

Educational Supervision in the Age of Artificial Intelligence: From Monitoring to Human-Centred Professional Coaching

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Abstract:

Educational supervision is a critical mechanism for improving the quality of teaching and learning. However, traditional supervision models centred on classroom visits and evaluative monitoring often suffer from limited frequency, discontinuity, and delayed feedback. This article analyses and synthesises the role of artificial intelligence (AI) in educational supervision and proposes a pathway for shifting from monitoring-oriented supervision toward human-centred professional coaching. Drawing on a synthesis of literature on contemporary supervision theory and AI in education, the analysis identifies three ways in which AI can meaningfully support supervisory practice: organising and analysing instructional evidence drawn from classroom recordings and lesson data; generating rapid, ongoing preliminary feedback that can anchor reflective dialogue; and extending the reach of supervision to remote and under-served schools through remote supervision arrangements. At the same time, incorporating AI into supervision raises genuine concerns about the reliability of the data produced, the privacy of both teachers and learners, and the risk that supervision drifts from a developmental practice into a form of technical surveillance. The article argues that AI is best understood as a tool that furnishes evidence for professional conversation rather than an autonomous arbiter of teaching quality, and that instructional supervisors need to build AI-related competencies alongside the relational skills of coaching if supervision is to remain a process that builds trust, fosters collaboration, and supports the genuine professional growth of teachers.

Key Word: Educational Supervision; Artificial Intelligence; Professional Coaching; Human-Centred Leadership; Teacher Development

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I. Introduction

Educational supervision connects policy with classroom practice, and its purpose is to improve the quality of teaching through cycles of observation, feedback, and support for teachers' professional growth (Sergiovanni & Starratt, 2007; Glickman, Gordon, & Ross-Gordon, 2018). Traditional supervision, however, has long depended on occasional classroom visits and evaluative monitoring, and this dependence brings familiar constraints: visits are too infrequent, supervisors are typically responsible for more schools than they can meaningfully serve, and feedback often arrives too late to shape the lesson it concerns (Zepeda, 2017). These constraints are felt most acutely in small and remote schools, which tend to receive less supervisory attention than their urban counterparts (Chinnawon, 2021). At the same time, contemporary thinking about supervision has shifted away from oversight and control toward instructional coaching, which treats the relationship between supervisor and teacher as a partnership built on reflective dialogue and shared learning rather than a one-sided judgment of performance (Knight, 2007; Schön, 1983).

Over the past decade, artificial intelligence has entered education rapidly, supporting the analysis of learner data, assessment, and decision-making by both administrators and teachers (Luckin, Holmes, Griffiths, & Forcier, 2016; Zawacki-Richter, Marín, Bond, & Gouverneur, 2019). This trend aligns with Thailand's own policy direction, which positions AI development and application as part of the country's broader digital transformation (Ministry of Higher Education, Science, Research and Innovation, & Ministry of Digital Economy and Society, 2023). Within supervision specifically, AI holds real promise: it can help organise and analyse instructional evidence drawn from classroom recordings, generate preliminary feedback more quickly than waiting for the next scheduled visit, and extend supervisory reach to remote schools through remote supervision (Perathoranich, 2025). Research on AI-supported classroom orchestration tools further suggests that such technologies can be designed to work alongside teachers' professional judgment rather than displace it (Holstein, McLaren, & Aleven, 2019) —

evidence that AI's contribution to supervision can be genuinely constructive when it is designed and implemented with care.

Even so, most of the literature on AI in education continues to concentrate on classroom-level applications such as adaptive learning and intelligent tutoring, while its application to supervision specifically has received comparatively little systematic attention (Zawacki-Richter et al., 2019). Karan and Angadi (2023) raise a further concern that deserves particular weight here: monitoring technologies introduced into schools risk sliding into technical surveillance rather than support for professional growth, a shift that can erode the trust between supervisor and teacher on which effective supervision depends. This concern echoes UNESCO's own position (2024, 2025), which insists that AI in education must remain human-centred, must protect the rights of those involved, and must never dispense with human oversight. What is missing, then, is a clear framework for introducing AI into supervision in a way that preserves what supervision is fundamentally for — building the trust that makes professional growth possible — rather than reducing it to a technical monitoring exercise.

