Artificial Intelligence Literacy as National Strategy: A Systematic Review of Policy, Equity, and Capacity Building across the Global South[*]

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Abstract

This study presents a systematic literature review of 24 academic and policy-focused sources published between 2020 and 2025, synthesizing how AI literacy is conceptualized, operationalized, and integrated into national and regional strategies. Using the PRISMA framework, this study identifies recurrent challenges—such as infrastructural disparities, linguistic exclusion, and policy fragmentation—and highlights innovative, context-sensitive initiatives in countries like India, Kenya, and South Africa. The findings highlight that AI literacy as a multidimensional construct that encompasses technical proficiency, civic engagement, ethical reasoning, and digital sovereignty. The study reveals that national strategies often mirror Global North paradigms, risking misalignment with local epistemologies and socio-economic conditions. As a corrective, the review underscores the need for regionally grounded, community-informed, and equity-driven approaches that position AI literacy as a foundational right and development tool. By treating AI literacy as a cross-sectoral policy issue rather than a narrow educational objective, this research contributes to the emerging discourse on inclusive, democratic, and fair digital transformation.

Keywords: AI Literacy, Digital Sovereignty, Education Policy, Global South, National Strategy, Technological Equity

1. Introduction

The global artificial intelligence market demonstrated remarkable expansion in 2024, exceeding $184 billion USD - representing a year-over-year increase of nearly $50 billion from 2023 figures. Current projections indicate that this exponential growth trajectory will continue unabated, with market valuations anticipated to surpass $826 billion USD by 2030 (Statista, 2024). As AI technologies increasingly mediate economic, political, and social processes worldwide, the imperative to equip individuals, institutions, and societies with foundational AI literacy has become a global strategic priority. Traditionally framed within narrow technical skill sets, AI literacy now encompasses a broader, multidimensional understanding that includes ethical reasoning, civic participation, algorithmic accountability, and cultural sensitivity. Research on cultural standards reveals how societal pressures to conform can generate mental health risks, underscoring the need for ethical frameworks that mitigate harms when normative systems are codified into technologies (Nosraty et al., 2020). In this expanded framing, AI literacy is not only a means of digital empowerment, but a prerequisite for meaningful participation in democratic societies, effective policy-making, and equitable innovation ecosystems. The stakes are especially high in the Global South, where persistent inequalities in infrastructure, education, and governance converge with the transformative potential of AI, presenting both pressing challenges and critical opportunities for fostering inclusive development.

National strategies around AI literacy are beginning to reflect this expanded vision, albeit unevenly. While countries such as India, Kenya, and South Africa have launched strategic initiatives to promote digital skills and integrate AI into public education and

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governance, substantial gaps remain in terms of regional reach, cultural contextualization, and policy coherence. These gaps are exacerbated by the tendency of dominant AI discourses—originating largely from the Global North—to promote models and curricula that are poorly aligned with the socio-economic and epistemological realities of marginalized communities. The result is a growing tension between the global proliferation of AI technologies and the local capacities required to govern, critique, and co-develop them in ways that reflect diverse needs and values.

The current study situates AI literacy as a foundational component of national strategy, particularly in regions grappling with developmental asymmetries and technological dependencies. It seeks to provide a comprehensive, evidence-based synthesis of how AI literacy is theorized, implemented, and contested across national and regional contexts, with a specific emphasis on the Global South. Drawing on 24 studies published between 2020 and 2025, this review critically maps the landscape of AI literacy initiatives, highlighting both structural impediments and innovative responses. Central to this inquiry is the recognition that AI literacy is not a culturally neutral or technocratic concept, but one deeply shaped by local histories, governance frameworks, and social contracts.

By applying a systematic literature review methodology grounded in the PRISMA framework, this research identifies patterns in national-level policy responses, educational reforms, civic engagement strategies, and infrastructural investments related to AI literacy. It also foregrounds the importance of regionally tailored, ethically informed, and community-embedded approaches that challenge the extractive, top-down models of digital transformation. In doing so, this study aims to contribute to an

emerging body of scholarship that repositions AI literacy as a strategic, civic, and ethical imperative—one that is central to building resilient, fair, and inclusive futures in an increasingly AI-mediated world.

2. Methodology and Procedure

This study adopted a systematic literature review methodology guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. Originally developed to standardize reporting in health-related systematic reviews, PRISMA has since gained widespread interdisciplinary application due to its emphasis on methodological transparency, reproducibility, and accountability in evidence synthesis. The framework structures the review process into four sequential stages—identification, screening, eligibility, and inclusion—allowing for clear documentation of the rationale behind study selection and exclusion. It also includes a comprehensive 27-item checklist that ensures thorough reporting of the review protocol, search strategy, inclusion criteria, data extraction procedures, and synthesis methods. This enhances the internal validity and replicability of the review, while minimizing the risks of selection bias or interpretive ambiguity.

In the context of this study, PRISMA provided a robust and transparent foundation for identifying, selecting, and synthesizing scholarly and policy-oriented literature on AI literacy as an emerging dimension of national strategic planning, particularly in the Global South. The framework was especially well-suited to the study's objective of mapping the conceptual, infrastructural, civic, and ethical dimensions of AI literacy across a diverse and heterogeneous body of literature. By adhering to PRISMA's

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procedural rigor, the review was able to systematically evaluate how AI literacy is theorized, implemented, and contested in educational, developmental, and governance contexts—ensuring that findings are grounded in clearly traceable, methodologically sound processes.

The eligibility criteria for inclusion were defined to ensure both relevance and rigor. Studies were considered if they were published between 2020 and 2025, written in English, and addressed AI literacy with explicit connections to national or regional strategies in education, governance, or economic development. Eligible works included peer-reviewed journal articles, conference proceedings, major scoping reviews, and policy analyses. Studies focusing solely on technical AI developments without socio-educational or civic dimensions were excluded, as were those lacking geographic or policy specificity.

