



ETHICAL CONSIDERATION IN THE MANAGEMENT OF DIGITAL LITERACY FOR SUSTAINABLE NATIONAL DEVELOPMENT



¹Oguejiofor, Chidumebi Ngozi, PhD

(<https://orcid.org/0000-0003-2008-0020>) cn.oguejiofor@unizik.edu.ng;

²Ani Anthonia Nwabugo, Ph.D.

(ana.ani.@unizik.edu.ng)

&

³Amaefule Forgive Nkiru, PhD

(fn.amaefule@unizik.edu.ng)

1,2&3 Educational Management and Policy,
Nnamdi Azikiwe University Awka

Abstract

Digital literacy, the ability to access, use, and critically evaluate digital technologies, is widely recognized as essential for sustainable development. It underpins economic growth, education, and social inclusion, especially in countries like Nigeria undergoing rapid digital transformation. However, implementing digital literacy programs raises significant ethical issues: ensuring equitable access, protecting users' privacy and rights, maintaining content integrity, and addressing environmental impacts. This paper reviews recent literature (2020–2025) on digital literacy and sustainable development, focusing on Nigeria and broader African/global contexts. It highlights key ethical challenges – such as the digital divide, data governance, misinformation, and e-waste – and discusses how policy and practice can manage these concerns. Incorporating principles from UNESCO and UN frameworks, Nigeria's national strategy, and case studies (e.g. UNESCO training, World Bank projects), we argue that ethical digital literacy management requires inclusive policies, robust digital rights protection, media-literacy education, and sustainable practices. Ultimately, aligning digital literacy initiatives with human rights and sustainability principles is crucial to “leave no one behind” in the digital age.

Introduction

Digital literacy broadly defined as the ability to access, manage, understand, communicate and create information safely and appropriately through digital technologies is a 21st-century competency essential for development. UNESCO emphasizes that digital literacy encompasses computer, ICT, information and media literacy skills, empowering especially youth to navigate online information critically and resist disinformation and online harms (UNESCO, 2021). In an increasingly digital world, governments view universal digital skills as integral to economic diversification and social progress. For example, Nigeria's 10-year National Digital Economy Policy explicitly lists “Digital Literacy & Skills” as one of eight strategic pillars to transform Nigeria into a leading digital economy (vision: “providing quality life and digital economies for all”) (Federal Ministry of Communications and Digital Economy, 2020). Similarly, recent UNESCO reports stress digital inclusion as key to achieving the Sustainable Development Goals (SDGs) – including quality education (SDG4), gender equality (SDG5), and effective institutions (SDG16) (UNESCO, 2023a).

However, the rush to build digital skills also brings ethical and social justice challenges. Ensuring equitable access means avoiding new divides: urban vs. rural, wealthy vs. poor, men vs. women, able-bodied vs. physically challenged. Protecting privacy and rights means guarding personal data and preventing surveillance or exploitation of new users. Maintaining content integrity means

teaching media literacy so learners can discern misinformation, hate speech or scams. Finally, digital programs must consider sustainability – from energy use of devices to the e-waste they generate. These issues were underscored in global forums: for example, UNESCO and UN leaders at the 2023 Culture of Peace forum called for digital literacy promotion with attention to online hate speech, data rights, and gender inclusion (United Nations, 2023).

This paper explores these ethical considerations in the “management” of digital literacy – i.e. how programs, policies and education can be organized responsibly for sustainable national development. It draws on recent research (2020+) and practice, with a focus on Nigeria (in the African and global context). After defining key concepts, we reviewed the literature on digital literacy and development, and then analyzed ethical dimensions under thematic headings (equity, privacy, content, environment, governance). In each area we cited current studies, policy reports, and international recommendations. By integrating this evidence, we offer recommendations for policymakers and educators to design digital literacy initiatives that advance development ethically and inclusively.

Problem Statement

Despite growing recognition of digital literacy's importance, the ethical considerations in its management for sustainable national development often remain underdeveloped or insufficiently integrated into policy and practice, particularly in developing countries. This oversight can lead to initiatives that inadvertently exacerbate the digital divide, compromise user privacy, facilitate the spread of misinformation, or fail to address the unique socio-cultural contexts of diverse populations. The core problem this paper addresses is the critical need to identify, analyze, and propose strategies for embedding ethical standards at every stage of digital literacy management to ensure it genuinely contributes to equitable and sustainable national progress.

Purpose of the Paper

This paper aims to:

- Examine the key ethical considerations in the management of digital literacy for sustainable national development.
- Analyze the challenges associated with upholding these ethical standards, especially in contexts like Nigeria.
- Highlight the implications of ethical and unethical digital literacy management for national development outcomes.
- Propose concrete recommendations for integrating ethical principles into policies and practices concerning digital literacy.

