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Exploring the Role of Artificial Intelligence in Personalized Learning Experiences in Early Childhood Education to Improve Children's Social Skills

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Abstract: This paper explores the potential and challenges of artificial intelligence (AI) in enhancing children's social skills through personalized learning experiences in early childhood education. With the development of generative AI technology, intelligent tools have gradually been introduced into the education field to tailor learning plans for children, which is conducive to the synchronous development of cognitive and social abilities. Research indicates that personalized learning not only enhances children's learning motivation and self-efficacy, but also promotes key social skills such as communication, teamwork and emotion management in group cooperation and interaction. AI technologies, such as dialogue agents, social robots, and VR/ AR-based interactive environments, can provide structured social exercises for children through real-time feedback and emotion recognition. However, the paper also highlights many challenges existing in the application of AI, including teacher adaptability, excessive reliance on technology, uneven resource distribution, privacy protection and ethical risks, etc. The author calls for the use of AI as an auxiliary tool, combined with human emotional care, to establish a transparent and responsible educational ecosystem, in order to promote the all-round and balanced development of children.

Keywords: Artificial Intelligence (AI), Early Childhood Education,Social Skills Development, Personalized Learning, Emotional Intelligence

1. Introduction

This paper will explore how artificial intelligence (AI) can provide personalized learning experiences for early childhood education to improve children’s social skills. With the rapid development of AI technology, especially the emergence of generative artificial intelligence in 2022, the use of new technologies in the field of early childhood education has become a significant driving force to promote education modernization. According to Alshahrani, AI technology can offer individualized predictions based on the characteristics of individuals, thereby offering tailor-made guidance plans for different children [1].

According to 21st-century skills, social skills are regarded as an increasingly indispensable ability in education, influencing academic success and long-term emotional health [2]. In early childhood education, the cultivation of children's social skills also has a profound impact on their future interpersonal communication and social adaptability. Although the significance of social skill

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development for children is widely acknowledged, current early childhood education systems still lack systematically structured curricula for effectively foster these skills [3]. Currently, the widespread application of AI in the field of education can help teachers achieve the development of children's social skills from personalized learning. For example, some AI-driven technologies, such as adaptive learning and intelligent tutoring systems, are providing personalized learning experiences by analyzing children's personality traits. Furthermore, AI-driven learning environments can integrate virtual reality (VR) and augmented reality (AR) to enhance interactivity, enabling educators to create immersive and engaging classroom Settings that support children's cognitive and social development [4]. In this regard, by continuously analyzing learning patterns, AI can effectively improve teaching methods, which not only meets the needs of individual students but also cultivates a more adaptive and efficient learning environment [5]. By contrast, traditional early childhood education may overlook individual differences, whereas AI can leverage data analysis and machine learning to dynamically adapt teaching plans to children's developmental needs [6]. Therefore, AI has demonstrated significant advantages in children's cognitive and social development, providing targeted teacher guidance and facilitating interactive learning that drives holistic growth [7].

However, current research on enhancing social skills through AI mostly focus on secondary education and higher education, with relatively insufficient exploration in early education [8]. Therefore, this paper aims to explore the opportunities and challenges of AI in improving children's social skills through personalized learning in early childhood education, and propose future integration and development directions.

2. Understanding the definition and interaction of personalized learning and social skills for early childhood education

2.1. The benefits of personalized learning

Personalized learning can help children adapt to different learning styles and promote their cognitive and social-emotional development by integrating social-emotional elements into teaching [9]. Unlike traditional standardized teaching methods, which often lack the flexibility to address the diverse learning needs of individual students, but personalized learning tailors educational experiences to align with each child's unique cognitive strengths and preferences. Research indicates that student engagement and comprehension significantly improve when learning materials are tailored to align with children's interests and preferred learning modalities [10]. For instance, it has been found that those who are good at learning visually benefit significantly from multimedia resources, while those who are good at learning through listening tend to perform well when exposed to oral teaching and interactive discussions [11,12]. By adapting pedagogical methods to learners' strengths, not only is knowledge retention optimized, but a deeper sense of self-efficacy and confidence is also cultivated in children.

Furthermore, personalized learning has been demonstrated to foster sustained motivation and persistence in educational activities. Studies have indicated that when children perceive learning as relevant to their personal interests, they approach academic challenges with greater enthusiasm and resilience [13]. Instructional interventions that are tailored to individual learning needs prevent students from experiencing excessive frustration or insufficient intellectual stimulation, thereby ensuring a more balanced cognitive developmen [14]. The implementation of this personalized learning technology further enhances the flexibility of teaching, as the content can be dynamically modified based on real-time assessment of students' progress [15].

