



AI Literacy for Teachers: An Ethical Imperative

Neelima G S

Teacher Trainee, PTM College of Education

Abstract

Artificial intelligence (AI) is increasingly influencing lesson planning, learning support, assessment, and teachers' professional work. These possibilities also create concerns involving accuracy, bias, privacy, transparency, academic integrity, inclusion, and overdependence on automated systems. This review discusses AI literacy as a professional and ethical competency for teachers. It uses a narrative review approach, drawing on selected scholarship on AI in education, AI literacy, and international guidance for teachers. The discussion is organised around the meaning of AI literacy, its pedagogical value, major ethical concerns, and implications for teacher education. The literature indicates that responsible AI use requires more than operational familiarity with digital tools: teachers need to understand the limits of AI outputs, check information against reliable sources, protect learners' data, identify possible bias, and make context-sensitive decisions about when AI is appropriate. International guidance also emphasises human agency, ethics, AI foundations, AI pedagogy, and professional learning as connected dimensions of teacher competence. Accordingly, teacher education should combine practical experimentation with case-based ethical discussion, assessment redesign, privacy awareness, and continuing professional development. This paper argues that AI should support rather than replace teachers' professional judgement and relationships with learners. As a narrative review, it does not report original survey data or claim to provide an exhaustive systematic review. It concludes with recommendations for integrating AI literacy into pre-service and in-service teacher education.

Keywords: AI literacy, artificial intelligence, teacher education, educational ethics, data privacy, academic integrity, digital pedagogy

Introduction

Artificial intelligence has become an important topic in educational discussions because digital systems can now generate text, images, explanations, questions, lesson materials, and feedback. Teachers may use AI-enabled applications to brainstorm activities, adapt resources for different learners, prepare formative assessments, or organise routine tasks. These uses can save time and offer new ways to support learning. However, AI-generated material can also be inaccurate, incomplete, biased, or unsuitable for a particular classroom. Its use raises questions about learner privacy, authorship, fairness, and the continuing responsibility of teachers for educational decisions.

The central issue is therefore not simply whether teachers can operate AI tools, but whether they can make informed and responsible decisions about them. Long and Magerko (2020) describe AI literacy in terms of competencies that help people understand, evaluate, and interact with AI.

In education, this broad view is especially relevant because teachers must connect technical possibilities with subject knowledge, curriculum goals, student needs, and professional ethics. The teacher remains responsible for judging whether a tool is appropriate and whether its output supports meaningful learning.

International guidance reinforces the importance of a human-centred approach. Miao and Cukurova (2024), in UNESCO's AI Competency Framework for Teachers, identify five connected dimensions: a human-centred mindset, ethics of AI, AI foundations and applications, AI pedagogy, and AI for professional learning. These dimensions suggest that AI literacy should be understood as a developing professional competence rather than a one-time technical skill.

This paper reviews selected literature and policy guidance to discuss the meaning of AI literacy, the educational opportunities and risks associated with AI, and the responsibilities of teachers. It also considers how teacher education programmes can build the knowledge and judgement required for responsible use. The paper is a narrative review of selected sources, not a systematic review and not an empirical survey.

Review Approach

This paper adopts a narrative literature-review approach. Selected sources were used to develop a conceptual discussion of AI literacy and its implications for teaching. The source base includes a foundational account of AI literacy, books discussing AI in education, and UNESCO guidance on AI and education and teacher competencies. The materials were considered thematically, with attention to four areas: the meaning of AI literacy, pedagogical applications, ethical challenges, and implications for teacher education. This approach supports a focused discussion but does not claim to include every publication on the topic. No original participants, questionnaire responses, or statistical findings are reported in this review.

Understanding AI Literacy

AI literacy can be understood as the knowledge and competencies needed to understand AI-enabled systems, use them purposefully, evaluate their outputs, and recognise their effects on people and society. It is broader than knowing which application to open or what prompt to enter. A teacher with AI literacy should be able to ask what a system is designed to do, what information may shape its response, where it may fail, and whether its output is suitable for the educational purpose.

Long and Magerko (2020) emphasise that AI literacy involves understanding core concepts and being able to critically engage with AI. In a classroom context, this means recognising that a fluent response is not necessarily a correct one. Generative AI systems may produce plausible but false information, inaccurate references, or explanations that do not match a learner's level. Teachers should therefore verify important claims, compare outputs with trusted sources, and adapt materials rather than treating AI-generated content as ready-made teaching material. AI literacy also includes ethical and social understanding. Teachers need to consider how AI systems may affect privacy, inclusion, accessibility, cultural representation, and learner agency. An AI

tool may work well for some language varieties or contexts but perform less effectively for others. The teacher must recognise that technology is shaped by human decisions and data, and that its outputs are not neutral or universally appropriate. AI literacy consequently combines practical knowledge, critical judgement, pedagogical understanding, and ethical responsibility.