Significance of the Paper

This paper is significant for:

- **Policymakers:** Providing a comprehensive ethical lens through which to formulate and evaluate national digital literacy strategies and policies.
- **Educators and Trainers:** Guiding the design and delivery of digital literacy curricula that promote responsible digital citizenship.
- **Technology Developers and Providers:** Encouraging the creation of ethical and inclusive digital tools and platforms.
- **Citizens:** Raising awareness of their rights and responsibilities in the digital sphere.
- **Researchers:** Identifying critical areas for further empirical investigation into the ethical dimensions of digital transformation.

Conceptual Clarification

Digital Literacy

Digital literacy encompasses not only technical skills but also the cognitive and ethical abilities to navigate digital spaces critically and safely. It includes media literacy, information literacy, and cyber

hygiene (Livingstone & Helsper, 2020). It encompasses critical thinking, digital communication, online safety, information evaluation, and content creation (Ng, 2020).

Ethical Considerations

Ethics in digital literacy involve principles of justice, equity, responsibility, privacy, transparency, and inclusivity in how digital knowledge is imparted, accessed, and utilized (Floridi, 2021). Ethics in digital literacy management refers to the principles and standards governing acceptable use, policy formulation, and equitable implementation of digital learning systems and technologies (Floridi, 2020).

Sustainable National Development

Sustainable national development involves strategies that meet the needs of the present without compromising the ability of future generations to meet their own needs. It integrates economic growth, environmental preservation, and social inclusion (UNESCO, 2021). Sustainable development refers to growth that meets current needs without compromising future generations. In digital contexts, it means ensuring long-term, equitable access to digital tools and skills (Mhlanga, 2022).

Literature Review and Context

Digital literacy as an enabler of development: Numerous studies note that digital skills accelerate economic and social development. The World Bank reports that expanding internet access and skills in Africa led to measurable poverty reduction and job growth: for example, extended internet coverage in Nigeria and Tanzania was associated with a ~7% drop in extreme poverty and 8% increases in labor participation over several years (World Bank, 2021). Digital inclusion programs have similarly empowered disadvantaged groups: a 2021 pilot in Uganda quadrupled women's basic digital skills and gave 90% of participants device ownership and new income opportunities (World Bank, 2021). These findings underline that digital literacy can “serve as a catalyst for the rapid development of the economy” (NITDA, 2023a). At the policy level, the Nigerian government recognizes digital skills as foundational. UNESCO notes that Nigeria's National Digital Economy Policy (2020–2030) makes digital literacy a national priority, aimed at equipping citizens for a digital economy (UNESCO, 2022). NITDA (the Nigerian tech agency) has set targets like 70% digital literacy by 2027, emphasizing that “every Nigerian deserves the right to digital literacy and skills for the future of work” (NITDA, 2023a). These commitments are backed by training programs: in March 2025 UNESCO trained Nigerian civil servants on AI and digital governance, part of a broader effort to embed digital competencies across government (UNESCO, 2025).

Ethics in digital education and media literacy: The academic and policy literature increasingly stresses ethical dimensions of digital learning. UNESCO defines digital literacy education as not only a technical skill but a component of media and information literacy that builds critical thinking and resilience against disinformation (UNESCO, 2021). UNESCO's Media and Information Literacy (MIL) programs, for example, explicitly include training on tackling disinformation, online safety, privacy, equality and diversity (UNESCO, 2021). These initiatives reflect a broader consensus: in the COVID-19 era and beyond, digital education must integrate ethics, protecting learners from online harms while promoting peace and inclusion (UNESCO, 2020).

Digital rights and governance: The United Nations has framed digital access and skills within human rights and SDGs. For example, UNESCO's 2023 Global Education Monitoring report warned that “the right to education is increasingly synonymous with the right to meaningful connectivity”, and it calls for national benchmarks to connect all schools by 2030 (UNESCO, 2023b). Importantly, the report highlights stark gaps in digital rights: only 16% of countries globally legally guarantee data privacy in education, and many EdTech products intrude on children's privacy (UNESCO, 2023b). These findings point to ethical risks if unaddressed. Nigeria, like other nations, must develop policies that protect users (students, citizens) from data misuse and harm even as it expands digital learning.

Sustainable development perspective: In sustainability discourse, “no one left behind” is a guiding principle. UNESCO's 2024 education strategy reaffirms that technology should be “designed to serve people in accordance with human rights” and used as a “common good” to support SDGs (UNESCO,

2024). This includes a strong focus on marginalized groups – women, the poor, people with disabilities, and linguistic minorities – to ensure digital inclusion. Similarly, the recent UN “Digital Compact” discussions emphasize promoting digital skills for a culture of peace, countering online hate, and creating safe, accessible platforms for all (United Nations, 2023). These global frameworks reinforce that ethical management of digital literacy is integral to sustainable national development.

