



Digital Literacy-Responsive Adult Education in Tanzania: A Systematic Literature Review

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Abstract

This systematic literature review examines the integration of digital literacy in adult education in Tanzania. It focuses on peer-reviewed articles, policy documents, reputable organisational publications and official reports published between 2015 and 2025. It used search engines (Google Scholar, PubMed, and Web of Science) for grey literature; databases such as JSTOR, ScienceDirect, Scopus, ERIC, Wiley Online Library, and MDPI; official government and organisational repositories and websites. Searching terms combined keywords and Boolean operators such as "Digital Literacy" and "Tanzania" and ("Adult Education" and "Tanzania") and ("Digital Literacy in Adult Education" or "Digital Literacy-Responsive Adult Education") and ("Digital Literacy-Responsive Adult Education" or "Integration of Digital Literacy-Responsive

Adult Education"). The inclusion criteria included published literature between April 2015 and April 2025; a focus on digital literacy relevant to the Tanzanian context; and discussions of digital literacy on adult education. The exclusion criteria include literature not based on the Tanzanian context; publications without a clear connection to digital literacy and adult education, and publications that are in a non-English language. The findings reveal that Tanzania has made commendable efforts to integrate digital literacy into adult education in terms of curriculum development, policy and strategic frameworks, implementation of initiatives and programmes, training of trainers, partnerships and collaborations, and use of mobile technology. Regardless of such efforts, some research gaps, such as infrastructure and technological access, pedagogical and instructional challenges, policy and strategic planning deficiencies, socio-cultural and psychological barriers, insufficient research on adult learners' needs, and gender

disparities in digital access, are noted regarding integrating digital literacy into adult education. This systematic review concludes that digital literacy in adult education in Tanzania remains underdeveloped, despite growing recognition of its importance in a digital and industrialising economy. Therefore, the policy and future directions for integration of digital literacy into adult education may be based on curriculum integration and framework development, professional development for educators, policy and strategic planning, and addressing the digital divide.

Keywords: *digital literacy, adult education, integration, digital literacy-responsive adult education*

Introduction

Digital literacy has been growing as an essential competency in the 21st century, shaping both educational outcomes and accessibility to socio-economic opportunities (UNESCO, 2018). In other words, digital literacy has emerged as a vital skill for socio-economic development in Tanzania and the world at large. Globally, the research emphasises the importance of digital literacy as a central skill for employability and lifelong learning (UNESCO, 2021). In the African context, digital literacy in adult education is increasingly prioritised in order to facilitate the empowerment of marginalised groups as well as promote digital inclusion (Amisi & Komba, 2022).

In many developing countries, the expansion of digital infrastructure and mobile technologies has opened up new possibilities for adult education (World Bank, 2020). This means that digital literacy is progressively recognised as a fundamental component of adult education. In the Tanzanian context specifically, where a large percentage of the adult population is engaged in informal economic activities and resides in rural areas, adult education provides a crucial platform for digital empowerment (Mwakyusa & Nchimbi, 2022). In other words, digital literacy is increasingly recognised as a vital skill, especially for adults who often face barriers in accessing digital technologies and education in Tanzania (Mwakyusa & Kibwana, 2021). Adult education that is integrated with digital literacy is vigorous to bridge the digital divide, while enhancing employability as well as fostering lifelong learning in the Tanzanian context (Moshi, 2021).

It is recently underscored that digital literacy is a critical enabler for adult learners to engage in economic activities, access information, and participate fully in society (Mwakyusa & Nchimbi, 2022). Adult learners with digital skills demonstrate

