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THE ROLE OF DIGITAL LITERACY AND TECHNOLOGY ADOPTION IN FACILITATING SOCIAL TRANSFORMATION IN AFGHANISTAN

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ABSTRACT

In Afghanistan, the rate of technological development is balanced by the challenges of digital literacy due to sociopolitical instability, the lack of infrastructure, and educational disparities. This research not only examined the landscape of digital literacy and technology use for Afghan adults, but also the challenges and opportunities around using technology. A quantitative cross-sectional design was employed and data were collected from 300 individuals aged 18 and older, representing urban and rural areas. Demographic representation was assured through purposive sampling by gender, age, education, and occupation. Data to assess participants digital skills, technology use, and perceived barriers to digital literacy and technology were collected through a five-point Likert scale questionnaire which relied on previously validated digital literacy frameworks. The participants completed the survey questions either face-to- face as part of an interview, or an online survey available in Dari and Pashto. The findings indicate that there are considerable gaps in access to, and skills to use, digital technologies, especially for rural and lesser educated groups, and identify distance and as a consequence reinforcing the digital divide in Afghanistan.This study fills a major gap in the research literature on digital literacies and provides an empirical study from a conflict-affected country such as Afghanistan, which is one of the few on this topic. This study also provides insights into complex links between sociopolitical instability and gender inequities and educational impediments to digital exclusion. The study underscores the need for improved access to technology and infrastructure as key factors in digital literacy initiatives. By presenting data-driven evidence from Afghanistan, this research adds a critical perspective to global digital literacy discussions, serving as a model for similar contexts. Policymakers

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and development organizations can use these findings to close digital divides and foster long-term digital empowerment in Afghanistan.

Keywords: *Digital literacy; Technology adoption; Digital competence; Digital skills; Digital transformation*

INTRODUCTION

In Aiming at alternatives to global transformation and social, economic & educational justice, digital based literacy and technologies are called Literacies of Capability. In fragile and developing local systems especially in states like Afghanistan with weak institutions and unfinished infrastructures the practices with emerging digital technology can create new possibilities in learning and communicating, as well as governorship and livelihood equity (Tinmaz et al, 2022; Edwards, 2014). Digital literacy in fragile contexts ultimately is not a technical skill, but a pathway to inclusive development and social resilience. Digital literacy in fragile contexts is not purely a technical skill, it is an essential pathway to inclusive development and social resilience.

Digital literacy the ability to access, evaluate, create, and communicate information using digital technologies is essential for engaging with and participating meaningfully in increasingly digitalized environments (Feerrar, 2019). Evidence suggests that digital literacy has a positive association with the ability to engage and benefit from digital technology (Yu et al., 2017; Mohammadyari & Singh, 2015). In the case of Afghanistan, differences in access and literacy in digital technologies are stark (Nazari & Musilek, 2023; Jauhiainen et al., 2022), with significant differences, particularly across gender, educational levels, and in urban versus rural contexts. Differences in access and participation in digital technologies not only limit equal engagement, but they highlight underlying structural and socio-cultural exclusions more broadly.

Although studies in equivalent political economies indicate education and contact with relevant digital content as sound predictors of digital engagement (Nikou et al., 2022; McDougall et al., 2018), empirical scholarship surrounding Afghanistan remains limited. The existing research consists mostly of conceptual or limited studies in urban contexts or at the higher education level, and even less research addresses marginalised groups exiting off exclusion, or rural context (Marín & Castaneda, 2022). As a result송 we know little about the everyday digital lives of Afghan citizens, especially underprivileged groups.

In addition, infrastructural constraints such as affordability, shortage of infrastructure, linguistic diversities, and a lack of digital confidence among women and the elderly still defy digital inclusion efforts (Tour, 2017; Rodríguez-de-Dios et al., 2016). Given the global evidence that digital literacy can support civic engagement, business, and social mobility (Cetindamar et al., 2021; Vodă et al., 2022), an understanding of its dynamics within Afghanistan is both timely and needed.

This study contributes to digital literacy by reporting original empirical findings from a vulnerable and understudied environment. This research uses a cross-sectional quantitative method to analyze the levels of digital literacy, usage practices, and perceived barriers of the Afghan demographic subgroups (i.e., the users in the three capacity categories). The findings will provide actionable data points for stakeholders and policymakers creating digital education and policy pathways for inclusive digital transformation. Overall, this research addresses the need for data-informed action to create digital resilience and equity for marginalized communities in conflict.