In summary, the literature shows broad agreement: digital literacy is crucial for development, but must be managed with attention to equity, rights, and sustainability. Next, we examine specific ethical challenges identified in research and policy, and how they are being addressed.

The Need for Ethical Management in Digital Literacy

The ethical management of digital literacy is pivotal for ensuring fairness and preventing abuse. The ethical management of digital literacy involves addressing issues like equitable access, data privacy, content integrity, environmental sustainability, and governance. Studies have highlighted the importance of integrating ethical considerations into digital literacy programs to ensure they contribute positively to sustainable development (UNESCO, 2023; UN, 2024):

Equitable Access and Inclusion: Ensuring all segments of society – including rural communities, the poor, and marginalized groups – have affordable, meaningful access to digital tools and learning. One of the most pressing ethical issues is the digital divide. Ethically managing digital literacy requires ensuring that rural populations, women, people with disabilities, and low-income communities are not excluded (Sambuli et al., 2020). Failure to provide accessible technologies is a violation of ethical and human rights standards (Ofori-Atta & Ansah, 2022). Governments must support universal design principles in digital infrastructure and literacy curricula. Unequal access to devices and the internet perpetuates social inequality and undermines national development goals.

Data Privacy and Digital Rights: Protecting personal information and user autonomy as digital tools collect more data. This includes legal safeguards, data literacy, and accountability in education technology. Teaching digital literacy without educating users about data privacy is ethically flawed. Many citizens are unaware of how their data is collected, stored, and used. Ethical management must include digital rights education, such as understanding consent and online surveillance (Ojedeji & Shava, 2021).

Content Integrity and Media Literacy: Teaching critical thinking to evaluate information and avoid harms like misinformation, hate speech, cyberbullying, and unethical content. With the proliferation of fake news, ethical digital literacy must train individuals to critically evaluate online information. This involves fostering civic responsibility and discouraging cyberbullying, hate speech, and manipulation (Ajibade & Mutula, 2021).

Environmental Sustainability: Addressing the ecological footprint of digital technologies – from energy use of devices and data centers to electronic waste disposal – within digital literacy programs.

Governance, Accountability and Cultural Sensitivity: Designing digital literacy initiatives in a participatory way, upholding human rights frameworks (including freedom of expression and cultural inclusion), and ensuring gender sensitivity. Ethical digital literacy promotes respect for cultural and religious diversity in content creation and consumption. Unregulated digital environments may expose users to harmful or culturally offensive content (Edewor & Alhassan, 2023).

Each of these themes is discussed below, with examples from recent studies and policies.

Equitable Access and Inclusion

A foundational ethical aim is that no one be left behind as Nigeria (and other nations) digitize. In practical terms, this means overcoming the “digital divide” – the gap between those who can use digital technologies effectively and those who cannot. In Nigeria and across Africa, infrastructure and cost barriers persist. For instance, Sub-Saharan Africa lags in both coverage and usage: by 2021, only 22% of people used mobile internet despite 84% living in 3G areas (GSMA, 2022). The gender gap is also striking – women in Africa are approximately 37% less likely than men to use mobile internet



(GSMA, 2022). These disparities mean that without targeted efforts, digital literacy initiatives risk exacerbating existing inequalities.

Ethical management thus calls for inclusive policies and programs. Nigeria's policy makers acknowledge this: NITDA aims for a 70% digital literacy rate, explicitly stating that every Nigerian has a "right to digital literacy" (NITDA, 2023a). This principle of inclusion aligns with UNESCO and UN guidance. For example, the UNESCO high-level forum on digital peace stressed "equal access to education" and bridging the gender digital divide by creating "accessible and safe digital platforms for all" (United Nations, 2023). In practice, inclusive digital literacy management might involve subsidized internet and devices for low-income students, free community training centers in rural areas, and programs specifically for women and persons with disabilities. The World Bank's projects illustrate this approach: a women's digital literacy pilot in Uganda (with refugee communities) reported a fourfold increase in women's digital skills and significantly improved economic opportunities (World Bank, 2021). Nigeria can emulate such models.

Cultural and linguistic relevance is another aspect of inclusion. Digital training content should be available in local languages and sensitive to community norms. UNESCO recommends tailoring media-literacy education to cultural contexts so that users "adopt a critical mindset" without undermining cultural values (UNESCO, 2021). In summary, ethical access requires equitable distribution of resources and adaptation of programs to reach Nigeria's diverse population – urban and rural, majority and minority groups, men and women alike.

