EMPOWERING ADULT LEARNERS THROUGH DIGITAL LITERACY FOR INCLUSIVE PARTICIPATION IN THE DIGITAL AGE IN ANAMBRA STATE

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Abstract
This study investigated how adult learners in Anambra State, Nigeria, can be empowered through digital literacy for inclusive participation in the digital age. The study addressed three research questions and tested two hypotheses using a concurrent triangulation research design. The study population comprised 8,320 adult learners enrolled in literacy programmes. A multistage sampling technique was used to select 382 adult learners for the quantitative phase, while five participants were purposively selected for the focus group interviews. Data were collected using a structured questionnaire and a focus group interview guide. The reliability of the questionnaire was established using the Cronbach Alpha method, yielding a coefficient of 0.76. Qualitative data were analysed using thematic analysis, while quantitative data were analysed using mean and standard deviation. The independent samples t-test was used to test the hypotheses at the 0.05 level of significance. The study revealed that adult learners can be empowered through digital initiatives such as digital entrepreneurship, online learning, and improved online safety awareness. Skills in social media marketing, digital payments, e-commerce management, and content creation equip learners for success in the digital economy. Lifelong learning is enhanced through access to online learning platforms, guided course selection, and digital certification, while awareness of online safety, privacy, and ethical digital behaviour promotes responsible engagement in the digital environment. The study concluded that these components collectively enhance economic inclusion, digital adaptability, and active participation in the evolving digital landscape. It recommended the integration of hands-on digital entrepreneurship training into adult education programmes, supported by practical tools, mentorship, and success stories to inspire and empower learners. The study contributes to the field of Adult and Continuing Education by providing empirical evidence that targeted digital literacy initiatives enhance the digital competence, economic participation, and lifelong learning opportunities of adult learners.

Keywords: Adult learners, digital age, e-learning, digital entrepreneurship

Introduction

The early decades of the twenty first century have brought changes to the ways individuals live, work, and interact that would have been difficult to imagine a generation ago. Much of this transformation can be traced to the expanding presence of digital technologies across nearly every domain of human activity. What has come to be described as the Fourth Industrial Revolution, or 4IR, refers to a convergence of developments in artificial intelligence, robotics, the Internet of Things, and data analytics. These technologies, it is often argued, are gradually dissolving the boundaries that once separated physical, digital, and biological spheres (Asa et al., 2025).

As these technologies continue to evolve, scholars have begun to speak of a transition toward what is termed the Fifth Industrial Revolution (5IR). This emerging phase is characterised by a more human centred approach, one in which digital innovations are intended

to augment human capabilities rather than replace them, to foster sustainable development, and to create economic and social opportunities that are more inclusive than those of the preceding era. In this context, digital tools have moved from the margins to the centre of everyday life. They are no longer specialised instruments used only by particular professions but have become integral to the routines of work, learning, and social connection.

In education, these technological shifts have been particularly transformative. Traditional models of instruction, which tended to emphasise the one way transmission of knowledge from teacher to learner, are gradually giving way to approaches that are more learner centred and digitally mediated. Technologies such as augmented reality, virtual reality, and online learning platforms now make it possible to study from almost anywhere, at almost any time. Learning has become more flexible, more virtual, and more global in its reach. For adult learners, this means opportunities to acquire knowledge and skills that are directly relevant to the digital era, often while balancing work and family responsibilities (Oyebamiji & Ezeala, 2024; Okeke, 2024). Communication has undergone similar changes. Social media, video conferencing, and collaborative digital tools allow individuals to maintain contact across great distances. At the same time, they require the development of new competencies in digital collaboration and responsible online interaction, skills that are increasingly essential for participation in digitally enabled workplaces and communities.

The economic implications of these developments are equally significant. Routine tasks that once provided stable employment are increasingly automated, while higher order cognitive, technological, and social abilities are rewarded (Asa et al., 2025). In this environment, digital literacy has ceased to be a specialist skill and has become something closer to a fundamental requirement for full participation in society. It enables individuals to access healthcare information, manage their finances, understand and exercise their rights, and engage in civic and economic life. Perhaps more importantly for the present study, digital literacy equips adult learners with the competencies needed to thrive in the digital economy. These include the ability to engage in digital entrepreneurship, to manage e-commerce activities, to make use of online marketing strategies, and to create professional digital content (Asa et al., 2025; Kiran, 2024).

