



American Journal of Data Science and Artificial Intelligence (AJDSAI)

ISSN: 3069-3632 (ONLINE)

VOLUME 2 ISSUE 2 (2026)



PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

AI Literacy as a Core Future Skill: A Systematic Literature Review

Cyrus D. Santiago^{1*}

Article Information

Received: March 01, 2026**Accepted:** May 15, 2026**Published:** August 10, 2026

Keywords

*AI Literacy, Education,
Future Skills, Generative Ai,
Systematic Literature Review,
Workforce Readiness*

ABSTRACT

This systematic literature review critically examines the construct of artificial intelligence (AI) literacy as a foundational competency for the 21st-century workforce and educational landscape. As generative AI becomes inextricably linked with global economic and societal operations, the demand for sophisticated human-AI interaction frameworks has surged. Synthesizing contemporary peer-reviewed studies, international policy frameworks, and empirical data from 2020 to 2026, this review identifies the multidimensional nature of AI literacy, encompassing cognitive understanding, practical competency, and rigorous ethical evaluation. The findings highlight the critical role of AI literacy in fostering self-regulated learning in educational settings and boosting creative self-efficacy and productivity in the workforce. Furthermore, the study addresses significant systemic barriers, including the digital divide and the ethical imperatives to mitigate algorithmic bias and safeguard data privacy. Ultimately, this review proposes that AI literacy is no longer an isolated technical skill but a mandatory pillar of modern civic and professional competence, demanding immediate, equitable integration into global educational curricula and organizational training paradigms.

INTRODUCTION

The integration of artificial intelligence (AI) into the foundational infrastructure of modern society represents a paradigm shift of unprecedented magnitude. As artificial intelligence transitions from highly specialized computational tools to ubiquitous, general-purpose technologies, it is becoming increasingly integrated into education, business, communication, productivity, decision-making, digital systems, and workforce operations. Consequently, the human competencies required to interface with, manage, and regulate these systems must undergo a necessary evolution.

Historically, digital literacy focused primarily on operational proficiency. However, the emergence of generative artificial intelligence (GAI) and algorithmically mediated decision-making environments demands a significantly more sophisticated cognitive framework. This advanced paradigm is conceptualized across contemporary academic and professional spheres as “AI literacy.” The problem this study addresses is the emerging “AI literacy gap”—a divide between individuals who possess the conceptual frameworks necessary to evaluate and direct AI tools safely, and those who lack the agency to navigate algorithmic environments critically. This gap actively reshapes the global labor market and determines socioeconomic equity. Therefore, this systematic literature review deeply examines the construct of AI literacy as a core future skill, synthesizing contemporary research to understand its multidimensional nature, educational integration, and macroeconomic implications.

Research Objectives And Questions

The primary objectives of this study are to analyze

contemporary theoretical definitions and frameworks of AI literacy across interdisciplinary fields; examine the role and integration of AI literacy within higher education, K-12 pedagogy, and workforce operations; identify recurring themes regarding the specific competencies and skills associated with AI literacy; and determine existing challenges, ethical concerns, gaps in current research, and future directions for institutional policy.

To achieve these objectives, this review addresses the following research questions: How is AI literacy defined and operationalized in current academic literature? What specific cognitive, technical, and ethical competencies are associated with AI literacy? How is AI literacy being integrated into educational curricula and professional workforce training? What challenges, ethical concerns, and infrastructural barriers exist in the systemic adoption of AI literacy?

MATERIALS AND METHODS

Search Strategy and Databases

To rigorously analyze the state of AI literacy, a Systematic Literature Review (SLR) was conducted. The methodology was structured around the SALSA Framework (Search, Appraisal, Synthesis, and Analysis) and strictly adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol applicable to the social sciences.¹ The literature search was conducted across major academic repositories to ensure a comprehensive overview of both technological and pedagogical advancements. The primary databases utilized included Scopus, Web of Science, Google Scholar, ERIC, and IEEE Xplore. Boolean operators were utilized to construct targeted search strings, focusing

¹ Multidisciplinary Digital Solutions Professional, Philippines

* Corresponding author's e-mail: cyrus.academia6690@gmail.com

on combinations such as: “AI literacy” OR “artificial intelligence literacy”, “future skills” OR “workforce readiness”; “AI education” OR “curriculum integration”; and “digital literacy” OR “algorithmic literacy”.

Inclusion And Exclusion Criteria

Literature was selected based on strict inclusion parameters: peer-reviewed empirical studies, theoretical frameworks, and institutional reports; published in the English language; published between the years 2020 and 2026 to capture the accelerated evolution of generative AI, and featuring an explicit focus on AI literacy, AI competency, or the integration of AI in education and workforce contexts.

Exclusion criteria systematically removed non-academic blogs, unverified pre-prints, or purely anecdotal editorials. Highly technical algorithmic engineering papers lacking a human-centric or literacy focus were also excluded, alongside duplicate studies across databases and studies focusing exclusively on standard digital literacy without addressing modern artificial intelligence.