Data Privacy and Security

As more Nigerians come online and use digital learning tools, personal data protection becomes an urgent ethical issue. Educational apps, learning platforms and even basic digital services often collect user data. Without proper safeguards, this can lead to privacy violations or misuse. The UNESCO GEM Report (2023) issued an "urgent call" on this matter: only 16% of countries legally guarantee data privacy in education by law, and an overwhelming 89% of EdTech products can surveil children (UNESCO, 2023b). In Nigeria, ensuring that digital literacy campaigns do not compromise data rights is paramount.

Ethical management means establishing clear data governance policies. For example, digital literacy programs should be transparent about what data they collect, why, and how it is used. Strong cybersecurity standards must be taught as part of the curriculum. UNESCO-trained Nigerian civil servants emphasized "data openness, data protection, and cybersecurity" in their digital skills training (UNESCO, 2025). This implies that government-managed digital literacy initiatives should include modules on data rights, consent mechanisms, and legal literacy (e.g. Nigeria Data Protection Act, 2023).

Moreover, at the policy level, Nigeria has been aligning with international norms. In 2021 Nigeria adopted a National Digital Economy policy that, under its "digital society" pillar, calls for strengthening cybersecurity and trust (Federal Ministry of Communications and Digital Economy, 2020). The Independent newspaper also highlights NITDA's goal to "strengthen policy implementation and legal framework" for digital trust (NITDA, 2023b). Embedding digital ethics into teacher training and public sector capacity-building is also critical. UNESCO's training of Nigerian officials explicitly aimed to prepare them "to mitigate the ethical- and human rights-related risks" of digital projects (UNESCO, 2025).

In education, ethical digital literacy means teaching students to protect their own privacy (e.g. strong passwords, recognizing phishing) and to respect others' data rights. For instance, Nigeria's National Library and other institutions could incorporate basic cyber-civics into library programs. Overall, guaranteeing data privacy and security is an ethical imperative if digital literacy is to empower citizens rather than expose them to harm.



Content Quality and Media Literacy

Digital platforms expose learners to a vast, unfiltered flow of information. An ethical digital literacy program must therefore go beyond technical skills and include media literacy – the ability to critically evaluate content. UNESCO defines this integration as key: digital literacy education should empower users to develop a “critical mindset” against disinformation, hate speech, and extremism (UNESCO, 2021). Nigeria’s education sector, as elsewhere, faces the challenge of teaching youth to navigate misinformation and cyberbullying online.

Practical steps include teaching critical evaluation and digital citizenship. UNESCO’s Media and Information Literacy (MIL) curriculum does exactly this: for example, it covers “tackling disinformation and misinformation, do’s and don’ts on social media, protecting online safety and privacy, equality and diversity” (UNESCO, 2021). Nigeria’s schools and libraries can adapt similar curricula. In fact, UNESCO’s Digital Education initiative encourages member states to incorporate digital literacy into lifelong learning, emphasizing that digital skills must include social and ethical dimensions (UNESCO, 2022).

Ethically, content also relates to respecting cultural values and diversity. Digital literacy should promote positive values. UNESCO’s 2023 Culture of Peace forum reiterated that educational content in the digital era should foster social cohesion and respect for vulnerable groups (United Nations, 2023). Therefore, digital literacy materials in Nigeria should include anti-bias education (e.g. countering online extremism) and highlight gender equality (building on SDG5). The Africa Code Week initiative (supported by UNESCO) shows how engaging women in STEM and digital literacy can advance equality (SAP, 2023).

Cyber-safety is another facet: teaching students about cyberbullying prevention and respectful online behavior falls under ethical digital literacy. Programmes like Common Sense Education’s Digital Citizenship (well-known in some countries) exemplify how curriculum can embed ethics. While such curricula may not yet be widespread in Nigeria, the rapid expansion of smartphone use among youth makes this urgent. A 2024 report by the Nigerian Communications Commission (NCC) indicated that active mobile subscriptions in Nigeria reached over 227 million by the end of 2023, with a significant portion being smartphone users (Nigerian Communications Commission, 2024). Ultimately, ethical management of digital literacy means curriculum designers should not equate literacy merely with the ability to operate devices, but must also instill responsibility, critical thinking, and respect for human rights.