One way to understand the significance of digital literacy is to consider its effects on access to information and knowledge production. The proliferation of digital technologies has dramatically reduced what might be called informational friction, the effort required to locate and obtain knowledge. Yet this very abundance of information brings its own difficulties. The sheer volume of material available, not all of it reliable, means that the ability to evaluate sources critically and to synthesize credible information has become essential (Kiran, 2024).

At the same time, the ways in which knowledge is created and shared are increasingly participatory. There is growing emphasis on constructivist and connectivist approaches, in which learners actively contribute to knowledge networks rather than merely consuming content produced by others (Oyebamiji & Ezeala, 2024). Taken together, these developments suggest that digital literacy is not merely a technical competency but a gateway to autonomy, opportunity, and inclusive participation. It also serve as a protection against the risks of social and economic marginalization in societies that are increasingly organized around digital systems.

These considerations have particular relevance for adult learners. Within the context of adult and continuing education, digital literacy is bound up with questions of empowerment. The concept of empowerment, as it applies to adult education, refers to the process through which individuals strengthen their capacity to think critically, to solve problems, to create, and to participate constructively in the settings where they live and work (Jimoyiannis, 2015). Digital literacy

contributes to this process in several ways. It enhances access to information, supports effective communication, develops problem solving abilities, and fosters confidence in using technological tools (Oyebamiji & Ezeala, 2024; Asa et al., 2025). Adults who become digitally literate are better able to locate and evaluate information, to connect with others through social media and professional platforms, and to address practical challenges using digital resources. They also tend to experience less anxiety when confronted with new technologies, which may enable more autonomous and effective engagement in learning and work contexts relevant to digital age opportunities (Brooks, 2024).

There is also a social dimension to this process. Digital literacy initiatives have the potential to reach groups that might otherwise be excluded from the benefits of digital transformation. The elderly, the unemployed, and those with low incomes are among the populations that can be supported through targeted programmes (Asa et al., 2025). In this sense, digital literacy is not only about individual advancement but also about creating conditions for more equitable participation in learning societies. It helps ensure that adult learners can partake in the economic, social, and technological dimensions of the digital age, rather than being left behind by changes they did not shape and may not fully understand. Turning to the economic realm, the importance of digital skills becomes even more apparent. The emergence of what is termed the digital economy emphasises digital entrepreneurship, cross border commerce, and innovative value creation. Adults who acquire competencies in areas such as social media marketing, e-commerce management, digital payments, content creation, and professional communication platforms like Slack, Microsoft Teams, and LinkedIn are positioned to engage effectively in these new economic spaces (Brooks, 2024; Kiran, 2024). Without such skills, individuals are at greater risk of being confined to insecure and poorly compensated work. With them, they may be better positioned to exercise autonomy, to innovate, and to participate meaningfully in the digital economy.

Given the pace at which technology continues to evolve, it is unlikely that skills acquired at one point in time will remain sufficient indefinitely. This reality has made lifelong learning a strategic necessity. Thus, adults must be able to update their knowledge and abilities continuously if they are to remain competitive in the labour market and connected to the social world. This goes to show that digital platforms have an important role to play in this regard. Massive Open Online Courses, online training programmes, certification courses, and blended learning systems all offer ways for learners to overcome geographical and temporal constraints. They enable self-directed study while also providing structured pathways for skill development (Okeke, 2024). Through such mechanisms, adult learners can cultivate what has been described as a growth mindset, approaching technological change not as a threat but as a source of opportunity.

