AI-POWERED DIGITAL LITERACY FOR ADULT LEARNERS: A PRACTICE-BASED STUDY ON CONFIDENCE AND SKILL DEVELOPMENT IN TECHNOLOGY USE

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ABSTRACT

This practice-based study examines the impact of an AI-supported digital literacy course (DigiLit) on adult learners' technology skills and confidence. Using a mixed-methods approach, we collected before-and-after surveys and written reflections from 11 participants, primarily from service-based professions. Learners used ChatGPT and Google Workspace tools to complete real-life tasks. Results showed a 40% increase in confidence using AI tools and marked improvement in digital fluency. Qualitative data highlighted themes such as overcoming fear of technology and applying new skills in work scenarios. The findings suggest that accessible, well-structured digital literacy programs can significantly support adult learners navigating modern digital environments.

KEYWORDS

artificial intelligence (AI), digital literacy, adult education (Andragogy), Google tools, technology confidence

1. INTRODUCTION

Many people need digital skills, not just for school or work but also for everyday life. Still, many adult learners, especially those in service jobs or from underserved communities, often get left out of the skill-based digital world. While artificial intelligence is reshaping industries, these learners frequently lack the basic digital fluency to engage with online forms, organize documents, or communicate confidently.

This challenge gave rise to DigiLit, an AI-supported digital literacy program designed to simplify the learning experience. The idea began as a personal observation and later evolved into a yearlong research and design process. Drawing on educational psychology and real-world teaching, the program was grounded in Vygotsky's Zone of Proximal Development (ZPD) concept, which highlights how learners grow through guided assistance [1].

From a learning perspective, technology is more than just digital hardware. As argued by Mansur and Beaty, anything that extends human capability, language, tools, or algorithms is technology [2]. That mindset shaped DigiLit. The course emphasized human connection, cultural context, and real-life tasks like sending resumes or using translation apps.

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This approach reflects a broader call for responsible and inclusive AI in education. As the Oxford AIEOU response highlights, educational tools must center on the learner, not just the system [3]. DigiLit is one attempt to bridge the gap between high-level AI innovation and the everyday needs of underserved learners.

2. METHODLOGY

This study used a mixed-methods approach to evaluate the effectiveness of the DigiLit course. We collected before-and-after surveys, reflection responses, and digital task data to measure learners' growth in confidence and usage of AI and Google tools. The course focused on building real-world digital skills for adults with limited tech backgrounds.

2.1. Participants and Recruitment

The DigiLit course was designed for adult learners with little or no formal digital education. Most learners had limited or no prior experience with AI tools, and many had only basic familiarity with Google Workspace apps. Participants were primarily immigrants working in service-related fields such as rideshare driving, food delivery, and pedicab services, ranging from their early 20s to over 60. While over 20 adults expressed interest, only 11 participated consistently and completed the course.

2.2. Course Format and Duration

DigiLit ran from Spring through Fall 2024. While online platforms like Zoom and Google Classroom were used, the core of the course relied on in-person, one-on-one mentoring. The instructor regularly visited participants in person at homes, community spaces, and even work, offering tailored support and scaffolding based on each learner's pace and comfort level.

Each unit focused on a simple, real-life task (like setting calendar reminders, creating folders, or translating signs) and connected it to free, accessible tools such as Gmail, Google Docs, Google Translate, and ChatGPT. The goal was to build confidence through repetition, real-world practice, and personal support.

2.3. Survey Tools and Justification

Before and after the course, learners completed digital literacy surveys. These included both multiple-choice and open-ended reflection questions. We use a 5-point Likert scale from 0 to 4, instead of the traditional 1 to 5, to allow learners to mark zero honestly if they had *no experience* at all. This helped us measure progress from a more accurate baseline [5].

2.4. Learning Design and Foundations

The instructional approach followed the ADDIE model and was shaped by Andragogy (adult learning theory) and Vygotsky's Zone of Proximal Development (ZPD) [6] [7]. Lessons were scaffolded to match each learner's level. We often started with mobile tools, since many learners only had access to smartphones. The course focused on hands-on practice, and AI tools like ChatGPT or Google Translate were introduced only after learners felt confident using basic apps like Gmail or Google Drive.

2.5. Data Collection and Ethics

Throughout the course, learners filled out check-ins and reflections. Their feedback gave insight into what worked, what felt overwhelming, and how they applied skills daily. Data was collected anonymously, and all participants gave informed consent [4].

3. RESULTS

The DigiLit course led to measurable improvements in digital literacy, confidence, and real-world application. Data came from pre- and post-course surveys, reflections, and learner feedback.