The literature search was conducted across a range of academic databases and digital repositories, including Scopus, Web of Science, Google Scholar, IEEE Xplore, and SpringerLink. The search strategy combined keywords such as "AI Literacy", "National Strategy", "AI Education", "Global South", "Digital Literacy Policy", and "Algorithmic Governance Education". In addition to database searches, backward reference chaining was used to identify further relevant publications from the bibliographies of key articles.

The initial search yielded 121 documents. Following the removal of duplicates and a preliminary screening of titles and abstracts, 67 articles were retained for full-text review. This process resulted in the final inclusion of 24 studies that met all predetermined criteria. These included both empirical and theoretical contributions that addressed the implementation,

framing, or policy implications of AI literacy within specific national or regional contexts.

Data extraction was conducted using a structured coding framework that categorized studies based on geographic focus, methodological approach, policy relevance, definitional clarity, and key findings. The synthesis employed thematic analysis, which allowed for the identification of recurrent patterns and emergent themes across the selected literature. Central themes included infrastructural and digital divides, philosophical underpinnings of AI literacy, the role of AI literacy in sustaining democratic participation, and the alignment of AI education with national development goals.

In order to mitigate bias, the review integrated a diversity of methodological approaches and ensured geographical breadth by including studies from South Asia, Sub-Saharan Africa, Latin America, and selected Global North comparisons for contrast. Although limited to English-language sources, efforts were made to include research grounded in local contexts and community-informed perspectives. The synthesis relied on narrative integration and qualitative meta-aggregation to derive cross-cutting insights, while preserving the contextual specificity of individual studies.

The results are presented thematically and regionally to reflect both the convergence of global AI literacy imperatives and the divergence of local implementation realities. This approach aligns with PRISMA's emphasis on transparent, replicable, and contextually grounded systematic synthesis, and it supports the development of evidence-based recommendations for national AI literacy strategies that are equitable, inclusive, and context-sensitive.

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3. Findings

The reviewed literature collectively illustrates the evolving significance of AI literacy as a strategic priority within national and regional development agendas, particularly across the Global South. Drawing from 24 systematically selected studies published between 2020 and 2025, the findings reveal a complex landscape in which AI literacy is variously defined, operationalized, and embedded within educational, governance, and economic frameworks. While some contributions adopt normative or theoretical lenses to conceptualize AI literacy as a civic, ethical, or philosophical competency, others emphasize its practical implications for institutional capacity-building, policy formulation, and social equity. The studies span a diverse array of geographical contexts—including Sub-Saharan Africa, South and Southeast Asia, Latin America, and Southern Europe—allowing for a comparative analysis of how AI literacy frameworks are shaped by local infrastructure, policy priorities, socio-economic conditions, and cultural epistemologies.

Okolo (2021) offered a comprehensive assessment of the opportunities and challenges associated with AI adoption in the Global South, with a particular focus on the national and regional implications for governance, infrastructure, and AI literacy. The paper highlighted how countries across Africa, Southeast Asia, Latin America, and the Caribbean are increasingly integrating AI to address development priorities in agriculture, healthcare, and education. Notable examples included AI-driven crop disease identification in East Africa, telehealth models in rural India, and AI teaching assistants in West Africa. However, the paper also underscored structural impediments, such as limited internet penetration, unreliable electricity, and a lack of localized AI

governance frameworks, especially in Sub-Saharan Africa. These constraints, the author argued, threaten to exacerbate global inequalities unless governments in the Global South develop robust national strategies to localize AI development, manage infrastructure deficits, and foster talent retention. Okolo (2021) emphasized the importance of digital skills training from early education onward, citing Kenya's Digital Economy Blueprint as a pioneering effort. Furthermore, the paper called for regionally anchored AI ecosystems supported by investment in local research labs and data centers, advocating for reduced dependency on foreign cloud platforms. Importantly, Okolo (2021) cautioned against the risk of "algorithmic colonization" and data labor exploitation, urging national policymakers to engage actively in global AI governance forums to shape inclusive policies that reflect regional needs and cultural values. AI literacy, therefore, was framed not only as technical proficiency, but also as a civic and regulatory competency essential for equitable AI futures in the Global South. These futures remain contingent on equitable infrastructure access—where systemic disparities in technological foundations routinely dictate which communities can harness AI's benefits and which face amplified marginalization (Mohammadi & Kharazmi, 2021).

Yi (2021) advanced a theoretical framework for understanding AI literacy, grounding it in the evolving landscape of literacy studies and emphasizing its relevance to civic participation and socio-educational development. The study conceptualized AI literacy as a composite of functional, social, and technological literacies, extending beyond technical competencies to include metacognitive and anticipatory capabilities. From both national and regional perspectives, the paper emphasized that AI literacy should empower individuals—particularly students and citizens in rapidly

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digitizing societies—to critically assess the socio-political implications of AI systems. In settings experiencing swift technological advancement, such as South Korea (the author's national context), the study argued that educational systems must adjust their objectives to prepare learners for the "anticipation" of future societal issues shaped by AI. A strong focus was placed on addressing the digital divide and preventing the exclusion of populations lacking digital and AI competencies, stressing the importance of locally tailored strategies to integrate AI literacy into public education. The paper identified metacognition—"knowing what to know"—as a core competency for AI literacy, equipping learners to navigate AI-mediated environments with autonomy. Furthermore, it connected AI literacy to democratic participation, advocating for curricula that cultivate critical reflection and subjective agency among citizens. Ultimately, the research made a case for national policy reforms that integrate AI literacy into foundational education, aligned with global education goals such as OECD's Education 2030 and UNESCO's Future Literacy initiative. This integration must explicitly address ethics pedagogy, as longitudinal studies reveal that even advanced learners routinely misinterpret applied ethical principles—not due to ill intent, but because ethical reasoning operates as a learned skill requiring structured guidance, particularly in contexts where technological complexity obscures consequences (Sabbar et al., 2019).