This article accordingly sets out to analyse and synthesise the role of AI in educational supervision, connecting contemporary supervision theory with the literature on AI in education, in order to propose a pathway from traditional monitoring-based supervision toward human-centred professional coaching. The discussion proceeds in three parts: the first examines the conceptual foundations of supervision in the AI era and the functional contributions AI can make; the second offers practical guidance for repositioning the supervisor's role from inspector to professional coach; and the third considers the ethical challenges and institutional conditions needed for AI to be used responsibly within supervision. The synthesis presented here is intended to be of practical use to instructional supervisors, school administrators, and educational authorities as they design supervision systems that bring technology and human values into balance.

II. Conceptual Foundations of Educational Supervision in the Age of Artificial Intelligence

Educational supervision has moved through several conceptual paradigms over recent decades — from clinical supervision, with its structured cycle of pre-observation planning, classroom observation, and post-observation reflective conference, to developmental supervision, which tailors the mode of supervision to each teacher's readiness and experience (Glickman, Gordon, & Ross-Gordon, 2018), and further to instructional coaching, which treats the supervisor and teacher as co-learners rather than casting them in an evaluator–evaluated relationship (Knight, 2007). What these contemporary approaches share is an emphasis on reflective practice — the teacher's own critical examination of their work (Schön, 1983) — which in turn depends on a stable foundation of trust and professional relationship between supervisor and teacher.

Within this landscape, AI offers several distinct functional contributions. First, AI-driven video and audio analysis can process classroom recordings to surface patterns of classroom interaction — the ratio of teacher to student talk time, the types of questions asked, or the moments when student engagement rises or falls — giving supervisors empirical evidence to draw on in reflective conversation, rather than relying solely on what they recall from a single observed lesson (Holstein, McLaren, & Alevan, 2019). Second, natural language processing can help summarise key points from lesson records or lesson plans and surface preliminary observations far more quickly than waiting on a single human reviewer (Ahmad, Alam, Rahmat, Mubarik, & Hyder, 2022). Third, digital platforms can extend supervision to schools in remote areas through remote supervision, easing the constraints of distance and the heavy caseloads that supervisors typically carry (Perathoranich, 2025).

These functional contributions, however, are best understood as decision support rather than automated judgments of teaching quality. As Luckin, Holmes, Griffiths, and Forcier (2016) argue, AI's educational value lies in its responsiveness to the context of learners and teachers, not in its technical capability alone. The figures AI can produce — talk-time ratios, question patterns, and the like — are quantitative observations that still require human interpretation in light of a lesson's learning goals, the particular learners involved, and its specific instructional intent. UNESCO's AI Competency Framework for Teachers (2024) makes the same point: AI in education must be grounded in a human-centred mindset and must remain under human oversight at all times. AI's role in supervision, then, is better framed as gathering evidence rather than rendering judgment, so that the professional conversation between supervisor and teacher remains the true centre of the supervisory process.

III. From Monitoring to Professional Coaching: Practical Approaches for Repositioning the Supervisor's Role

Moving from monitoring-based supervision to human-centred professional coaching is not simply a matter of adopting new tools; it requires rethinking the relationship between supervisor and teacher itself — from one in which the supervisor inspects and judges, to one in which both parties jointly examine and develop practice (Knight, 2007). In this reframed relationship, AI does not replace the supervisor but relieves them of mechanical burdens — note-taking, the compiling of quantitative evidence — freeing time and attention for the deeper conversation that is the true substance of professional development (Zepeda, 2017).

In practice, an AI-supported supervision cycle might unfold as follows. Before the observation, supervisor and teacher agree together on the focus of the visit, shaped by that teacher's own professional development goals. During the observation, an AI system may record and analyse classroom interaction relevant to the agreed focus, while the supervisor attends to dimensions that call for human judgment — the emotional climate of the room, or the quality of the relationship between teacher and students, for instance. After the observation, whatever the AI has analysed becomes a starting point for conversation rather than a final verdict: the supervisor asks the teacher whether the evidence reflects their intentions for the lesson, and how they might adjust going forward. This approach is consistent with coaching practice that favours asking questions over supplying ready-made answers (Knight, 2007), and it keeps the teacher as the owner of their own development rather than merely the subject of an external evaluation.