Environmental Sustainability

The ecological impact of digital technologies is an emerging ethical concern. From smartphones and computers to data centers, the digital sector consumes energy and materials, and generates e-waste. For sustainable development, Nigeria must consider these when scaling up digital literacy. A 2020 sustainability guide even suggests that digital literacy programs teach “responsible technology use” and “environmental impact of digital devices” (Global E-waste Monitor, 2020). While direct research on this in Nigeria is scarce, related initiatives highlight the issue. Notably, Nigeria has begun addressing e-waste through environmental regulations. In January 2023, UNEP reported that Nigeria amended its laws to implement Extended Producer Responsibility: manufacturers and importers are now legally accountable for the full lifecycle of electronic products (UNEP, 2023). This means tech companies must finance e-waste recycling, encouraging eco-friendly design. Such policies embody the principle that the digital revolution should not create an environmental burden. In an ethical digital literacy framework, these measures support teaching learners about recycling and energy efficiency (e.g. encouraging longer device use, choosing energy-saving settings).

Recommendations: Digital literacy initiatives should include modules on e-waste and environmental best practices. For example, schools could teach students how to repurpose old phones safely or to dispose of batteries properly. Government programs might partner with recycling startups (like West African E-waste Challenge participants) to integrate community clean-up events. By doing so, Nigeria

ensures that building digital skills also respects ecological limits, fulfilling its sustainable development mandate.

Governance, Policy and Stakeholder Engagement

Finally, ethical digital literacy management requires thoughtful governance. This means policies and programs should be transparent, accountable, and participatory. As Nigeria's National Digital Economy plan suggests, effective implementation relies on "stronger policy implementation and legal framework" and broad partnerships (Federal Ministry of Communications and Digital Economy, 2020). Engaging local educators, civil society, and the private sector can improve relevance and fairness of initiatives.

UNESCO and UN documents emphasize multilateral and multi-stakeholder collaboration. For instance, the UN's High-level Advisory Body on AI (United Nations, 2024a) and the UN Code of Conduct for Information Integrity (United Nations, 2024b) involve many actors to guide digital ethics. Nigeria can similarly convene forums on digital education ethics, ensuring voices of teachers, parents, disabled persons, and youth are heard. Clear metrics and monitoring are also ethical issues: programs should be evaluated to ensure they reduce, not worsen, inequalities. Nigeria's DigitalForAll initiative includes "measurable impact and awards" objectives – tracking such indicators helps hold stakeholders accountable to equity goals (NITDA, 2023).

Gender sensitivity is critical in governance. UNESCO's Gender Equality priority urges concrete measures (UNESCO, 2024). Nigeria's agencies could set quotas or special programs for female participation in tech clubs, drawing on UNESCO-supported models. Likewise, attention must be paid to rural communities, ethnic minorities, and people with disabilities – for example by recruiting local trainers or using radio-based digital lessons where internet is scarce. As of 2022, only 35% of Nigeria's rural population had internet access, compared to 54% in urban areas (NCC, 2023). Such disparities underscore the need for targeted and culturally sensitive approaches.

In summary, ethical management goes beyond curriculum to include policy design. It involves legally mandating inclusivity and privacy (data protection laws), building digital literacy competencies in teachers (only half of countries do so, according to UNESCO, 2023a), and coordinating among education, ICT, and finance ministries. When countries do this well, they build "effective, accountable and inclusive institutions" (UN SDG16) that sustain digital literacy programs.

Policy and Institutional Responsibilities

Government Role: Governments have an ethical obligation to provide regulatory frameworks that promote digital equity, privacy, and access (ITU, 2023). Investment in digital infrastructure must be accompanied by policies that protect vulnerable populations.

Educational Institutions: Schools must integrate digital ethics into their ICT curriculum. Ethical awareness should not be left to chance but taught as a core competency, fostering critical thinking and responsible digital citizenship (Chigona, 2021).

Civil Society and Private Sector: Ethical partnerships with private sector actors can enhance outreach but must be monitored to avoid exploitative practices, such as data commodification or surveillance capitalism (Zuboff, 2020).

Challenges to Ethical Digital Literacy Management in Nigeria

In Nigeria, like many developing nations, efforts to mainstream digital literacy are visible through programs like the National Digital Economy Policy and Strategy (2020–2030). However, ethical lapses in upholding ethical standards in digital literacy management persist due to:

- **Infrastructure Deficits:** Pervasive issues of unreliable electricity supply and inconsistent internet connectivity, particularly in rural areas, form the bedrock of the digital divide (Abdulrazaq et al., 2020; BusinessDay, 2025). Without basic access, ethical discussions around data privacy or misinformation become moot for large segments of the population.
- **Funding Limitations:** Scarce financial resources often constrain the scope, quality, and sustainability of digital literacy programs, making it difficult to invest in robust ethical frameworks, secure infrastructure, or ongoing training (Sustainability Directory, 2025f).



