

Towards an Inclusive Digital Literacy Framework

Naomy Mwaurah

Research and Innovation, Boma International Hospitality College, Nairobi, Kenya.



Copyright © 2025 by Naomy Mwaurah. This work is made available under the terms of the Creative Commons Attribution 4.0 International License: <https://creativecommons.org/licenses/by/4.0/>

Abstract:

Inclusive digital literacy is essential for effective navigation of a digitized society, extending beyond technical skills to encompass critical thinking, information management, and ethical digital citizenship. Its definitions have evolved from instrumental views to nuanced approaches that acknowledge the interplay between technology, society, and education. The transition into the digital age, accelerated by Industry 4.0 and the COVID-19 pandemic, highlights digital literacy as a primary means of employment and a necessary 21st-century skill. Despite digital inclusivity incentives, adapting remains a challenge for those with limited access or skills. Supporting SDGs 4, 5, and 10, developing an inclusive digital literacy framework is paramount, requiring a multi-faceted approach involving policy, instructional design, and resource allocation to bridge disparities. This paper, through a qualitative literature review, addresses barriers to digital inclusion, assesses existing digital literacy models, and proposes inclusive strategies. Key barriers include the socio-economic divide, the digital divide, educational and skills gaps, and psychological and cultural factors. Existing models, such as the G20 Digital Literacy Simplified Model, DigComp, UNESCO Media and Information Literacy Framework, Digital Literacy Framework for Citizens, Maturity Model for Digital Literacies, Framework for Digital Fluency, and DigiLit Framework, each have strengths in defining competencies but limitations in addressing diverse contexts, foundational skills, or practical implementation for marginalized communities. Proposed inclusive strategies emphasize understanding the landscape of digital literacy by identifying target audiences, assessing needs, analyzing barriers, and reviewing existing resources. An inclusive digital literacy framework, designed with UDL principles, culturally relevant, multilingual, and accessible modular curriculum with real-world applications, is vital for bridging the digital divide. It promotes digital empowerment, adaptable learning, cultural relevance, and equitable access. Successful implementation requires multi-stakeholder collaboration and

continuous evaluation to ensure all individuals can participate in the digital age, fostering equity and socio-economic development.

Keywords: Digital Literacy, Digital Literacy Framework, Inclusive Digital Literacy

Introduction

The digital age transformed information use and circulation. Digital literacy is crucial for employment in Industry 4.0. The Covid-19 pandemic accelerated global digitization, particularly in education. However, adapting to this new digital culture remains challenging for those with limited access to tools and skills. (Abiddin et al., 2022). Digital literacy is a necessary skill for 21st-century citizens (Kaeophanuek & Chaisriya, 2022). Digital literacy is vital in the digital age due to the online environment's vast, complex, and often unreliable information. This requires competencies to control and verify digital content (Anthonysamy & Sivakumar, 2022).

First introduced and defined by Gilster in 1997, digital literacy is the capability to interpret and utilize digital content in diverse forms from variety of sources as it is presented on computers. List (2019) states that digital literacy is a compilation of interrelated abilities or competencies required for survival in the digital era. As reported by Van Laar et al. (2017), digital literacy is made up of 7 fundamental skills and 5 contextual skills. Fundamental skills (problem-solving, information management, critical thinking, collaboration, technical communication, and creativity) are functional. Contextual skills (self-direction, adaptability, ethical awareness, lifelong learning, and cultural awareness) are strategic.

As reported by Lee et al. (2023), *'digital literacy frameworks mainly refer to skills and capabilities of the entire population.'* However, specific research has been conducted in the area of digital literacy for vulnerable populations, who are endowed with less supporting infrastructure. Developing an inclusive digital literacy framework is crucial for modern education, especially given rapid technological changes and the acceleration caused by COVID-19. Digital literacy involves using digital tools and critically evaluating, creating, and communicating information. Bridging digital literacy gaps requires a multi-faceted approach, including policy, instructional design, and resource allocation, supporting SDGs 4, 5, and 10.

The COVID-19 pandemic has further illuminated the urgency of addressing digital literacy disparities, with studies indicating that students without adequate digital skills face heightened risks and barriers in online learning environments (Mega et al., 2022). A study in Indonesia revealed the necessity for digital literacy curricula to evolve and adapt in response to the heightened reliance on technology during the pandemic (Purnama et al., 2021). Adeleye et al. (2024) therefore report that the digital divide remains a pressing issue, necessitating educational institutions to adopt comprehensive strategies that ensure equitable

access to digital competencies, thereby fostering a more inclusive learning environment.

The ongoing evolution of digital literacy frameworks must consider the diverse needs of learners while emphasizing the development of critical thinking and information literacy skills (Marín & Castañeda, 2022). As outlined by Adewumi and Oladele (2023), fostering a culture that embraces digital fluency requires systemic change across educational institutions to create environments conducive to learning. Ultimately, the goal is to develop a digital literacy framework that addresses technical skills and prepares people to navigate and thrive in increasingly complex digital landscapes.