improved literacy and numeracy outcomes and greater social inclusion (Moshi & John, 2024). The integration of digital literacy into adult education supports national development goals, including those outlined in Tanzania's Development Vision 2025 and the Sustainable Development Goals (SDGs) (UNESCO, 2021). Specifically, the integration support Tanzania's Development Vision 2025 key goals such as high-quality education and training that meets the changing demands of the global and digital economy; a well-educated and learning society through access to knowledge and lifelong learning to all Tanzanians; good governance and the rule of law which encourages civic participation using support of digital literacy; and a strong and competitive economy that enhances productivity by using digital technologies. On the other hand, the SDGs that are relevant and supported by digital literacy in adult education are Goal 4 (quality education) which ensures inclusive and equitable quality education through promotion of lifelong learning opportunities for all; Goal 8 (decent work and economic growth) which insists on sustainable and inclusive economic growth and productive employment; Goal 9 (industry, innovation and infrastructure) which address resilient infrastructure, inclusive and sustainable industrialization and innovation; Goal 10 (reduced inequalities) which empowers marginalized groups via accessibility to digital skills; and Goal 17 (partnerships for the goals) which strengthen global partnerships and capacity building using even technology and education. As Tanzania advances its digital infrastructure under the national development agenda, integrating digital literacy into adult education programmes is essential to bridge the digital divide and foster inclusive growth (Kihombo et al., 2023).

The concept of digital literacy extends beyond basic computer skills to encompass critical thinking, problem-solving, and effective communication in digital environments (Chacha & Mwita, 2022). For adult learners, digital literacy responsiveness in education requires curricula, pedagogy, and learning environments tailored to their specific needs and contexts, including linguistic, cultural, and socio-economic factors (Nkya & Saidi, 2020). Alternatively, the digital literacy in the context of adult education refers to the ability to access, understand, evaluate, create, and communicate information using digital technologies (Eshet-Alkalai, 2004). It encompasses technical skills, critical thinking, and the capacity for lifelong learning (Martin, 2006). In the Tanzanian context, digital literacy is often linked to broader goals of poverty reduction, gender equality, and economic development (Ministry of Education, Science and Technology-Tanzania, 2020). Given Tanzania's diverse population and varying

levels of access to technology, responsive adult education is critical for enhancing participation and learning outcomes (Kasuga et al., 2024).

In Tanzania, the Government's Digital Tanzania initiative aims to enhance digital skills among citizens, including adults, to support socio-economic development (Tanzania Ministry of Education, 2022). Specifically, Tanzania has made notable progress in expanding ICT access, particularly through mobile phone penetration and government-led digital transformation policies such as the National ICT Policy (2016). Despite these efforts, gaps remain in delivering digital literacy that responds to the contextual needs of adult learners, particularly in rural and underserved areas (Mushi & Katunzi, 2021). In addition, the digital inequality persists, especially among rural adults, women, and marginalised communities (IICD, 2015). The adult education systems often face challenges such as outdated curricula, a lack of trained educators, and limited access to digital devices, hindering effective digital literacy integration (Ngowi et al., 2023). The responsiveness of adult education programmes to digital literacy demands remains under-researched and unevenly implemented (Mtega & Malekani, 2019). To date, there is no clearly established conclusion on the status of the integration of digital literacy in adult education in Tanzania. It is only a small percentage of adult learners in Tanzania who possess functional digital literacy skills, with wide disparities based on location, age, and educational background (Mgendi, 2021).

Moreover, there is a growing recognition of digital literacy in Tanzania as an essential tool for socio-economic development. However, the integration of digital literacy into adult education in Tanzania between 2015 and 2025 has remained limited, uneven, and inadequately supported (MoEST, 2016; URT, 2020). The national frameworks, such as Education and Training Policy (2014), Tanzania's Development Vision 2025 and others, emphasise lifelong learning and ICT adoption; however, the actual implementation in adult education settings remains slow and fragmented (MoEST, 2016; URT, 2020). As stated earlier, many adult learners in rural areas have little access to digital tools, skilled facilitators, or localised digital content, something which deepens the digital divide (UNESCO, 2021). Although the Tanzania National Digital Education Strategy 2024/25–2029/30 sets ambitious goals for enhancing digital skills among adults, these initiatives began only in late 2024, leaving a critical implementation gap in the preceding years (MoEST, 2024). These unattended problems provoke imperative questions about critical issues in integrating digital literacy into adult education between 2015 and 2025.