Yet skill acquisition, however important, is not the whole of what digital literacy entails. Responsible engagement with digital environments is equally essential. This includes awareness of online safety, understanding of privacy protection, and commitment to ethical conduct. Adults need to be able to evaluate information critically, to avoid harmful behaviours such as cyberbullying, to respect the intellectual property of others, and to attend to their own digital well-being (Kiran, 2024). These competencies contribute to the formation of informed digital citizens who can participate in the digital society in ways that are not only effective but also safe, ethical, and socially constructive. Despite growing recognition of digital literacy's importance, significant barriers remain. In many developing regions, adult learners continue to face limited access to digital infrastructure, insufficient training opportunities, and low awareness of what

digital tools can offer. These challenges are evident in contexts such as Anambra State, where the present study is situated. It is against this backdrop that the need arises for empirical investigation into how digital literacy can empower adult learners in Anambra State for inclusive and effective participation in the digital age, and what forms of support might enable them to do so.

Purpose of the study

The general purpose of this study is to explore how digital literacy can empower adult learners in Anambra State to participate inclusively and effectively in the opportunities presented by the digital age. Specifically, the study seeks to:

1. Investigate how digital literacy empowers adult learners in Anambra State for meaningful and inclusive participation in the digital age.
2. Identify the digital skills and initiatives that equip adult learners in Anambra State for success in the digital economy.
3. Examine strategies that promote responsible digital engagement among adult learners in Anambra State

Research Questions

In line with the specific objectives, the following research questions are raised to guide the study:

1. How does digital literacy empower adult learners in Anambra State for meaningful and inclusive participation in the digital age?
2. What digital skills and initiatives equip adult learners in Anambra State for success in the digital economy?
3. What strategies promote responsible digital engagement among adult learners in Anambra State?

Hypothesis

The following hypotheses were stated and tested at 5 % level of significance:

Ho_1: There is no significant difference in the mean rating of male and female adult learners on how digital literacy empower adult learners in Anambra State for meaningful and inclusive participation in the digital age

Ho_2: There is no significant difference in the mean rating of male and female adult learners on how digital skills and initiatives equip adult learners in Anambra State for success in the digital economy

Methods

The study adopted a concurrent triangulation research design. This research strategy was chosen for this study because it allowed the researcher to acquire direct information from the field and to integrate quantitative and qualitative techniques, allowing for triangulation. A study design that allows for triangulation, according to Cohen, Manion, and Morrison (2000), has a higher likelihood of boosting the credibility and validity of research findings. This study was carried out in Anambra State, Nigeria. Eight thousand three hundred and twenty (8320) adult learners consisting of 2457 male adult learners and 5863 female adult learners, make up the population of the study. The sample size for the study was determined using the Taro Yamane (1967) sample size determination formula, which is expressed as:

$$n = \frac{N}{1+(Ne^{\wedge}2)};$$

where n represents the sample size, N is the population size, and e is the level of precision (0.05). Using the population of 8,320 adult learners, the formula produced a sample size of 382 respondents, which was considered adequate for the study. The study adopted a multistage

sampling technique. In the first stage, the 21 Local Government Areas in Anambra State were included in the study. In the second stage, two adult literacy centres were randomly selected from each LGA. In the third stage, the sample size of 382 respondents was proportionally distributed across the LGAs based on the population of adult learners. Furthermore, proportional allocation was applied to ensure gender representation.

For male adult learners: $n_{male} = \frac{2457}{8320} \times 382 = 112.82 \approx 113$

For female adult learners: $n_{female} = \frac{5863}{8320} \times 382 = 269.18 \approx 269$

This resulted in 113 male respondents and 269 female respondents, reflecting their proportions in the study population. Finally, the respondents were selected from the sampled literacy centres using simple random sampling. A sampling frame containing the registration numbers of all adult learners in each selected centre was obtained from the centre coordinators. Each eligible learner was assigned a unique identification number, and the required number of respondents from each centre was selected through a simple random procedure without replacement (A computer-generated random numbers was used as the random device). This ensured that every adult learner in the selected centres had an equal and independent chance of being included in the study.