Beyond supporting supervisors directly, AI can also strengthen teachers' capacity for self-coaching — using video analysis, for example, to let teachers review their own teaching before meeting with a supervisor, which can build a stronger sense of ownership over professional growth and lessen any feeling of being watched from outside (Thongmee, 2022). At the school level, anonymised, aggregated data drawn across many classrooms can also help identify broader instructional trends, allowing professional learning communities to design more targeted, shared development priorities. This shifts AI's role from an instrument that monitors individuals to a shared resource that supports the whole institution's learning — a direction consistent with the emphasis on staff participation that Perathoranich (2025) places on AI-era educational administration more broadly.

None of this works, however, without teachers' willing consent and trust as a starting condition. If AI is introduced without clear communication about how the data will be used, teachers may reasonably feel watched rather than supported, which undermines the very purpose of professional coaching (Karan & Angadi, 2023). Supervisors therefore need to be transparent from the outset that data collected through AI is meant to support professional growth — not to feed into performance evaluations that bear directly on a teacher's career.

IV. Ethical Challenges and Institutional Conditions for Responsible AI-Enabled Supervision

The integration of artificial intelligence into educational supervision creates opportunities for more systematic evidence collection, timely feedback, and wider access to professional support. At the same time, it introduces ethical concerns that differ from those associated with conventional supervision. These concerns are particularly important because supervision depends fundamentally on trust, openness, and teachers' willingness to reflect honestly on their practice. If AI is perceived primarily as a mechanism for monitoring or evaluating teachers, its use may undermine the very professional relationships that supervision is intended to strengthen. Responsible AI-enabled supervision therefore requires attention not only to what AI can do, but also to how data are collected and used, who retains decision-making authority, and what institutional safeguards are established.

1. Ethical Challenges of AI-Enabled Supervision

Three ethical challenges are particularly important. The first concerns privacy, data protection, and informed participation. AI-supported video and audio analysis may involve identifiable information about teachers and students, including their images, voices, classroom interactions, and potentially sensitive learning-related information. Educational institutions therefore need explicit procedures governing the purpose of data collection, informed consent, access rights, storage, security, retention periods, and eventual deletion. Particular attention should be given to students because they may be recorded even though the primary purpose of supervision is teachers' professional development. Wipatasilapin (2023) highlights the importance of safeguards for educational data, while UNESCO (2025) emphasises that protecting learners' rights should precede the adoption of AI technologies in educational settings. Accordingly, classroom data collected for supervision should be limited to clearly communicated supervisory purposes.

The second challenge is the potential transformation of professional supervision into technological surveillance. Although AI can provide richer and more continuous evidence than conventional classroom observation, teachers may perceive such systems as mechanisms for monitoring or future evaluation. Karan and Angadi (2023) caution that monitoring technologies introduced without adequate ethical safeguards may create wariness among teachers and discourage experimentation with new instructional approaches. This is particularly problematic because effective coaching requires professional safety, openness, and trust.

The third challenge concerns over-reliance on AI-generated quantitative evidence. AI may identify patterns such as teacher–student talk ratios, questioning patterns, participation frequencies, or changes in student engagement. However, such indicators represent only selected dimensions of teaching. Relational and contextual qualities—including responsiveness to individual learners, cultural sensitivity, emotional support, and professional judgment—may not be adequately captured numerically. As Himmakas (2023) suggests, excessive dependence on quantitative information may shift attention from what is educationally meaningful to what is technologically measurable. AI-generated evidence should therefore be regarded as one source among multiple

sources and interpreted in relation to classroom context, learning objectives, teacher reflection, and professional judgment.

2. Institutional Conditions for Responsible Implementation

Addressing these ethical challenges requires more than technical safeguards. Responsible AI-enabled supervision depends on institutional conditions that establish clear boundaries between technological support and human professional responsibility. Three conditions are particularly important.

First, educational institutions require clear governance and policy frameworks defining the purpose, scope, ownership, access, and permissible use of AI-generated supervisory data. AI-supported supervision for professional development should be explicitly separated from formal performance evaluation and decisions concerning promotion or career advancement. Such separation can help maintain teachers' confidence that supervision is intended to support professional growth rather than managerial surveillance.