Educational Opportunities and Pedagogical Uses

Used thoughtfully, AI can support several aspects of teachers' work. During lesson planning, it may help generate examples, suggest discussion questions, produce alternative explanations, or propose activities linked to a learning objective. Teachers can then evaluate and revise these suggestions in light of the syllabus, students' prior knowledge, and classroom resources. AI can also help produce different versions of a text or offer preliminary ideas for differentiated instruction. Such uses may be valuable when teachers retain control over the final material and check it for accuracy, relevance, and accessibility.

AI tools may also support formative assessment by helping teachers draft quiz questions, rubrics, feedback prompts, or practice exercises. These outputs can provide a starting point, but assessment decisions should not be delegated uncritically to automated systems. A teacher must check whether questions assess the intended learning outcomes, whether feedback is fair and understandable, and whether a student's work is being judged in its proper context. Automated scores or recommendations should not become the sole basis for consequential decisions about learners. AI can contribute to professional learning by helping teachers explore unfamiliar concepts, compare instructional approaches, or reflect on lesson plans. Yet, the usefulness of these applications depends on the quality of the prompt, the reliability of the output, the teacher's subject knowledge, and the availability of time and digital access. AI is best treated as a support for professional thinking rather than a substitute for it. Holmes et al. (2019) discuss the potential of AI in education alongside the need to consider its wider implications for teaching and learning.

Ethical Challenges in the Use of AI

Accuracy, Transparency, and Professional Accountability

AI-generated content may contain factual errors, fabricated citations, misleading explanations, or outdated information. These limitations are particularly important in education, where students may assume that a teacher-provided resource is trustworthy. Teachers should verify information against dependable sources and disclose relevant limitations when AI has contributed substantially to a resource. They should also avoid presenting AI-generated text as though it were necessarily authoritative. Professional accountability remains with the educator and the institution, not with the software.

Bias, Fairness, and Inclusion

AI systems can reproduce patterns and stereotypes present in their training data or design. As a result, generated examples, images, feedback, or recommendations may underrepresent certain groups or reinforce cultural and linguistic assumptions. A system may also be less reliable for

learners whose language, disability-related needs, or cultural context are poorly represented in its data. Teachers should review outputs for stereotypes and omissions, provide varied examples, and consider whether the tool could disadvantage particular learners. A human-centred approach requires attention to equity rather than assuming that automated outputs are inherently objective.

Privacy and Data Protection

Teachers may be tempted to enter student names, marks, written work, personal circumstances, or other identifiable information into online AI tools. Doing so can create privacy and security risks, particularly when the data-handling practices of a service are unclear. Teachers should follow institutional policy and applicable data-protection requirements, avoid entering identifiable student information into unapproved systems, and use anonymised examples wherever possible. Schools and teacher education institutions should provide clear guidance about approved tools, consent, data retention, and the limits of acceptable use.

Academic Integrity and Authorship

Generative AI complicates familiar ideas about originality, authorship, and independent work. Students may use AI to brainstorm, edit, translate, or generate complete responses. A blanket assumption that all AI use is either acceptable or unacceptable may not serve learning well. Teachers should make expectations explicit for each task: whether AI may be used, for what purpose, how assistance should be acknowledged, and which parts must demonstrate the learner's own understanding. Assessment can also include drafts, oral explanations, classroom writing, reflection, and process evidence. These approaches help teachers evaluate learning rather than relying only on a polished final product.

Overdependence and Human Agency

Excessive reliance on AI may reduce opportunities for learners to practise reasoning, writing, problem-solving, and independent decision-making. It can also encourage teachers to accept ready-made plans without reflecting on students' needs. The appropriate response is not necessarily to exclude AI from all learning, but to design purposeful boundaries. Some activities may benefit from AI-supported exploration, while others should require unaided practice or direct interaction. Teachers should preserve opportunities for questioning, creativity, collaboration, and human feedback. AI should expand learners' capabilities without removing their responsibility to think.

The Teacher's Role in Responsible AI Integration

The teacher's role includes selecting appropriate tools, setting clear learning purposes, checking outputs, protecting learners, and explaining ethical expectations. Teachers need to ask whether AI use improves the learning experience or merely makes a task faster. They should consider the age and needs of learners, curriculum requirements, accessibility, available infrastructure, and possible consequences of errors. In high-stakes situations, such as grading, placement, or decisions about student support, human review and accountability are especially important.

Teachers also have a responsibility to help students become critical users of AI. This includes teaching learners to verify claims, compare sources, identify possible bias, protect personal information, acknowledge assistance, and explain their reasoning. Students should understand that AI-generated responses can be useful starting points but are not a replacement for evidence or independent judgement. A classroom culture that encourages questions about how and why a tool was used can support responsible experimentation without treating technology as unquestionable.

