From Prompt to Practice: Swedish Preschool Principals' Perspectives on AI After Professional Development

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Abstract

Artificial intelligence (AI) is increasingly influencing early childhood education (ECE), presenting both opportunities and ethical challenges. Preschool principals, as key pedagogical leaders, play a critical role in guiding this integration. This study investigates how Swedish preschool principals perceive AI following a targeted professional development (PD) workshop. While prior research has examined AI's potential for teaching and administration, little attention has been given to leadership perspectives and their alignment with core educational values.

A full-day PD workshop was conducted with approximately 40 principals, combining lectures, interactive exercises, and scenario-based role play. Participants explored concepts such as AI bias, prompt engineering, and ethical dilemmas using generative AI tools. Survey data were collected from 28 principals immediately after the workshop, providing qualitative insights into their experiences, concerns, and perceived needs.

Thematic analysis identified three areas: strategic and pedagogical potential of AI, competence, confidence and critical literacy, and ethical integration and governance. Findings indicate that successful AI adoption in ECE requires structured PD, clear policy frameworks, and a commitment to democratic, equitable and child-centred values. The study also demonstrates how networked learning principles, including collaborative reflection, peer dialogue and distributed leadership, can support ethical and inclusive AI integration.

Keywords

Artificial Intelligence, Early Childhood Education, Pedagogical Leadership, Preschool Education, Professional Development

Introduction

The rapid development of artificial intelligence (AI) is transforming education, creating both opportunities and challenges for early childhood education (ECE). Within this emerging field, often referred to as AIECE, research has largely focused on AI's potential to personalise learning, streamline administrative tasks and enhance engagement (Micheni et al., 2024). While consensus exists that AI will play an increasingly significant role in education, its implications for leadership in preschool settings remain underexplored (Su et al., 2023).

In Sweden, the revised National Curriculum for Preschool (Skolverket, 2025) positions principals as pedagogical leaders responsible for guiding change processes and ensuring that educational practices are grounded in research and proven experience. Their role extends beyond administration to shaping the quality and direction of preschool education. Professional development (PD) is therefore essential for equipping principals with the knowledge, skills and ethical frameworks needed to navigate AI integration (Kurent & Avsec, 2023; Otterborn, 2023).

This study adopts the lens of networked learning, which emphasises collaborative inquiry, relational engagement and the use of digital tools to support knowledge creation (Networked Learning Editorial Collective (NLEC), 2021). Networked learning is not merely about connectivity; it involves dialogue, mutual support and collective problem-solving, motivated by shared challenges and enabled by convivial tools (Illich, 2025; Ryberg et al., 2025). Research on digital ecosystems and online communities demonstrates that collaborative structures and well-designed digital tools strengthen engagement and knowledge co-construction (Moy & Feldstein, 2024). Similarly, studies of networked knowledge activities illustrate how learners navigate digital environments to seek information, negotiate meaning and coordinate action (Dennen, 2024). These principles informed the design of the PD workshop examined in this study, where principals engaged in scenario-based role play, peer dialogue and collaborative reflection. Understanding how these experiences shape principals' perceptions of AI is crucial for ensuring that implementation aligns with democratic, child-centred values (Klevering & McNae, 2019; Strehmel et al., 2019).

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Aim and Research Questions

The aim is to investigate how principals perceive AI in preschool following targeted PD. This paper encapsulates their perspectives on what is required for AI integration that supports core educational values in preschools in Sweden.

1. How do preschool principals reflect on the opportunities, challenges, and ethical considerations of implementing AI in preschool practice?
2. What needs or prerequisites do preschool principals identify for ensuring that AI use aligns with preschools' core educational values?