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2.2. The importance of social skills in early childhood education

In early childhood education, social skills encompass children's self-regulation ability, moral standards and interpersonal communication competencies. These factors all have an impact on their academic performance, emotional regulation and long-term social adaptation ability when they transition to primary school in the future. It has been well-documented that children with strong social skills are more likely to establish and maintain meaningful relationships, navigate social complexities, and engage effectively with peers [16]. In this process, the cultivation of early socialization experience can support children to communicate, cooperate and resolve conflicts better with others, while enabling children to effectively cope with social challenges. Beyond foundational social skills, social competence is increasingly recognized as a key component of emotional intelligence (EI), as the ability to interpret, regulate, and express emotions appropriately directly facilitates positive social interactions [17]. Intellectual cultivation is of great significance, but in early childhood education, emotional education should also be given due attention. In this regard, when raising children, a balanced development of both IQ and EQ should be taken into account, and neither should be neglected. In this way can help children better adapt to social life [18].

Beyond its interpersonal benefits, the acquisition of social skills has been found to contribute greatly to children's future academic achievement, especially the transition to primary school readiness. At first, according to Nix, the cultivation of children's social-emotional skills in preschool can promote better school preparation after the transition to primary school [19]. Research has also suggested that children who demonstrate strong social adaptability are more likely to participate actively in collaborative learning activities, seek academic assistance when needed, and engage in problem-solving tasks that facilitate cognitive growth [20]. Moreover, it has been observed that social interaction within structured group learning environments fosters leadership, cooperation, and adaptability—competencies that are not only essential in educational contexts but also critical for professional and social success in adulthood [21]. Therefore, by becoming aware of and beginning to develop children's social skills at an early age, they have more opportunities to develop a high level of self-awareness, empathy, resilience, all of which are integral to their development of holistic competence. Overall, emphasizing the cultivation of social skills in early education is conducive to improving children's academic performance, emotional regulation ability and long-term social adaptability. Therefore, systematically integrating social and emotional abilities into the curriculum system should become an important direction of educational policies.

2.3. Interaction between personalized learning and social skills

The interaction between personalized learning and social skill development underscores the necessity of educational strategies that integrate individualized instruction with structured social engagement. Although personalized learning has often been associated with independent study, research has indicated that it does not preclude social interaction. On the contrary, significant academic and social benefits have been observed when peer collaboration, small-group discussions, and cooperative learning projects are incorporated into personalized learning frameworks [22]. In this process, children not only have the opportunity to engage in shared learning tasks, but also engage in reflective and respectful conversations together, a way that has been shown to be critical for future learning achievement [23,24]. Therefore, by embedding interactive elements into personalized educational experiences, essential communication, teamwork, and negotiation skills can be developed, ensuring a holistic approach to cognitive and social growth.

Furthermore, social competence has been found to play a crucial role in optimizing the effectiveness of personalized learning. The ability to clearly express learning preferences, communicate effectively with teachers, and interact with peers is regarded as a key factor in

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improving the overall learning experience [25]. In other words, children who possess strong interpersonal skills are more adept at advocating for their educational needs, collaborating with instructors, and utilizing social interactions to reinforce their understanding of academic content. It has been suggested that personalized learning itself serves as an effective mechanism for refining social skills, as student-centered teaching will promote their self-awareness in development [24]. Through self-directed learning activities, structured role-playing scenarios, and peer-assisted projects, students have been observed to enhance their capacity for interpersonal communication, leadership, and collaboration [26].

Therefore, to ensure a well-rounded educational experience, it is essential to integrate individualized learning strategies with structured social interactions. A balance between independent learning and cooperative engagement should be maintained to foster both academic excellence and interpersonal competence. By creating an educational environment that addresses both individual learning needs and collective social dynamics, children can develop the cognitive and social skills necessary for long-term success [27].

3. Enhancing children's social skills through AI technology

3.1. AI's role in promoting children's social skills

Artificial intelligence (AI) has emerged as a transformative tool in early childhood education, particularly in fostering children's social skills. Unlike traditional training methods, AI-driven systems offer adaptive, interactive and personalized learning experiences. Through AI-driven conversational agents, children can engage in structured social interactions within a controlled environment, gradually developing their communication and emotional intelligence skills [4,26,28-30].

