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AI Literacy: Teaching Students and Teachers How to Use Tools Safely and Ethically

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Abstract

Artificial Intelligence has moved from being a specialised technological concept to becoming an increasingly visible part of everyday educational practice. Students use AI-enabled applications to search for information, generate ideas, translate text, solve problems, summarize readings, write computer code, and obtain explanations of difficult concepts. Teachers are similarly exploring AI for lesson planning, creation of learning materials, formative feedback, assessment design, administrative tasks, and professional learning. This rapid expansion has created a fundamental transformation in the relationship between learners, teachers, information, and technology.

Keywords: Artificial Intelligence, Educational Practice, Computer Code, Lesson Planning, Formative Feedback.

Introduction

However, the increasing availability of AI tools does not automatically mean that students and teachers know how to use them appropriately. A student may be able to generate a sophisticated essay through an AI system without being able to determine whether the information is accurate. A teacher may use an AI-generated lesson plan without recognizing that it contains factual errors or culturally inappropriate assumptions. Similarly, an individual may unknowingly enter confidential information into an AI platform or reproduce biased AI-generated content without questioning its origin.

These situations demonstrate that the educational challenge is not simply access to artificial intelligence, but the development of the capacity to understand, question, evaluate, and responsibly use artificial intelligence.

This capacity is increasingly described as AI literacy.

AI literacy represents a broader competence than simply knowing how to operate an AI application. It includes an understanding of fundamental AI concepts, awareness of how AI systems generate and process information, practical competence in interacting with AI tools, the ability to critically evaluate AI-generated outputs, awareness of ethical and social implications, and the capacity to make responsible decisions about when and how AI should be used.

The importance of AI literacy becomes even greater in education because educational institutions are responsible not only for transmitting knowledge but also for developing independent thinkers and responsible citizens. If students begin to depend excessively on AI for writing, reasoning, decision-making, or problem-solving, the educational purpose of learning may be weakened. On the other hand, if AI is integrated thoughtfully, it can provide opportunities for personalized learning, experimentation, feedback, creativity, accessibility, and collaboration.

Therefore, the central issue is not whether AI should be present in education. The more important question is how students and teachers can develop the knowledge and judgment required to use AI in ways that enhance learning without compromising human agency, academic integrity, privacy, fairness, and ethical responsibility.

AI literacy consequently needs to be understood as an educational priority rather than merely a technological skill.

Conceptual Background of AI Literacy

The emergence of AI literacy can be understood as part of the broader development of digital literacy, information literacy, and media literacy. In earlier educational contexts, digital literacy largely focused on the ability to operate computers, access online information, communicate through digital platforms, and create digital content. Information literacy emphasized the ability to locate, evaluate, and use information effectively, while media literacy focused on interpreting and critically evaluating media messages.

Artificial intelligence introduces a new dimension to all these forms of literacy because AI systems can increasingly participate in the production of information itself.

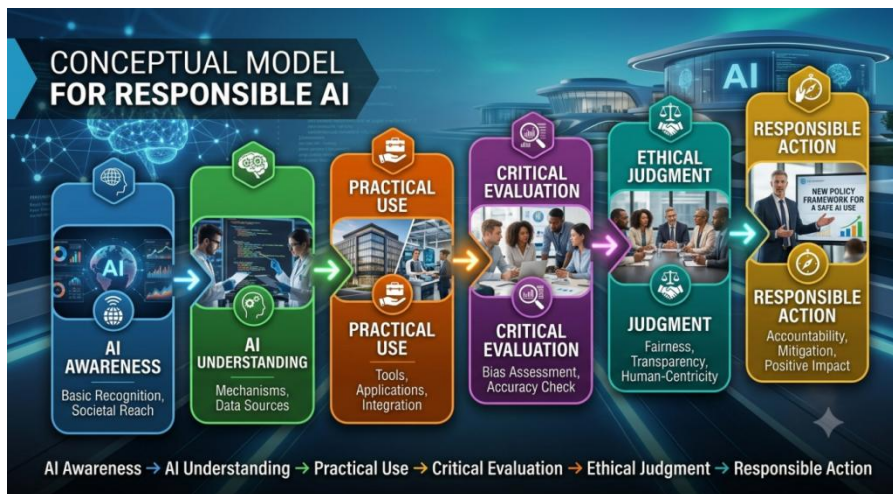
A conventional search engine generally directs users toward existing sources. A generative AI system, in contrast, can produce a new response based on patterns learned from large amounts of data. This distinction is educationally significant. The output generated by an AI system may appear coherent, detailed, and authoritative while nevertheless containing incorrect information.

Consequently, the traditional question of “Where did this information come from?” must increasingly be accompanied by questions such as:

- How was this response generated?
- What information may have influenced it?
- What assumptions does it contain?
- Can its claims be independently verified?
- What information may be missing?
- Could the response contain bias?
- Is it appropriate to use this output for the intended educational purpose?

AI literacy therefore develops at the intersection of technical understanding, information evaluation, critical thinking, ethical reasoning, and responsible action.