Previous research

Adams et al. (2023) demonstrate how generative AI tools such as ChatGPT can support educational leadership by streamlining administrative tasks, enhancing communication, and facilitating decision-making. However, they also caution against ethical and relational risks, particularly the potential erosion of human-centred leadership practices. Otterborn (2023) and Kurent and Avsec (2023) emphasise the importance of professional learning in supporting the meaningful use of digital tools in preschool settings. Their work suggests that without structured development opportunities, preschool teachers and principals may struggle to critically engage with AI technologies, leading to superficial or misaligned implementation. This aligns with broader concerns about digital competence and ethical literacy in ECE.

Meanwhile, Klevering and McNae (2019) and Strehmel,et al. (2019) underscore the significance of ethical and distributed leadership in ECE. They argue that collaboration, reflection, and value-based practice are central to effective leadership, particularly when navigating complex changes such as digitalisation. These perspectives provide a theoretical framework for understanding how AI may influence leadership and learning in preschool and reinforce the need for (if implemented) AI adoption to align with democratic, child-centred values.

Sundqvist and Nilsson (2021) show that preschool principals' own understanding of technology, as well as their perceptions of what constitutes technology education, strongly condition the support they provide to staff. The study reveals considerable variation in leaders' conceptualisations of technology, ranging from narrow artefact-focused views to more complex and process-oriented understandings.

Together, previous research suggests that successful AI integration in ECE requires more than technical infrastructure—it demands leadership that is ethically grounded, culturally responsive, and committed to inclusive, reflective practice.

Background

Preschool in Sweden is a publicly funded educational institution for children aged one to five, governed by national legislation and curriculum. It is considered the first stage of the Swedish education system and is designed to promote children's development and lifelong learning in a safe, inclusive, and stimulating environment. The Swedish Education Act (SFS 2010:800, 2010) stipulates that all education, including preschool, must be grounded in democratic values and human rights, such as the inviolability of human life, individual freedom and integrity, equality, and solidarity (SFS 2010:800, 2010). Furthermore, education must be based on scientific evidence and proven experience.

The principal of a preschool unit/units holds a central role as both an educational leader and an administrative manager. According to the Education Act, the principal is responsible for leading and coordinating the pedagogical work, making decisions about the internal organisation, and allocating resources based on children's varying needs (SFS 2010:800, 2010). The principal must also ensure that the education aligns with national goals and is continuously developed through systematic quality work (Skolverket, 2025). The curriculum for preschool further elaborates the principal's responsibilities, which include fostering a learning culture among staff, ensuring inclusive practices, promoting gender equality, and facilitating collaboration with guardians and other educational institutions. The principal is also tasked with creating an accessible learning environment and ensuring that children in need of special support receive appropriate challenges and assistance (Skolverket, 2025). In addition, principals are expected to support PD among staff and contribute to the implementation of a national PD programme (SFS 2010:800, 2010)

Together, these frameworks position the principal not only as a manager but as a key agent in shaping the pedagogical direction and quality of preschool education in Sweden.

The Professional Development Day

A full-day PD on AI was conducted for approximately 40 preschool principals in a larger city in Sweden. The workshop was collaboratively designed and facilitated by two university teachers and researchers, which included a mix of lectures, interactive exercises, and group discussions. The content focused on AI, digitalisation, and the revised Swedish preschool curriculum, with particular attention to the practical use of AI for principals.

During the workshop, participants engaged in activities exploring AI bias and hallucination, practised prompt engineering using the PREPARE framework and participated in scenario-based role-play exercises involving AI personas. These personas were created by the individual with prompting, for example, *"You are a parent who is frustrated that your child is not receiving enough support in preschool. I am the principal and want to listen and explain how we work with support measures. Respond as a real parent."* This exercise gave participants a great deal of personal freedom to create their own scenarios and personas most suitable for the conversations they would like to practice.