Therefore, this review systematically examines 10 years of literature (2015–2025) on digital literacy-responsive adult education in Tanzania. It specifically focuses on the extent to which digital literacy is integrated into adult education in Tanzania; notable research gaps on the integration of digital literacy into adult education in Tanzania; policy and future directions on the integration of digital literacy into adult education in Tanzania. Generally, there has been a knowledge gap on the integration of digital literacy into adult education in Tanzania for the past 10 years.

Conducting the study on establishing the status of integrating digital literacy into adult education in Tanzania for the past 10 years is essential for various reasons. It specifically gives the general realities of digital literacy in adult education in Tanzania in the period between 2015 and 2025. It likewise reveals the research gaps that have existed for the past 10 years regarding digital literacy-responsive adult education in Tanzania. It finally gives the way forward in terms of theoretical and policy implications concerning digital literacy-responsive adult education in Tanzania.

Methodology

This systematic literature review study was conducted across search engines and academic databases. Specifically, the study used Google Scholar, PubMed, and Web of Science as search engines for grey literature. These search engines were selected due to their credibility (Gusenbauer & Haddaway, 2020). Furthermore, this systematic literature review used databases such as JSTOR, ScienceDirect, Scopus, ERIC, Wiley Online Library, and MDPI; official government and organisational repositories and websites. The databases were used because they provide rigorous evidence and relevant studies, which eventually led to the review's outcome, validity, and explanatory power. They provided accessibility to the evidence with varying levels of precision, recall, and reproducibility regarding digital literacy-responsive adult education in Tanzania between the period of April 2015 and April 2025.

Searching terms combined keywords and Boolean operators such as "Digital Literacy" and "Tanzania" and ("Adult Education" and "Tanzania") and ("Digital Literacy in Adult Education" or "Digital Literacy-Responsive Adult Education") ("Adult Education" or "Lifelong Learning") and ("Digital Literacy-Responsive Adult Education" or "Integration of Digital Literacy-Responsive Adult Education". The search terms were used to refine the search to identify the most relevant literature, retrieve targeted and efficient literature, and focus on the specific topic

“digital literacy responsive-adult education” and the relationship between digital literacy and adult education. Generally, the combined keywords and Boolean operators increased precision, comprehensive searching, efficiency, and time saving.

The inclusion criteria included published literature (peer-reviewed articles, reports, and policy documents) between April 2015 and April 2025; focus on digital literacy relevant to the Tanzanian context; and discussions of digital literacy on adult education. The exclusion criteria include literature not based on the Tanzanian context; publications without a clear connection to digital literacy and adult education; and publications that are in a non-English language. After screening, 50 relevant publications were analysed. Specifically, the screening remained with 29(58%) peer-reviewed articles, 12(24%) reports, and 9(18%) policy documents). Therefore, this systematic literature review draws its findings from 35 publications of the period between 2015 and 2025 in Tanzania.

Findings and Discussion

The findings and discussion of this review are based on the specific objectives of the study. The objectives include investigating integration of digital literacy into adult education in Tanzania between the period of April 2015 and April 2025; investigating research gaps on the integrated digital literacy into adult education in Tanzania between the period of April 2015 and April 2025; and analysing policy and future directions for integration of digital literacy into adult education in Tanzania between the period of April 2015 and April 2025.

Integration of Digital Literacy into Adult Education

The period from 2015 to 2025 has experienced praiseworthy efforts by Tanzania to integrate digital literacy into adult education. The integration of digital literacy into adult education in Tanzania for the past 10 years (April 2015 and April 2025) is notable in different areas:

Curriculum review and development

Between 2015 and 2025, Tanzania made deliberate efforts to modernise adult education by weaving digital technologies into curriculum review and delivery. National frameworks such as the National ICT Policy (2016), the Education Sector Development Plan (MoEST, 2018), and the more recent National Digital Education Strategy (2024/25–2029/30) (MoEST, 2024) created the foundation for this shift. Building on these, the Institute of Adult Education introduced ICT courses, set up

e-learning systems, and experimented with blended assessments (IAE, 2025). At the same time, the Tanzania Commission for Universities established guidelines to safeguard the quality of online and distance learning (TCU, 2024), while broader initiatives like the Digital Tanzania Project (World Bank, 2021) and the AI in Education Guidelines of 2025 (MoEST, 2025) supported the use of digital tools in teaching and learning. Although challenges such as poor connectivity, limited digital pedagogy among instructors, and exclusion of some learners remain (Sanga, 2023; Massawe & Mushi, 2025), adult education today places far greater emphasis on digital literacy and lifelong learning skills, showing that technology has become an essential part of its curriculum reform journey.

