



## Non-Formal Education in Promoting Technological Literacy and Lifelong Learning among Adults

### Abstract

As digital technology permeates almost every aspect of life, the "Digital Divide" has shifted from a matter of physical access to a challenge of skills and confidence. This paper looks at how Non-Formal Education (NFE) plays a key part in promoting tech literacy and a culture of lifelong learning among adults. While formal education systems often struggle with rigid curricula and slow adaptation to tech shifts, NFE offers a flexible, learner-centred alternative that works for adults who learn in their own way. Using Andragogy as a framework, this study analysed how NFE environments help overcome tech anxiety, replacing it with learning on demand that emphasised practical, immediate use. The paper explored key concepts, including digital tools and the shift toward a gap in digital skills (what some call the Digital Divide), through a qualitative review of recent global trends.

Findings suggested tech literacy works best when instruction is situated within the learner's daily life and supported by peers or mentors. The study concluded that for digital inclusion to be sustainable, policy-makers must move beyond providing hardware and invest in the non-formal sector as a primary engine for continuous adult development. Recommendations included integrating NFE into national education frameworks and promoting intergenerational "tech champion" programs to ensure no adult is left behind.

**Keywords:** Non-Formal Education, Technological Literacy, Lifelong Learning, Andragogy, Digital Divide, Adult Education

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### Introduction

In a fast-changing digital world, being able to navigate technology is essential for getting ahead in life; it is not just a professional advantage. Many adults went through formal education

decades ago, but it didn't prepare them for cloud computing, AI, or even basic digital banking. That is where Non-Formal Education (NFE) comes in-it's flexible and fills a big gap. Unlike traditional schooling which often has a

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fixed approach, NFE meets adults where they are, focusing on the skills they need now.

NFE is flexible and that is its biggest strength. Formal institutions often struggle to update their curricula as fast as technology changes, but NFE programmes- from community workshops to online groups, can adapt quickly to new trends (Rogers, 2014). This agility helps adults become tech-savvy, which is about using digital tools to solve real problems and access information. For adults, this is all about learning throughout life- a continuous, voluntary pursuit (Field, 2006). But a big challenge remains. Many adults, especially in rural or marginalised communities, face a tough time: they lack hardware and feel uncomfortable using technology (Van Dijk, 2020).

Traditional education can feel intimidating or irrelevant to their daily struggles. NFE takes away the classroom fear factor, replacing grades and exams with hands-on experiences. By grounding technology teaching in the learner's life; using Andragogy - NFE turns technology into a tool for empowerment (Knowles et al., 2015). This paper argues that technology literacy needs to be nurtured through NFE as a lifelong habit, not just something you finish at university . By looking at community-based learning and digital fluency, a society can be built where every adult has the tools to participate in the digital age.

## Conceptual Clarifications

### Non-Formal Education (NFE)

If formal education is a structured path you follow (Primary → Secondary → University), NFE is more like a

flexible network that connects people. It's any organised, intentional learning activity outside traditional school (Coombs & Ahmed, 1974). NFE is unique because it puts people first. It doesn't bother with prerequisites or tests; it cares about what the learner needs now. For an adult, this could be a weekend workshop on digital marketing at a local library or a community group teaching older folks how to use government e-services. It's structured with clear goals but flexible enough to fit the participants' pace and context (Rogers, 2014).

### Lifelong Learning

We often think of education as something you finish, but Lifelong Learning says it is ongoing, voluntary and driven by you (Field, 2006). In the digital age, lifelong learning is not just a nice-to-have, it's a must. Technology changes fast, so adults need to keep learning. This puts the focus on the individual, not the institution, and says every stage of life is a chance to pick up a new skill (Jarvis, 2007).

### Technology

Technology means using human knowledge to solve real problems (Arthur, 2009). For an adult learner, technology is about getting things done in the modern world. It is the bridge between a problem and a solution. Understanding technology means getting the logic behind the tools we use; that is the start of digital independence.

### Digital Tools

Technology is the big idea, Digital Tools are the actual things we use like smartphones, laptops, apps, websites. For many adults, these tools can feel

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alien. NFE helps by making them less scary, turning a smartphone into a handy tool or an app into a helpful assistant. These tools are how we use technology in everyday life (Van Dijk, 2020).