METHODS

Research Design

In this research, a quantitative cross-sectional study was used to explore digital literacy and digital technology adoption among the Afghan population. The research at a single point in time used a standardized survey to gather demographic information, digital competencies, technology use information and perceptions of barriers. This design permitted rigorous statistical testing of variable relationships and provided a comprehensive snapshot of the current state of digital engagement in Afghanistan.

Sampling Strategy

Three hundred recruitments were carried out using purposive sampling with adults age 18 years or older from the countryside and cities of Afghanistan. Because of an exploratory approach to research that was aimed at a deeper and context oriented understanding of digital literacy and the acceptance of technology for Afghan adults it was appropriate to use a non-randomized sampling method. The sampling strategy was directed at drawing different opinions by arranging a variation across certain qualifiers such as gender, age, education level, and occupational background: thus allowing the generalizability and relevance of the findings within the context in Afghanistan.

Participants were chosen upon pre-determined inclusion criteria for relevance and consistency. Participants were eligible if they were Afghan nationals, 18 years or older, had access to a digital device (such as a smartphone, tablet, or computer), and agreed to provide informed consent.

Recruitment was facilitated through local facilitators and trained enumerators , who engaged with a variety of community-based organizations, non-governmental organizations (NGOs), schools, and community centers across multiple provinces. This strategy was designed to maximize inclusivity , particularly in areas where digital access is limited due to infrastructural or socio-political challenges.

Demographic quotas were set in an attempt to overcome the bias which might arise from purposive sampling procedure. Such quotas mattered for about 60% male and 40% female, with representation from both urban and rural areas as well. Participants were also

stratified by their education level and age group to cover the different socio-demographic segments.

While purposive sampling could not provide statistical generalization beyond the population in Afghanistan, it was considered an appropriate sample design because of the exploratory nature of the research and contextual issues in Afghanistan, such as security concerns, limited digital infrastructure, and uneven access to technology. The primary goal was to gather qualitatively rich and contextually grounded data that could inform national-level policies and localized interventions.

Data Collection Instrument

Data were collected by means of a structured questionnaire developed from validated digital literacy frameworks, e.g., the European Digital Competence Framework (DigComp) and other available models. Sections on demographics, self-reported digital literacy competencies, how often one uses technology, and perceived obstacles to adoption were included. Digital literacy competency and attitude were assessed on a five-point Likert scale (Strongly Disagree to Strongly Agree).

Instrument Reliability and Validity

Validity Testing

In order to verify content validity, we had a panel of experts in a range of areas including digital education, linguistics, and Afghan socio-cultural contexts, review the questionnaire. We used their inputs to clarify some questions for clarity, cultural-appropriateness for the Afghan context, and ensure they were relevant in the Afghan context. Then, we did some pilot testing using a small sample (n = 30) similar to our target population to test for understanding and usability.

Reliability Testing

The internal consistency of the questionnaire was determined using Cronbach's Alpha. A reliability coefficient above 0.7 is considered an acceptable measure of reliability for social science research. All sections of the questionnaire had other good internal consistency as shown in Table 1 which supports the reliability of the use of this questionnaire in the Afghan context.

Table 1. Reliability Analysis of the Digital Literacy Questionnaire

Questionnaire Section	Number of Items	Cronbach's Alpha	Interpretation
Digital Literacy Skills	10	0.82	Good internal consistency
Technology Use Frequency	5	0.78	Acceptable

Perceived Barriers to Adoption	6	0.80	Good internal consistency
Overall Instrument	21	0.84	Good internal consistency

Note: Cronbach's alpha values above 0.70 indicate acceptable to good reliability.

Data Collection Procedure

Data collection was conducted over a two-month period via face-to-face interviews and online surveys. This was largely dependent on available technology for access. Trained enumerators conducted the interviews in Dari and Pashto so that the interviews met culturally and linguistically relevant standards. Flexible data collection strategies were used to respond to the context in Afghanistan to maximize participation and to ensure respondents' safety concerning sociopolitical circumstances, for example, security and accessibility. Before participating, informed consent was obtained from each participant.

Data Analysis

Data were coded and analyzed using the SPSS application. Descriptive statistics provided a summary of each participant's demographics and digital literacy level. Inferential statistics, such as ANOVA, was used to test the differences in digital literacy scores based on demographic groups education and residence. ANOVA was selected as it is an appropriate method of comparing mean differences across different groups with assumptions of normality, and homogeneity of variances which were tested for and met. Patterns of technology use and perceived barriers were analyzed for frequency. Although they were included in the study, they were not considered a primary aim of this study. Examples of additional analyses include regression and correlation. Ethical Issues to Consider The study strictly adhered to ethical research standards, including voluntary participation, confidentiality, and anonymity. Participants were made aware of their ability to withdraw without incurring any costs. Cultural sensitivity and local ethical norms were given special consideration, and the research team was the only one who had access to the secure data storage. Ethical approval was obtained from the appropriate institutional review board prior to commencement.