Policy and strategic frameworks

Between 2015 and 2025, Tanzania has made significant strides in integrating digital literacy into adult education through various initiatives of policy and strategic frameworks. The National Adult Literacy and Mass Education Rolling Strategy (NALMERS) 2020/2021–2024/25 underscores the importance of incorporating digital skills into adult learning programmes, aiming at enhancing personal, social, economic, and political development (URT, 2020). The key components of the NALMERS are the development of accessible, quality programmes, capacity building, and promotion of research and innovation.

Additionally, the 2023 edition of the Education and Training Policy emphasises the development of digital literacy to align with the nation's goal of transforming into an industrial economy by 2025 (Ministry of Education, Science and Technology, 2024). For example, the government allocated Tsh 18 billion to purchase ICT equipment for schools in 2023 (The Citizen, Thursday, December 19, 2024). Accordingly, approximately 17,700 desktops and 10,384 laptops were distributed to primary schools, while secondary schools received over 31,000 desktops and 10,000 laptops. This initiative aims to enhance digital literacy among students and teachers, facilitating a transition towards a digitally enabled education system. In Addition, over 3,000 secondary school teachers underwent ICT training in two phases to equip them with the skills necessary to integrate technology into their teaching practices. This capacity-building effort is crucial for fostering a digitally literate teaching workforce capable of supporting the nation's industrial transformation.

Another notable move in policy and framework is the Tanzania Digital Economy Strategic Framework (2024–2034). The Ministry of Information, Communication, and Information Technology (MICIT) has outlined a strategic framework to

promote digital literacy across various demographics. These include youth and adults' digital skills enhancement which aimed for 60% of youth and adults to attain basic digital skills by June 2029; integration of digital literacy in education by incorporating digital literacy courses into primary, secondary, and tertiary education curricula; and establishment of digital institutions which aimed at creating ICT colleges, digital technology institutes, and innovation centers to provide digital skills training.

Furthermore, the Draft National Digital Education Strategy (2024–2030) is another achieved policy and strategic framework. This draft strategy, developed by the Ministry of Education, Science and Technology, focuses on integrating ICT into education to reduce the digital divide and improve learning outcomes. These outcomes comprise of infrastructure and access which aims at enhancing digital connectivity in educational institutions, especially in underserved rural areas; affordable digital tools aiming at promoting the use of affordable internet, digital devices, and secure educational platforms; and stakeholder collaboration which perform by engaging public and private sectors, civil society, and academia in the implementation of the strategy.

Community Learning Centres (CLCs) and EdTech Initiatives are another achieved policy and strategic framework. Organisations like DVV International have been instrumental in establishing Community Learning Centres (CLCs) in districts such as Kibaha, Kongwa, Kisarawe, and Mpwapwa. These centres serve as hubs for non-formal adult education, offering digital literacy programmes that are accessible to the local population. Additionally, EdTech companies like ShuleYetu Innovations Limited and Mtabe have developed digital platforms to enhance learning; particularly ShuleYetu Innovations Limited which provides a digital school management system that integrates various school operations, improving efficiency and accessibility; and Mtabe which offers offline access to educational content via SMS, ensuring that students in areas with limited internet connectivity can still access learning materials.