Activities exploring AI bias and hallucinations involved prompting pictures of principals to discuss how they looked in the eyes of AI. This prompted participants to discuss aspects such as clothing, age, gender, ethnicity, and more. Time-hallucinations were prompted by asking the AI about specific dates or events— "What happened in *city name* yesterday?" and language-bias towards gender stereotypes by asking, such as *"Explain what spatial awareness is so that a woman/man can understand*.". These were discussed in smaller groups during the workshop and then openly shared at the end of each workshop section throughout the day. These activities reflect core principles of networked learning, including collaborative inquiry, distributed leadership, and the use of convivial tools. Principals engaged in collaborative reflection, peer learning, and scenario-based exercises, which fostered shared understanding and distributed leadership. Such interactions are central to networked learning, where knowledge is co-constructed through social and technological connections.

Data Collection

At the end of the workshop, survey data were collected from the participating principals to explore their perspectives on AI in Swedish preschool and, in extension, ECE. The workshop-based approach enabled both participant engagement in reflective practice and empirical data collection in a naturalistic PD context. Participation was voluntary and based on informed consent, with all data handled in accordance with ethical guidelines and data protection regulations. The researcher orally informed the participants and asked for written consent as the first question on the questionnaire. They could say "No" and decline to give consent, which would end the survey. By giving consent, they could proceed to read and answer the main questions. They could also withdraw their consent at any point and thereby forfeit all data. Out of approximately 40 participants, 28 answered the questionnaire.

No personal data was collected. The questionnaire began with background questions, in which respondents indicated their current professional role (all were principals or vice principals) and reported their total years of experience in preschool. Gender was not a variable, since fewer than 5% of participants were seemingly male. In the questionnaire, participants were asked to highlight any thoughts or questions that arose during the workshop regarding AI in preschool from a leadership perspective. They were also invited to identify what they considered the most important need to ensure that AI is used in a way that aligns with preschool values and improves quality. Finally, respondents were asked how they previously used AI-related tools or services in their professional work before PD Day, and to briefly describe how and in what context. The open-ended format allowed for rich, qualitative insights into principals' perceived needs and experiences related to AI in the preschool setting.

Data Analysis

Given the immediate and practice-oriented nature of the data, collected directly after a structured PD day, inductive thematic analysis (ITA) was particularly appropriate for identifying patterns in how preschool principals reflected on AI in relation to leadership and ethical considerations. As emphasised by Souza et al. (2021) and Boukranaa & Sandy (2024), ITA enables researchers to identify, analyse, and report themes without imposing preexisting theoretical frameworks, allowing for a grounded and flexible interpretation of

participants' reflections.
The iterative nature of ITA supported the development of interrelated themes that evolved through repeated engagement with the data. This resonates with findings by Murphy et al. (2022) and Olaniyan & Govender (2023), who highlight how inductive analysis can surface nuanced insights that reflect both individual perspectives and broader systemic concerns.
Moreover, the use of ITA aligns with the principles of networked learning (Mahat-Shamir & Kagan, 2022), as the data were generated in a socially embedded, non-formal learning environment. The analysis was sensitive to how participants' reflections were influenced by peer dialogue, scenario-based role-play, and shared critical engagement with AI tools. As Fereday and Muir-Cochrane (2006) suggest, combining inductive and deductive reasoning can enrich thematic development. While this study primarily employed an inductive approach, the interpretation of themes was informed by existing literature on AI in ethical leadership in ECE.

Results

The result is organised into three themes, derived inductively from the data.

Theme 1. Strategic and Administrative Potential of AI

Respondents consistently identified AI as a promising tool for enhancing both administrative efficiency and pedagogical planning in preschool leadership. Many principals described how AI could support routine tasks such as email formulation, documentation, and meeting preparation. Several had used AI to summarise data for systematic quality work, generate action plans, and create materials for staff development. These applications were seen as time-saving and conducive to more strategic leadership. Beyond administrative tasks, AI was also viewed as a resource for pedagogical innovation. Principals reported using AI to generate project ideas, produce visual materials for presentations, and support staff training. One example involved using AI to create exercises for workshops on communication and collaboration. These uses suggest that AI is beginning to be integrated into both operational and pedagogical domains, albeit in exploratory and uneven ways.
However, the potential of AI was not equally accessible to all. Some respondents noted limitations in their ability to use advanced features, such as image generation, due to budgetary or technical constraints. This raised concerns about digital equity and the risk of uneven implementation across preschool contexts. Reflective practice was highlighted as a key condition for ethical and effective integration. Principals advocated for regular opportunities to discuss and evaluate AI use, both within leadership teams and among staff. Peer learning and collaborative reflection were seen as vital for developing shared understandings and navigating the complexities of AI adoption. These practices were not only mechanisms for PD but also viewed as expressions of democratic leadership.