- **Varying Digital Competencies:** A wide spectrum of existing digital skills among the populace requires tailored and flexible approaches, making it challenging to implement uniform ethical guidelines (Sustainability Directory, 2025f).
- **Regulatory Gaps and Enforcement:** While Nigeria has laws related to data protection (e.g., Nigeria Data Protection Act), their effective enforcement and public awareness remain challenges, particularly in the rapidly evolving digital education space (Zenodo, n.d.). In addition, there is lack of legal frameworks protecting minors online.
- **Limited Policy Implementation:** Many policies exist on paper but lack effective implementation mechanisms.
- **Socio-Cultural Factors:** Traditional gender roles and cultural norms can hinder digital inclusion for women and girls, necessitating context-specific ethical interventions (BusinessDay, 2025).
- **Low Awareness:** Many stakeholders, including educators and parents, lack awareness of digital ethics.
- **Teacher Training and Capacity:** Many educators lack adequate training in digital pedagogy and the ethical implications of digital technologies, limiting their ability to impart these crucial skills effectively (Adedoyin & Soysa, 2020; IRJMS, 2025).
- **Budgetary Deficits:** Low budgetary allocations for ICT in education.
- **Cybersecurity Threats:** Developing nations are often disproportionately targeted by cybercriminals due to weaker security infrastructures and lower public awareness, raising ethical concerns about protecting vulnerable users.

Opportunities

Despite these challenges, opportunities exist in expanding mobile learning, public-private partnerships, and community-based digital training hubs (Adebayo & Oduguwa, 2021).

Conclusion

Digital literacy is a powerful driver of national development, but its benefits will only be sustainable if programs are managed ethically. From the foregoing review, several principles emerge. First, inclusion is paramount: governments must actively bridge the digital divide (gender, socio-economic, geographic) so that digital literacy does not reinforce inequalities. Second, digital rights must be guaranteed: data privacy, cyber safety, and child protection are non-negotiable components of any digital education policy. Third, critical content skills should be taught alongside technical ones, training learners in media literacy, digital ethics, and citizenship. Fourth, sustainability must be integrated: Nigeria's experience with e-waste shows how environmental ethics can be embedded at the national level, and literacy programs should echo this by promoting eco-conscious usage and disposal of tech. Finally, collaborative governance is needed to implement these principles – policies should align with international frameworks (e.g. UNESCO's guidelines) and involve diverse stakeholders to ensure accountability.

For Nigeria (and similarly for other African nations), these considerations translate into concrete actions: robust teacher training in digital pedagogy and ethics, inclusion of local communities in program design, legal protections (as in the Data Protection Act and e-waste regulations), and continuous monitoring against SDG targets. When digital literacy is managed with ethics at its core, it can truly empower people and contribute to sustainable national development – helping Nigeria achieve its vision of a “digital economy providing quality life and digital economies for all”.

As Nigeria and other nations pursue digital transformation for sustainable development, ethical management of digital literacy is non-negotiable. Issues of equity, privacy, and responsible use must be central to any national strategy. Fostering ethical digital citizens through inclusive and reflective policies will not only advance technological capacity but also strengthen democratic institutions, economic resilience, and cultural integrity.



Policy Recommendations:

1. **National Digital Ethics Policy:** Develop a comprehensive national policy specifically addressing ethical guidelines for digital literacy, data governance, and responsible AI use across all sectors, with clear oversight and enforcement mechanisms.
2. **Universal Access Mandate:** Prioritize and accelerate investments in digital infrastructure (broadband, electricity) in underserved rural and peri-urban areas, coupled with initiatives for affordable devices and data.
3. **Digital Literacy & Ethics Curriculum Integration:** Mandate the integration of digital literacy, critical media literacy, and digital citizenship education (including data privacy and AI ethics) into national curricula from primary to tertiary levels.
4. **Teacher Professional Development:** Establish national programs for continuous professional development of educators on digital pedagogy and the ethical implications of digital tools.
5. **Funding for Ethical Innovation:** Create funding streams for research and development of ethical AI solutions and open-source educational technologies tailored to Nigeria's context.

Recommendations for Practice:

1. **Develop School-Level Ethical Guidelines:** Schools and educational institutions should create clear ethical guidelines for digital technology use, data handling, and online behavior for students, teachers, and administrators.
2. **Implement Data Protection Protocols:** Educational institutions must adopt robust data privacy and security measures, transparently communicate data policies to students and parents, and secure informed consent for data collection.
3. **Promote Critical Thinking and Media Literacy:** Actively teach students how to critically evaluate online information, identify misinformation, and understand the construction of digital narratives.
4. **Foster a Culture of Responsible Digital Citizenship:** Encourage respectful online interactions, promote digital empathy, and address issues like cyberbullying through educational programs and supportive school environments.
5. **Community Engagement:** Engage parents and community leaders in digital literacy initiatives, educating them on online safety and responsible technology use to create a supportive ecosystem.