Benton (2023) presented a normative philosophical argument situating AI literacy as a "primary good" within the framework of John Rawls's political liberalism, thereby elevating its status as a foundational right necessary for citizenship in liberal democratic societies. The author contended that the widespread social and political integration of AI necessitates a rethinking of the resources citizens require to meaningfully exercise their two moral powers: a

sense of justice and a sense of the good. AI literacy, understood as the ability to critically engage with and evaluate AI technologies—including awareness of their limitations, implications, and embedded values—was argued to be essential for sustaining democratic participation, equality, and autonomy. Benton (2023) emphasized that this is especially relevant at the national level, where states bear the responsibility of safeguarding freedoms through equitable education policies and institutional infrastructures. Rather than prescribing specific curricular models, the paper called for governments to recognize AI literacy as a legitimate claim under the principles of justice, warranting public provision akin to other Rawlsian primary goods such as rights, liberties, and opportunities. This framing implies the need for national AI literacy initiatives that are universally accessible and not contingent upon socio-economic background or geographic location. The paper concluded that in order for liberal democracies—particularly in contexts like South Africa, where the author is based—to remain just and fair, AI literacy must be institutionalized as a basic entitlement underpinning informed citizenship.

Alamäki et al. (2024) conducted an empirical study exploring the intersection of AI literacy and sustainable development within higher education, focusing on undergraduate business administration students. The research aimed to assess students' capabilities and perceptions regarding AI's potential to contribute to societal sustainability transitions, while also identifying effective pedagogical strategies to enhance understanding in these areas. The study employed a mixed-format workshop including lectures, surveys, group discussions, and reflective writing to elicit student responses. Using an abductive qualitative methodology, the authors developed a taxonomy of AI literacy in the context of sustainable

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development, offering a novel framework for curriculum design in higher education. Results indicated that students generally struggled to address sustainability-related challenges due to limited foundational knowledge of both AI and sustainable development. Nonetheless, groups containing at least one well-informed participant demonstrated deeper engagement with ethical considerations and practical applications of AI. The findings emphasized the importance of peer learning and the role of higher education institutions in fostering AI literacy that is contextually grounded in global sustainability goals. For national strategies in the Global South, this study underscores the value of integrating AI literacy into sustainability-oriented curricula to cultivate critical, socially responsive capacities necessary for equitable development.

Korte et al. (2024) investigated the development of AI literacy among international university students through cross-cultural, online workshops conducted jointly by institutions in Finland and Hong Kong. The study targeted students (N = 29) from 13 countries, all with limited prior experience in programming or AI. Over two workshop sessions held in 2021 and 2022, students engaged in five hours of online instruction focused on AI literacy within the context of global media education. The researchers employed a mixed-methods design, utilizing pre- and post-intervention questionnaires and reflective learning diaries to assess conceptual understanding and pedagogical impact. Quantitative analysis via paired-samples t-tests revealed statistically significant improvements in both conceptual knowledge and self-perceived competence in AI. Qualitative thematic analysis of student diaries uncovered initial apprehensions and unfamiliarity with AI concepts, which evolved into a sense of empowerment and increased engagement. The findings underscored the potential of

interactive, participatory, and cross-cultural pedagogical approaches to foster AI literacy among diverse learner populations.

Stolpe and Hallström (2024) conducted a conceptual analysis aimed at integrating AI literacy into broader frameworks of technological literacy in response to growing calls for equipping students with competencies to navigate AI-infused futures. The study examined five existing AI literacy frameworks through the lens of three established traditions in technological knowledge: technical skills, technological scientific knowledge, and socio-ethical technical understanding. The analysis revealed that current AI literacy frameworks for technology education place a predominant focus on technological scientific knowledge—such as understanding AI concepts, system recognition, and systems thinking—and socio-ethical dimensions, including AI ethics and the human role in AI development. In contrast, technical programming skills, while present, were less emphasized. The authors argued for the need to conceptualize technological literacy as a form of multiliteracy, where AI literacy becomes an integrated, cross-cutting component. Their proposed framework highlights the importance of embedding socio-ethical awareness and conceptual knowledge alongside practical competencies within technology education curricula. This work is particularly relevant to Global South contexts considering national strategies for AI capacity building, as it emphasizes an inclusive, ethically grounded, and interdisciplinary approach to AI literacy that can support equitable access to emerging technologies. Recent findings similarly emphasize that without updated curricula and better-trained educators, even well-designed AI literacy frameworks struggle to translate into effective student learning outcomes (Tomraee et al., 2025).

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Mansoor et al. (2024) conducted a large-scale comparative study to evaluate AI literacy among university students across four countries in Asia and Africa, positioning AI literacy as a critical extension of media and information literacy and a prerequisite for equitable societal progress. The study surveyed 1,800 students to assess AI literacy levels and identify demographic and academic determinants of AI awareness, as well as usage tendencies. The analysis revealed substantial cross-national disparities, with Malaysian students exhibiting significantly higher AI literacy scores compared to their counterparts from other participating countries. Among the various demographic variables considered, nationality and academic degree emerged as the most influential, followed by the field of scientific specialization, whereas age and gender showed negligible effects. The study emphasized that students' academic trajectories significantly shaped their perceptions and potential engagement with AI tools. The authors called for the development of more refined measurement tools and further research into underexplored variables influencing AI literacy. These findings are particularly relevant to national AI strategies in the Global South, highlighting the need for targeted, context-sensitive capacity-building initiatives that address structural and educational disparities in AI literacy. This challenge mirrors sector-specific adoption patterns observed in healthcare, where professionals require both technical upskilling and systems designed for clinical workflows—demonstrating that effective AI literacy must address domain-specific operational realities alongside foundational competencies (Tomraee et al., 2022). Such dual-focused approaches are equally critical for institutional capacity building.

