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Theoretical perspectives on digital literacy programs: A comparative study of initiatives in Africa and the United States

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Abstract

This review paper analyses digital literacy programs in Africa and the United States, highlighting the theoretical underpinnings and practical implementations across diverse socio-economic, cultural, and technological contexts. Examining key theoretical frameworks—Technological Literacy, Media Literacy, and Information Literacy—explores how these theories inform the design, execution, and evaluation of digital literacy initiatives. The analysis reveals both region-specific challenges and universal opportunities for enhancing digital literacy, emphasizing the need for contextually adapted, inclusive, and sustainable programs. Insights into policy implications and practical recommendations for practitioners are discussed alongside future research directions to deepen understanding and improve the effectiveness of digital literacy programs globally. This paper underscores the pivotal role of digital literacy in empowering individuals and fostering societal development in the digital age.

Keywords: Digital Literacy; Theoretical Frameworks; Comparative Analysis; Africa; United States; Digital Inclusion

1. Introduction

In the 21st century, digital literacy has emerged as a foundational skill integral to navigating the complexities of the modern world. Defined broadly, digital literacy encompasses a range of competencies that enable individuals to access, understand, evaluate, and create information using digital technologies (Belshaw, 2012; Lawless and Schrader, 2014). Its importance transcends mere proficiency in using gadgets and software; it is a crucial enabler of individual empowerment and societal development. In an era where information is abundant and digital platforms are central to communication, education, and business, being digitally literate is synonymous with being equipped to participate fully in society. This participation includes everything from engaging in the digital economy and accessing government services online to contributing to social and political discourses on digital platforms.

The imperative to scrutinize digital literacy programs in diverse contexts, such as Africa and the United States, stems from the acknowledgement of digital literacy's role in levelling playing fields and bridging digital divides. However, the socio-economic, cultural, and technological landscapes of Africa and the United States are markedly different. Africa, with its vast diversity and varying levels of infrastructure, presents a unique set of challenges and opportunities in digital literacy (Choi, Dutz, and Usman, 2020; Datta, Byrd, Okoli, and Mbarika, 2005). Many African nations are grappling with issues such as limited access to digital devices and the internet, alongside efforts to integrate digital literacy into education systems at various levels. Conversely, with its advanced digital infrastructure and widespread technology use, the United States faces equity and inclusion challenges within its digital literacy initiatives, ensuring that all citizens,

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regardless of socio-economic status, have the skills needed for the digital age (Sharma, Fantin, Prabhu, Guan, and Dattakumar, 2016; Thompson, Jaeger, Taylor, Subramaniam, and Bertot, 2014).

Comparing digital literacy programs across these distinct regions offers insights into how different challenges are addressed and how various theoretical perspectives on digital literacy are applied in practice. Such a comparison sheds light on innovative approaches that could be adapted or scaled across contexts, contributing to the global discourse on digital literacy education.

The primary goal of this review is to delve into the theoretical perspectives that underpin digital literacy programs in Africa and the United States. By doing so, it aims to:

- Analyze how different digital literacy theories and models are applied in designing and implementing digital literacy initiatives.
- Identify commonalities and differences in approaches to digital literacy across the two regions, with a focus on how socio-economic, cultural, and technological factors influence these approaches.
- Evaluate the effectiveness of these theoretical frameworks in addressing the specific challenges of digital literacy in each context.

This review will focus on a curated selection of digital literacy initiatives from Africa and the United States, spanning various types such as government-led programs, non-profit initiatives, and community-based projects. The initiatives selected will be those that explicitly reference or can be analyzed through specific theoretical frameworks of digital literacy, such as the Technological Literacy Framework, Media Literacy, and Information Literacy, among others. By examining these initiatives through the lens of these frameworks, the review seeks to provide a nuanced understanding of digital literacy efforts in both regions. It will not cover all possible digital literacy programs but will instead highlight representative examples to draw insights into broader trends and theoretical underpinnings.

2. Theoretical Frameworks for Digital Literacy

Digital literacy has been defined and redefined over the years, reflecting the rapid evolution of technology and its permeation into every facet of life (Marsh, 2005; Thompson et al., 2014). Initially, digital literacy was narrowly construed as the ability to operate computers and navigate the internet. However, as digital technologies have become more sophisticated and integral to personal, educational, and professional domains, the definition of digital literacy has expanded significantly. Today, it encompasses a wide range of skills, including but not limited to understanding and managing digital content, critical thinking and evaluation of digital information, effective communication and collaboration through digital platforms, and creating content with digital tools. This broadened definition underscores the transition from purely technical competencies to more complex cognitive and socio-emotional skills, reflecting the multifaceted nature of engaging with digital environments.