Theme 2. Competence, Confidence and Critical Literacy

Despite the enthusiasm for AI's potential, many principals expressed uncertainty and concern regarding their own competence and that of their staff. A significant proportion admitted to limited prior experience with AI tools and emphasised the need for further education. The lack of familiarity with prompt design and critical evaluation of AI-generated content was frequently mentioned. This competence gap was seen as a barrier to meaningful and ethical integration, with several respondents warning that without adequate training, AI use could become superficial or misguided. Interestingly, these concerns persisted even after several hours of hands-on prompt engineering during the PD day. While the practical element may have increased participants' comfort with the act of prompting itself, deeper uncertainty remained. Principals questioned the reliability, accuracy, and neutrality of AI outputs, particularly in contexts requiring pedagogical judgement. Some expressed concern that staff might rely on AI to produce content that misrepresents their actual work, especially in performance reviews or recruitment processes. The influence of prompt phrasing on AI responses was also noted, with several respondents highlighting how implicit or nuanced prompts could shape outcomes in unintended ways.
To address these challenges, structured PD was identified as a critical prerequisite by the participants. Principals called for hands-on workshops, examples of best practice, and ongoing support to build AI literacy among both leadership and staff. Training in prompt design, source criticism, and ethical use was considered essential. Critical literacy was also emphasised as a pedagogical imperative. Respondents argued that staff and children alike must be equipped to evaluate digital content and understand the implications of AI in everyday life. This suggests that AI education should be embedded within broader efforts to promote digital competence and critical thinking in preschool settings.

Theme 3. Ethical Integration and Governance

Ethical considerations were a recurring and deeply felt theme in the responses. Principals raised concerns about authenticity, transparency, and data privacy. Several questioned how to ensure that AI-generated content was appropriately attributed and critically reviewed. The risk of over-reliance on AI, particularly in decision-making processes that require empathy, contextual understanding, and human judgment, was also noted.

Respondents emphasised the importance of aligning AI use with the values of the Swedish preschool curriculum (Skolverket, 2025), including democracy, equality, and child-centred learning. There was a shared view that AI should support, rather than replace, human judgement and pedagogical intentions. Ethical integration was seen not merely as a technical issue but as a matter of educational philosophy and professional integrity.

To safeguard these values, principals expressed a clear need for national and local guidelines to regulate AI use in preschools. Many called for directives from the Swedish National Agency for Education and municipal authorities concerning permissible applications, data protection, and ethical frameworks. In addition to external governance, several advocated for the development of internal policies to ensure transparency and accountability. The absence of clear policies was seen as a source of confusion and inconsistency, with some staff being worried others might be using AI in ways that potentially conflicted with institutional values or legal requirements, in preschool. The establishment of coherent governance structures was therefore viewed as essential for maintaining ethical integrity and trust within the preschool community.

Discussions

The reflections of preschool principals in this study reveal a complex and evolving understanding of AI integration in early childhood education. While participants recognised AI's potential to enhance administrative efficiency and pedagogical innovation, their responses also underscored significant concerns regarding competence, equity, ethics and governance. These findings suggest that AI adoption in ECE is not merely a technical endeavour but a deeply pedagogical and philosophical one.