3.1. Participants' Confidence Growth

Before the course, most learners rated their digital confidence between Beginner (0) and Basic (1). Afterward, the majority reported confidence levels of Advanced (3) or Expert (4), showing an overall increase of approximately 40% [8].

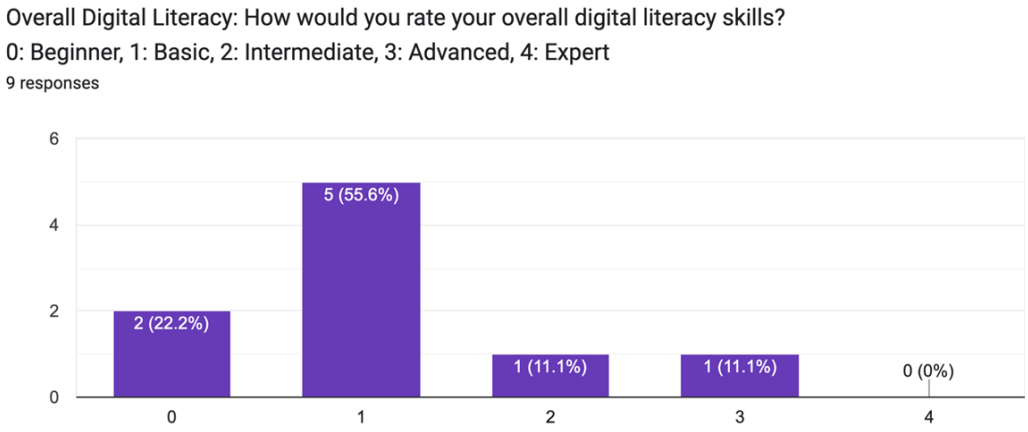

Figure 1. Pre-course self-assessment of overall digital literacy (N = 9)

3.2. Growth in Tool Familiarity

Before the course, many learners rated themselves as unfamiliar or only somewhat familiar with key Google tools. For example, in the pre-course survey:

- 36.4% were not familiar with **Google Docs**
- 36.4% had never used **Google Sheets**
- 54.5% were unfamiliar with **Google Slides**
- 72.7% had never used **Google Sites**

These numbers reflected a strong need for basic and intermediate-level training (see Figure 2). Although the post-course survey did not repeat the same tool-specific questions, learner reflections and task completion data showed clear improvement. All participants created Google

Docs, organized Drive folders, and completed tasks using Google Forms and Calendar, demonstrating applied proficiency beyond self-reported metrics.

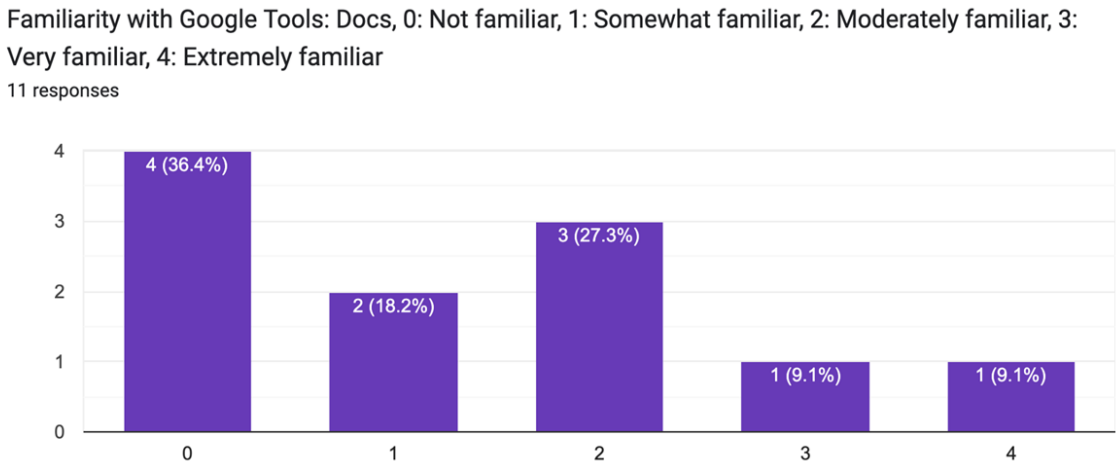

Figure 2. Pre-course familiarity ratings for Google Docs, Sheets, and Slides (N = 11)

3.3. AI Tool Use

Before the course, most learners had never used AI. Afterward, 100% reported using ChatGPT, and many explored Google Gemini, Claude, or Microsoft Copilot. Tasks included translation, drafting, brainstorming, and planning [9].