UNESCO's guidance places human agency and ethical considerations at the centre of AI competency development (Miao & Cukurova, 2024). This is significant because the educational value of AI cannot be measured only by speed or convenience. Decisions must also consider fairness, inclusion, learner well-being, teacher autonomy, and the purpose of education. Teachers are not simply users of digital products; they are professionals who interpret tools in relation to learners and educational values.

Integrating AI Literacy into Teacher Education

AI literacy should be incorporated into both pre-service teacher education and continuing professional development. A single introductory lecture may raise awareness but is unlikely to develop the judgement needed for classroom practice. Programmes should combine foundational knowledge about AI with practical tasks, ethical case studies, lesson design, assessment planning, and reflective discussion. Teacher trainees can compare AI-generated and textbook explanations, identify factual errors, examine examples for bias, and revise outputs to suit different learners. These activities help make critical evaluation part of everyday teaching practice.

Training should include privacy and security routines. Trainees need practice in distinguishing public information from sensitive student data, checking whether a tool is approved for educational use, and anonymising examples. They should also learn how to communicate AI-use rules clearly to students and parents. Institutions can support this work by providing written guidance, recommended tools, procedures for reporting concerns, and opportunities for teachers to share experiences. Such support is preferable to leaving each teacher to interpret risks alone.

Assessment literacy is another essential element. Teacher education should prepare educators to design tasks that reveal students' understanding even when AI tools are available. This may involve process-based assessment, oral questioning, classroom demonstrations, portfolios, drafts, and reflective explanations. The purpose is not to make assessment unnecessarily punitive, but to align evidence of learning with the intended outcomes. Teachers should also consider whether AI tools are accessible to all students; assessment arrangements should not unfairly reward learners who have better devices, connectivity, or paid access.

UNESCO's framework identifies progression in teachers' AI competence, from acquiring basic knowledge to deepening and creating more advanced practices (Miao & Cukurova, 2024). This suggests that professional learning should be continuous and differentiated. Beginners may need support with core concepts, safe use, and output verification. More experienced teachers may

explore subject-specific applications, evaluate tools systematically, or contribute to institutional guidelines. Professional development should therefore be practical, ongoing, and responsive to teachers' actual classroom contexts.

Discussion

The literature and guidance considered here point to a consistent principle: effective AI integration depends on the relationship between technical capability, pedagogical purpose, and ethical judgement. Familiarity with AI tools alone does not ensure responsible use. Teachers must be able to evaluate outputs, understand limitations, recognise risks, and decide when a tool should not be used. The ethical dimension is not an optional addition to AI literacy; it is part of the competence itself.

The review also indicates that responsibility cannot rest on individual teachers alone. Educational institutions should establish clear policies, offer training, protect student data, and provide equitable access to appropriate tools. Policymakers and technology providers also have roles in transparency, accountability, accessibility, and the design of systems that respect human rights. A teacher may understand the risks but still face difficulties if institutional guidance is absent or if suitable alternatives are unavailable.

Because this is a narrative review of selected sources, its conclusions are conceptual rather than empirical. It does not establish how many teachers possess AI literacy or how widespread particular practices are in any region. Further research could examine teachers' competencies in specific school contexts, evaluate the impact of professional-development programmes, and compare teachers' confidence with their demonstrated ability to detect errors, bias, and privacy risks. Such studies should report transparent methods and evidence so that conclusions can be assessed and replicated.

Conclusion

AI literacy is an essential professional competency for teachers working in increasingly digital educational environments. It involves more than operating applications: it includes understanding AI's capabilities and limitations, evaluating outputs, protecting student information, identifying bias, supporting academic integrity, and preserving learner agency. AI can assist with planning, resource development, assessment preparation, and professional learning, but these benefits depend on careful human review and clear educational purpose.

Teacher education should therefore integrate AI literacy through practical activities, ethical case studies, privacy guidance, assessment redesign, and continuing professional development. Institutions should establish clear expectations and ensure that teachers have the support needed to use AI safely and equitably. The central principle is that AI should enhance the work of teachers without displacing professional judgement or the human relationships at the heart of education. This review is based on selected literature and policy guidance and does not present original survey findings. Future empirical research can investigate how teacher training influences actual AI-related knowledge and classroom practice.



References

1. Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.
2. Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (Article 1, pp. 1–16). Association for Computing Machinery. <https://doi.org/10.1145/3313831.3376727>
3. Miao, F., & Cukurova, M. (2024). AI competency framework for teachers. UNESCO. <https://doi.org/10.54675/ZJTE2084>
4. UNESCO. (2021). AI and education: Guidance for policy-makers. UNESCO.