This literature review, therefore, addresses the barriers to digital inclusion, assesses the existing digital literacy models, and proposes inclusive strategies.

Methodology

The study is based on a qualitative method using content analysis techniques. An extensive narrative literature review was done on digital literacy frameworks. The steps followed for review were:

1. Defining the research questions and objectives
2. Selecting databases and other research sources
3. Define search terms
4. Merging hits from different sources or databases
5. Performing the review
6. Synthesizing the results

The search terms and phrases included: digital literacy, the digital literacy framework, inclusive digital literacy frameworks, and barriers to inclusive digital literacy. The review focused on the following frameworks: The G20 Digital Literacy Simplified Model, DigComp, UNESCO Media and Information Literacy Framework, Digital Literacy Framework for Citizens, Maturity Model for Digital Literacies, Framework for Digital Fluency, and DigiLit Framework

Findings and discussion

Barriers to Inclusive Digital literacy

Digital inclusion faces multifaceted barriers, including socio-economic, technological, and psychological factors, impacting access to information and opportunities. Understanding these challenges is crucial for developing effective solutions.

Socio-economic Divide

One primary barrier to digital inclusion is the socio-economic divide, which manifests in various forms, including income disparities, educational

inequalities, and divergent access to digital technologies. Studies suggest that individuals from lower socio-economic backgrounds often face higher obstacles in accessing digital resources and are less likely to engage with technology (Hamburg & Lütgen, 2019; Tsatsou, 2020). This divide is particularly pronounced among vulnerable populations, including older adults, individuals with disabilities, and low-income families, who encounter psychological barriers stemming from negative attitudes towards technology (Lin et al., 2018; Yang et al., 2022). These compounded barriers necessitate targeted interventions that address not only the provision of technology but also user familiarity and comfort with its use.

Digital Divide

Technological challenges significantly contribute to the digital divide, particularly in rural and underserved areas where infrastructure may be lacking. As outlined by Johansson (2025), the digital divide encompasses the *access divide* (inequities in access to devices, internet connectivity, and technological infrastructure), the *usage divides* (disparities in the ability to effectively utilize digital tools), and the *skills divide* (gaps in digital literacy and competency). With technological advancements, these gaps may continue to widen.

Poor internet and high device costs hinder equitable digital access, particularly in rural areas lacking broadband. (Beaunoyer et al., 2020; Adni et al., 2024). This has led to an urban-rural divide, with significant gaps existing between urban centers and rural regions in access to high-speed internet (Johansson, 2025). The efficiency of public digital services is heavily reliant on government investment in infrastructure, which remains inconsistent across regions, further exacerbating disparities (Beaunoyer et al., 2020). Initiatives aimed at enhancing digital literacy within these communities are vital, as they foster a better understanding of available technologies and the skills required to utilize them effectively (Solehudin, 2024).

According to Beaunoyer et al. (2020), the COVID-19 pandemic highlighted existing inequalities, transitioning many essential services to digital formats, thus rendering access to technology as a necessity rather than a luxury. This shift underscores how vital digital inclusion is for equitable participation in society, particularly in scenarios involving health care, education, and social services (Lyles et al., 2021). Addressing these needs requires not only technological solutions but also policy frameworks that promote inclusivity, ensuring that the benefits of digitalization reach all communities (Tsatsou, 2020; Hamburg & Lütgen, 2019).

Educational and skills Gaps

Inadequate digital literacy, particularly among marginalized groups, stems from educational and skills gaps. Poor curriculum integration, insufficient resources, and limited teacher training create disparities. Varied student proficiencies and tech access worsen skills gaps, fostering exclusion. Bridging these gaps through

curriculum integration, teacher training, and better tech access is vital for inclusivity.

Psychological and Cultural Factors

Psychological and cultural factors significantly influence digital engagement. Marginalized individuals may view technology as intimidating or irrelevant, leading to disengagement. (Lin et al., 2018; Thompson & Paul, 2016). A lack of supportive social networks that encourage technology use further exacerbates this issue, especially in isolated communities (Correa & Pavez, 2016).

Tackling barriers to digital inclusion necessitates an integrated approach that encompasses socio-economic considerations, technological accessibility, and psycho-cultural factors. Strengthening digital literacy programs, improving infrastructure, and fostering a positive disposition towards technology among marginalized groups are essential steps toward bridging the digital divide.

Existing Digital Literacy Models

Digital literacy models guide efforts to improve technology competency, defining necessary skills for a digital world. Each model has strengths and weaknesses impacting its applicability.

1. G20 Digital Literacy Simplified Model

The G20 Digital Literacy Simplified Model is informed by the stages outlined in the Innovation Diffusion Theory, including awareness, interest, evaluation, trial, and adoption. This model focuses on fostering digital literacy in professional environments, particularly in fields such as mental health and education. The model's structured approach allows professionals to systematically engage with technological advancements, providing a step-by-step guide that can enhance the efficiency of implementing digital literacy programs (Shi, 2024).