A structured questionnaire was used for data collection. The questionnaire comprise of two sections: I and II. The respondents personal information was supplied in Section I, while the objectives and research questions were divided into three clusters in Section II. Responses to the questionnaire items were based on a four-point Likert type rating scale, with Strongly Agree (SA) (4 points), Agree (A) (3 points), Disagree (D) (2 points), and Strongly Disagree (SD) (1 point). The instrument was face validated by three experts two from Adult Education Department and one from science Education unit all from the University of Nigeria, Nsukka. To ensure the reliability of the instruments, a pilot study was carried out using 30 respondents in Enugu State, Nigeria. Data obtained from the pilot study was subjected through Cronbach alpha analysis to determine the internal consistency of the instrument. The internal consistency of the instrument was determined for clusters A, B and C comprising of 21 items in all. A reliability coefficient of 0.83 was determined for the 21 items. This suggested that the instrument demonstrated extremely high dependability. Before the distribution and collection of the questionnaire, permission to administer the questionnaire at the various centers were obtained from the Head of Departments of literacy centers. A written informed consent to conduct the study and duration of the survey was also given. This way, respondents avail themselves for the study. The researcher and one research assistant distributed and collected the questionnaire from the respondents at their respective adult literacy centers in Enugu State. The researcher assistant was briefed on the modalities for distributing and collecting the questionnaire from the respondents on the spot. This ensured that the questionnaires were appropriately completed by the respondents. As result of this, all the questionnaire there was a 100% return of the questionnaire, and they were duly used for data analysis. For the qualitative data, Focus Group Discussion (FGDs) interview guide was used. Quantitative data generated were analysed using mean and standard deviation while independent sample t-test analysis was used to test the hypothesis at 0.05 level of significance. Any item with mean value that is greater than or equal to 2.50 was considered as accepted while items with mean values less than 2.50 were considered as rejected. Null hypothesis was rejected if the p- value is less than 0.05, while it was upheld if p-value is greater than 0.05. For the qualitative data analysis, all the transcribed data were imported into Micro-soft word for data cleaning and subsequently imported into QDA Miner Lite for thematic analysis.

Results

Research Question 1: How does digital literacy empower adult learners in Anambra State for meaningful and inclusive participation in the digital age?

Table 1: Mean with standard deviation responses of the respondents on how does digital literacy empower adult learners in Anambra State for meaningful and inclusive participation in the digital age

Sn	Item Statements	$\bar{X}$	SD	Decision
1	Digital literacy helps adult learners access information needed for personal and economic development.	2.63	0.89	Agreed
2	Digital literacy enables adult learners to communicate effectively using online platforms.	3.09	1.14	Agreed
3	Digital literacy enhances adult learners' ability to participate actively in modern technological environments.	2.64	0.86	Agreed
4	Learning digital skills increases adult learners' confidence in using digital technologies.	3.11	0.97	Agreed
5	Digital literacy helps adult learners adapt to technological changes in society.	2.76	0.88	Agreed
6	Digital literacy promotes the inclusion of adult learners in digital and economic activities.	3.17	1.04	Agreed
7	Digital literacy empowers adult learners to solve problems using digital tools and resources.	2.78	0.79	Agreed
	Grand Result	2.88	0.94	Agreed

Note: $\bar{X}$=Mean, SD=Standard Deviation, N = Number of Respondents= 382

The results presented in Table 1 reflect respondents' perceptions regarding the role of digital literacy in empowering adult learners in Anambra State for meaningful and inclusive participation in the digital age. Specifically, respondents acknowledged that digital literacy helps adult learners access information needed for personal and economic development. This shows that acquiring digital skills enables learners to seek relevant knowledge online, enhancing their ability to make informed decisions and participate effectively in economic activities. The data further revealed that respondents perceive digital literacy as enhancing communication through online platforms. This indicates that adult learners are able to interact, collaborate, and share information efficiently in digital spaces, which is crucial for participation in contemporary socio-economic environments. Additionally, participants agreed that digital literacy enhances the ability to participate actively in modern technological environments and increases confidence in using digital tools. These findings imply that digital skills not only provide access to technology but also build self-efficacy, motivating learners to engage more fully with digital platforms and innovations. The respondents also highlighted the role of digital literacy in promoting adaptability to technological changes and inclusion in digital and economic activities. This underscores the importance of digital competencies in enabling adult learners to keep pace with evolving technologies and participate in broader economic and social networks. Finally, participants agreed that digital literacy empowers adult learners to solve problems using digital tools, reflecting its contribution to practical problem-solving, innovation, and independent learning.