The recent move in Tanzania is the establishment of the National Digital Education Strategy of 2024. In relation to Tanzania, the policy considers integration of digital literacy into adult education in various ways: Inclusion and accessibility for adults whereas the strategy sets a national target of ensuring at least 60% of youth and adults acquiring digital proficiency by 2029 (Ministry of Education, Science and Technology 2024); integrating digital literacy into Adult and Non-Formal Education programmes and Community Learning Centres (DVV International &

MOEST, 2024); curriculum reform and tailored content whereas educational materials are being developed in multimedia formats and tailored for low-bandwidth and offline environments including adult learners in rural areas (Tanzania Institute of Education, 2024). In addition, the policy has shed the light on Professional Development for adult educators whereas teachers and facilitators involved in adult education receive ICT training and pedagogical support to deliver digital literacy; cross-sectoral applications in which digital literacy training is linked to other sectors; and supportive infrastructure and partnerships initiatives like SmartWASOMI through which internet accessibility and devices are extended underserved communities using collaboration with civil society, NGOs, and development partners is (SmartWASOMI Report, 2024; Tanzania Institute of Education, 2024; UNESCO, 2024)

Implementation initiatives and programmes

Several programmes have been instrumental in promoting digital literacy among adults. The Integrated Community-Based Adult Education (ICBAE) programme, operational across 25 regions of mainland Tanzania, focuses on providing basic education, vocational skills, and life skills using a learner-centred approach (DVV International, 2023). Within community-based adult education (ICBAE), digital technologies have been explicitly integrated alongside literacy, numeracy, vocational, health, and civic education since around 2015, reflecting a holistic functional literacy model that includes digital competence (Kahurananga & Heinze, 2023).

Adult learners in distance-learning contexts (e.g., Kisarawe District ODL programmes) report enhanced access and engagement via ICT tools (smartphones, laptops, software), although proper infrastructure and training remain lacking (Juma & Mwila, 2024). Similarly, TET (technical and vocational education and training) students exhibit solid operational (cognition, invention, presentation) and collaboration skills, but digital, poor analytical, evaluative, creative, and ethical/legal awareness capabilities (Raphael & Kipene, 2024). Organisations like Powering Potential have introduced solar-powered computer labs in rural schools, enhancing access to digital resources and training.

Training of trainers

Capacity-building workshops for adult educators have been initiated to equip them with the necessary ICT skills (World Bank, 2023). In August 2023, DVV International conducted a three-week Training of Trainers in Kibaha District,

training 160 community facilitators (District Adult Education Officers and DAEOs as ToTs), covering four wards across Dodoma and Coast regions. These ToTs were equipped to use the REFLECT (Regenerated Freirean Literacy through Empowering Community Techniques) methodology and Participatory Rural Appraisal (PRA) tools to integrate functional literacy and numeracy into real community activities like soap-making, vegetable vending, and motorcycle transport. Upon completion, the facilitators cascaded the training, benefiting over 50 adult learner groups and embedding digital concepts. For example, using mobile devices for record keeping in daily livelihoods.

Another initiative is Powering Potential's SPARC/SPARC+ Training (2017–2022), according to Powering Potential (2018). Between 2017 and 2022, Powering Potential implemented its SPARC and SPARC+ (Society for the Promotion of Area Resource Centres) programmes in remote secondary schools, including Ngorongoro and Zanzibar. ToTs (local teachers) were trained in solar-powered Raspberry Pi labs preloaded with offline digital libraries (RACHEL, Khan Academy, Kolibri). This included teacher workshops on basic coding, digital lesson design, and managing Raspberry Pi environments. As a ripple effect, 34 schools benefited, with over 3,000 Tanzanian teachers/students completing the ICT curriculum and more than 1,000 secondary-level ICT certifications.

Besides, there have been TEHAMIKA's (ICT) Community and Women-Focused ToTs (2015–2025). Since its inception, TEHAMIKA has been a major force in Tanzania's digital literacy scene: delivered modular training across 25+ regions, training 1,000+ graduates, including many rural educators and volunteers; emphasis placed on empowering 100+ women via volunteer and outreach ToTs who then train in their local villages with high practical uptake and 80% employment success; and continual development (2015–2025) of ToT materials such as internet basics, digital tools for entrepreneurs, and inclusive ICT for marginalized adults (TEHAMIKA, 2018).