One key limitation is its potential neglect of grassroots innovations crucial for engaging marginalized communities. The model may prioritize top-down approaches that do not account for local contexts or existing inequalities in access to technology (Hagerman, 2019).

2. Digital Competence Framework (DigComp)

The European Digital Competence Framework (DigComp) outlines five key areas: information literacy, communication, content creation, safety, and problem-solving. It aims to create a comprehensive understanding of digital skills applicable across various contexts. DigComp provides a standardized approach to understanding digital competencies, which can inform educational policies and curriculum development. Its widespread recognition facilitates international collaboration (Nedungadi et al., 2018).

The framework sometimes adopts a generalized approach, which may not account for individual cultural contexts or varying resources available to different demographics, risking the exclusion of groups who do not fit within its model or those with limited access to academic environments (Hagerman, 2019; LEE & Fanea-Ivanovici, 2023).

3. UNESCO Media and Information Literacy Framework

This framework focuses on equipping individuals with critical media skills and understanding the socio-political implications of media use, serving to promote responsible digital citizenship. By emphasizing critical thinking, the UNESCO framework encourages users to engage thoughtfully with digital content, fostering informed citizens who can contribute positively to society (Nedungadi et al., 2018).

However, the framework may overlook foundational digital skills required for those just beginning to engage with technology. Its focus on higher-order skills can be daunting for individuals lacking basic competencies, potentially reinforcing existing inequalities (Janetzko, 2017).

4. Digital Literacy Framework for Citizens

Developed by Lü et al., this framework focuses on building the digital capacities of citizens through practical training and awareness programs. This framework provides accessible digital literacy education tailored to different community contexts, which is crucial for empowering underrepresented populations (Lü et al., 2023). However, it can struggle to operationalize its goals when faced with practical barriers to digital engagement, such as infrastructure deficits, financial constraints, and varying educational backgrounds among target populations.

5. Maturity Model for Digital Literacies

The maturity model addresses functional, socio-economic, and transformational dimensions of digital literacy to promote progress toward digital inclusion. This model incorporates various dimensions of literacy, allowing for a nuanced view of individual and community growth in digital engagement, enhancing understanding of the role of digital literacy in socio-economic development (Sharma et al., 2018).

Its phased approach may inadvertently prioritize individuals who already possess some level of digital competence, leaving those who need immediate access and support behind.

6. Framework for Digital Fluency

This framework emphasizes dynamic capabilities that enable adaptability in various digital environments. It encourages a flexible understanding of digital skills that can evolve based on changing technology landscapes, which is vital in today's fast-paced digital world (Cain & Coldwell-Neilson, 2024).

However, this presupposition may render it impractical for individuals without foundational skills, potentially alienating those who cannot develop further competencies due to a lack of base knowledge (Kaper et al., 2019).

7. DigiLit Framework

Developed to enhance digital literacy integration in literacy lessons, the DigiLit framework focuses on planning, reflection, coaching, and evaluation processes of digital tool adoption in classrooms. It provides educators with a structured approach to effectively implementing digital resources, contributing to improved literacy outcomes (Baxa & Christ, 2017).

However, it may overlook the diversity of student needs and fail to accommodate the varying levels of technological access among students, which is particularly pertinent in inclusive education (Hagerman, 2019).

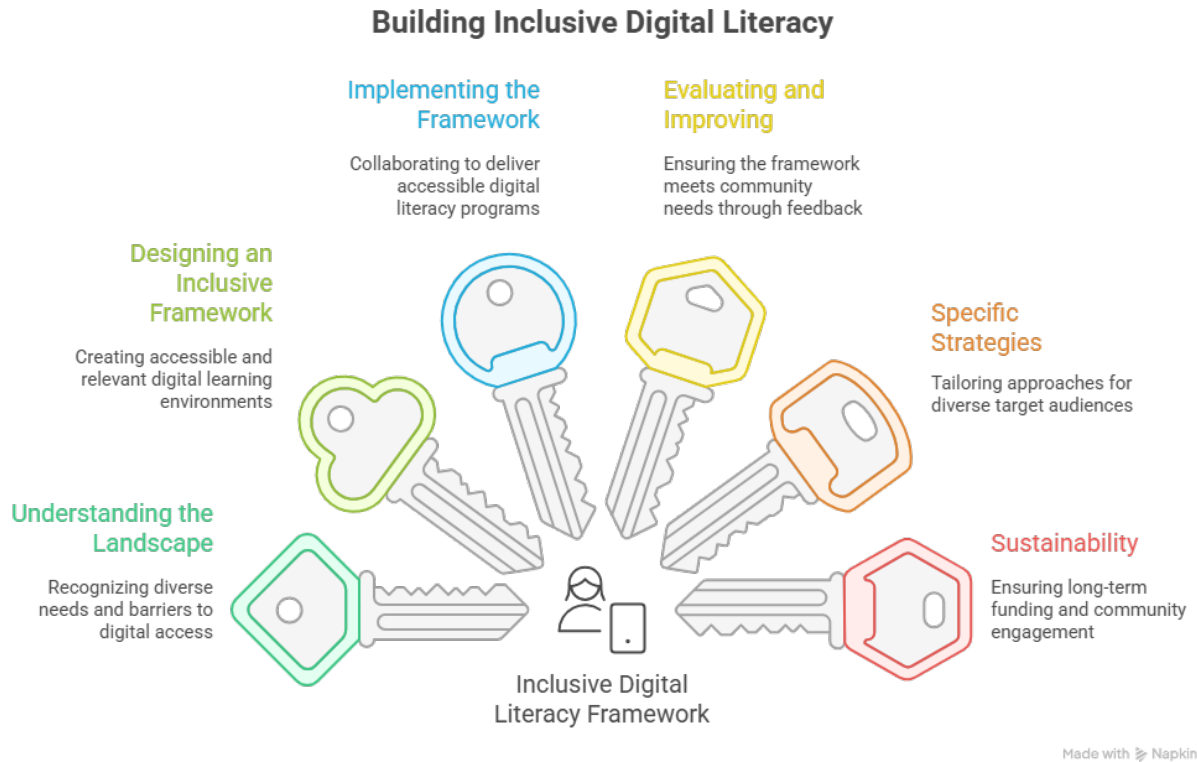
Existing digital literacy models offer valuable insights but have strengths and weaknesses. Acknowledging these is crucial for effective program development that addresses diverse needs. Integrating elements from these models is necessary for a holistic and inclusive digital literacy approach.