Children's social development can be significantly enhanced through guided interactions, especially when supported by adaptive technologies such as AI. These technologies simulate structured social environments where feedback is immediate, iterative, and tailored to individual progress, which helps children refine their communication and emotional skills. For example, AI-powered chatbots and social robots can engage young learners in interactive dialogue exercises, offering real-time, personalized feedback that enhances their social competence [31]. Compared with the traditional classroom environment, teachers' feedback may be delayed or generalized, while artificial intelligence systems provide continuous and responsive input, promoting participation and accelerating social learning [32].

Current artificial intelligence applications, such as immersive simulations and social role-playing games, assist children in experiencing social behaviors and receiving real-time feedback during interactions [33]. Additionally, AI-driven VR and AR tools further enhance peer collaboration and social-emotional learning (SEL), enabling children to practice social cues, teamwork, and problem-solving in engaging yet structured settings [34]. This approach aligns with Piaget's constructivist theory, which emphasizes that children actively construct knowledge through interactions with their environment rather than passively receiving information [35].

Building upon the theoretical perspectives discussed earlier, AI excels in personalizing social learning experiences through real-time data analytics and machine learning. By analyzing children's verbal and non-verbal behaviors, AI dynamically adjusts interaction complexity, modifies learning content, and provides targeted feedback to enhance social competence [36]. In addition, artificial intelligence can support teachers by identifying patterns of children's social behaviors, which might be overlooked in traditional teaching. For instance, by collecting and analyzing data over a period of time, artificial intelligence can identify the areas where children struggle in social aspects, thereby facilitating the subsequent design of more targeted intervention measures by educators [37]. Taken

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collectively, these insights offer a robust foundation for understanding how AI can enhance social skills development in early childhood education. The next section explores how these theories are translated into practical AI applications that enhance children's social learning.

3.2. Specific implementation of AI in social skills development

Based on these theoretical underpinnings, artificial intelligence (AI) technology has been employed to support the development of social skills among young children. This section delineates several of the most efficacious AI applications within this domain, encompassing chatbots, gamified learning environments, AI-driven social robots, and AR or VR-based social simulations.

Tai and Chen discovered that children who engaged in daily dialogues with AI chatbots significantly improved their capacity to initiate and sustain conversations compared to their counterparts who solely relied on traditional classroom teaching [38]. It highlights how AI-driven chatbots and virtual mentors can steer structured conversations to assist children in cultivating key social skills such as language expression, active listening, and taking turns. These systems not only provide real-time and adaptive feedback but also adjust the conversation content according to the individual needs of children, promoting deeper understanding and interaction. By practicing in a safe and non-judgmental environment, children can confidently explore the diversity of language use and gradually enhance their social skills [29].

Beyond providing direct conversational support, AI also enhances the learning environment by creating captivating and collaborative social experiences. Gamified learning environments further intensify peer collaboration and interaction, making the nurturing of social skills more vigorous and enjoyable. For example, AI-driven role-playing games, such as “TogetherTales RPG”, effectively integrate social challenges, team-based tasks, and problem-solving undertakings. Throughout the process, AI dynamically adjusts the difficulty levels and furnishes behavioral feedback to facilitate children's social growth [39].

In addition to the influence of virtual tools, AI social robots play a crucial role in developing children's emotional intelligence and interpersonal capabilities. A study conducted by Kry-Westlund and Breazeal on preschool children indicated that interactions with AI-assisted robots significantly enhanced their ability to recognize and respond to social cues,including robot language expression, facial expression, body movement and other non-verbal behavior. In this process, These robots involve children in organized group discussions, storytelling activities, and social and emotional learning (SEL), encouraging cooperation and communication [40]. This aligns with the broader educational potential of large language models, which can support interactive and personalized learning experiences. As highlighted by Kasnec, such models can foster student engagement, collaboration, and critical reflection by facilitating dynamic and meaningful interactions. When integrated thoughtfully, these AI systems do not merely deliver content but act as conversational partners, helping children practice social-emotional skills, articulate their ideas, and develop digital literacy in a safe, guided environmenti [26].

3.3. AI as an emotional support system for social skills development

In addition to promoting social interaction, AI can also function as an emotional support system, aiding children in regulating their emotions and alleviating social anxiety, thereby fostering more comprehensive social development.