2.1. Core Theories and Models

Several theoretical frameworks and models have been instrumental in shaping our understanding of digital literacy and guiding the development of digital literacy programs:

- Technological Literacy Framework: This framework emphasizes the knowledge and skills needed to use, manage, evaluate, and understand technology. It goes beyond proficiency with tools, advocating for a deeper comprehension of how technology affects society and the individual. The framework suggests that to be technologically literate, one must know how to use technologies and understand their implications (Markauskaite, 2006; Wong and Aspinwall, 2004).
- Media Literacy: Media literacy is closely related to digital literacy, focusing on the ability to access, analyze, evaluate, and create media in various forms. In the digital age, media literacy extends to digital media, encompassing skills necessary to navigate and critically engage with content across digital platforms. It advocates for an informed and critical perspective towards media consumption and production (Lowgren and Reimer, 2013).
- Information Literacy: This concept involves the skills required to locate, evaluate, and use information effectively. In digital literacy, information literacy is crucial for discerning the reliability of digital sources and integrating digital information into knowledge building. It addresses the challenges posed by the abundance of information in the digital age, highlighting the need for critical evaluation and ethical use of information (Anunobi and Udem, 2014; Lau, 2006).

2.2. Application to Digital Literacy Programs

The application of these theoretical frameworks to digital literacy programs involves integrating their core principles into the design, implementation, and evaluation of such initiatives. By doing so, programs can address the multifaceted nature of digital literacy, ensuring that participants acquire technical skills and develop critical thinking, ethical understanding, and creative capacities.

Incorporating elements from these frameworks ensures a holistic approach when designing digital literacy programs. For instance, incorporating media literacy principles can help learners critically assess digital content, while aspects of the technological literacy framework can foster an understanding of the broader implications of technology use. These theories inform the pedagogical strategies and learning activities employed during the implementation phase. For example, information literacy principles can guide the development of activities that enhance learners' research skills and ability to evaluate digital sources. Similarly, incorporating media literacy can encourage learners to analyze and create digital media, fostering a critical and participatory approach to digital content. Evaluating the effectiveness of digital literacy programs involves assessing the acquisition of technical skills and the development of critical, ethical, and creative capacities among participants (Falloon, 2020). Theories such as information literacy provide criteria for evaluating learners' ability to locate and assess information, while media literacy can inform the assessment of learners' critical engagement with digital media (Addy et al., 2024; Kong, 2014; Mhlongo, Daraojimba, Olubusola, Ajayi-Nifise, and Falaiye, 2024; Oguejiofor, Omotosho, et al., 2023).

In diverse contexts, these theoretical frameworks help tailor digital literacy programs to meet different populations' specific needs and challenges. For example, in areas with limited access to technology, the emphasis might be on foundational skills within the technological literacy framework. Conversely, in highly digitized societies, the focus might shift towards advanced media and information literacy skills to navigate digital information and communication complexities.

By grounding digital literacy programs in these theoretical frameworks, educators and program developers can ensure that initiatives are comprehensive, addressing the full spectrum of skills required to navigate the digital world effectively.

3. Comparative Analysis of Digital Literacy in Africa and the United States

3.1. Overview of Digital Literacy Programs

Digital literacy initiatives across Africa often target underserved communities, focusing on bridging the digital divide and empowering individuals with the skills necessary for socio-economic development. Programs like Africa Code Week and Digital Skills Foundation emphasize basic computer skills, coding, and safe internet use (West, Kraut, and Ei Chew, 2019). These initiatives are designed with a clear understanding of the local context, aiming to provide accessible education and training despite varying infrastructure levels and technology access. The goals are often centred around increasing employability, fostering entrepreneurial capabilities, and enabling citizens to participate fully in a digital society (Matli and Ngoepe, 2020; Storte et al., 2019).

In the U.S., digital literacy programs such as EveryoneOn and DigitalLearn.org cater to a wide audience, including low-income families, the elderly, and other digitally marginalized groups (LiteracyLink and Education). These initiatives focus on improving access to digital technologies and the internet and teaching skills ranging from basic computer use to advanced digital competencies necessary for the modern workforce. The objectives align with enhancing educational opportunities, ensuring equitable access to digital resources, and preparing all citizens for a digital economy (Aderibigbe, Ohenhen, Nwaobia, Gidiagba, and Ani, 2023; Ninduwezuor-Ehiobu et al., 2023; Oguejiofor, Uzougbo, Kolade, Raji, and Daraojimba, 2023).