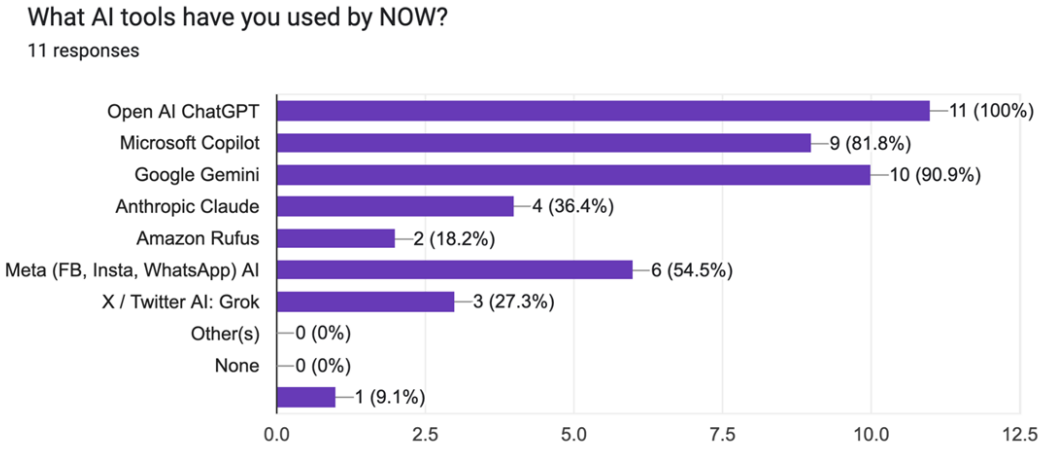

Figure 3. AI tools used by participants after completing the DigiLit course

3.4. Learner Reflections

Participant reflections captured the program's impact in their own words:

"This class paved the way."
"I made trip plans with AI."
"We carry a gold mine in our phones."

These responses reflect self-efficacy [11] and the importance of relevant, adult-centered instruction [10].

3.5. Course Satisfaction

On a 0–4 scale, 91% of learners reported being "Very Satisfied" or "Satisfied" with the course, and several asked about continued learning with AI and Google tools [9].

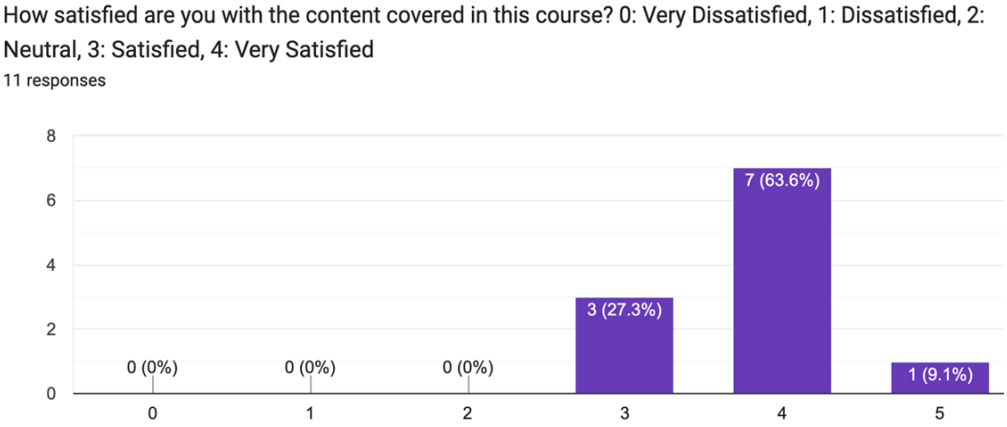

Figure 4. Participant satisfaction with DigiLit course content and delivery

4. DISCUSSIONS

The findings of this study highlight a simple truth: digital literacy cannot be taught effectively without attention to the learner's context, motivation, and readiness. In the DigiLit project, success came from the tools ChatGPT, Google Workspace, and video tutorials, building trust, simplifying tasks, and meeting learners where they were.

Scaffolding was key. Personalized mentoring, one-on-one visits, and small wins helped participants gradually move from unfamiliarity to independence.

From a learning theory standpoint, the course was rooted in Vygotsky's Zone of Proximal Development (ZPD). Adult learners often need a "more competent other," not just to deliver knowledge, but to model, support, and gradually withdraw assistance. AI tools like ChatGPT helped in this scaffolding process, but they worked best in tandem with human encouragement. AI can function within a learner's ZPD, but meaningful growth requires a blend of technological and human support [12].