A useful conceptual model is:



The sequence is important. Awareness alone does not produce literacy. A student may know that ChatGPT or another generative AI system exists, but this does not mean that the student understands its limitations. Similarly, technical proficiency without ethical awareness may result in inappropriate or harmful use.

AI literacy should therefore be viewed as a multidimensional competence in which knowledge and practical ability are combined with critical judgment and ethical responsibility.

Meaning and Definition of AI Literacy

AI literacy can broadly be defined as the capacity of an individual to understand fundamental concepts related to artificial intelligence, interact effectively

with AI systems, critically evaluate their outputs, recognize their limitations and risks, and use them in an ethical, safe, and socially responsible manner.

This definition contains several important elements.

First, AI literacy requires conceptual knowledge. Users need to understand, at least at a basic level, concepts such as algorithms, machine learning, data, generative AI, automated decision-making, and pattern recognition.

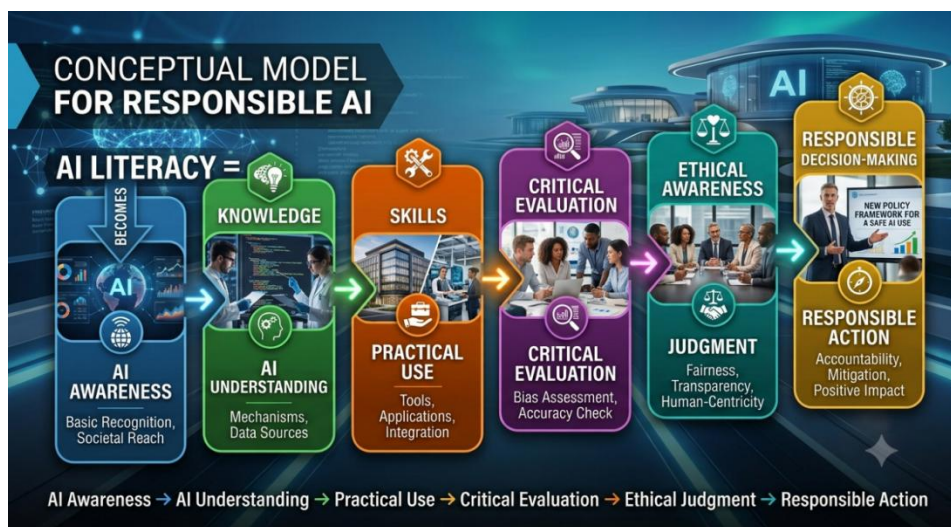
Second, it involves practical competence. Individuals should know how to interact with AI tools appropriately, formulate useful instructions, refine questions, and obtain information in ways relevant to their educational objectives.

Third, AI literacy requires critical evaluation. AI-generated information should not automatically be accepted as factual. Users must assess accuracy, relevance, completeness, evidence, and possible bias.

Fourth, AI literacy involves ethical awareness. Users must understand questions concerning privacy, intellectual property, academic integrity, fairness, transparency, accountability, and human responsibility.

Finally, AI literacy involves responsible decision-making. An AI-literate individual should be capable of deciding not only how to use AI but also when AI should not be used.

Thus, AI literacy may be represented as:



This conceptualization is particularly important in educational settings because the ultimate purpose of education is not simply the production of answers. Education aims to develop understanding, reasoning, creativity, independent judgment, and the capacity to make informed decisions.

Evolution of AI Literacy in Education

The educational role of AI has developed through several stages.

In the early stage, artificial intelligence was primarily associated with highly specialized systems such as expert systems, automated problem-solving, and intelligent tutoring environments. The use of AI was largely controlled by institutions and specialists.

The second stage involved the expansion of adaptive learning and automated educational technologies. These systems began using learner data to personalize educational content, recommend activities, and provide automated feedback.

The current stage is characterized by the rapid growth of generative AI. Students and teachers can directly interact with AI systems using ordinary language. AI can generate explanations, essays, questions, examples, images, presentations, summaries, and computer code within seconds.

This development has changed the nature of AI literacy. Earlier users mainly needed to understand how to operate AI-supported educational systems. Contemporary users need to understand how to collaborate with generative AI while retaining human control and judgment.

This distinction is fundamental. The educational objective should not be to produce students who can generate maximum content through AI. It should be to produce students who can use AI to improve their understanding while continuing to think independently.

Need and Significance of AI Literacy

The growing presence of AI in education creates an urgent need for systematic AI literacy.

- **AI Literacy and Independent Learning**

AI tools can provide immediate explanations and examples. However, students must learn to use these capabilities as learning support rather than as substitutes for intellectual effort.

For example, a student who asks an AI system to explain a difficult concept and then compares that explanation with a textbook may strengthen understanding. In contrast, a student who simply copies the AI response into an assignment may complete the task without developing the underlying knowledge.

AI literacy therefore helps students move from answer-seeking to understanding-seeking.

- **AI Literacy and Critical Thinking**

One of the most important educational purposes of AI literacy is strengthening critical thinking.

AI-generated responses can be persuasive even when they are inaccurate. Students therefore need to develop the habit of questioning information rather than accepting it because it is well written.