3.2. Theoretical Perspectives in Practice

In Africa, digital literacy programs often incorporate the Technological Literacy Framework elements, focusing on practical skills that enable individuals to use and understand technology in their daily lives and work. Information literacy is also a critical component, especially in programs aimed at educators and students, to facilitate effective research and learning through digital means. However, the application of media literacy is varied, with some programs incorporating critical thinking about digital content, particularly concerning social media use and online safety.

Digital literacy initiatives in the United States frequently employ a comprehensive approach that integrates aspects of all three theoretical frameworks. Media literacy, for example, is prominently featured in programs designed to help

users understand and critically evaluate digital content. Information literacy is emphasized in educational settings, equipping students and adults with the skills to navigate digital information environments effectively. Technological literacy is foundational, with a strong focus on enabling users to interact with various digital tools and platforms (Hobbs, 2010; Silverblatt, Miller, Smith, and Brown, 2014). Both regions recognize the importance of a multifaceted approach to digital literacy, though the emphasis on specific frameworks can differ based on local needs and challenges. African programs may prioritize technological and information literacy to address fundamental access and educational challenges. At the same time, U.S. initiatives often have the luxury of focusing more on media literacy and advanced digital skills due to higher levels of technology penetration and access (Ocholla and Bothma, 2007; Zinn, 2012).

3.3. Challenges and Opportunities

3.3.1. Challenges

In Africa, limited access to digital devices and the internet is a significant barrier to digital literacy. In the U.S., although access is generally higher, disparities exist among rural, low-income, and marginalized communities. Both regions face cultural challenges, including resistance to technology adoption in traditional communities and generational divides in digital skills. Sustainable funding is a concern for digital literacy programs, with initiatives in Africa often relying on international donors and partnerships, while those in the U.S. may depend on government grants and private philanthropy.

3.3.2. Opportunities

The widespread use of mobile phones in Africa presents an opportunity to deliver digital literacy training through mobile-based programs. In the U.S., mobile platforms can also support learning and access to digital resources. Engaging local communities in the design and implementation of digital literacy programs can ensure that initiatives are culturally relevant and effectively meet the needs of target populations. Leveraging innovative technologies such as gamification, virtual reality, and online learning platforms can make digital literacy training more engaging and accessible. Collaborations between governments, NGOs, and the private sector can enhance resource availability and program reach in both regions.

In conclusion, while digital literacy initiatives in Africa and the United States face distinct challenges, there is a shared recognition of the importance of comprehensive digital literacy encompassing technological, information, and media literacy. By learning from each other's experiences and adapting innovative approaches, both regions can enhance the effectiveness of their digital literacy programs, ultimately empowering individuals to thrive in a digital world.

4. Implications for Policy and Practice

4.1. Policy Implications

The comparative analysis of digital literacy initiatives in Africa and the United States yields valuable insights for policymakers in both regions. Understanding the theoretical underpinnings of these programs is crucial for developing effective but also equitable and inclusive policies.

Policies should be grounded in a comprehensive understanding of digital literacy that encompasses technological, media, and information literacy. This approach ensures that digital literacy policies address the full spectrum of skills needed to navigate the digital world. Policymakers should consider how digital literacy intersects with issues of access, education, and economic development, tailoring policies to their populations' specific needs and challenges. Policies must prioritize reducing the digital divide. In Africa, this might involve investments in infrastructure to improve internet access and affordability (Ahmed, 2007; Mutula, 2005, 2008). In the U.S., efforts could focus on ensuring that marginalized and underserved communities can access digital devices and high-speed internet. Policies should aim to remove barriers to digital participation for all citizens, regardless of their socio-economic status, geographic location, or age (Cullen, 2003; Obaigbena, Biu, Majemite, Oliha, and Dada, 2024; Odunaiya, Nwankwo, Okoye, and Scholastica, 2024; Okoli, Obi, Adewusi, and Abrahams, 2024).