AI-driven emotional recognition, sentiment analysis, and adaptive interventions provide real-time emotional feedback, helping children manage social anxiety and improve emotional regulation [31]. These systems utilize computer vision and natural language processing (NLP) technologies to analyze children’s facial expressions, voice tone, and language patterns, enabling the detection of

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stress, discomfort, or engagement levels [41]. When signs of anxiety or distress are detected, AI systems can dynamically adjust their responses, such as modifying conversation pace, providing encouraging feedback, or offering alternative engagement strategies to foster a more supportive social learning environment.

Moreover, AI has shown significant promise in supporting children with autism spectrum disorder (ASD), who often struggle with interpreting emotions, understanding social cues, and maintaining reciprocal interactions. Through controlled simulations of real-life social situations, AI-based social training programs enable ASD children to practice communication skills with AI-generated feedback [34]. These AI-driven tools provide step-by-step guidance on recognizing facial expressions, understanding tone of voice, and responding appropriately in social situations. Cabibihan conducted a study showing that children with ASD who engaged in AI-based social training for six weeks exhibited significant improvements in maintaining eye contact and interpreting facial expressions, underscoring the effectiveness of AI interventions in social skill development [42].

Beyond ASD intervention, AI-powered virtual reality (VR) and augmented reality (AR) environments have been used to enhance emotional resilience and social adaptability in children. By simulating various social scenarios—such as conflict resolution, group collaboration, and public speaking—these AI-enhanced environments allow children to experience and navigate social interactions in a stress-free manner. Research suggests that such immersive experiences not only boost children's confidence in social settings but also nurture empathy and emotional intelligence [43]. Additionally, AI-powered sentiment analysis tools can generate personalized emotional development reports for teachers and parents, providing insights into a child's social and emotional progress over time, thereby enabling more effective intervention and guidance [44].

However, while AI has shown great potential in supporting children's emotional and social development, concerns remain regarding its accuracy and ethical implications. Some studies indicate that AI emotion recognition systems may struggle with cultural variations in emotional expression, leading to potential biases in interpretation [45]. In addition, it is critical to consider whether relying on AI for emotional support affects children's ability to develop deeper social intelligence. As a result, experts emphasize that AI should complement, rather than replace, traditional human-led social interactions in early childhood education. While AI serves as an effective tool for structured emotional guidance, striking a balance between technology and authentic social engagement remains essential to ensure holistic social-emotional development in children [46].

Thus, it can be seen that although AI offers structured and scalable support for social-emotional learning, its limitations in capturing the complexity of human emotions and interactions must not be overlooked. AI-driven interventions, while valuable, lack the intuitive adaptability and contextual awareness that characterize human relationships. Over-reliance on such technologies may inadvertently lead to interactions that are overly structured and mechanized, diminishing opportunities for children to engage in spontaneous and nuanced social exchanges. To maximize its benefits while mitigating these risks, AI should be integrated as a supplementary tool rather than as a primary means of fostering social intelligence.

4. Challenges in implementing AI-assisted social skill development in early childhood education

Despite the significant potential of AI-assisted education in enhancing children's social skills, its application in early childhood education faces multiple challenges. These challenges encompass teacher adaptability and acceptance, over-reliance on technology, resource inequalities, data privacy concerns, ethical dilemmas, and potential risks to children's social development. Addressing these challenges is crucial to ensuring that AI-driven learning fosters rather than hinders the development of children's social skills.

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4.1. Teacher adaptability, training, and standardized frameworks

To address the challenges and gaps in the integration of artificial intelligence in education, there is an urgent need for more diverse learning support to reduce existing limitations. As the application of artificial intelligence in education becomes a focus for an increasing number of stakeholders, its accessibility offers opportunities to explore its use in teaching and learning [47]. However, despite the new possibilities brought by the application of artificial intelligence, its effective implementation largely depends on teachers' acceptance and ability. As the core figures in education, teachers face numerous challenges in practical application.

One major challenge lies in teachers' ability to adapt to AI-driven teaching methods, especially for experienced teachers who may find it difficult to effectively integrate AI into social skills training [48]. Many teachers are skeptical about AI's ability to accurately assess children's learning progress and its broader teaching impact, leading to low acceptance [49]. Traditional teaching methods emphasize direct human interaction, while AI-based social skills training often relies on virtual simulations and algorithmic regulation. This fundamental difference has led some educators to question the legitimacy of AI as a teaching tool [50]. Additionally, some researchers are concerned that AI might reshape the teacher-student relationship, thereby reducing opportunities for genuine interpersonal interaction. Without adequate training and institutional support, balancing AI-assisted learning with traditional interactive teaching remains a significant challeng [51]. Therefore, teachers not only need to introduce new teaching methods but also critically reevaluate their professional identities and adjust their teaching strategies to adapt to the AI-enhanced educational environment [52]. Teachers' self-efficacy plays a crucial role in the application of AI in teaching. Their perception of their ability to effectively use AI will directly influence their confidence and behavior in applying AI in the classroom [53].

