaching and scientific enlightenment.

Unclear orientation of training objectives: Some universities have an insufficient understanding of the composition of digital and intelligent literacy of preschool education normal students, simplifying it as technical operation skills, while ignoring core dimensions such as digital teaching design, digital ethics, and adaptability to children's development. The training process lacks targeted guidance on the integration of AIGC technology and preschool education, leading to rigid application of technology by normal students and difficulty in designing digital teaching activities that conform to the physical and mental development laws of children.

### 2.2. Weak practical support system and insufficient scene adaptability

Lagging construction of practical platforms: Most normal universities have not yet established digital and intelligent training bases adapted to AIGC technology, lacking professional facilities such as virtual simulation teaching systems and AIGC teaching resource development platforms. The practical activities of normal students are mostly limited to simple technical operation exercises, making it difficult to carry out complex digital teaching practice and resource development tasks, resulting in poor effectiveness in cultivating practical ability.

Lack of real teaching scenarios: AIGC-empowered practical teaching mostly stays at the level of simulated scenarios, lacking connection with the real teaching environment of kindergartens [3]. Normal students find it difficult to test the application effect of digital and intelligent technology in real educational situations, and cannot fully consider practical factors such as individual differences of children and teaching interaction feedback, leading to the disconnection between the cultivated digital and intelligent literacy and job requirements. In addition, the school-enterprise-kindergarten collaborative mechanism is imperfect, and scientific and technological enterprises and kindergartens lack enthusiasm for participating in the cultivation of normal students' digital and intelligent literacy, making it difficult to provide real project resources and practical guidance.

### 2.3. Deficiency of teachers' literacy and inadequate empowering ability

Teachers' digital and intelligent literacy needs to be improved: Some preschool education teachers lack systematic AIGC technology training, have insufficient understanding of the functional characteristics and application scenarios of AIGC tools, and find it difficult to effectively guide normal students in carrying out

digital and intelligent teaching practice. Teachers' teaching concepts still remain in the traditional mode, failing to make full use of AIGC technology to innovate teaching methods, which affects the quality and efficiency of literacy cultivation [4].

Insufficient interdisciplinary teaching ability: The cultivation of digital and intelligent literacy empowered by AIGC requires the integration of interdisciplinary knowledge, such as educational technology, preschool education, and computer science. However, current normal universities lack teaching staff with interdisciplinary backgrounds. Teachers are often limited to teaching in their own professional fields, making it difficult to guide normal students to achieve in-depth integration of technology and educational concepts, which restricts the comprehensiveness and effectiveness of digital and intelligent literacy cultivation.

### 2.4. Imperfect evaluation system and unclear guiding role

One-sided evaluation content: The existing evaluation system mostly focuses on normal students' mastery of digital and intelligent technology knowledge and operation skills, ignoring core dimensions such as digital teaching application effect, digital ethics awareness, and innovation ability [5]. The evaluation content cannot fully reflect the comprehensive level of digital and intelligent literacy, leading normal students to emphasize technical operation over teaching application, and making it difficult to form a digital and intelligent literacy structure that meets professional needs.

Single evaluation method: The evaluation method is mainly a summative evaluation, such as examinations and skill assessments, lacking dynamic tracking and feedback of the learning process. Process-oriented evaluation tools supported by AIGC technology have not been fully applied, making it difficult to accurately capture the growth track and existing problems of normal students' digital and intelligent literacy, and unable to provide a scientific basis for personalized training. In addition, the evaluation subjects are relatively single, lacking the participation of external subjects such as enterprise experts and kindergarten teachers, resulting in insufficient objectivity and practicality of evaluation results.

### 2.5. Lack of digital ethics education and a weak sense of responsibility

While bringing convenience, AIGC technology also triggers ethical issues such as data privacy protection and content compliance. In the current cultivation of digital and intelligent literacy in normal universities, digital ethics education is seriously lacking, and normal students have insufficient cognition of the application boundaries and ethical norms of AIGC technology. Some normal students abuse AIGC to generate teaching content and ignore the protection of children's data privacy in practice, lacking the awareness of digital social responsibility as educators, and thus cannot meet the ethical requirements of preschool education in the digital and intelligent era.

## 3. Development paths of AIGC empowering the digital and intelligent literacy of preschool education normal students

### 3.1. Reconstructing the curriculum system and strengthening the integration of AIGC and specialized majors

Clarifying training objectives and content framework: Based on the *Teachers' Digital Literacy* standard, combined with the needs of the preschool education industry and the technical characteristics of AIGC, construct a trinity digital and intelligent literacy training objective system of "technical foundation +

professional application + ethical norms." The curriculum content covers core modules such as AIGC technology foundation, digital teaching resource development, early childhood education data analysis, and digital ethics, focusing on cultivating normal students' technical application ability, digital teaching design ability, and social responsibility awareness. For example, offer courses such as "AIGC Preschool Education Resource Development" and "Application of Intelligent Teaching Tools" to strengthen the practical orientation.

Innovating curriculum organization forms: Break the boundaries of traditional disciplines and build a modular and interdisciplinary curriculum system. Deeply integrate AIGC technology content with specialized courses such as preschool education and child psychology, and incorporate digital teaching cases and practical tasks into professional courses such as language teaching and science education. Adopt a blended teaching model, combining online AIGC autonomous learning platforms with offline practical drills to realize the organic unity of theoretical learning and practical application. In addition, set up optional course modules to meet the personalized development needs of normal students, such as digital picture book creation and intelligent education equipment debugging.