Kotsis (2024) explored the critical role of scientific literacy in

enabling policymakers to effectively legislate AI with specific relevance to national and regional contexts. The study argued that as AI becomes increasingly embedded in vital societal sectors—such as healthcare, finance, and public governance—legislators must possess a foundational understanding of AI's scientific and ethical dimensions to craft policies that balance innovation with social accountability. In highlighting region-specific interests, the paper used the European Union's General Data Protection Regulation (GDPR) as a key case study, demonstrating how scientifically literate policymakers have driven globally influential regulatory standards that prioritize transparency, data protection, and algorithmic accountability. The paper emphasized that such regulations not only safeguard societal values, but also offer a framework to foster responsible innovation within regional governance structures. Furthermore, Kotsis (2024) advocated for structured educational interventions—including interdisciplinary training, engagement with scientific advisers, and integration of technical curricula into political education—as national strategies to bridge knowledge gaps in policymaking circles. This need is particularly acute at the local and regional levels, where legislative responses to AI often lag behind rapid technological development. The author concluded that enhancing scientific literacy among legislators is indispensable to forming adaptable, forward-thinking AI governance frameworks, particularly in light of evolving global standards and the imperative for transnational collaboration. Such frameworks require coherent legislative strategies, as evidenced by comparative studies of economic crime policies where fragmented approaches—lacking comprehensive definitions or preventive mechanisms—consistently fail to address systemic challenges. This underscores the necessity for AI governance that combines technical understanding with holistic policy design to avoid

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regulatory ambiguities and implementation gaps (Taheri et al., 1401 [2022 A.D.]).

Flatela and Funda (2024) proposed a comprehensive framework to enhance AI digital literacy among South African youth, emphasizing the national imperative of inclusive digital skills development amid the country's entrenched socio-economic divides. Grounded in Icek Ajzen's Theory of Planned Behavior (TPB), the study examined psychological and social factors—attitudes, subjective norms, and perceived behavioral control—that influence youth engagement in AI education. The paper identified systemic barriers such as unequal access to digital infrastructure, under-resourced schools, and insufficiently trained educators, which disproportionately affect students in rural and economically disadvantaged regions. In response, the authors proposed a multi-pronged strategy tailored to South Africa's national context. This includes integrating AI education into the national curriculum from an early age, fostering public-private partnerships (e.g., Google Africa Developer Scholarship), promoting community-driven awareness initiatives, and investing in teacher training to build both technical and pedagogical capacity. The model underscores the critical role of governmental policy in scaling AI literacy, referencing the National Digital and Future Skills Strategy as a foundational step. The framework thus addresses both individual-level behavioral determinants and structural challenges, aiming to create an equitable ecosystem for AI education that aligns with national development goals. The study concluded that strategic, context-sensitive interventions are essential for enabling South African youth to participate meaningfully in the global AI-driven economy and to support long-term national innovation and competitiveness. This psychological-behavioral approach gains

urgency, given established evidence that digitally mediated environments—when navigated without adequate literacy—can compound cognitive stressors and undermine developmental outcomes, particularly for marginalized youth (Nosraty et al., 2021). These interventions must extend beyond education systems: workforce research confirms that psychological support structures are equally critical for sustaining employability in AI-transformed labor markets, with marginalized groups facing 37% greater barriers to accessing these resources (Toosi & Sajjadi, 2025). Other studies assert that literacy interventions achieve greatest impact when they engage both target learners and their support networks— a principle evidenced in media education where parent-child collaborative learning reduces barriers more effectively than isolated classroom instruction (Hosseini et al., 2025). This suggests similar potential for community-embedded AI literacy models.

Peters and Tukdeo (2024) advanced a critical research agenda for Artificial Intelligence in Education and Development (AI4E&D), with a focus on the Global South and specific emphasis on national and regional implications, particularly in India. Their framework called for integrating AI not merely as a technological tool, but as a transformative development philosophy that links educational reform with broader socio-economic objectives. The authors highlighted how initiatives in India—such as AI-driven teacher training and regionally adapted platforms—reflect the urgent need for localized strategies that respect linguistic diversity, infrastructural constraints, and socio-cultural contexts. They examined global and South-South initiatives (e.g., UNESCO's AI for Education in Africa and the World Bank's AI for Development in South Asia), advocating for policies that democratize access to AI tools, while guarding against technological elitism and widening inequity. Through a series of research recommendations, they

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identified areas crucial to national and local AI literacy development: equitable AI-powered personalized learning, digital infrastructure accessibility, teacher capacity building, and inclusive governance. Emphasizing ethical and socially grounded AI deployment, they proposed hybrid AI-human education systems and open-source platforms tailored to local needs. Their call to action is clear: without national frameworks that balance global innovation with local empowerment, countries in the Global South risk becoming passive consumers rather than active contributors to the AI revolution. The paper framed AI literacy not only as a technical skill, but as a strategic capacity-building imperative for sustainable development across regions. This precarious balance reflects a fundamental tension in technological adoption—where transformative potential coexists with systemic vulnerabilities—demanding the same strategic risk assessment frameworks used in enterprise IT integration to govern AI's societal implementation (Soroori Sarabi et al., 2023).