Hypothesis 1: There is no significant difference in the mean rating of male and female adult learners on how digital literacy empower adult learners in Anambra State for meaningful and inclusive participation in the digital age

Table 2: t-test analysis of difference in respondents' responses on how digital literacy empower adult learners in Anambra State for meaningful and inclusive participation in the digital age

Respondents	N	$\bar{X}$	SD	t-cal	Df	p-value	Decision
Males	113	2.71	0.89	3.15	380	0.00	Sig.
Females	269	3.05	0.99				

$\bar{X}$ = Mean; SD = Standard Deviation; t-cal = t- calculated value; N = Number of respondents for each category; df = Degrees of freedom; Sig = Significant at 0.05 level.

This hypothesis was tested using an independent samples t-test to compare the responses of male and female adult learners regarding how digital literacy empowers them for meaningful and inclusive participation in the digital age. The analysis revealed a significant difference between the mean responses of males ($\bar{X}$ = 2.71, SD = 0.89) and females ($\bar{X}$ = 3.05, SD = 0.99), t-cal(380) = 3.15, p = 0.00, at the 0.05 level of significance. Based on this result, the null hypothesis was rejected, indicating that male and female respondents' perceptions of the empowerment provided by digital literacy differ significantly, with females perceiving a higher level of digital empowerment than their male counterparts.

Research question 2: What digital skills and initiatives equip adult learners in Anambra State for success in the digital economy?

Table 3: Mean responses of respondents on the digital skills and initiatives that equip adult learners in Anambra State for success in the digital economy

sn	Item Statements	$\bar{X}$	SD	Decision
1	Training in social media marketing helps adult learners promote businesses online.	2.77	0.78	Agreed
2	Knowledge of digital payment systems enables adult learners to conduct online transactions easily.	3.23	0.91	Agreed
3	Skills in e-commerce management help adult learners participate in online business activities.	2.78	0.74	Agreed
4	Learning content creation skills enables adult learners to generate income through digital platforms.	3.32	0.87	Agreed
5	Access to digital entrepreneurship training prepares adult learners for opportunities in the digital economy.	2.88	0.71	Agreed
6	Digital skills training helps adult learners become self-employed in the digital economy.	3.11	1.01	Agreed
	Grand Result	3.02	0.84	Agreed

Note: $\bar{X}$=Mean, SD=Standard Deviation, N = Number of Respondents= 382

The results in Table 3 indicate that respondents generally agreed that digital skills and initiatives equip adult learners in Anambra State for success in the digital economy ($\bar{X}$ > 2.50). The findings suggest that training in social media marketing, knowledge of digital payment systems, e-commerce management skills, content creation, and access to digital entrepreneurship training collectively enhance adult learners' ability to participate effectively in online business activities. Respondents also perceived digital skills training as a key enabler for self-employment and income generation through digital platforms. Although the adoption of these digital skills

was largely viewed positively, the results also imply that the full benefits of digital initiatives may depend on learners' consistent engagement and access to supportive technological infrastructure.

Hypothesis 2: There is no significant difference in the mean rating of male and female adult learners on the digital skills and initiatives equip adult learners in Anambra State for success in the digital economy

Table 4: t-test analysis of difference in respondents' responses on the digital skills and initiatives equip adult learners in Anambra State for success in the digital economy

Respondents	N	$\bar{X}$	SD	t-cal	Df	p-value	Decision
Males	113	2.64	1.02	7.31	380	0.00	Sig.
Females	269	3.40	0.66				

$\bar{X}$ = Mean; SD = Standard Deviation; t-cal = t- calculated value; N = Number of respondents for each category; df = Degrees of freedom; Sig = Significant at 0.05 level.

An independent samples t-test was conducted to determine the difference in respondents' responses on how digital skills and initiatives equip adult learners in Anambra State for success in the digital economy. The results showed a significant difference between the mean responses of males ($\bar{X}$ = *2.64, SD = 1.02*) and females ($\bar{X}$ = *3.40, SD = 0.66*), *t-cal(380)* = 7.31, p = 0.00, at the 0.05 level of significance. Consequently, the null hypothesis was rejected, suggesting that male and female respondents differ significantly in their perceptions of how digital skills and initiatives prepare adult learners for success in the digital economy, with female respondents perceiving greater benefits.