As teachers face numerous challenges in adapting to artificial intelligence, policy-level support is also crucial for promoting the application of artificial intelligence in education. In recent years, many countries and regions have been attempting to formulate guidelines to regulate the application of artificial intelligence in educational scenarios and provide corresponding teacher training and resource support. Among them, the Digital Education Action Plan 2021-2027 proposed by the European Union is a representative policy framework. This plan has identified artificial intelligence as an important component of modern education and emphasized the need to update digital skills training to adapt to the era of artificial intelligence.

This policy emphasizes the need to enhance teachers' artificial intelligence literacy and their ability to apply it in teaching to effectively respond to the artificial intelligence-assisted teaching environment. Among them, two key measures aim to ensure the standardized application of artificial intelligence in education and equip educators with the necessary related skills:

"Ethical Guidelines for Educators on the Use of Artificial Intelligence and Data in Teaching and Learning" (Action 6), to ensure the responsible application of artificial intelligence in the classroom and address ethical issues.

"Updating the European Digital Competence Framework to Cover Artificial Intelligence and Data-related Skills" (Action 8), to strengthen educators' adaptability in artificial intelligence-driven teaching environments through standardized skill development.

Although these policy measures have been helpful, teachers still face significant challenges in adapting to artificial intelligence. The integration process is made more difficult by the lack of a standardized training framework. Many teachers, especially new ones, encounter difficulties in practice due to insufficient technical expertise, limited understanding of the principles of artificial intelligence, and a lack of adequate professional development time. Currently, early childhood education curricula mainly focus on project-based and experiential learning, but often lack resources

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suitable for AI-driven instruction. Additionally, the absence of unified teaching guidelines further complicates the integration of AI into the curriculum [54].

It can thus be seen that in order to fully leverage the potential of artificial intelligence and ensure that teachers can effectively integrate it into the classroom, it is necessary to establish structured teacher training programs, systematic skill development systems, and standardized teaching frameworks. Without these fundamental elements, the application of artificial intelligence may widen the gap between technological development and its practical application in the classroom.

4.2. Overreliance on AI and its impact on social skill development

In addition to the challenges teachers face when applying AI, over-reliance on AI in the classroom also poses risks to children's social skills development. First, the long-term use of AI tools may weaken face-to-face communication abilities, allowing digital interfaces to replace real human relationships, thus impeding the natural development of social competencies [55]. While AI can provide structured opportunities for social practice, it struggles to replicate the emotional depth and unpredictability inherent in human interaction [56].

It follows that a potential reduction in direct interpersonal interaction may hinder the development of basic social skills such as empathy, adaptability, and non-verbal communication. The traditional classroom environment provides spontaneous dialogue, peer collaboration, and real-time feedback from teachers, all of which help students navigate complex social dynamics. Despite its advances, AI lacks the ability to fully understand the nuances of human emotion and environment that are essential to fostering deep human relationships. In addition, over-reliance on AI-driven feedback mechanisms may limit students' ability to interpret ambiguous social cues or manage conflict in natural social settings. While AI can serve as a valuable complementary tool in education, its implementation should be carefully designed to enhance, not replace, real social interactions. Therefore, a balanced approach that combines AI with traditional teaching methods is necessary to ensure that students continue to develop basic social skills.

Apart from the potential influence on the development of social skills, excessive reliance on AI will also pose other challenges, particularly regarding how children interact with AI and form thinking habits under the guidance of algorithms. For example, social robots might recommend specific books or behaviors in accordance with algorithms, which insidiously molds children's thinking patterns and behavioral habits. However, this process lacks transparency, making it difficult for children and parents to understand the basis of the recommendations [57].

Additionally, AI may to some extent weaken the interaction between teachers and children, thereby influencing the development of children's independence and problem-solving capabilities. Despite the fact that AI excels in specific tasks, it cannot substitute for human creativity, critical thinking, and adaptive reasoning [58,59]. Hence, AI should be regarded as an auxiliary tool rather than a replacement for human-guided social learning.