Das and Muschert (2024), in their editorial for a special issue of the *Russian Sociological Review,* examined the socio-cultural and political implications of AI in the Global South, emphasizing national and regional concerns around AI literacy, access, and sovereignty. The authors critiqued the hegemonic dominance of the Global North in AI development, arguing that this imbalance has intensified digital colonialism by extracting data from Global South nations without equitable benefit or consent. They highlighted how the Global South's infrastructural deficits—such as low internet penetration, limited digital literacy, and inadequate AI readiness—hamper national and local capacities to meaningfully engage with or regulate AI. The introduction pointed to national examples such as India's Aadhaar biometric program and Kenya's Hello Tractor platform to illustrate both the risks and opportunities of AI

integration. Additionally, cultural imperialism emerged as a major theme, with AI systems often reflecting Western epistemologies and failing to align with local values or languages, thereby marginalizing indigenous knowledge systems. The authors called for a decolonial AI framework that centers the needs, languages, and epistemologies of Global South communities, and proposed regionally tailored solutions including AI-powered financial inclusion in Nigeria and agri-tech in Kenya. The issue collectively underscored the urgent need for national strategies and regional collaborations that democratize AI access, foster context-sensitive literacy, and empower local agency in shaping AI futures. Such decolonial efforts must also confront the outsized influence of tech giants in shaping AI discourse, where corporate-academic symbiosis—through funded research, conference sponsorships, and narrative control—often legitimizes extractive data practices, while marginalizing critical perspectives. Studies reveal how these power asymmetries distort regulatory frameworks and education systems to prioritize corporate interests over public goods (Sarfi et al., 2021).

Van Wyk's (2024) scoping review systematically examined 40 peer-reviewed articles and conference proceedings (2020–2024) on AI literacy in higher education across the Global South, with specific emphasis on philosophical, ethical, and regional frameworks. The study underscored the transformative potential of AI in higher education, while cautioning against its capacity to exacerbate digital divides, particularly in under-resourced regions. A critical concern was the underrepresentation of Global South philosophies—such as Ubuntu ethics—in dominant AI literacy paradigms, which are often shaped by Western-centric models. Findings highlighted that AI literacy remains inconsistently defined and is frequently conflated with adjacent literacies like digital or

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information literacy. While educational disciplines are leading AI literacy integration, there is a stark paucity of contributions from the Library and Information Science (LIS) field, despite its crucial role in fostering equitable information access. The review identified gaps in policy, funding, and implementation capacity among Global South governments, with studies calling for context-sensitive curricula, localized ethical frameworks, and improved infrastructure. Social justice themes—including technological extractivism, linguistic exclusion, and unequal access to generative AI tools—emerged as central. The review emphasized the need for national and regional policies that address ethical AI use, advocate for inclusive governance, and develop localized capacity-building initiatives. Van Wyk (2024) concluded that embedding AI literacy within higher education systems in the Global South demands interdisciplinary collaboration, culturally relevant ethics, and sustained institutional commitment to equity. These challenges are universal across academic disciplines, with professional graduate programs revealing similar gaps - where strong student demand for AI education contrasts sharply with institutional unpreparedness, particularly in faculty competencies and ethical guardrails for emerging technologies (Rahmatian & Sharajsharifi, 2021).

Khan et al. (2024) addressed the stark disparities in AI adoption between high-income and low-income countries (LICs), arguing for a more equitable global approach to AI deployment. Their position paper highlighted that despite the transformative potential of AI for sectors critical to development—such as health, education, governance, and energy—LICs are largely excluded from mainstream AI discourse and policy due to structural challenges and limited research attention. Drawing from leapfrogging and absorptive capacity theories, the authors posited that AI catch-up in LICs is feasible, but must be context-sensitive. For LICs with

relatively stronger foundations, leapfrogging strategies may be effective, whereas others may benefit more from phased learning and institutional development. The paper underscored the importance of distributive justice and global cooperation in supporting LICs' AI integration, recommending targeted international support from bodies like UNESCO, the OECD, USAID, and the World Bank through technology transfer, funding, and capacity-building initiatives. The authors emphasized that addressing deficiencies in digital infrastructure, human capital, and participatory frameworks is crucial to narrowing the global AI divide. Such participatory models must simultaneously address systemic pedagogical barriers, as evidenced by global syntheses showing AI's educational potential remains throttled by institutional inertia, misaligned incentives, and the false dichotomy between technological upskilling and humanistic learning traditions (Rahmatian & Sharajsharifi, 2022).

Kalantzis and Cope (2024) examined the transformative implications of generative AI for literacy education, framing this technological shift as historically significant—comparable to the invention of moveable type and the printing press. They characterized generative AI as a writing machine that merges the unnatural language of code with natural human language, enabling multimodal outputs that span textual, visual, and algorithmic forms. The paper offered a theoretical and historical perspective on how this integration alters the meaning and practice of literacy, arguing for the need to reconceptualize literacy education within what they termed a "cyber-social" framework. They proposed a revised "grammar" for understanding literacy in the AI era, one that accounts for the complexities of machine-generated language and the new communicative affordances it entails. In addition, they described an experimental educational application that utilizes

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generative AI to support learning, highlighting its potential to enhance, but also complicate literacy practices. The study emphasized that literacy instruction must evolve to equip learners with the critical capacity to engage with AI-generated content, a challenge particularly relevant to AI literacy strategies in the Global South. There, equitable access to such technologies and the pedagogical rethinking of literacy are crucial for inclusive digital participation.