Research question 3: What strategies promote responsible digital engagement among adult learners in Anambra State?

Table 5: Mean responses of the respondents on the strategies that promote responsible digital engagement among adult learners in Anambra State

sn	Item Statements	$\bar{X}$	SD	Decision
1	Access to online learning platforms encourages adult learners to continue learning throughout life.	2.60	0.89	Agreed
2	Guidance on selecting appropriate online courses helps adult learners improve their digital knowledge.	2.87	0.97	Agreed
3	Digital certification programmes motivate adult learners to acquire more digital skills.	2.68	1.02	Agreed
4	Awareness of online safety helps adult learners avoid digital fraud and cyber threats.	3.00	0.79	Agreed
5	Knowledge of privacy protection enables adult learners to safeguard their personal information online.	2.56	0.98	Agreed
6	Training on ethical digital behaviour encourages responsible use of digital technologies.	2.95	0.91	Agreed
7	Digital literacy programmes encourage adult learners to participate responsibly in online communities.	2.88	0.89	Agreed
8	Continuous digital training helps adult learners remain relevant in the evolving digital world.	2.65	0.94	Agreed
	Grand Result	2.77	0.92	Agreed

Note: $\bar{X}$=Mean, SD=Standard Deviation, N = Number of Respondents= 382

The results in Table 5 provide insights into the strategies that promote responsible digital engagement among adult learners in Anambra State. The analysis of results, shows that all the listed strategies were positively perceived by the respondents as strategies that promotes lifelong learning and responsible digital engagement among adult learners ($\bar{X}$ > 2.50). Thus, respondents agreed that access to online learning platforms encourages adult learners to continue learning throughout life, while guidance on selecting appropriate online courses significantly helps adult learners improve their digital knowledge. The findings further reveal that digital certification programmes motivate adult learners to acquire more digital skills, and awareness of online safety enables them to avoid digital fraud and cyber threats. Additionally, knowledge of privacy protection was seen as important for safeguarding personal information online, while training on ethical digital behaviour encourages responsible use of digital technologies. Respondents also agreed that digital literacy programmes foster responsible participation in online communities, and that continuous digital training helps adult learners remain relevant in the evolving digital world.

Discussion of Findings

This study found that digital literacy plays a significant role in empowering adults who are pursuing learning. Specifically, it strengthen the capacity of adult learners to find and use information, communicate with others, work through problems, and engage meaningfully in settings shaped by technology. One way to interpret this is that such skills provides them with resources for directing their own learning, making informed choices, and taking part in economic and social life. Thornton et al. (2024) reported similar finding, observing that those who are digitally literate tend to be more capable of locating, assessing, and applying digital information to address practical challenges. In a related research, Thompson et al. (2024) found that individuals with these skills are often better equipped to manage tasks such as accessing health information, handling personal finances online, and navigating everyday digital services. The findings also resonate with those of Asa et al. (2025), who described problem-solving as a higher-order competency. In their view, this involves not merely using digital tools but selecting appropriate technologies to respond to complex situations and generate original solutions. Beyond access to information, there is evidence that digital literacy contributes to how adults communicate and take part in digital spaces. Those who develop such skills appear more able to collaborate with others, exchange knowledge, and sustain social ties through various platforms. This observation is consistent with the work of Asa et al. (2025), who noted that digital literacy encompasses more than basic operational ability. It includes, in their account, the capacity to use professional platforms such as Slack, Microsoft Teams, and LinkedIn for advanced communication and cooperative work. Thompson et al. (2024) similarly stressed that competence in digital communication is increasingly necessary for maintaining social connections and for participating fully in contemporary life.