One prominent theme was the strategic and administrative potential of AI. Principals described how AI could streamline routine tasks such as documentation, meeting preparation and quality assurance reporting. These applications align with previous research indicating that generative AI tools can support educational leadership by improving efficiency and enabling more strategic focus (Adams et al. 2023).

The second theme, competence, confidence and critical literacy, points to a widespread need for PD. Despite participating in hands-on activities during the workshop, many principals expressed uncertainty about prompt design, source evaluation and the reliability of AI-generated content. This suggests that technical familiarity alone is insufficient; deeper pedagogical and ethical understanding is required. Otterborn (2023) and Kurent and Avsec (2023) similarly argue that professional learning must go beyond tool usage and foster critical engagement with digital technologies. Within a networked learning framework, this theme resonates with the principle of critical reflexivity, which emphasises collaborative reflection and dialogue as essential for developing digital and ethical literacy. Equipping both educators and children with the skills to navigate AI-generated content responsibly is not only a technical goal but a social one, grounded in shared inquiry and co-construction of knowledge (Dennen, 2024; Moy & Feldstein, 2024; NLEC, 2021).

Ethical concerns were a recurring and deeply felt aspect of the data. Principals raised questions about authenticity, transparency, and the risk of over-reliance on AI in decision-making processes that require empathy and contextual judgment. These reflections align with Klevering and McNae, (2019) and Strehmel et al. (2019), who stress that ethical and distributed leadership in ECE must be grounded in collaboration, reflection, and shared values. AI integration, therefore, must be guided by educational principles that prioritise human relationships, pedagogical intentions, and democratic values. Networked learning offers a useful lens here, foregrounding trusting relationships and collective responsibility for ethical practice. AI integration, therefore, must be guided by educational principles that prioritise human relationships, pedagogical intentions, and democratic values. Networked learning offers a useful lens here, foregrounding trusting relationships and collective responsibility for ethical practice.

A particularly salient point was the absence of clear policy frameworks. Principals emphasised the need for national and municipal guidelines to regulate AI use in preschools, including directives on data protection, permissible applications and ethical standards. Without coherent policies, there is a risk of inconsistent practices and ethical breaches, particularly in settings where staff may lack the training to critically assess AI outputs. Within a networked learning perspective, governance can be understood as a collective process in which policies and practices are co-developed through dialogue and shared responsibility rather than imposed in isolation.

The study also raises important questions about leadership identity in the age of AI. While AI can support administrative tasks, it may also reshape the nature of leadership itself. Adams et al. (2023) caution that AI could erode relational aspects of leadership if not carefully managed. This concern was echoed by several principals, who emphasised the irreplaceable value of human judgement, empathy, and contextual understanding in preschool leadership. The challenge, then, is to ensure that AI serves as a complement, not a substitute, for human leadership. The workshop format itself illustrates how PD grounded in networked learning principles can support ethical and inclusive AI integration. Scenario-based role-play, collaborative reflection, and peer learning were not only effective strategies but also core elements of networked learning, in which knowledge is co-constructed through social and technological connections and guided by shared challenges (NLEC, 2021; Ryberg et al., 2025). These practices foster distributed leadership and create opportunities for principals to engage in collective inquiry and knowledgeable action, which are essential for navigating complex innovations such as AI. In sum, the findings suggest that successful AI integration in ECE requires a multifaceted approach that combines technical training with ethical reflection, policy clarity with pedagogical intentionality and leadership development with collaborative learning.

Future Implications

The findings suggest several implications for future PD and AI policy in ECE. First, PD programmes should be designed as networked learning environments that incorporate hands-on, collaborative, and reflective activities to build both technical and ethical AI literacy. Second, national and municipal education authorities should develop clear policy frameworks to guide the use of AI in preschools, ensuring alignment with democratic and child-centred values. Finally, fostering equitable access to AI tools and promoting ongoing peer dialogue and collective inquiry can support responsible and inclusive integration of AI across diverse preschool settings.

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Author Contributions

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