Brites (2024) examined the evolving intersection of media literacy, civic engagement, and digital technologies in Portugal, with a particular focus on how emerging AI tools reshape youth participation and regional democratic culture. The study contextualized media literacy as a foundational component of citizenship education and emphasized that AI literacy must now be seen as integral to equipping individuals—especially young people—with the competencies needed to navigate algorithmic information systems and automated decision-making environments. Drawing on empirical studies and policy analysis, Brites (2024) highlighted regional disparities in access to digital and AI-related educational resources across urban and rural Portugal, noting that national curricula and teacher training programs often lack AI-specific pedagogical content. The work called for inclusive educational reforms that address these imbalances, recommending participatory learning environments that foreground local experiences and socio-political realities. Of national interest, the study referenced Portugal's digital transition policies and EU-aligned initiatives, arguing that they must incorporate localized AI literacy strategies that go beyond technical skills to include critical thinking, ethical reasoning, and socio-political awareness. Brites (2024) concluded that without regionally adapted and socially grounded AI literacy frameworks, young citizens risk becoming

passive consumers of AI-driven media environments, rather than active participants in democratic and digital public spheres.

Kathala and Palakurthi (2024) proposed a comprehensive AI literacy framework tailored to the unique needs and constraints of developing nations, with particular attention to national and regional implementation strategies. The paper identified key challenges impeding AI literacy across such contexts, including limited infrastructure, insufficient policy prioritization, inadequate teacher training, and language and cultural barriers. The authors emphasized that most existing AI educational content and strategies originate in the Global North, making them ill-suited for local deployment without significant adaptation. Their framework advocates for the integration of AI education into national curricula, context-sensitive teacher training, and the use of mobile and online platforms to bridge accessibility gaps. Notably, they highlighted case studies such as India's secondary school AI modules and Rwanda's AI master's program partnership with Carnegie Mellon University to demonstrate how regional strategies can be both innovative and scalable. Policy recommendations included the development of localized curricula, leveraging public-private partnerships to overcome resource constraints, and building national capacity through coordinated efforts between ministries of education, technology, and industry. The framework placed strong emphasis on aligning AI education with local economic priorities and sociocultural contexts to ensure relevance and sustainability. The authors concluded that advancing AI literacy at national and subnational levels is essential not only for economic development, but also for fostering equitable participation in the global digital transformation.

Liu et al. (2024) investigated how AI literacy interacts with

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citizens' engagement in AI policy support, using a U.S.-based national survey to assess the mediating role of AI-related news exposure, interpersonal discussions, and individual AI efficacy. Central to their findings was the role of AI efficacy—a person's confidence in understanding and evaluating AI—which significantly influenced how AI literacy and news exposure translated into policy support. The study applied the communication mediation model to show that AI-related news consumption led to higher policy support, primarily when it stimulated interpersonal discussions and increased AI literacy. However, this pathway was significantly moderated by AI efficacy: only individuals with high perceived efficacy demonstrated a strong, positive relationship between AI exposure and support for AI regulations. Although the research was set in a U.S. national context, its findings have direct implications for national and regional policymaking elsewhere. Specifically, the results underscore the importance of fostering both AI literacy and efficacy at the population level to ensure informed democratic participation in AI governance. For countries developing or implementing AI strategies, this study offers empirical backing for policies that promote AI education through accessible media, structured public dialogue, and community-based learning. The authors concluded that to build robust public support for ethical and effective AI regulation, national strategies must move beyond technical instruction and cultivate citizen confidence and critical engagement. This critical engagement must extend to evaluating the health of digital environments themselves, where studies demonstrate that algorithmically amplified harms—from addictive design to misinformation ecosystems—actively degrade mental well-being and democratic participation. Literacy frameworks should therefore equip citizens to assess both AI applications and

the infrastructural conditions that enable their harms (Zamani et al., 1400 [2021 A.D.]).

Zreik (2024) provided a detailed analysis of digital transformation and resilience in Asian emerging markets, with a specific focus on the role of digital literacy and policy adaptation in navigating disruptions linked to the Fourth Industrial Revolution (4IR). The chapter outlined both the opportunities and structural challenges faced by countries such as India, Indonesia, Vietnam, and the Philippines in integrating technologies like AI, automation, IoT, and blockchain into national development strategies. Zreik (2024) highlighted a persistent digital divide, noting that regional disparities in infrastructure, education, and regulatory capacity undermine equitable access to technological benefits. Digital literacy emerged as a crucial lever for resilience, enabling individuals and institutions to adapt to technological volatility and contribute to sustainable economic transformation. The author emphasized the need for government-led investment in digital skills training, particularly in rural and low-income regions, and advocated for policies that balance rapid digital uptake with inclusive, socially grounded educational frameworks. Case studies illustrated successful national and local responses, showing how adaptive policies and localized education programs can strengthen both economic competitiveness and social equity. Ultimately, Zreik (2024) concluded that AI and digital literacy must be embedded in national resilience strategies to ensure that emerging markets can navigate disruption, while promoting inclusive growth and digital sovereignty.

Carayannis et al. (2024) explored how generative AI (Gen AI) technologies can be strategically leveraged to enhance the resilience and competitiveness of small and medium enterprises

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(SMEs), with implications for both national economic policy and local development. The authors framed Gen AI not merely as a tool for automation, but as a catalyst for innovation and strategic transformation in digitally evolving economies. Using a conceptual and case-informed approach, the study emphasized that the success of Gen AI adoption among SMEs hinges on their digital orientation, the presence of enabling infrastructures, and the development of AI literacy among employees and leadership. Nationally and regionally, the paper underscored the importance of public policy in supporting this transition, recommending targeted educational programs, infrastructure investments, and ecosystem partnerships to foster Gen AI capabilities across diverse SME sectors. The authors identified key barriers such as limited digital skills, resource constraints, and legacy systems, particularly affecting SMEs in less-developed regions. These challenges were linked to broader socio-economic disparities, indicating that national strategies must incorporate inclusive AI literacy initiatives tailored to local contexts. Ultimately, the article advocated for a policy framework that treats AI literacy not only as a technical imperative, but as a strategic economic enabler for regional innovation, competitiveness, and resilience in the face of disruption.