Another dimension that emerged from the study, concerns the psychological and social effects of acquiring digital skills. Adult learners surveyed, reported that learning to use digital tools had strengthened their confidence and helped them adjust more readily to technological shifts. This aligns with Brooks (2024), who found that structured digital training programmes tend to improve both actual competence and self-assessed ability. Asa et al. (2025) further added that digital literacy encourages what might be called a growth mindset a disposition that enables individuals to adapt more quickly to unfamiliar systems and evolving digital contexts. In this sense, the benefits are not only practical but also attitudinal, affecting how learners approach

change. This was vividly illustrated during the focus group discussions, where a 45-year-old female trader shared: "*Before this program, my phone was just for calls and texts. I was scared of 'browsing' because I thought I would make a mistake and lose all my money. Now, learning has changed my mind. I use WhatsApp to talk to my suppliers and even search for market prices in Onitsha. The biggest change is my confidence. When my children talk about things online, I can join the conversation. I don't feel like I'm living in a different world from them anymore. It makes me feel like I am part of this new time, not just watching it pass me by.*" This testimony underscores how digital literacy fosters not only practical skills but also a profound sense of inclusion and self-efficacy, bridging generational and social gaps.

Digital literacy may also play a part in reducing forms of exclusion. By helping individuals overcome barriers related to access or familiarity, it can enable greater participation in economic and social life. This supports the argument put forward by Thompson et al. (2024), who emphasised that well-designed digital literacy initiatives are essential for addressing inequality and ensuring that marginalised groups are not left behind in an increasingly digital society. When examined more closely, the connection between digital skills and economic participation becomes particularly clear. Respondents in the study indicated that practical abilities such as using social media for marketing, managing digital payments, running e-commerce activities, and creating content had equipped them to take part in online business, generate income, and contribute productively to the digital economy. These observations suggest that digital literacy is not solely about technical proficiency. It can also open pathways to economic activity and employment. Asa et al. (2025), for instance, reported that digital marketing skills enable individuals to promote businesses online, develop new business models, and enhance productivity within organisations. The same authors also noted that digital literacy supports entrepreneurship by allowing individuals to make use of online platforms for commercial purposes. A 38-year-old male fashion designer who participated in the FGDs provided a concrete example of this economic empowerment: "*I knew how to sew, but my business was just for people in my street. The training on social media marketing was the key that opened the door. I learned how to take better pictures of my work and post them on Instagram and Facebook. Now, I get orders from people in Awka and even Asaba. I also learned about digital transfers, so my customers can pay me directly. It is not just about knowing a skill anymore; it is about using these digital tools to show your skill to the whole world. That is how you succeed today*." This narrative directly illustrates how digital skills can transform a local enterprise into a broader economic venture, confirming the quantitative findings on the importance of social media marketing and digital payments.

Content creation and familiarity with digital payment systems appear to be especially relevant in this context. Respondents frequently mentioned that learning to produce content had created opportunities to earn money, while knowledge of digital payments made it possible to carry out transactions securely and efficiently. Asa et al. (2025) described professional content creation as a skill that has become nearly indispensable across many sectors. Similarly, Thompson et al. (2024) observed that understanding digital financial tools improves an individual's ability to manage money and engage in online economic activities.

There is also evidence that digital skills training can foster self-employment and entrepreneurship. When adults are given access to relevant training, they may acquire the practical knowledge needed to create work for themselves. This is illustrated by programmes documented by the International Training Centre of the International Labour Organization (ITC ILO, 2020). One such initiative, "Digitalizadas", focused on empowering rural women through

training in digital entrepreneurship. Other examples include "Refugeeks" and "The Last Mile", both of which have shown that intensive digital training can help disadvantaged groups move into self-employment or professional roles within the technology sector. These cases point to the broader potential of digital skills development as a means of promoting economic inclusion and improving employability. In considering how best to support adult learners, the study also examined strategies that encourage lifelong learning and responsible digital engagement. Among the approaches identified were access to online learning platforms, guidance in selecting appropriate courses, digital certification programmes, and training in online safety, privacy protection, and ethical behaviour. Respondents indicated that these measures helped them continue learning and participate more responsibly in digital environments. This finding echoes the work of Okeke (2024), who highlighted the importance of online platforms in expanding educational access and supporting flexible learning. Brooks (2024) similarly reported that blended learning models those combining online and face-to-face instruction tend to improve engagement and help learners retain what they have learned.