Strategies for Inclusive Digital Literacy Framework

Inclusive strategies, drawing from existing literature and frameworks, are vital to fostering digital literacy. By using culturally relevant content and adaptable learning, we can empower all individuals to engage with the digital age, bridging the digital divide for a more equitable and prosperous society.

Figure 1:

Strategies for an Inclusive Digital Literacy Framework



1. Understanding the Landscape of Digital Literacy

Before developing an inclusive framework, it's crucial to understand the current state of digital literacy and the challenges faced by different populations. This involves:

- ***Identifying Target Audiences:***

Diverse community groups, including those with disabilities, low-income families, non-native speakers, and individuals with limited formal education, require a community needs assessment, ownership, a train-the-trainer program, and community hubs. Program success hinges on stakeholder involvement, especially from the government, NGOs, the private sector, and the local community. According to Okafor (1982), as cited by Abiddin et al. (2022), the following levels of implementation have to be emphasized:

- i. Cultivate public awareness among the communities involved in the implementation of the program. The needs or wants of the local community are different and influenced by various factors.

ii. Systematically analyze the existing problems. In a local community, problems and ways of solving them are different from other communities.

iii. Trained program leader for every digital literacy program.

- *Assessing Existing Skills and Needs:*

Conduct surveys, focus groups, and interviews to determine the current digital skills, access to technology, and perceived needs of each target audience.

- *Analyzing Barriers to Access:*

Identify the obstacles preventing individuals from engaging with digital technologies, such as affordability, lack of internet access, language barriers, and fear of technology.

- *Reviewing Existing Resources:*

Evaluate the current digital literacy programs and resources available in the community to identify gaps and opportunities for improvement.

2. Designing an Inclusive Framework

An inclusive digital literacy framework should be designed with accessibility, relevance, and adaptability in mind. Key considerations include:

- *Universal Design for Learning (UDL):* Apply UDL principles to create flexible learning environments that cater to diverse learning styles and abilities. This includes providing multiple means of representation, action and expression, and engagement.
- *Culturally Relevant Content:* Develop learning materials that are relevant to the cultural backgrounds and experiences of the target audiences. This can involve using examples, scenarios, and language that resonate with their values and beliefs.
- *Multilingual Support:* Offer digital literacy programs and resources in multiple languages to accommodate non-native speakers.
- *Accessibility Features:* Ensure that all digital platforms and resources are accessible to individuals with disabilities. This includes providing alternative text for images, captions for videos, and keyboard navigation.
- *Modular Curriculum:* Develop a modular curriculum that allows learners to progress at their own pace and focus on the skills they need most.

- *Real-World Applications:* Emphasize the practical applications of digital literacy skills in everyday life, such as online banking, healthcare, job searching, and communication.

According to Munisa et al. (2024), incorporating local wisdom into digital literacy programs boosts relevance and engagement by tailoring content to community values, experiences, and languages. This fosters participation, confidence, and digital skill development through localized content, community input, livelihood relevance, and case studies.

3. Implementing the Framework

Effective implementation requires a collaborative approach and a commitment to ongoing evaluation and improvement. Strategies include:

- *Partnerships:*

Collaborate with community organizations, libraries, schools, and businesses to reach target audiences and leverage existing resources. Digital literacy cannot exist in isolation; rather, it must be included as part of comprehensive community development strategies. As supported by Rahman et al. (2021), developing a clear pathway to engage different populations through targeted digital literacy education will empower them to thrive in the digital age. This includes focusing not only on education but also on providing access to tools and resources relevant to various life contexts, such as economic development, healthcare, and governance. Estonia promotes digital literacy through E-residency, rural broadband, and national digital skills training. Building strong relationships with external groups (government, NGOs, companies) fosters community development and cooperation. The University of Rhode Island's Summer Institute in Digital Literacy (SIDL) offers a professional development course for adults, aiming to enhance digital literacy, collaborative research, and learner-educator collaboration. According to Abiddin et al. (2022), the SIDL program can be used to develop an extensive framework for community development programs for digital literacy through the development of partnerships between institutions of learning and communities.