López Costa (2025) examined the knowledge, usage, and challenges associated with AI and data literacy among teachers in rural Catalan schools, highlighting the barriers to effective AI integration in underserved educational contexts. Based on survey data from a representative sample, the study found that while more than half of the teachers reported moderate to high theoretical knowledge of AI, actual classroom application remained limited. AI was primarily used for text generation, content detection, and lesson planning, with less emphasis on more advanced

functionalities such as video generation or simulations. Data literacy levels mirrored AI literacy in that conceptual understanding often failed to translate into practical competency. Teachers expressed concerns about ethical implications, academic integrity, and the potential erosion of students' critical thinking abilities. The findings underscored systemic issues such as insufficient training, limited resources, and the need for targeted support mechanisms. The author recommended policy interventions to bridge digital and pedagogical divides—such as optimized resource allocation, university-school partnerships, improved training frameworks, and teacher mobility between rural and urban areas.

Ghimire (2025) proposed a pedagogical framework that integrates ChatGPT into classroom instruction to foster critical AI literacy through a transnational and post-digital lens. Drawing on Scott Graham's (2023, in Ghimire, 2025) recursive writing model and Suresh Canagarajah's (2019, in Ghimire, 2025) concept of transnational writing habits, the article advocated for a multidimensional approach to AI literacy, emphasizing rhetorical sensitivity, linguistic inclusivity, and metacognitive engagement. The study introduced a critical praxis of "pausing, pondering, posing, and prioritizing" to guide students in developing AI-informed writing practices, particularly in multicultural and multilingual educational settings. It highlighted two forms of metacognitive activities designed to reinforce students' transnational habitus through fact-checking and reflective revision processes using ChatGPT. By repositioning AI tools as facilitators of critical dialogue and self-reflection, the framework encourages students—especially those from international and marginalized backgrounds—to engage with diverse epistemologies and language practices. This approach is especially pertinent for Global South contexts, where national AI strategies must address linguistic

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diversity, educational equity, and culturally responsive pedagogy. Parallel efforts in other literacy domains have shown that tailored, community-based instruction—especially when addressing underserved populations—can effectively bridge digital inclusion gaps and foster long-term engagement (Sakhaei et al., 2024).

Jaiswal and Schaathun (2025) critically examined the concept of digital sovereignty through a philosophical and historical lens, foregrounding its implications for individual autonomy and national governance in the digital era. While much existing literature focuses on state sovereignty in the face of multinational technology companies, this paper shifted attention to what the authors termed "human sovereignty"—the capacity of individuals to understand and navigate the complex technological systems that increasingly govern their lives. Central to the discussion is the idea that reliance on regulatory and legal mechanisms alone is insufficient to protect citizen rights in the digital domain, particularly given the rapid evolution of technology and information systems. Instead, the authors argued for a renewed emphasis on education as the primary means of safeguarding freedom and agency. At the national and local levels, this translates into a call for AI literacy initiatives that equip citizens with the critical thinking skills necessary to understand algorithmic influence, evaluate digital platforms, and participate meaningfully in democratic governance. The paper warned that without such interventions, individuals and even policymakers become alienated from decision-making processes—subordinated to technological rationality and opaque infrastructures. The authors concluded that human sovereignty must be a core pillar of digital sovereignty frameworks, requiring governments to invest in educational systems that promote informed digital citizenship and local resilience to technological disruption.

Misra et al. (2025) conducted a systematic literature review to assess the role of digital sovereignty within the industry 5.0 framework, with particular implications for national and regional governance of AI and related technologies. Drawing on 121 synthesized studies, the authors emphasized the strategic importance of maintaining control over digital infrastructure, data, algorithms, and technological standards to support national security, economic autonomy, and cultural values. In the context of rapid AI deployment, they argued that sovereignty extends beyond state actors to include individual and institutional capacities for ethical and autonomous digital engagement. Key national concerns identified included cross-border data governance, technological dependency, and fragmented regulatory standards—each of which may hinder local innovation and control. The study proposed a range of policy strategies to strengthen digital sovereignty, notably national investments in digital infrastructure, support for open-source technologies, and targeted AI literacy and education initiatives. These were framed as foundational to ensuring resilience and reducing dependency on foreign technological regimes, especially for countries seeking to advance their digital agendas within Industry 5.0. Of particular relevance was the call to integrate human-centric values in AI development, emphasizing local ethics, transparency, and accountability in algorithmic decision-making. The authors concluded that digital sovereignty—anchored in both policy and public literacy—is essential for nations to harness AI responsibly, protect citizen rights, and shape innovation in alignment with local development goals. Such sovereignty requires policy frameworks that balance enforceability with societal legitimacy, as studies of security laws demonstrate that even stringent regulations backfire when their design breeds ambiguity or public distrust. AI governance must therefore

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prioritize both technical precision and participatory legitimacy to avoid the 'inverse effectiveness' seen in other regulatory domains (Aghigh et al., 2022).

4. Discussion

Based on the examined studies, a comprehensive PRISMA-informed synthesis reveals the complex landscape of AI literacy as it intersects with national, regional, and local interests across the Global South and beyond. The corpus of studies reflects a growing scholarly consensus that AI literacy is no longer a peripheral competency, but a strategic priority for digital inclusion, policy efficacy, democratic participation, and economic resilience.

Across national contexts—particularly in South Asia and Sub-Saharan Africa—AI literacy is closely tied to state capacity and educational infrastructure. Several studies point to the uneven distribution of AI knowledge and readiness across regions, urban-rural divides, and socio-economic strata. Broader patterns of AI integration reveal that personalization technologies, ethical concerns, and uneven access frequently intersect, shaping both user experience and policy urgency (Toosi et al., 2024). These disparities are exacerbated by infrastructural deficits, linguistic exclusion, and weak institutional coordination, suggesting that top-down national policies often fail to penetrate to subnational levels where actual implementation occurs. Studies such as Okolo (2021) reinforce this concern by mapping structural dependencies on foreign technologies and expertise, calling instead for national investments in localized AI capacity and human capital.