AI literacy encourages learners to examine evidence, compare sources, identify assumptions, and distinguish between verified information and plausible-sounding claims.

- **AI Literacy and Academic Integrity**

Generative AI has complicated traditional definitions of academic work. Students can now obtain assistance with writing, coding, summarization, translation, and problem-solving.

The challenge is to distinguish legitimate learning assistance from the replacement of independent academic work.

AI literacy can help students understand institutional expectations and recognize that academic integrity involves more than avoiding plagiarism. It also involves honest representation of one's intellectual contribution.

- **AI Literacy and Privacy**

Educational users may have access to sensitive information relating to students, teachers, research participants, institutions, or families.

Entering such information into an AI system without considering privacy implications may create significant risks.

AI literacy therefore requires users to develop a privacy-conscious approach to technology.

- **AI Literacy and Future Employability**

AI is increasingly influencing professional environments. Future graduates may be expected to work alongside AI-supported systems rather than compete exclusively with them.

Students therefore need transferable capabilities such as critical evaluation, effective human-AI collaboration, prompt formulation, information verification, ethical reasoning, and problem-solving.

AI literacy can consequently become an important component of employability and lifelong learning.

Dimensions of AI Literacy

AI literacy should not be treated as a single skill. It consists of several mutually connected dimensions.

- **Conceptual Understanding**

The first dimension is understanding what artificial intelligence is and how it differs from ordinary digital technologies.

Students and teachers do not necessarily need advanced programming knowledge, but they should understand basic concepts such as data, algorithms, machine learning, generative AI, training, prediction, and automated decision-making.

Conceptual understanding helps users develop realistic expectations. They become less likely to assume that AI systems “know” information in exactly the same way that humans do.

- **Technical and Operational Competence**

The second dimension involves the ability to interact effectively with AI tools.

This includes:

- selecting an appropriate AI tool;
- providing clear instructions;
- refining questions;
- specifying context;
- evaluating different outputs;
- revising prompts;
- combining AI assistance with other information sources; and
- using the final output appropriately.

Operational competence should always remain connected to educational purpose. The objective is not merely to become skilled at prompting but to use prompting as a means of achieving meaningful learning outcomes.

- **Critical Evaluation**

The third dimension is the ability to evaluate AI-generated content.

An AI-literate user should ask:

- Is it accurate?
- Is there evidence?
- Is the information current?
- Does the response answer the actual question?
- What information may be missing?

- Could the response contain bias?
- Can the claim be verified independently?

This dimension is especially important because AI systems can produce highly fluent but factually incorrect responses.

- **Ethical Awareness**

The fourth dimension concerns the ethical implications of AI use.

Students and teachers need to understand:

- privacy;
- confidentiality;
- academic integrity;
- intellectual property;
- fairness;
- transparency;
- accountability; and
- human responsibility.

Ethical awareness ensures that technological capability does not become detached from social responsibility.

- **Social and Human Awareness**

AI does not operate in a social vacuum. Its effects may differ across individuals and communities.

For example, biased data can contribute to unequal outcomes, while unequal access to AI tools can create new forms of educational disadvantage.

AI literacy therefore requires awareness of the social consequences of technological decisions.

- **Responsible Decision-Making**

The highest level of AI literacy involves judgment.

An AI-literate student should be able to determine whether AI assistance is appropriate for a particular assignment. An AI-literate teacher should be able to decide whether using AI for assessment or feedback is pedagogically and ethically appropriate.

The central principle is: Use AI when it strengthens learning; do not use AI merely because it is available.

This principle places educational objectives before technological convenience.

- **Reflective Practice**

AI literacy also requires reflection. Students and teachers should periodically examine how AI is influencing their thinking, learning, teaching, and decision-making.

Reflection can help identify overdependence and encourage a healthier balance between technological assistance and human intellectual effort.

AI Literacy as a Shared Responsibility

AI literacy should not be treated solely as the responsibility of students. Teachers, educational institutions, administrators, policymakers, and technology providers all have roles to play.

- Students need to learn responsible use.
- Teachers need to model responsible use.
- Institutions need to establish clear policies.
- Administrators need to provide training and infrastructure.
- Policymakers need to establish appropriate standards for privacy, equity, and accountability.

This shared-responsibility perspective is essential because individual users cannot solve all AI-related risks on their own. For example, a student cannot independently resolve institutional ambiguity regarding whether a particular AI use is permitted. Similarly, a teacher cannot solve broader problems of unequal access without institutional support.

AI literacy must therefore be supported by an AI-ready educational environment.

Central Principle of the Chapter

The central argument of this chapter is that the goal of AI literacy is not to produce students and teachers who use the maximum number of AI tools. The goal is to develop educational users who can determine:

what to use, when to use it, why to use it, how to evaluate it, what information to protect, and when human judgment must take priority over AI-generated suggestions.

In other words:

- AI competence without critical thinking may create dependency.
- AI knowledge without ethics may create misuse.
- AI access without equity may create new inequalities.
- AI literacy combines all three with human judgment.

This understanding provides the foundation for examining how students and teachers can be prepared to use artificial intelligence safely, ethically, critically, and productively in contemporary educational environments.

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