African Girls Can Code ("Binti Dijitali", 2018–2025), from 2018, UN Women (with Tanzania's Ministries of Education & ICT and ITU) ran the "Binti Dijitali" coding camps (UN Women, 2025). Accordingly, ToTs, mostly university students and young professionals, were trained in digital literacy and coding fundamentals; and in 2023, the Dar es Salaam camp (two weeks) enabled ToTs to mentor young women like Annagrace and Flora in building real-world projects (robots, smart energy systems). These ToTs now lead digital clubs in Arusha, Manyara, Tanga, and Kilimanjaro, amplifying reach across tens of secondary schools.

Also, the NIAGARA Grant-University Library ToTs (2023), whereby in March 2023, the NIAGARA project delivered digital competence training to adult educators in Tanzanian higher-education libraries (NIAGARA Project, 2023; eLearning Africa, 2025). Through this, ToTs (librarians and faculty) received training in digital tools like online databases, information literacy, and combating misinformation. They subsequently rolled out short professional workshops for adult learners in universities, reinforcing the use of open educational resources (OER), hybrid learning, and digital civic engagement. Another initiative was eLearning Africa 2025–Pre-Conference ToT Workshops whereby at eLearning Africa 2025 (May 7–9 in Dar es Salaam), several pre-conference workshops functioned as high-impact ToTs: sessions like “ICT Competency Framework for Teachers”, “From e-tivity to m-tivity (mobile learning design)”, and “Developing Data Fluency for Student Success” catered to trainers in adult education equipping them with digital pedagogies. Attendees, many of whom train adult learners, left empowered to integrate blended learning, mobile platforms, and data-informed teaching into local programmes.

Partnerships and collaborations

Collaborations with tech companies and international NGOs have facilitated resource mobilisation and technical support (GSMA, 2021). According to the UNESCO Institute for Lifelong Learning (UIL 2019), efforts to integrate digital literacy into adult education have been piloted by NGOs and international development agencies, such as UNESCO and the Swedish International Development Agency (SIDA). Powering Potential & Potential Enhancement Foundation, in which, in 2015, U.S.-based Powering Potential launched Tanzania’s SPARC initiative, installing solar-powered Raspberry Pi computer labs in rural secondary schools. Supported by the Raspberry Pi Foundation, Segal Family Foundation, the Tanzanian Rural Energy Agency, and later the Ministry of Education, they provided offline digital libraries (e.g., Khan Academy, Scratch) alongside hands-on teacher and student training. By 2016, Powering Potential established the local Potential Enhancement Foundation, empowering Tanzanians to install and maintain labs and deliver training. The impact of this partnership is over 103 installations, 34,000+ users, and a 58 % employment success rate through ICT skills.

UCSAF & She Codes for Change–Girls in ICT Day, whereby starting in 2016, Universal Communication Access Funds (UCSAF) and local NGO She Codes for Change launched Tanzania’s “Girls in ICT Day”. They provide 3-day coding and

app-pitch training to secondary-school girls and teachers nationwide. To date, ~428 girls and 32 teachers have participated, gaining critical technical and entrepreneurial skills. UN Women & Ministries – African Girls Can Code Initiative (“Binti Dijitali”), from 2018 to 2021, UN Women, in partnership with Tanzanian Ministries (Gender, ICT, and Education), the AU Commission, and ITU, rolled out “Binti Dijitali” coding camps for women aged 17–25. Over 600 participants from 32 countries received training, including 100 Tanzanians. Phase 2 (2023–2025), supported by Belgium, reached over 1,000 girls through intensive digital bootcamps.

Another effort was the UNESCO-Alwaleed Grants–Digital Literacy in TVET (2024), in which, in October 2024, UNESCO Dar es Salaam selected five community projects under the Alwaleed Philanthropies grant. One, Mwanyanya Green Society in Unguja, which focuses on integrating digital literacy into early-learning pedagogies and teacher training to support TVET development. Additionally, YAPO operates in Dar es Salaam and Dodoma, offering youth digital and arts training. UNESCO–UNFPA–UN Women Joint Programme (2019–2023), in which, since 2019, this multi-agency programme, backed by KOICA, has distributed smartphones to 400 adolescent girls and young women in rural districts like Ngorongoro. Training included online communication, information-seeking, privacy awareness, and ethical use of IT.