- *Train-the-Trainer Programs:*

Develop train-the-trainer programs to equip community leaders and volunteers with the skills to deliver digital literacy training. As stated by Abiddin et al. (2022), there is a scarcity of DL instructors, with only a few well-trained librarians in different countries like Pakistan. They suggested that higher education staff should be formally trained so they are able to raise awareness for not only students but also conduct various DL programs. This has been improving with time. Equally, community team leaders who can act as DL agents are crucial with the right skills and competencies. The Malaysian government has established rural development and security committees at the grassroots level to act as agents of development in rural areas. This committee is a driving force for

various programs directly related to the socio-economic development of the villagers, digital literacy being one of them through the Malaysia Digital Economy Corporation (MDEC) and the #SayaDigital movement.

- *Flexible Delivery Methods:*

A variety of delivery methods, such as in-person workshops, online courses, and mobile learning, enable accommodating different learning preferences and schedules. The framework proposed by Adeleye et al. (2024) emphasizes the transformative potential of educational technology in promoting digital literacy inclusively. Hybrid learning, blending in-person and online methods, accommodates diverse digital proficiencies. Technology training, from basic computer skills to advanced digital collaboration tools, bridges the digital divide through interactive platforms, online courses, tutorials, VR/AR, and data analytics. Educational programs should foster digital skills among students and educators, while lifelong learning initiatives should address generational gaps in adult and elderly populations.

- *Affordable Access:*

Provide affordable or free access to computers, internet, and digital literacy training for low-income individuals and families. In Germany, there is the Digital Pact for Schools, an investment in digital infrastructure and tools for education, and also public Wi-Fi networks, which expand free connectivity options across urban and rural areas.

- *Mentorship Programs:*

Pair experienced digital users with individuals who are new to technology to provide personalized support and guidance.

- *Marketing and Outreach:*

Develop targeted marketing and outreach campaigns to raise awareness of digital literacy programs and resources among target audiences.

4. Evaluating and Improving the Framework

Digital literacy initiatives, especially for underserved groups, need grassroots involvement and culturally relevant programs led by community members to address specific challenges and foster ownership. Continuous evaluation is vital to meet community needs and achieve goals. Strategies include:

- *Data Collection:*

Collect data on program participation, learner outcomes, and user satisfaction through surveys, assessments, and focus groups.

- *Feedback Mechanisms:*

Establish feedback mechanisms to solicit input from learners, instructors, and community partners.

- *Regular Review:*

Regularly review the curriculum, resources, and delivery methods to ensure they are up-to-date and effective.

- *Impact Assessment:*

Conduct impact assessments to measure the long-term effects of the digital literacy framework on individuals and the community.

- *Continuous Improvement:*

Use the data and feedback collected to make continuous improvements to the framework and ensure it remains relevant and effective.

5. Specific Strategies for Different Target Audiences

- *Individuals with Disabilities:*

Ensure that all digital platforms and resources are accessible. Provide assistive technology and training on how to use it.

- *Low-Income Families:*

Provide affordable access to computers, internet, and digital literacy training. Focus on skills that can help them find jobs, manage their finances, and access government services. Building on findings by Kiwanuka and Sibindi, there is a clear connection between digital literacy and financial inclusion. Strategies should prioritize providing comprehensive digital financial literacy training to disenfranchised groups, such as low-income populations or women. This includes simplifying the digital tools used for financial transactions, ensuring accessibility, and promoting user-friendly technology that does not require extensive prior knowledge. This means affordable access, a mobile-first approach, offline resources, and accessible features.

- *Non-Native Speakers:*

Offer digital literacy programs and resources in multiple languages. Use visual aids and simplified language.

- *Individuals with Limited Formal Education:*

Focus on practical skills and real-world applications. Use hands-on activities and avoid technical jargon.

6. Sustainability

To ensure the long-term success of the digital literacy framework, it is important to develop a sustainable funding model and build local capacity. Strategies include:

- *Diversifying Funding Sources:*

Seek funding from a variety of sources, including government grants, corporate sponsorships, and individual donations.

- *Building Local Capacity:*

Train local instructors and volunteers to deliver digital literacy training. Abiddin et al. (2022) highlight a shortage of Digital Literacy (DL) instructors, noting that only a few librarians in countries such as Pakistan are adequately trained. They propose formal training for higher education staff to enable them to raise awareness and conduct DL programs. While this situation is improving, the role of community team leaders as DL agents with appropriate skills and competencies remains vital.

The Malaysian government has established rural development and security committees at the grassroots level to drive various programs, including digital literacy, which are essential for the socio-economic development of villagers. This initiative is supported by the Malaysia Digital Economy Corporation (MDEC) and the #SayaDigital movement.