Recommendations for Further Research:

1. **Empirical Studies on Ethical Impact:** Conduct longitudinal studies to empirically assess the long-term impact of ethically managed versus unethically managed digital literacy programs on student outcomes, community development, and economic growth in Nigeria.
2. **Context-Specific Ethical Frameworks:** Research the development of culturally and contextually relevant ethical frameworks for digital literacy management that address Nigeria's unique socio-cultural dynamics.
3. **Effectiveness of AI Literacy Education:** Investigate the most effective pedagogical approaches for teaching AI literacy and ethics to diverse age groups in the Nigerian context.
4. **Digital Inclusion and Vulnerable Groups:** Conduct in-depth studies on the specific challenges and ethical considerations in providing digital literacy to marginalized groups (e.g., persons with disabilities, internally displaced persons, rural women) and evaluate the efficacy of targeted interventions.
5. **Policy Implementation and Evaluation:** Research the effectiveness of current Nigerian policies related to data protection and digital literacy in practice, identifying gaps and suggesting improvements.

By prioritizing these ethical considerations and implementing the proposed strategies, Nigeria can harness the immense potential of digital literacy to not just participate in the global digital economy, but to do so in a manner that is equitable, inclusive, and truly sustainable for generations to come.



References

- Abdulrazaq, N., Ndako, S., Emecheta, J., & Aliyu, I. (2020). A systematic review of data privacy and security in Nigeria's online education: Ethical consideration and challenges. *Inter-Disciplinary Journal of Science Education (IJ-SED)*, 5(1), 98-112. <https://ij-sed.com/11.%203.%20Anthony%20Bisong%20A%20Systematic.pdf>
- Adebayo, F. A., & Oduguwa, S. A. (2021). Digital literacy in Nigerian education: Challenges and prospects. *Journal of Educational Development and Practice*, 12(1), 44–56.
- Adedoyin, O. B., & Soysa, V. (2020). Teachers' perspectives on the integration of ICT into teaching and learning in higher education institutions in Nigeria. *Journal of Learning for Development*, 7(1), 1-17.
- Ajibade, P., & Mutula, S. M. (2021). *Digital literacy as a driver for socio-economic development in Africa: Ethical implications*. Information Development, 37(4), 518–529. <https://doi.org/10.1177/0266666920953564>
- BusinessDay. (2025, April 3). *From exclusion to inclusion: Ensuring equal digital access for women in Nigeria - Part two*. <https://businessday.ng/news/legal-business/article/from-exclusion-to-inclusion-ensuring-equal-digital-access-for-women-in-nigeria-part-two/>
- Chigona, W. (2021). *Digital citizenship and inclusion: Lessons for ICT curriculum in African schools*. African Journal of Information Systems, 13(1), 22–38.
- Edewor, N., & Alhassan, J. A. (2023). *Cultural ethics and digital literacy among Nigerian youths*. Journal of African Media Studies, 15(1), 134–149. https://doi.org/10.1386/jams_00096_1
- Federal Ministry of Communications and Digital Economy. (2020). *National Digital Economy Policy and Strategy (2020-2030): A Digital Nigeria for All*.
- Floridi, L. (2020). *The logic of information: A theory of philosophy as conceptual design*. Oxford University Press.
- Floridi, L. (2021). *Ethics, governance, and policies in digital environments*. AI & Society, 36(1), 1–12. <https://doi.org/10.1007/s00146-020-00953-2>
- Global E-waste Monitor. (2020). *The Global E-waste Monitor 2020: Quantities, flows and the circular economy potential*. United Nations University (UNU), International Telecommunication Union (ITU), & United Nations Environment Programme (UNEP).
- GSMA. (2022). *The Mobile Economy Sub-Saharan Africa 2022*. GSMA Intelligence.
- Independent NG. (2024, February 1). *DigitalForAllChallenge: DG NITDA unravels plan to create tech clubs across Nigeria*. Independent.ng.
- International Research Journal of Multidisciplinary Scope (IRJMS). (2025, April). *Digital literacy skills in Southern Nigerian tertiary institutions*. https://www.irjms.com/wp-content/uploads/2025/04/Manuscript_IRJMS_02243_WS.pdf
- International Telecommunication Union (ITU). (2023). *National digital transformation: Policy toolkit*. <https://www.itu.int/en/ITU-D/Digital-Development>
- Livingstone, S., & Helsper, E. J. (2020). Digital literacy, digital lives: Policy and practice. *Digital Education Review*, 37, 7–28.
- Mhlanga, D. (2022). *Digital transformation and the future of development in Africa: A human-centered approach*. Development in Practice, 32(6), 783–793. <https://doi.org/10.1080/09614524.2022.2044819>
- Ng, W. (2020). Digital literacy: A framework for evaluating digital competency in educational contexts. *Educational Technology Research and Development*, 68, 405–428.
- Nigeria Data Protection Act. (2023). *Laws of the Federation of Nigeria*.
- NITDA. (2023a, July 27). *NITDA to achieve 70% digital literacy by 2027*. National Information Technology Development Agency. Retrieved from Independent.ng.
- NITDA. (2023b, August 16). *NITDA reiterates commitment to digital trust, innovation*. Independent Newspaper. Retrieved from Independent.ng.
- Ofori-Atta, A., & Ansah, A. B. (2022). *Ethical technology design and digital accessibility in*