Use of mobile technology

Given the high mobile phone penetration, mobile learning (m-learning) platforms are being used to deliver digital literacy content (ITU, 2022). The United Republic of Tanzania, National ICT Policy (2016) indicates that Tanzania has made notable progress in expanding ICT access, particularly through mobile phone penetration and government-led digital transformation policies, including the National ICT Policy (2016). Best practices observed in digital literacy programmes include community-based ICT centres, mobile learning units, and public-private partnerships that provide subsidised access to devices and training (GIZ, 2019). Mobile learning (mLearning) using SMS and WhatsApp-based instruction has shown promise in reaching adult learners in remote areas (Kibona & Mgaya, 2020).

Research Gaps on the Integrated Digital Literacy into Adult Education

According to the UNESCO Institute for Lifelong Learning (UIL) (2019), efforts to integrate digital literacy into adult education have been piloted by NGOs and international development agencies, such as UNESCO and the Swedish

International Development Agency (SIDA). These programmes often combine face-to-face teaching with ICT tools like mobile phones, tablets, and radio-based learning (SIDA Evaluation Report, 2018). However, the scalability of such programmes remains limited due to infrastructure challenges, especially in rural regions (Mwalongo, 2020).

Studies highlight that when digital tools are introduced into adult education in culturally and contextually appropriate ways, learner engagement, confidence, and socio-economic participation improve significantly. However, there is a gap in systemic government-supported initiatives that embed digital literacy as a core part of adult education curricula (Twaakyondo, 2018). Some of these gaps registered as follows:

Infrastructure and technological access

Limited access to digital devices and reliable internet connectivity remains a significant barrier. In rural areas like Kisarawe District, adult learners face challenges such as inadequate infrastructure, high technology costs, and insufficient digital literacy skills, which impede the optimal ICT use in distance learning programmes (Senkoro, 2020).

Pedagogical and instructional challenges

Many adult educators lack adequate training in digital pedagogy, affecting their ability to effectively integrate technology into teaching. This deficiency leads to suboptimal learning experiences and outcomes for adult learners (Pimmer et al., 2016).

Policy and strategic planning deficiencies

The absence of comprehensive policies and strategic plans for digital literacy in adult education contributes to inconsistent implementation and a lack of direction in integrating ICT into educational practices (Mtebe & Raphael, 2017).

Socio-cultural and psychological barriers

Adult learners often encounter psychosocial barriers such as fear of technology, low self-efficacy, and lack of motivation, which hinder their engagement with digital learning tools (Sualehi, 2023). These barriers are particularly pronounced among older adults, women, and individuals from rural communities.

Gender disparities in digital access

Gender disparities in digital access and skills further exacerbate the digital divide. In Tanzania, a significant gap exists between male and female access to mobile internet, with only 17% of women having access compared to 35% of men, limiting women's opportunities for digital learning (UNESCO, 2021).

Insufficient research on adult learners' needs

There is a lack of targeted research focusing on the specific digital literacy needs and challenges faced by adult learners in Tanzania. This gap impedes the development of tailored interventions and programmes that address the unique requirements of this demographic (Mtebe & Raphael, 2017).

Policy and Future Directions for Integration of Digital Literacy into Adult Education

This section highlights the policy and future directions aimed at improving learning outcomes and empowering adults to thrive in an increasingly digital society. In so doing, some important directions are presented as follows:

Curriculum integration and framework development

Developing comprehensive digital literacy curricula aligned with established frameworks is crucial. For instance, the DigComp 2.2 framework outlines five key competence areas: information/data literacy, communication/collaboration, digital content creation, safety, and problem-solving (Vuorikari et al., 2022). Integrating these competencies into adult education programmes ensures a structured approach to digital literacy development.