- *Creating a Community of Practice:*

Establish a community of practice for digital literacy practitioners to share best practices and collaborate on projects. Establish a vibrant and active community of practice specifically designed for digital literacy practitioners. This community will serve as a central hub for sharing innovative best practices, fostering collaborative projects, and continuously advancing the field of digital literacy. Through regular communication, workshops, and shared resources, members will be empowered to enhance their skills, address common challenges, and collectively contribute to the development of effective digital literacy initiatives worldwide. Upcoming edited book titled "*Cultivating Collaboration: Communities of Practice in Librarianship*."

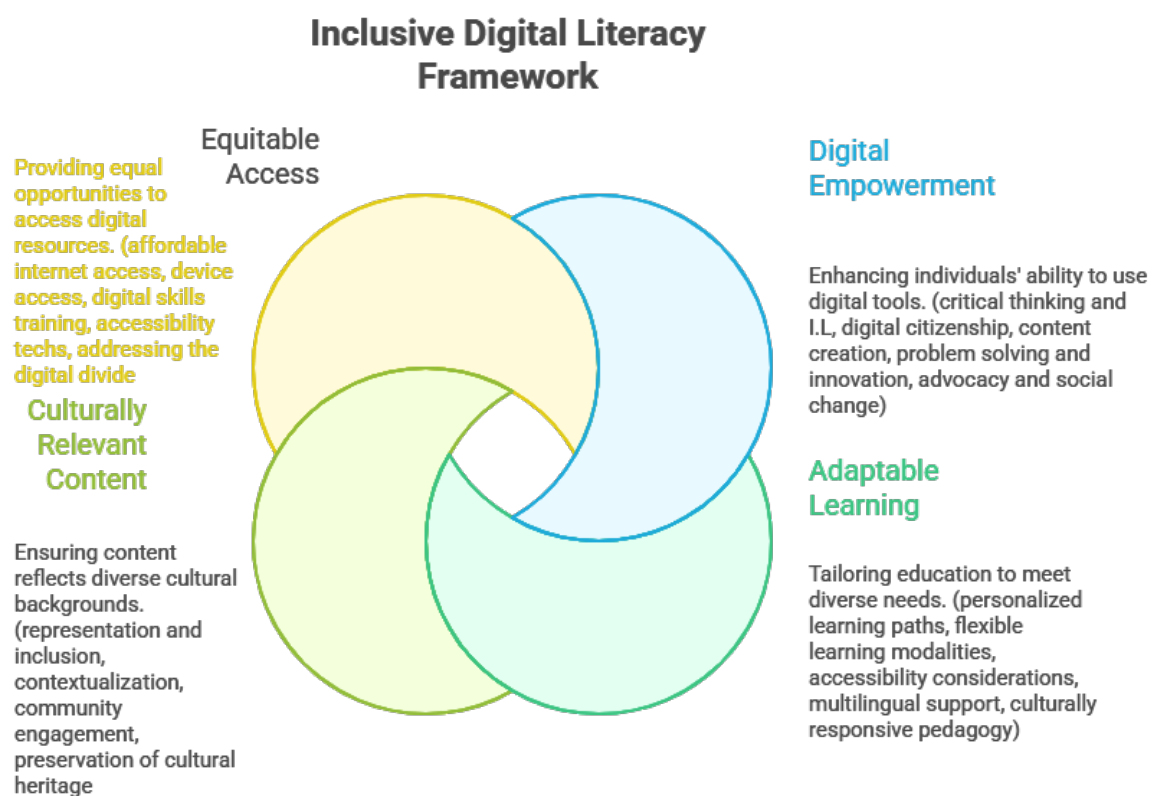
- *Advocating for Policy Changes*

Advocate for policies that support digital equity and access for all. The multifaceted and significant role of digital literacy in fostering economic development necessitates policymakers' attention, as emphasized by Bejaković and Mrnjavac (2020). Policymakers need to implement inclusive, multi-stakeholder strategies with continuous evaluation to meet evolving user needs. This requires national digital literacy strategies, funding, public-private partnerships, and regulatory frameworks, all aimed at bridging the digital divide.

By actively implementing and championing these core strategies, we lay the groundwork for a more inclusive and equitable digital society. This comprehensive approach ensures that every individual, regardless of their background or socioeconomic status, is empowered with the necessary skills and resources to fully participate in and contribute to the digital world. Ultimately, this fosters an environment where innovation flourishes, opportunities are accessible to all, and everyone has the genuine opportunity to thrive and reach their full potential in an increasingly digital future. The outcome is an inclusive framework that entails: digital empowerment, adaptable learning, culturally relevant content and equitable access.

Figure 2:

Components of an inclusive digital literacy framework



Made with Napkin

By focusing on digital empowerment, adaptable learning, culturally relevant content, and equitable access, we can create a more inclusive digital literacy framework that empowers all individuals to thrive in the digital age. This requires a collaborative effort from educators, policymakers, community organizations, and technology providers to ensure that everyone has the opportunity to participate fully in the digital world.