4.3. Resource inequity, infrastructure limitations, and policy barriers

In addition to the aforementioned challenges, the implementation of AI in early childhood education is further hindered by financial constraints, infrastructural gaps, and inconsistent policy support. Despite evidence that augmented reality (AR) and virtual reality (VR) technologies enhance social skill acquisition, many schools lack the funding to procure or maintain AI tools [60]. Regional disparities in governmental prioritization of AI education exacerbate inequities, with well-funded schools offering cutting-edge AI experiences while under-resourced institutions face technological marginalization [61].

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Moreover, infrastructure deficiencies compound these challenges. AI systems demand robust computational resources, which are often unavailable in resource-limited educational settings. Additionally, the development of efficient, reliable AI tools remains an ongoing hurdle. Many existing AI applications are confined to classroom supplementation, and fragmented research efforts lack cohesive frameworks to optimize their pedagogical potential [62]. Without targeted policy interventions and equitable resource allocation, AI-driven education risks widening existing socioeconomic divides.

4.4. Ethical dilemmas and algorithmic limitations

Ethical concerns surrounding AI extend beyond pedagogical impacts to broader societal implications. Algorithmic bias, for example, may perpetuate stereotypes or restrict exposure to diverse perspectives, inadvertently shaping children's worldview in ways that lack human oversight [57]. Furthermore, the opaque nature of AI decision-making processes raises accountability issues, as educators and parents may struggle to evaluate the appropriateness of AI-generated content. In addition, the lack of transparency in AI systems can lead to unintended reinforcement of biases, as these systems often rely on historical data that may carry societal prejudices. This issue is particularly concerning in educational settings, where AI-driven recommendations influence children's learning paths and access to information. Without proper oversight, such systems could unintentionally limit critical thinking by narrowing the diversity of perspectives presented to students [63].

In summary, while AI-assisted education holds great promise for enhancing children's social skills, its implementation in early childhood education is fraught with challenges. Addressing teacher adaptability, preventing over-reliance on technology, ensuring equitable access to AI resources, establishing standardized frameworks, and mitigating ethical concerns are all essential steps toward maximizing the benefits of AI in education. Moving forward, a collaborative effort among educators, policymakers, and technology developers is necessary to overcome these barriers and create an inclusive, effective, and responsible AI-driven learning environment.

5. Conclusion

The integration of artificial intelligence (AI) into children's education is increasingly prevalent, presenting both significant opportunities and challenges. As mentioned above, while AI holds the promise of enhancing early learning through personalized instruction and interactive technologies, it has also raised serious concerns about its impact on children's cognitive and social development, as well as ethical issues such as data privacy and algorithmic bias [60,64].

When implementing artificial intelligence, the emotional and moral aspects of early childhood development need to be handled with caution. Although AI can simulate structured interactions, it lacks the intuitive adaptability, empathy, and contextual understanding inherent in human communication. Over-reliance on AI in social learning environments may inadvertently limit children's creativity, emotional resilience, and ability to form genuine interpersonal relationships [60]. These risks underscore the importance of maintaining a human-centered approach to education and ensuring that the design and deployment of AI technologies are transparent, inclusive, and accountable [58].

Although artificial intelligence has certain constraints, it generally provides considerable support in actual education to promote the development of children's social skills. Adaptive feedback systems, immersive simulations, and dialogue agents, etc., can offer children personalized opportunities to practice communication, collaboration, empathy, and conflict resolution in ways that are appropriate for their participation and development as young children. These experiences not only help acquire specific social abilities but also promote confidence, emotional awareness, and a deeper

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understanding of others. Particularly, artificial intelligence promotes a more inclusive approach to social learning by adapting to each child's development pace and needs. It allows for the early detection of social and emotional challenges and provides personalized interventions, thereby contributing to the creation of a more equitable learning environment. Artificial intelligence can serve as a scaffold for children's zone of proximal development, offering supportive interactions that facilitate gradual social growth and autonomy.

In conclusion, integrating artificial intelligence into early childhood education must prioritize ethical responsibility and teaching integrity. AI should not be seen as a substitute for human interaction but rather as a supplementary tool that, when used appropriately, can enrich children's social learning experiences. To fully realize the potential of AI in education, it is essential to cultivate educators' AI literacy, establish a sound policy framework, and promote interdisciplinary collaboration among researchers, teachers, and developers. Only by aligning the implementation of AI with core values such as fairness, empathy, and human development can we ensure that technology becomes a catalyst for children's holistic growth rather than a constraint [60].

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