Participants made notable gains in confidence, but what truly mattered was relevance. Tasks had to make sense to the learner's world, whether filling out online forms or using translation apps for work. If learners didn't see a personal connection, engagement dropped. This supports reducing cognitive load and aligning learning with motivation and context [13].

Looking forward, there is room to improve through clearer calibration. Understanding learner interests and tailoring the entry point can boost motivation from day one. A predictive takeaway here is that future digital literacy programs should:

– Begin with interest discovery before skill teaching
– Use adaptive scaffolding based on ongoing feedback
– Blend human mentoring and AI tutoring for maximum impact

4.1. Learner Spotlights

Participant stories reflected how the DigiLit course went beyond technical instruction to support real-life empowerment. One learner, unfamiliar with most tools initially, used Google Docs and AI to prepare documents and secure a job at H&R Block. Another used Google Drive to organize paperwork for retirement planning and relied on AI to map out multi-city travel.

Several learners shared how the course helped them build technology into their daily lives. One wrote, "This class gave me a key to go on." Others described using their phones more confidently and connecting the tools to their career goals, including resume building and supporting educational transitions.
These reflections illustrate how personalized support and relatable tasks delivered through a blend of technology and trust can transform uncertainty into action and self-assurance.

4.2. Lessons Learned

While the course outcomes were positive, several challenges surfaced along the way. Some participants initially hesitated about AI, uncertain whether it applied to their lives or was safe. Others hesitated to engage deeply with unfamiliar tools because of prior negative experiences with technology. Building trust took time.

Language and tone mattered. Many learners responded more positively to everyday explanations than to technical terminology. Incorporating culturally familiar examples and allowing space for multilingual clarification helped create a more welcoming environment. These nuances proved essential in onboarding adults with varying digital histories and comfort levels.

4.3. Format

The DigiLit learning experience followed a simplified, structured pathway to build confidence through gradual, real-world application. This progression can be summarized as:

Initial Interest → Trust and Scaffolding → Practical Tasks → Confidence Growth → Real-World Application

This step-by-step structure helped adult learners move from unfamiliarity with digital tools to confidently applying them in daily tasks.

5. FUTURE WORK

Future iterations of DigiLit should expand on the principle that learning must meet the learner where they are. A more flexible, Socratic approach could allow instructors to ask open-ended questions and guide learners based on their needs, interests, and lived experiences. Rather than following a rigid, sequential path, modules could be delivered non-linearly, allowing participants to begin with the topics most relevant to their lives or work [14].

Integrating project-based learning (PBL) will help learners apply digital skills in meaningful, real-world contexts. This shift allows for developing transferable skills, essential factors in long-term retention and learner empowerment [15]. Tools like Google Sites or AI chatbots could be framed around projects like resume building, job applications, or community storytelling.

Another area for improvement is calibration, or the ability to assess and respond to learner readiness, motivation, and prior exposure. Participants who show high curiosity can be introduced to advanced tools earlier, while those unfamiliar with basic functions can receive more personalized scaffolding.

One predictive insight is the need to teach learners how to transfer skills across platforms. Recent learning theory notes that the ability to apply knowledge from one context to another, called *far transfer*, is a hallmark of deep learning and motivation for self-improvement [16]. Transfer is most successful when learners are shown how skills relate across domains and may explore and reflect [17].

These insights align with educational neuroscience, which suggests that self-awareness of the learning process can activate sustained interest and independent exploration. For underserved adults navigating digital tools for the first time, these strategies can transform technology from a barrier into a source of confidence and growth.

6. CONCLUSIONS

This mini-class showed that a simple, human-centered approach to digital literacy can lead to meaningful, real-life outcomes. The course was built on direct mentoring, practical tasks, and step-by-step scaffolding; all designed to meet learners where they were. Participants didn't just explore new tools; they developed confidence, independence, and a better understanding of how digital skills connect to everyday life.

Several learners applied these skills in practical ways. One participant used Google Docs and AI tools to prepare documents and manage time. Others organized personal records in Google Drive or used Google Calendar to plan daily routines. All participants reported using AI chats in some form after the course. These outcomes support the importance of accessible, personalized instruction that combines technological tools with human guidance.

As learners moved from hesitation to confidence, their reflections made it clear: technology became less intimidating and more useful. One participant said, "This course gave me the key to go on." That sentiment captures the value of thoughtful, AI-enhanced education delivered with attention and care.

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Salih Mansur is an educator, researcher, and instructional technologist focused on making digital learning more accessible, inclusive, and human-centered. He integrates AI, multimedia, and educational psychology to support underserved learners and bridge digital gaps.