PRISMA Flow and Screening Process

Initial database searches yielded expansive datasets (e.g., initial identification of over 4,200 records in broad searches). Following the removal of duplicates, titles and abstracts were scanned for context and focus, systematically reducing the pool. Full-text articles were then appraised for methodological rigor and relevance. The final included corpus comprises heavily cited foundational frameworks, large-scale quantitative deployments (ranging up to 1,035 participants), and global policy documents from institutions such as the OECD and UNESCO.

RESULTS AND DISCUSSION

Theme 1: Definitions And Frameworks Of AI Literacy

The conceptualization of AI literacy has evolved from a specialized focus on computational programming toward a holistic, multidisciplinary framework. Early foundational literature, notably Long and Magerko, defined AI literacy through 17 specific competencies enabling individuals to evaluate, communicate, and collaborate with AI. However, subsequent scholars noted this framework was highly complex for standardized educational settings.

Contemporary consensus, such as the framework proposed by Chiu distinguishes between AI literacy (a foundational conceptual understanding prioritizing critical thinking and ethical awareness) and AI competency (the practical proficiency to operate and optimize AI systems). Furthermore, massive institutional initiatives, such as the OECD and European Commission’s “Empowering Learners for the Age of AI” framework, operationalize AI literacy through three durable pillars: Knowledge (understanding probabilistic outputs and limitations), Skills (computational and critical thinking), and Attitudes (adaptability, empathy, and responsible mindsets).

Theme 2: AI Literacy In Education

The integration of AI into academic spheres forces a reevaluation of pedagogy. The literature reveals a powerful synergistic effect between AI literacy and Self-Regulated Learning (SRL). When students possess highly developed AI literacy, they transition from passive consumers to active cognitive agents, utilizing AI for project-based learning and research enhancement.

Conversely, a lack of literacy results in an over-reliance on generative algorithms, often termed “e-cheating,” which bypasses fundamental critical thinking and severely diminishes long-term cognitive development. To counter this, institutions are prioritizing AI-assisted pedagogy and curriculum integration. Global frameworks, such as the UNESCO AI Competency Framework for Teachers, mandate that educators master AI foundations, ethics, and human-centered AI pedagogy across progression levels (Acquire, Deepen, Create) to effectively mediate student learning.

Theme 3: Workforce And Future Skills

As AI functions as a general-purpose technology, it disrupts both blue-collar operations and white-collar intellectual labor. In this environment, AI literacy dictates workforce readiness and employability. The Generative AI Literacy (GAIL) framework maps the architecture of these required skills across five dimensions: basic technical proficiency, prompt optimization, quality evaluation, innovative practice, and ethical/compliance awareness.

High AI literacy acts as a psychological catalyst, enhancing an employee’s “Creative Self-Efficacy” and allowing them to aggressively explore AI’s creative potential safely. Furthermore, leadership literature indicates a shift toward the leader as a “decision architect,” whose primary role is the strategic allocation of tasks between human personnel and algorithmic systems, requiring baseline data and AI literacy to maintain oversight and avoid over-automated decision regimes.

Theme 4: Ethical And Social Concerns

Raw technical proficiency devoid of deep ethical reasoning is widely recognized as socially harmful. The domain of “AI Ethics Literacy” has emerged as a distinct sub-field, encompassing AI ethics knowledge (understanding fairness, privacy, human-centricity), attitude (recognizing positive/negative impacts), and competence (responsible decision-making).

Significant social concerns include the perpetuation of algorithmic bias, data privacy vulnerabilities, and the industrial-scale production of digital misinformation. The literature highlights a critical phenomenon where higher AI literacy paradoxically increases trust while simultaneously lowering irrational privacy paranoia, mitigating “algorithm aversion”. However, severe infrastructural divides—such as the “access gap” identified in comparative studies between the Global North and Global South—threaten to exacerbate global inequalities if equitable AI literacy

policies are not aggressively implemented.

Discussion Of Findings

The synthesis of current literature indicates a definitive shift in the understanding of AI literacy: it is no longer viewed as an isolated technical skill, but as a foundational pillar of modern civic competence, heavily intertwined with digital, media, and ethical literacies. The findings collectively suggest that while organizational and educational adoption of AI is accelerating rapidly, the pedagogical scaffolding required to ensure this adoption is safe and effective is lagging.

Emerging trends point toward the legal and institutional formalization of AI literacy, as evidenced by its inclusion in the PISA 2029 global evaluations and the regulatory requirements of the EU AI Act. However, significant gaps in current research remain. There is a documented dearth of empirical studies explicitly testing students' comprehension of AI literacy and their capacity to use tools responsibly, beyond self-reported measures. Furthermore, existing frameworks predominantly privilege individual technical proficiency over collective, participatory engagement with AI design and deployment. Future directions must prioritize the development of standardized, cross-culturally validated psychometric scales to measure AI literacy, alongside targeted research into how socio-cultural contexts mediate AI adoption in the Global South.