Conclusions

This paper highlights the urgent need for an inclusive digital literacy framework to bridge the digital divide. By analyzing existing barriers (socio-economic, technological, educational, psycho-cultural) and evaluating current digital literacy models, the paper proposes a framework based on digital empowerment, adaptable learning, culturally relevant content, and equitable access. Digital empowerment fosters technical skills, critical thinking, and confidence. Adaptable learning (UDL, flexible delivery) caters to diverse needs, while culturally relevant content enhances engagement. Equitable access to technology, the internet, and affordable training is crucial. Successful implementation requires collaboration among governments, educational institutions, community organizations, and the private sector, with continuous evaluation. This framework aims to create a society where everyone can participate meaningfully in the digital age, promoting equity and socio-economic development.

Acknowledgments

I would like to express my sincere gratitude and acknowledge the invaluable support provided by my institution, Boma International Hospitality College. Their commitment to fostering an environment conducive to learning and growth has been instrumental in the development and completion of this work.

References

- Abiddin, N. Z., Ibrahim, I., & Aziz, S. A. A. (2022). Advocating Digital Literacy: Community-Based Strategies and Approaches. *Academic Journal of Interdisciplinary Studies*, 11(1), 198. <https://doi.org/10.36941/ajis-2022-0018>
- Adeleye, O. O., Eden, C. A., & Adeniyi, I. S. (2024). Educational Technology and the Digital Divide: A Conceptual Framework for Technical Literacy Inclusion. *International Journal of Science and Research Archive*, 12(1), 150–156. <https://doi.org/10.30574/ijrsra.2024.12.1.0405>
- Adewumi, O. O., & Oladele, E. (2023). E-Skills and Digital Literacy: An Investigation Into the Perceived Competencies of Distance Learning Students in the University of Lagos. *Niu HMS*, 8(4), 147–161. <https://doi.org/10.58709/niujhu.v8i4.1739>
- Adni, D. F., Rusadi, S., & Baharuddin, T. (2024). Adaptive Policy in Website-Based Digitization of Government Public Services: A Thematic Analysis. *Journal of Local Government Issues*, 7(1), 54–67. <https://doi.org/10.22219/logos.v7i1.29404>
- Anthonyamy, L., & Sivakumar, P. (2022). A New Digital Literacy Framework to Mitigate Misinformation in Social Media Infodemic. *Global Knowledge Memory and Communication*, 73(6/7), 809–827. <https://doi.org/10.1108/gkmc-06-2022-0142>

- Baxa, J., & Christ, T. (2017). The DigiLit Framework. *The Reading Teacher*, 71(6), 703–714. <https://doi.org/10.1002/trtr.1660>
- Beaunoyer, E., Dupère, S., & Guitton, M. J. (2020). COVID-19 and Digital Inequalities: Reciprocal Impacts and Mitigation Strategies. *Computers in Human Behavior*, 111, 106424. <https://doi.org/10.1016/j.chb.2020.106424>
- Bejaković, P., & Mrnjavac, Ž. (2020). The importance of digital literacy on the labour market. *Employee Relations: The International Journal*, 42(4), 921–932. <https://doi.org/10.1108/ER-07-2019-0274>
- Cain, K., & Coldwell-Neilson, J. (2024). Digital Fluency – A Dynamic Capability Continuum. *Australasian Journal of Educational Technology*. <https://doi.org/10.14742/ajet.8363>
- Correa, T., & Pavez, I. (2016). Digital Inclusion in Rural Areas: A Qualitative Exploration of Challenges Faced by People From Isolated Communities. *Journal of Computer-Mediated Communication*, 21(3), 247–263. <https://doi.org/10.1111/jcc4.12154>
- Hagerman, M. S. (2019). Digital Literacies Learning in Contexts of Development: A Critical Review of Six IDRC-Funded Interventions 2016–2018. *Media and Communication*, 7(2), 115–127. <https://doi.org/10.17645/mac.v7i2.1959>
- Hamburg, I., & Lütgen, G. (2019). Digital Divide, Digital Inclusion and Inclusive Education. *Advances in Social Sciences Research Journal*. <https://doi.org/10.14738/assrj.64.6457>
- Janetzko, D. (2017). Social Bots and Fake News as (Not) Seen From the Viewpoint of Digital Education Frameworks. *Medienpädagogik Zeitschrift Für Theorie Und Praxis Der Medienbildung*, 61–80. <https://doi.org/10.21240/mpaed/00/2017.07.05.x>
- Johansson, M. (2025). *Bridging the Digital Divide: Strategies for Inclusive Digital Transformation* (SSRN Scholarly Paper No. 5078871). Social Science Research Network. <https://doi.org/10.2139/ssrn.5078871>
- Kaeophanuek, S., & Chaisriya, K. (2022). A Conceptual Framework for an Adaptive Tutorial System with Gamification to Enhance Digital Literacy. *International Journal of Interactive Mobile Technologies (IJIM)*, 16(19), Article 19. <https://doi.org/10.3991/ijim.v16i19.32997>
- Kaper, M. S., Winter, A. F. d., Bevilacqua, R., Giammarchi, C., Mccusker, A., Sixsmith, J., Koot, J., & Reijneveld, S. A. (2019). Positive Outcomes of a Comprehensive Health Literacy Communication Training for Health Professionals in Three European Countries: A Multi-Centre Pre-Post Intervention Study. *International Journal of Environmental Research and Public Health*, 16(20), 3923. <https://doi.org/10.3390/ijerph16203923>
- LEE, Y.-., & Fanea-Ivanovici, M. (2023). A Review and Comparative Analysis of Digital Literacy Frameworks – Where Are We Heading and Why? *Theoretical and Practical Research in Economic Fields*, 14(2), 457. [https://doi.org/10.14505/tpref.v14.2\(28\).22](https://doi.org/10.14505/tpref.v14.2(28).22)
- Lin, Z., Yang, L., & Zhang, Z. (2018). To Include, or Not to Include, That Is the Question: Disability Digital Inclusion and Exclusion in China. *New Media & Society*, 20(12), 4436–4452. <https://doi.org/10.1177/1461444818774866>
- Lü, G., Chen, T., & Ding, J. (2023). Research on the Construction of Digital Literacy Framework for Citizens—Comparative Analysis Based on Five