Inclusive and accessible learning environments

Creating learning environments that accommodate the diverse needs of adult learners is essential. A study on digital literacy programmes for older adults emphasises the importance of personalised instruction, hands-on engagement, and the use of accessible technology tools to foster confidence and competence among learners (Gruben et al., 2025). Such approaches can be particularly effective in addressing the needs of marginalised groups.

Professional development for educators

Equipping educators with the necessary skills to teach digital literacy is vital. Research indicates that teacher training in digital and information literacy positively impacts teaching–learning processes in adult education (Gisbert et al., 2022). Implementing continuous professional development programmes can

enhance educators' ability to effectively integrate digital tools into their teaching practices.

Policy and strategic planning

Establishing clear policies and strategic plans is fundamental for the successful integration of digital literacy into adult education. In Tanzania, the National Adult Literacy and Mass Education Rolling Strategy (2020/2021–2024/25) outlines goals and objectives to improve adult literacy levels, including the incorporation of digital skills (Ministry of Education, Science and Technology, 2020). Such policies provide a roadmap for implementing digital literacy initiatives.

Addressing the digital divide

Implementing digital literacy training programmes that specifically target marginalised populations can help bridge the digital divide. A systematic literature review on digital literacy training programmes for marginalised groups highlights the importance of tailored interventions that consider the unique challenges faced by these populations (Bansal & Choudhary, 2019). These programmes should focus on providing access to technology, developing relevant content, and offering support services to ensure effective learning outcomes.

Conclusion, Theoretical and Policy Implications

This section submits conclusions, theoretical and policy implications, following the systematic review of the study at hand. It specifically gives the general realities of digital literacy in adult education in Tanzania in the period between 2015 and 2025. It likewise gives the way forward in terms of theoretical and empirical implications.

Conclusion

The systematic review reveals that digital literacy in adult education in Tanzania remains underdeveloped, despite growing recognition of its importance in a digital and industrialising economy. While several policies with reference to ICT and digital competencies are notable, actual integration into adult education remains fragmented, underfunded, and often urban-centric. Generally, there are key conclusions of this review. There is a mismatch between policy intentions and implementation in digital literacy for adult learners. Adult educators lack adequate digital pedagogical training, which limits the effectiveness of digital learning interventions. Marginalised populations (e.g., women, rural adults, older adults) face additional barriers such as limited access to devices, the internet, and digital

support. Locally contextualised digital content is minimal, reducing engagement and relevance for learners. There is a critical lack of empirical studies and impact evaluations on digital literacy programmes for adult education in Tanzania.

Theoretical Implications

The first theoretical implication is adult learning theory and transformative learning. This systematic review supports the idea that digital literacy enables adults to critically reflect on their lives and engage in lifelong learning. However, without support structures, transformation is stunted. The second theoretical implication is digital inclusion frameworks. The findings align with digital inclusion theories that emphasise access, skills, and meaningful use. Many adult education programmes in Tanzania only address access, neglecting skills and meaningful engagement. The third theoretical implication is socio-technical systems theory. The review illustrates how digital tools alone are insufficient: socio-cultural readiness, teacher support systems, and policy frameworks are all necessary for integration to succeed.

Policy Implications

The first policy implication is the integration of digital literacy into national adult education curricula. It insists on developing a standardised national curriculum that incorporates the DigComp 2.2 framework or a locally adapted equivalent to embed digital competencies systematically. The second one is investing in infrastructure and internet access for adult learning centres. Plan to target rural and underserved areas to reduce the digital divide, including the provision of solar-powered digital learning hubs. The third policy implication is professional development for adult educators. This calls for the launch of national digital literacy capacity-building programmes for adult education facilitators, focusing on digital pedagogy and content development. Another implication is inclusive, gender-sensitive policies which imply designing policies that address digital exclusion among women and rural learners, including subsidies for devices, digital safety training, and gender-responsive learning environments. Finally, monitoring and evaluating digital literacy programmes are insisted. Establish robust M&E mechanisms for tracking the effectiveness and inclusivity of digital literacy initiatives in adult education.

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