Digital literacy should be integrated into national curricula, from primary to tertiary education. This integration requires a policy framework that supports teacher training in digital literacy, developing relevant learning materials, and incorporating digital tools in classrooms. By embedding digital literacy in education, policymakers can lay the foundation for a digitally literate society. Policymakers should encourage collaborations between the government, the private sector, non-profit organizations, and educational institutions to leverage resources, expertise, and networks for

digital literacy initiatives. These partnerships can enhance the scale and impact of digital literacy programs, making them more sustainable over the long term (Millard, 2015).

4.2. Practical Implications

For practitioners involved in designing and implementing digital literacy programs, theoretical insights from the comparative analysis offer guidance on enhancing program effectiveness, inclusivity, and sustainability.

- Design programs that address the comprehensive nature of digital literacy, incorporating elements of technological, media, and information literacy. This holistic approach ensures learners develop a broad range of skills, from basic technical competencies to critical thinking and creative problem-solving in digital contexts.
- Develop program content relevant to the learners' cultural, socio-economic, and technological context. Customizing content to local needs and challenges can increase engagement and ensure that digital literacy training is both practical and impactful.
- Employ pedagogical strategies that prioritize active learning, critical thinking, and problem-solving. Techniques such as project-based learning, peer-to-peer teaching, and real-world applications of digital skills can make learning more engaging and effective.
- Ensure that digital literacy programs are accessible to all, including people with disabilities, non-native language speakers, and those with limited prior exposure to technology. This might involve providing content in multiple languages, using assistive technologies, and designing learning activities that accommodate diverse learning styles and abilities.
- Implement mechanisms for ongoing evaluation of program outcomes and feedback from participants. Use this data to refine and adapt programs over time, ensuring they remain relevant and effective in changing technology landscapes and societal needs.

By considering these policies and practical implications, policymakers and practitioners can work together to advance digital literacy in Africa and the United States, fostering more digitally inclusive societies where everyone can participate fully in the digital age.

5. Conclusions and Future Directions

5.1. Summary of Findings

This comparative analysis of digital literacy programs in Africa and the United States has illuminated the multifaceted nature of digital literacy and the diverse approaches to fostering it across different contexts. Key insights include:

- Theoretical Foundations: Both regions employ a blend of theoretical frameworks—Technological Literacy, Media Literacy, and Information Literacy—though the emphasis varies according to local needs and challenges. In Africa, the focus tends to be on foundational technological and information literacy to address access and basic educational needs. In contrast, the United States, benefiting from higher levels of digital access, emphasizes media literacy and critical engagement with digital content.
- Contextual Adaptations: The implementation of digital literacy programs is deeply influenced by socio-economic, cultural, and technological contexts. This underscores the importance of tailoring initiatives to fit the specific needs of target populations, whether it is bridging significant access gaps in African countries or addressing digital inclusion and advanced literacy skills in the U.S.
- Challenges and Opportunities: Common challenges include disparities in access to technology and the internet, cultural barriers to technology adoption, and securing sustainable funding. However, opportunities exist in leveraging mobile technology, engaging communities in program development, and utilizing innovative educational technologies to enhance learning experiences.

5.2. Future Research Directions

To build on the findings of this comparative analysis, future research could explore several avenues:

- Emerging Theories: Investigate new and emerging theoretical perspectives on digital literacy that may arise as digital technologies evolve. This includes theories that address the increasing integration of artificial intelligence, machine learning, and the Internet of Things (IoT) in everyday life.

- Empirical Studies on Program Outcomes: Conduct empirical studies to assess the outcomes of digital literacy programs, focusing on the long-term impacts on participants' lives, careers, and communities. This could involve longitudinal studies to track changes and identify the most effective practices and frameworks.
- Cross-Cultural Comparative Research: Expand the scope of comparative research to include additional regions and contexts, fostering a more global understanding of digital literacy initiatives. This could help identify universal best practices as well as strategies that are uniquely effective in specific contexts.
- Integration of Digital Literacy Across Disciplines: Explore how digital literacy can be integrated across various educational disciplines and sectors, from formal schooling to informal learning environments, and its role in promoting lifelong learning and adaptability in a rapidly changing digital world.
- Policy Impact Studies: Examine the impact of specific policies on the success and sustainability of digital literacy programs, identifying policy levers that can most effectively support digital literacy initiatives.

By addressing these areas, future research can contribute to a more nuanced understanding of digital literacy and its critical role in empowering individuals and transforming societies. The ultimate goal should be to ensure that digital literacy initiatives are inclusive, effective, and adaptable to the ever-evolving digital landscape, thereby enabling individuals worldwide to participate fully and equitably in the digital age.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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