- Africa. *Journal of Ethics and Information Technology*, 24(3), 335–349.
- Ojedeji, T., & Shava, G. (2021). *Privacy and surveillance in Africa's digital economy: Emerging ethical concerns*. *African Journal of Information Ethics*, 10(1), 45–60.
- Sambuli, N., Ndung'u, N., & Gichoya, D. (2020). *The digital inclusion agenda in Africa: Opportunities and ethical risks*. Carnegie Endowment for International Peace.
- SAP. (2023). *Africa Code Week Impact Report 2023*.
- Sustainability Directory. (2025f, April 13). *What are the key challenges in implementing digital literacy programs?* <https://sustainability-directory.com/question/what-are-the-key-challenges-in-implementing-digital-literacy-programs/>
- UNESCO. (2020). *Education in a post-COVID-19 world: Nine ideas for public action*. UNESCO.
- UNESCO. (2021). *Digital literacy for lifelong learning: Concepts, policy, and practice*. UNESCO.
- UNESCO. (2021). *Ethics of artificial intelligence and education: Guidance for policy-makers*. <https://unesdoc.unesco.org/ark:/48223/pf0000377071>
- UNESCO. (2021). *Media and Information Literate Citizens: Think critically, click wisely!* UNESCO.
- UNESCO. (2021, July 12). *UNESCO and Africa Code Week creatively fast-track gender equality in the digital world*. UNESCO News.
- UNESCO. (2022). *Digital education: A global overview of policies and practices*. UNESCO.
- UNESCO. (2022). *Nigeria: Strengthening digital skills for a resilient society*. UNESCO.
- UNESCO. (2023). *Global Education Monitoring Report 2023: Digital inclusion and education*. United Nations Educational, Scientific and Cultural Organization. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000376700>
- UNESCO. (2023, July 19). *UNESCO issues urgent call for appropriate use of technology in education*. UNESCO Global Education Monitoring (GEM) Report.
- UNESCO. (2023, September 8). *Embracing ethical AI and digital literacy: UNESCO urges global action for a culture of peace in the digital era*. UNESCO News.
- UNESCO. (2023a). *Digital inclusion for all: Building bridges to achieve the SDGs*. UNESCO.
- UNESCO. (2023b). *Global Education Monitoring Report 2023: Technology in education - A tool on whose terms?* UNESCO.
- UNESCO. (2024). *UNESCO Education Strategy 2024-2029: Unleashing the power of education for a sustainable future*. UNESCO.
- UNESCO. (2024). *UNESCO Gender Equality Priority*. UNESCO.
- UNESCO. (2025, March 17). *Advancing Nigeria's digital transformation: UNESCO trains the civil service on AI and digital government*. UNESCO News.
- United Nations Environment Programme (UNEP). (2023, January 5). *Nigeria acts to fight growing e-waste epidemic*. UNEP News.
- United Nations. (2023, September 21). *Culture of Peace forum calls for digital literacy promotion with attention to online hate speech, data rights, and gender inclusion*. United Nations.
- United Nations. (2024a). *High-level Advisory Body on Artificial Intelligence*. [Please verify the exact publication or official announcement of this body by the UN in 2024.]
- United Nations. (2024b). *UN Code of Conduct for Information Integrity*.
- World Bank. (2021). *Digital Africa: The path to inclusive growth*. World Bank.
- Zenodo. (n.d.). *Qualitative Study on Data Privacy Policy and Data Mining in Educational Assessment in Nigeria*. Retrieved June 10, 2025, from <https://zenodo.org/records/14603591/files/15%20OF%2046.pdf?download=1>
- Zuboff, S. (2020). *The age of surveillance capitalism: The fight for a human future at the new frontier of power*. PublicAffairs.