Thematically, AI literacy is consistently framed not only as technical knowledge, but also as a civic and ethical competency.
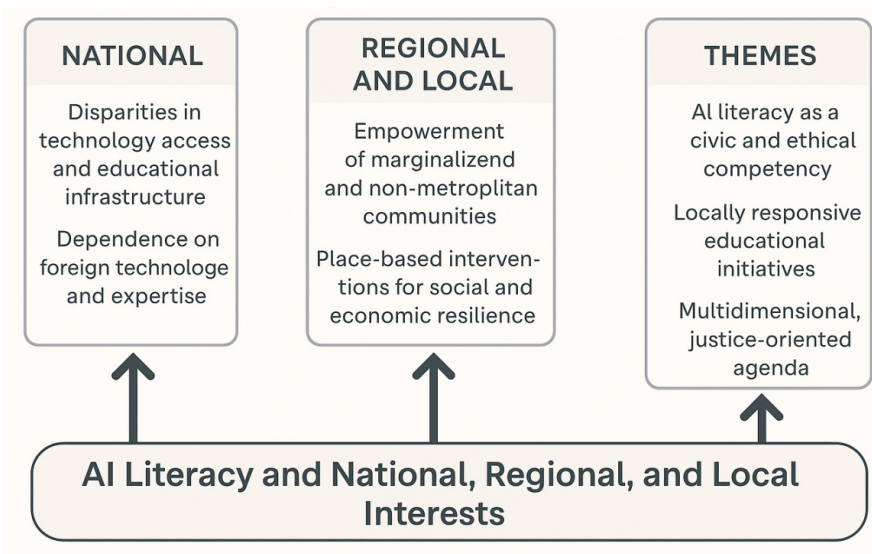
Benton (2023) and Yi (2021) conceptualize AI literacy through philosophical and normative lenses, arguing that it underpins democratic legitimacy and should be treated as a primary educational entitlement. This argument finds practical resonance in studies, which show how culturally and linguistically adapted curricula—grounded in community participation and local epistemologies—can empower marginalized populations and democratize digital futures. Such approaches explicitly resist the homogenizing logic of Global North-centric AI frameworks and underscore the need for decolonial AI education.

In terms of implementation, a recurring insight is the necessity of integrated, multilevel strategies. Liu et al. (2024) demonstrate how AI literacy translates into policy support only when accompanied by high self-efficacy and mediated by active discourse, implying that AI literacy must be deeply embedded in national civic culture and media ecosystems. Meanwhile, the studies by Misra et al. (2025) and Carayannis et al. (2024) shift focus to economic development, presenting AI literacy as a resilience factor for SMEs and a foundational element of digital sovereignty within the Industry 5.0 paradigm. These findings point to a convergence of educational, economic, and regulatory dimensions in AI literacy frameworks, reinforcing the idea that national development agendas must treat AI education as cross-cutting infrastructure. Investing in educational initiatives not only enhances internal organizational capacity, but also signals a commitment to ethical responsibility and strategic adaptability (Zamani et al., 2024).

Lastly, regional and local adaptations emerge as vital for equitable AI integration. Brites (2024) and Zreik (2024) illustrate how place-based interventions, aligned with local civic goals and

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regional labor needs, can close AI literacy gaps and build social resilience. The literature collectively suggests that without such contextualization, AI adoption risks entrenching existing inequalities and alienating non-metropolitan populations from emerging digital economies. Figure 1 summarizes the importance of AI literacy in national, regional and local interests.

Figure 1. The Importance of AI Literacy in National, Regional and Local Interests

NATIONAL

Disparities in technology access and educational infrastructure

Dependence on foreign technologe and expertise

REGIONAL AND LOCAL

Empowerment of marginalizend and non-metroplitan communities

Place-based interventions for social and economic resilience

THEMES

AI literacy as a civic and ethical competency

Locally responsive educational initiatives

Multidimensional, justice-oriented agenda

AI Literacy and National, Regional, and Local Interests

Source: Authors

5. Concluding Remarks

This review affirms that AI literacy extends far beyond a purely technical skillset, positioning it as a strategic national priority that intersects with broader issues of governance, social equity, civic

participation, and cultural autonomy. The findings consistently demonstrate that AI literacy has become a multidimensional concept, encompassing domains such as education policy, democratic resilience, digital sovereignty, and local innovation ecosystems. In the Global South, these dimensions are further complicated by entrenched structural inequalities, linguistic barriers, and epistemic marginalization, underscoring the need for contextually grounded and justice-oriented policy responses.

As such, national strategies must move beyond aspirational rhetoric toward concrete, inclusive, and regionally adapted interventions. Empirical evidence from Sub-Saharan Africa, South Asia, and Latin America reveals that effective AI literacy policies must be responsive to local infrastructural conditions, integrate ethical and civic components into curricula, and empower stakeholders—including educators, policymakers, and citizens—to critically engage with AI technologies. The adoption of community-informed pedagogies, multilingual instructional methods, and cross-sectoral governance models emerges as crucial to ensuring that AI literacy fosters genuinely inclusive development.

Furthermore, the review underscores that AI literacy is integral to achieving digital sovereignty. In a global landscape, where technological infrastructure and algorithmic systems are increasingly centralized and monopolized, national autonomy and the ability to formulate independent policy agendas depend on developing internal capacities for ethical, civic, and technical engagement with AI. This need is particularly urgent in the Global South, where patterns of data extractivism and technological dependency risk perpetuating historical forms of marginalization and disenfranchisement.

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