The role of certification and structured learning pathways also emerged as significant. Digital certificates and guided routes through educational content appear to motivate learners by allowing them to demonstrate their skills to potential employers. Asa et al. (2025) commented on the growing relevance of micro-credentials and digital badges in this regard, noting that they offer a way to validate specific competencies in the labour market. Thornton et al. (2024) and Okeke (2024) further stressed that educators have an important part to play in offering direction and individual support, ensuring that adult learners are not left to navigate digital learning environments entirely on their own. This motivational aspect was highlighted by a 52-year-old retired teacher during the FGDs, who stated: "*What helped me most was learning how to learn online safely. At first, I was clicking every link I saw. But the session on online safety and privacy was an eye-opener. Now I know to check if a website is real before I enter my details, and I am careful about what I post. Also, getting a small certificate after our digital literacy class gave me a real sense of achievement. It made me want to sign up for another online course on my own, just to feel that pride again.*" Her experience demonstrates how a combination of safety awareness and formal recognition can spark the motivation for self-directed, lifelong learning.

Equally important is the need for learners to understand the risks associated with digital participation. Awareness of online safety, data privacy, and ethical conduct emerged as a key theme. Participants recognised the importance of being able to identify threats such as cyber fraud and of managing personal information responsibly. Asa et al. (2025) identified digital safety as a core competency, encompassing the ability to recognise phishing attempts, secure networks, and protect sensitive data. Kiran (2024) made a related point, emphasising that individuals must take an active role in managing their digital footprint through careful use of privacy settings and thoughtful online behaviour. The retired teacher's account above also reinforces this point, as she explicitly credits the safety training with transforming her from a vulnerable user into a cautious and informed participant in the digital space. As she aptly concluded, "*We need to know the benefits, but we must also know the dangers to stay safe in this digital world.*"

Given the speed at which technology evolves, the study also confirmed that ongoing training is necessary to maintain digital competence over time. Skills that are sufficient today may become outdated tomorrow, making continuous learning a practical necessity. Asa et al. (2025) described lifelong learning in this context as a strategic imperative, adding that

organisations and educational institutions should cultivate environments that encourage experimentation and sustained skill development. At the same time, it would be misleading to suggest that digital literacy is equally accessible to all. The study acknowledged that factors such as socio-economic background and age can influence the level of proficiency individuals are able to achieve. This observation is consistent with the findings of Kiran (2024) and Thompson et al. (2024), both of whom reported that people from more advantaged backgrounds tend to attain higher levels of digital literacy, largely because they have greater access to technology and learning opportunities. Addressing these disparities through inclusive and well-targeted initiatives remains essential if the goal of a digitally competent and equitable society is to be realized.

Conclusion

The study concludes that digital literacy is an important tool for empowering adult learners in Anambra State and for supporting their meaningful participation in the emerging digital society. By developing relevant digital competencies, adult learners can strengthen their capacity for continuous learning, economic participation, and responsible engagement in digital environments. However, the effectiveness of digital literacy in achieving these outcomes depends largely on the availability of adequate training opportunities, supportive learning structures, accessible technological infrastructure, and inclusive policies that address existing disparities among learners. Therefore, sustained institutional support and well-designed digital literacy initiatives are essential for ensuring that adult learners can fully benefit from the opportunities presented by the evolving digital landscape. These findings offer practical implications for adult/continuing education policy and practice in Anambra State and beyond.

Recommendations

The following recommendations emerge from the findings and conclusions of this study. They are offered with an awareness that their applicability may depend on local circumstances and available resources.

1. Adult education providers in Anambra State should consider incorporating hands-on digital entrepreneurship training into their curricula. Such training could include practical instruction in social media marketing, digital payment systems, e-commerce management, and content creation. For such training to be effective, it would benefit from being supported by access to practical tools, opportunities for mentorship, and exposure to success stories that can inspire and motivate learners.
2. Given the pace at which digital technologies continue to evolve, adult education programmes may wish to establish mechanisms that support lifelong learning among their participants. This should involve creating partnerships with online learning platforms, offering guidance to help learners select appropriate courses, and providing opportunities for digital certification.
3. Digital literacy initiatives should include explicit attention to online safety, privacy protection, and ethical digital behaviour. Training programmes should therefore address topics such as identifying phishing attempts, securing personal information, managing digital footprints, and engaging respectfully in online communities.

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