CONCLUSION

This systematic literature review establishes that AI literacy is the critical human competency for navigating the algorithmic age. The major findings reveal that true AI literacy requires a complex synthesis of cognitive understanding, practical technical application, and rigorous ethical evaluation.

The implications for education are profound, necessitating a transition from factual recall to critical algorithmic evaluation and the widespread upskilling of K-12 and higher education faculty. For the workforce, AI literacy is the primary defense against labor displacement, demanding that workers evolve from manual task executors into strategic directors of intelligent systems. Future research opportunities must focus on addressing infrastructural inequalities and developing evidence-based pedagogical interventions that successfully bridge theoretical AI literacy with demonstrable, ethical AI competency.

Limitations of The Study

Consistent with standard academic research, this systematic review is subject to several methodological limitations. First, the reliance on specific academic databases (such as Scopus and Web of Science) may exclude relevant gray literature, corporate white papers, or emerging pre-prints that hold significant value in a rapidly evolving field. Second, artificial intelligence technology is advancing at an unprecedented pace; literature synthesized

up to 2026 may quickly become superseded by novel algorithmic capabilities. Finally, the current corpus of literature exhibits a notable lack of longitudinal studies, limiting the ability to definitively measure the long-term cognitive and socio-economic impacts of integrated AI literacy interventions.

REFERENCES

- Almatrafi, O., Johri, A., & Lee, H. (2024). A systematic review of AI literacy conceptualization, constructs, and implementation and assessment efforts (2019–2023). *Computers and Education Open*, 6, Article 100173. <https://doi.org/10.1016/j.caeo.2024.100173>
- Casal-Otero, L., Catala, A., Fernández-Morante, C., Taboada, M., Cebreiro, B., & Barro, S. (2023). AI literacy in K-12: A systematic literature review. *International Journal of STEM Education*, 10, Article 29. <https://doi.org/10.1186/s40594-023-00418-7>
- Chiu, T. K. F. (2025). AI literacy and competency: Definitions, frameworks, development and future research directions. *Interactive Learning Environments*, 33(5), 3225–3229. <https://doi.org/10.1080/10494820.2025.2514372>
- Stanford Institute for Human-Centered Artificial Intelligence. (2026). *AI index report 2026*. Stanford University. https://hai.stanford.edu/assets/files/ai_index_report_2026.pdf
- Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–16. <https://doi.org/10.1145/3313831.3376727>
- Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence*, 2, Article 100041. <https://doi.org/10.1016/j.caeai.2021.100040>
- Organization for Economic Cooperation and Development & European Commission. (2025). *Empowering learners for the age of AI: An AI literacy framework for primary and secondary education* [Review draft]. https://ailiteracyframework.org/wp-content/uploads/2025/05/AILitFramework_ReviewDraft.pdf
- Miao, F., Shiohira, K., & Lao, N. (2024). *AI competency framework for students*. UNESCO. <https://www.unesco.org/en/articles/ai-competency-framework-students>
- Georgetown University Center for Security and Emerging Technology. (2024). *AI and the future of workforce training*. <https://cset.georgetown.edu/publication/ai-and-the-future-of-workforce-training/>
- U.S. Department of Labor. (2025). *Artificial intelligence literacy framework* (TEN 07-25). <https://www.dol.gov/sites/dolgov/files/ETA/advisories/TEN/2025/TEN%2007-25/TEN%2007-25%20%28complete%20document%29.pdf>
- Liu, X., Zhang, L., & Wei, X. (2025). Generative artificial intelligence literacy: Scale development and its effect

- on job performance. *Behavioral Sciences*, 15(6), 811. <https://www.mdpi.com/2076-328X/15/6/811>
- Lo, L. S. (2025). AI literacy: A guide for academic libraries. *College & Research Libraries News*, 86(3), 120. <https://doi.org/10.5860/crln.86.3.120>
- European Commission. (2025, May). *Empowering learners for the age of AI: Launch of the draft AI literacy framework and stakeholder consultations*. <https://education.ec.europa.eu/event/empowering-learners-for-the-age-of-ai-launch-of-the-draft-ai-literacy-framework-and-stakeholder-consultations>
- Intizar, M. S., & Siddique, A. (2026). Artificial intelligence in strategic decision-making: From automation to augmentation. *American Journal of Applied Research and AI*, 1(1), 5–12. <https://doi.org/10.54536/ajarai.v1i1.7032>
- Alipasa, C. D. L. (2026). Trust and ethics for artificial intelligence in authentic education. *American Journal of Applied Research and AI*, 1(1), 1–4. <https://doi.org/10.54536/ajarai.v1i1.6617>