### Literature Review

The academic conversation around non-formal education (NFE) has shifted from seeing it as a second-class option to recognising it as key to surviving in a technology-driven world. For decades, the "Digital Divide" was all about physical access; who had a computer and who didn't. But now, scholars like Jan van Dijk (2020) and UNESCO (2023) say we are dealing with a "Second-Level Digital Divide". This gap is about skills, how you use technology, and why you bother. Even when adults get the tools, they often stay "digitally excluded" if they do not know how to use them for things that matter, like getting e-health services or spotting online misinformation

Hamim Islam (2024) notes that formal education is often too stuck in its ways to bridge this gap, but NFE programs are flexible enough to help adults navigate this fast-changing digital world. A big theme in research is the mental block adults hit when facing new technology. Knud Illeris (2007) talked about "non-learning", where adults subconsciously reject stuff that feels scary or too academic.

Many adults have "educational scars" from school, so NFE is a chance to fix that. Research in Khulna (2024) and Nigeria (Somieari-Pepple, 2023) shows NFE takes away the fear. By ditching exams for peer support and hands-on stuff, NFE builds what Albert Bandura (1997) called Self-Efficacy- the learner's

belief they can master the technology. Without this, technology lessons don't stick. Also, traditional education is often "just-in-case", making students learn stuff they might need someday. But adults are different. Stephen Brookfield (1986) and Malcolm Knowles (1980) said adults are "problem-centred" and want to learn what they need now.

Current research says technology sticks best when it's tied to real life. A 2025 study on Adult Education and Sustainable Development (Gogaram, 2026) found adults in rural areas picked up digital skills faster when they could use them straight away, like checking weather forecasts or selling goods online. This fits with Andragogy: adults learn best when it's useful now. Finally, researchers like Peter Jarvis (2007) and John Field (2006) see NFE as central to Lifelong Learning, not a stop-gap. In a world where technology changes every 18 months, "finishing school" is a myth. UNESCO's 2025 International Literacy Day Factsheet says while literacy is improving, digital illiteracy among adults is a big problem for the global economy. Research points to NFE as the way forward (UNESCO, 2023).

### Methodology

This study takes a qualitative approach, using secondary sources to look at how non-formal education helps adults become digitally literate and lifelong learners. The research involves a systematic review and analysis of existing writing on non-formal education initiatives, digital literacy programmes, and strategies for lifelong learning in adult education. The data collection involved a thorough review of secondary sources, including academic journals, reports from government

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agencies and NGOs, and case studies on non-formal education programmes for adults. These sources gave insights into how digital literacy initiatives and lifelong learning programmes are designed, implemented, and what they achieve.

The data were analysed thematically, pulling out key themes and patterns about non-formal education's role in boosting digital literacy and promoting lifelong learning among adults. The analysis focused on finding relevant information that shows the impact, challenges, and opportunities of non-formal education in this area.

### Findings and Discussion

Based on our theoretical analysis and review of existing research, several critical points come up about how non-formal education (NFE) helps adults become tech-savvy.

#### Findings

**The "Play" Factor as a Bridge:** One of the biggest findings is that NFE lets adults experiment with technology without the fear of messing up; something that is often punished in formal schooling. By dropping grades and hierarchies, NFE lets adults learn by trying things out, which is how they really master technology.

**Contextual Relevance Over Curriculum:** Unlike formal education with its fixed syllabus, NFE is tailored to fit. Adults pick up digital skills faster when they are taught stuff they need right now, like a trader learning digital accounts or a parent learning to video-call their kid abroad.

**The Power of Social Capital:** Adults getting tech-savvy is not usually a solo

thing. It is social. NFE programmes that use peer mentors work better because they build a support network that lasts.

#### Discussion

These points suggest we need to rethink "schooling". For adults, formal classrooms are often too rigid and slow for today's fast-changing technology. NFE is not just a backup for those who missed out; it's the best fit for lifelong learning. By following Andragogy, NFE treats adults like experts in their own lives, making technology a tool they control. But there is a big challenge: Funding and Recognition. NFE is often underfunded compared to universities. To bridge the digital divide, community centres and mobile learning need to be seen as just as important as traditional institutions.

#### Conclusion

Technology is moving fast, and one-time education is not enough anymore. Non-Formal Education (NFE) is the best way to keep adults digitally literate and included. NFE is low-pressure and relevant, so it works for adults. Technology literacy is a journey, not a destination with a diploma. If we rely only on formal institutions, millions will get left behind. Strengthening NFE creates a society where learning is a natural, lifelong thing.

#### Recommendations

**Policy Integration:** Governments should fit NFE into education plans, giving community digital literacy programmes stable funding.

**Modular "Micro-Learning":** Break digital literacy into small, practical bits adults can do at their own pace.

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Incentivise Peer-Mentoring: Create "Tech Champion" programmes where locals are trained to help others with technology.

Intergenerational Initiatives: Get youth to help out in NFE centres, mixing ages and sharing skills.

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