- International Digital Literacy Frameworks. *Frontiers in Educational Research*, 6(30). <https://doi.org/10.25236/fer.2023.063001>
- Lyles, C. R., Wachter, R. M., & Sarkar, U. (2021). Focusing on Digital Health Equity. *Jama*, 326(18), 1795. <https://doi.org/10.1001/jama.2021.18459>
- Marín, V. I., & Castañeda, L. (2022). Developing Digital Literacy for Teaching and Learning. In *Handbook of Open, Distance and Digital Education* (pp. 1–20). Springer, Singapore. https://doi.org/10.1007/978-981-19-0351-9_64-1
- Mega, I. R., Yuanita, Y., Arsisari, A., & Ulfah, W. A. (2022). Learners' Digital Literacy in the Online Learning During Covid-19. *English Review Journal of English Education*, 10(2), 699–706. <https://doi.org/10.25134/erjee.v10i2.6314>
- Munisa, M., Putri, U. N., Sari, W. V., & Fitri, N. A. (2024). DIGITAL LITERACY BASED ON LOCAL WISDOM IN INCLUSIVE EDUCATION. *PIONIR: JURNAL PENDIDIKAN*, 13(1). <https://doi.org/10.22373/pjp.v13i1.22058>
- Nedungadi, P., Menon, R., Gutjahr, G., Erickson, L., & Raman, R. (2018). Towards an inclusive digital literacy framework for digital India. *ResearchGate*, 60(6). <https://doi.org/10.1108/ET-03-2018-0061>
- Purnama, S., Ulfah, M., Machali, I., Wibowo, A., & Narmaditya, B. S. (2021). Does Digital Literacy Influence Students' Online Risk? Evidence From Covid-19. *Heliyon*, 7(6), e07406. <https://doi.org/10.1016/j.heliyon.2021.e07406>
- Rahman, T., Amalia, A., & Aziz, Z. (2021). *From Digital Literacy to Digital Intelligence*. 154–159. <https://doi.org/10.2991/assehr.k.210120.119>
- Sharma, R. S., Malone, L. G., Guan, C., & Dattakumar, A. (2018). A Maturity Model for Digital Literacies and Sustainable Development. In *Encyclopedia of Information Science and Technology* (4th ed., pp. 2280–2291). IGI Global Scientific Publishing. 10.4018/978-1-5225-2255-3.ch198
- Shi, J. (2024). Bridging the Digital Divide in Mental Health: An Innovation Diffusion-Based Framework for Advancing Digital Literacy Among Professionals. *Lecture Notes in Education Psychology and Public Media*, 38(1), 53–65. <https://doi.org/10.54254/2753-7048/38/20240587>
- Solehudin, Rd. H. (2024). The Problematic of Digital Inequality in an Educational Political Policy Perspective. *Edukasia*, 5(1), 531–540. <https://doi.org/10.62775/edukasia.v5i1.763>
- Thompson, K. M., & Paul, A. (2016). "I Am Not Sure How Much It Will Be Helpful for Me": Factors for Digital Inclusion Among Middle-Class Women in India. *The Library Quarterly*, 86(1), 93–106. <https://doi.org/10.1086/684144>
- Tsatsou, P. (2020). Is Digital Inclusion Fighting Disability Stigma? Opportunities, Barriers, and Recommendations. *Disability & Society*, 36(5), 702–729. <https://doi.org/10.1080/09687599.2020.1749563>
- Yang, H., Chen, H., Pan, T., Lin, Y., Zhang, Y., & Chen, H. (2022). Studies on the Digital Inclusion Among Older Adults and the Quality of Life—A Nanjing Example in China. *Frontiers in Public Health*, 10. <https://doi.org/10.3389/fpubh.2022.811959>