## 3.2. Improving the practical support system and constructing diversified practical scenarios

Strengthening the construction of digital and intelligent training bases: Normal universities should increase investment to build digital and intelligent training bases integrating virtual simulation teaching, AIGC resource development, and educational data analysis. Equip with professional facilities such as virtual reality equipment, AIGC teaching software, and children's behavior data collection and analysis systems, simulate kindergarten teaching scenarios, and provide immersive practical experience for normal students. For example, build a virtual kindergarten classroom to support normal students in carrying out digital teaching drills, interactive game design, and other practical activities.

Deepening school-enterprise-kindergarten collaborative cooperation: Establish a stable school-enterprise-kindergarten collaborative education mechanism, and jointly develop practical projects and curriculum resources with scientific and technological enterprises and high-quality kindergartens. Scientific and technological enterprises provide AIGC technology training and tool support for normal students, and kindergartens provide real teaching scenarios and practical tasks, forming a closed-loop training model of "theoretical learning—technical training—practical application—feedback optimization." For example, cooperate with educational technology companies to carry out digital teaching resource development projects, and organize normal students to go deep into kindergartens to carry out AIGC teaching application practice.

Expanding the content and forms of practice: Enrich the types of practical tasks, covering multiple dimensions such as digital teaching plan design, AIGC teaching resource development, and children's learning data analysis. Encourage normal students to participate in innovation and entrepreneurship projects, and use AIGC technology to develop educational products and services suitable for children. Carry out cross-regional practical exchanges through online teaching and research platforms, share digital teaching experience and cases, and broaden practical horizons.

## 3.3. Strengthening the construction of teaching staff and improving the empowering ability

Carrying out specialized training to improve teachers' digital and intelligent literacy: Formulate a plan for improving teachers' digital and intelligent literacy, and regularly organize preschool education teachers to participate in special training on AIGC technology application and digital teaching design. Invite industry

experts and technical personnel from scientific and technological enterprises to carry out lectures and workshops, help teachers master the functional characteristics and application methods of AIGC tools, and update teaching concepts and methods. In addition, support teachers to participate in scientific research projects related to digital and intelligent education, and improve their interdisciplinary research ability and teaching innovation ability.

Constructing interdisciplinary teaching teams: Integrate the teaching resources of educational technology, computer science, preschool education, and other disciplines to form interdisciplinary teaching teams. Team members cooperate with each other to undertake the teaching, practical guidance, and curriculum development of digital and intelligent literacy courses, realizing the organic integration of technical knowledge and professional educational concepts. Establish a teacher exchange and cooperation mechanism to promote knowledge sharing and teaching collaboration among teachers of different disciplines, and improve the overall teaching level.

## 3.4. Optimizing the evaluation system and strengthening process-oriented and comprehensive evaluation

Enriching evaluation content to fully cover literacy dimensions: Construct a diversified evaluation content system covering digital awareness, digital and intelligent knowledge and skills, digital teaching application, digital social responsibility, and professional development. Pay attention not only to normal students' technical operation skills and knowledge mastery, but also to their core literacy, such as digital teaching design effect, innovation ability, and ethical awareness. For example, when evaluating the ability of digital teaching resource development, consider both the level of technical realization and the educational significance and child adaptability of the resources.

Innovating evaluation methods and strengthening process-oriented feedback: Combine the advantages of AIGC technology to build an evaluation model combining "process-oriented evaluation + summative evaluation." Use AIGC evaluation tools to dynamically track the learning process of normal students, collect information such as learning behavior data and practical operation records, generate personalized evaluation reports, and provide a basis for teaching adjustment and personalized guidance. Adopt summative evaluation methods such as project achievement display, teaching practice drills, and interdisciplinary collaborative tasks to comprehensively examine normal students' comprehensive application ability of digital and intelligent literacy.

## 3.5. Strengthening digital ethics education and shaping a sense of responsibility

Integrating ethics education content: Incorporate digital ethics into the whole process of digital and intelligent literacy cultivation, set up relevant course modules on digital ethics, covering core topics such as data privacy protection, AIGC content compliance, and technical application boundaries. Through teaching forms such as case analysis and ethical debates, guide normal students to recognize the ethical risks in the application of AIGC technology and establish a correct view of digital ethics.

Strengthening ethical guidance in practice: Strengthen the requirements of ethical norms in practical teaching, requiring normal students to strictly abide by relevant laws, regulations, and ethical standards when using AIGC tools to develop teaching resources and collect children's data. Cultivate normal students' ethical judgment and decision-making ability through simulating ethical dilemma scenarios, ensuring that they can use digital and intelligent technology responsibly in future teaching practice.

## 4. Conclusion and prospect

AIGC technology provides a brand-new opportunity for improving the digital and intelligent literacy of preschool normal education students. Normal universities should make efforts from five dimensions: reconstructing the curriculum system, improving practical support, strengthening the construction of teaching staff, optimizing the evaluation system, and strengthening ethics education, to build a digital and intelligent literacy training system that deeply integrates AIGC with preschool education majors. By clarifying the training orientation, innovating teaching models, deepening collaborative cooperation, and improving the evaluation mechanism, educators can give full play to the empowering value of AIGC technology, comprehensively improve the digital and intelligent literacy of preschool education normal students, and lay a solid foundation for them to adapt to the needs of the preschool education industry in the digital and intelligent era and realize their career development.

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