Second, supervisors require AI competencies alongside relational coaching skills. They need sufficient AI literacy to understand the capabilities and limitations of AI-generated evidence and to interpret it appropriately. At the same time, technological competence cannot replace coaching, questioning, listening, feedback, ethical judgment, and relationship-building skills. UNESCO's AI Competency Framework for Teachers (2024) provides a useful reference, although these competencies should be adapted to supervisors' distinct professional roles. Responsible implementation therefore requires supervisors who can combine AI literacy with relational coaching competence.

Third, responsible implementation requires equitable technological access and institutional capacity. AI-enabled supervision should not create disparities in which well-resourced schools receive continuous data-supported professional support while small and remote schools remain disadvantaged. Inequalities in connectivity, equipment, digital platforms, and staff capacity are therefore both technological and ethical concerns. Chinnawon (2021) and Hengphok (2023) identify the digital divide as a constraint on Thailand's educational digital transformation, while Thailand's National AI Strategy also recognises the importance of access and capacity development (Ministry of Higher Education, Science, Research and Innovation, & Ministry of Digital Economy and Society, 2023).

The relationship between these ethical challenges and the institutional conditions required to address them is synthesised in **Table 1**.

Table 1. Synthesis of Ethical Challenges and Institutional Conditions for Responsible AI-Enabled Supervision

Ethical challenge	Key risk	Institutional condition	Human-centred principle	Key sources
Privacy and data security	Misuse of teachers' and students' personal data	Clear data governance, consent, access, and security policies	Rights and dignity	Wipatasilapin (2023); UNESCO (2025)
Technological surveillance	Reduced trust and professional openness	Separate supervision from performance evaluation	Trust and professional safety	Karan & Angadi (2023)
Over-reliance on AI data	Contextual aspects of teaching may be overlooked	Human interpretation and professional judgment	Human oversight	Himmakas (2023); UNESCO (2024)
AI competency limitations	Inappropriate use or interpretation of AI evidence	AI literacy combined with coaching skills	Professional competence	UNESCO (2024)
Digital inequality	Unequal access, especially for remote schools	Equitable infrastructure and capacity investment	Equity and inclusion	Chinnawon (2021); Hengphok (2023); MHESI & MDES (2023)

As shown in Table 1, responsible AI-enabled supervision requires a balance between technological capability and institutional responsibility. Clear data governance, professional trust, human judgment, supervisors' combined AI and coaching competencies, and equitable access provide the conditions under which AI can support supervision without replacing human agency. Together, these conditions position AI as a tool for strengthening evidence-informed professional dialogue while preserving trust, equity, and professional growth.

V. Conclusion

Educational supervision in the age of artificial intelligence stands at a genuine crossroads of opportunity and risk. AI can support supervisory work by organising and analysing instructional evidence, offering rapid and continuous feedback, and extending supervision's reach to remote schools. Yet its real value does not lie in technical capability alone, but in whether it is introduced in ways that preserve what supervision is fundamentally for: building the trust and partnership between supervisor and teacher on which professional growth depends. This

article has argued that shifting from monitoring-based supervision toward human-centred professional coaching requires placing AI in the role of evidence-gatherer rather than judge of teaching quality — with whatever AI produces serving as a starting point for reflective conversation, never as the final word on a lesson observed. This shift, in turn, depends on solid institutional conditions: clear data-use policies, AI competencies developed alongside supervisors' coaching skills, and equitable infrastructure investment that does not leave small or remote schools behind. Ultimately, the success of AI-enabled supervision will not be measured by how advanced its technology is, but by the trust, collaboration, and professional growth it actually produces in classrooms.

VI. Recommendations

Policy

1. Educational authorities should establish policies governing AI use in supervision that are clearly separated from performance evaluation systems, in order to reduce teachers' concerns and build trust in the supervisory process.
2. Clear standards should be set for the privacy and security of classroom video and audio data specifically, given that this data inevitably involves the personal information of both teachers and students.

Practice

1. Schools should build supervisors' AI competencies alongside their relational coaching skills, adapting UNESCO's AI Competency Framework for Teachers to the specific demands of the supervisory role.
2. Supervision cycles should be designed so that AI-generated evidence serves as a starting point for reflective dialogue rather than a final evaluative judgment.
3. Teachers should be encouraged to use AI for self-coaching ahead of reflective conferences with supervisors, to strengthen their sense of ownership over their own professional development.

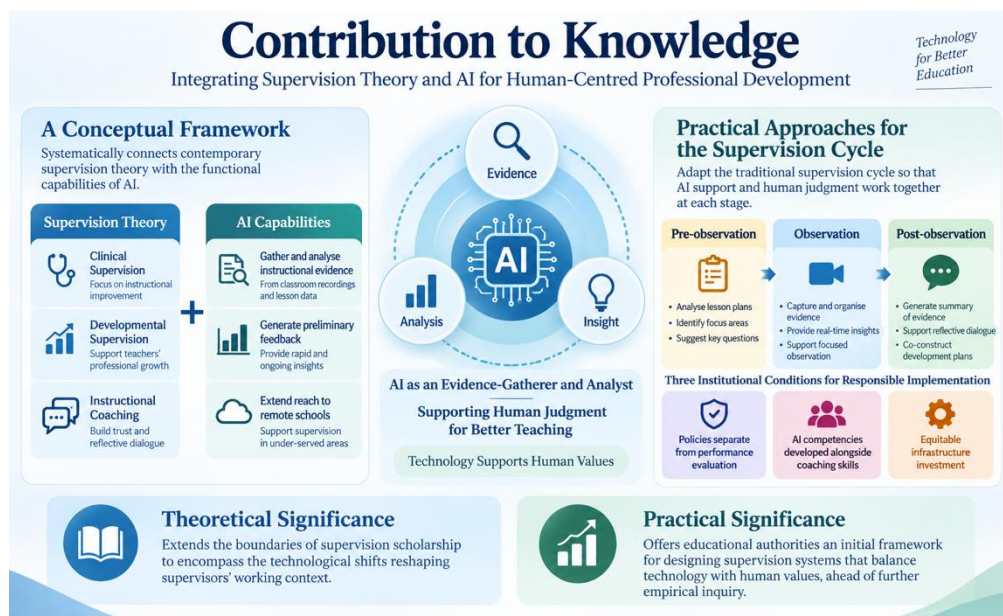
Resources and Equity

Educational authorities should invest in digital infrastructure equitably, with particular attention to small and remote schools, so that access to quality supervision does not become another axis of inequality.

Research

Empirical research is needed to examine the effects of AI-supported supervision on teaching quality and on the professional relationship between supervisors and teachers within the Thai school context.

VII. Contribution to Knowledge



As illustrated in Figure 1, this article makes two principal contributions. First, it proposes a conceptual framework that systematically connects contemporary supervision theory—clinical supervision, developmental supervision, and instructional coaching—with the functional capabilities of artificial intelligence. This integration addresses a gap in the literature, where AI in education has typically been examined separately from supervision theory. Within the proposed framework, AI is deliberately positioned as an evidence-gatherer and analyst rather than a judge of teaching quality, thereby preserving the essential character of supervision as a trust-building process that supports teachers' professional development.

Second, the framework translates this conceptual integration into practical approaches for adapting the traditional supervision cycle—pre-observation, observation, and post-observation—so that AI-generated evidence and human professional judgment complement each other at each stage. As shown in Figure 1, responsible implementation further depends on three institutional conditions: separating AI-supported supervision from performance evaluation, developing AI competencies alongside coaching skills, and ensuring equitable investment in digital infrastructure. Together, these contributions have both theoretical and practical significance. Theoretically, the framework extends supervision scholarship to encompass the technological changes reshaping supervisors' professional contexts. Practically, it provides educational authorities with an initial framework for designing supervision systems that harness AI capabilities while preserving human judgment, trust, equity, and professional growth.

VIII. Declaration of Generative AI Use

Generative AI (ChatGPT, OpenAI) was used solely for English-language editing and assistance in the visual presentation of the Contribution to Knowledge framework. AI was not used for literature selection, analysis, synthesis, interpretation, or conceptual development. These processes were conducted entirely by the authors. All AI-assisted outputs were reviewed and revised by the authors, who take full responsibility for the final content of the article.

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