RESULT AND DISCUSSION

The demographic data of 300 participants who participated in this study of digital literacy and technology adoption in Afghanistan is illustrated in Table 2. Of the participants in this study, a slight majority of participants were male (60%), the participants who identified as females accounted for 36.7%, while 3.3% decided not to report any gender. 70% of the responders are from the age bracket between 18 and 34 years, which would still be a relatively young population that can be argued as sourcing from Afghanistan's substantial youth population. Regarding the educational qualifications, 40% are high school graduates and 30%

had a bachelor's degree or higher. Ten percent reported no formal education, indicating diversity in education levels within the sample. According to the occupational data, 30% of people work in government or private sectors, 30% are students, and 15% own small or medium businesses. A majority of respondents (70%) reside in urban areas, with the remaining 30% from rural locations, allowing for a comparison between urban and rural digital engagement. In terms of device ownership, **Figure 1** shows that smartphones are the most frequently owned digital tool (75%). The other commonly owned devices include basic mobile phones (50%) and computers/laptops (40%). Alarmingly, 5% reported having no digital device.

Lastly, the frequency of internet access is high, with 60% reporting daily use of the internet, and 25% reporting the use of the internet multiple times per week, as shown in **Figure 2**. The above usage statistics correspond with moderate to high levels of connectivity to the internet among the participants. Ultimately, this demographic information is helpful contextual information for interpreting levels of digital literacy and technology adoption among the Afghan population.

Table 2. Demographic Characteristics of the Study Participants

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	180	60.0%
	Female	110	36.7%
	Prefer not to say	10	3.3%
Age Group	18 – 24	90	30.0%
	25 – 34	120	40.0%
	35 – 44	60	20.0%
	45 or older	30	10.0%
Education Level	No formal education	30	10.0%
	Primary education	60	20.0%
	High school graduate	120	40.0%
	Bachelor’s or higher	90	30.0%
Occupation	Student	90	30.0%
	Teacher / Lecturer	30	10.0%
	Government/Private Employee	90	30.0%
	Business Owner	45	15.0%
	Other	45	15.0%
Place of Residence	Urban	210	70.0%
	Rural	90	30.0%

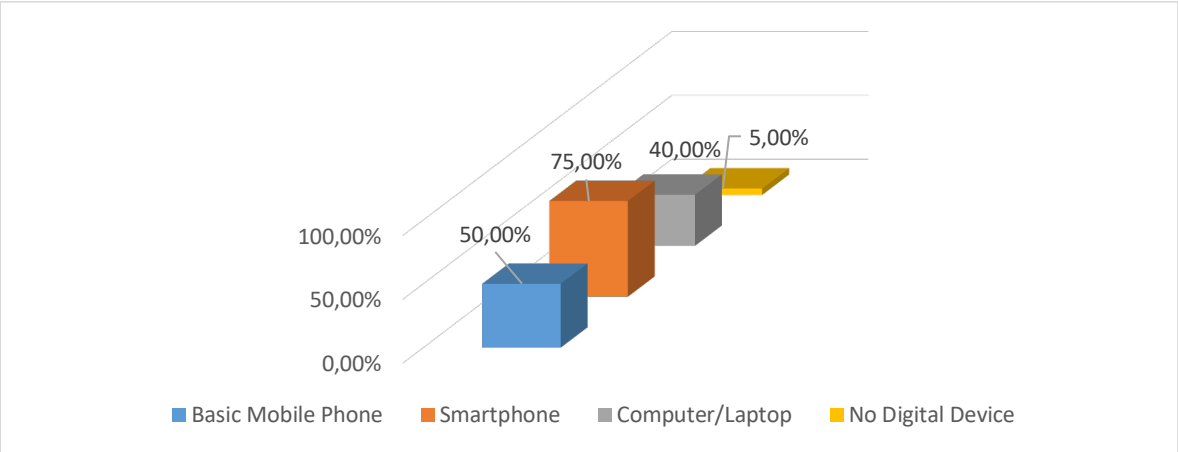

Figure 1. Device Ownership Distribution Among Users.

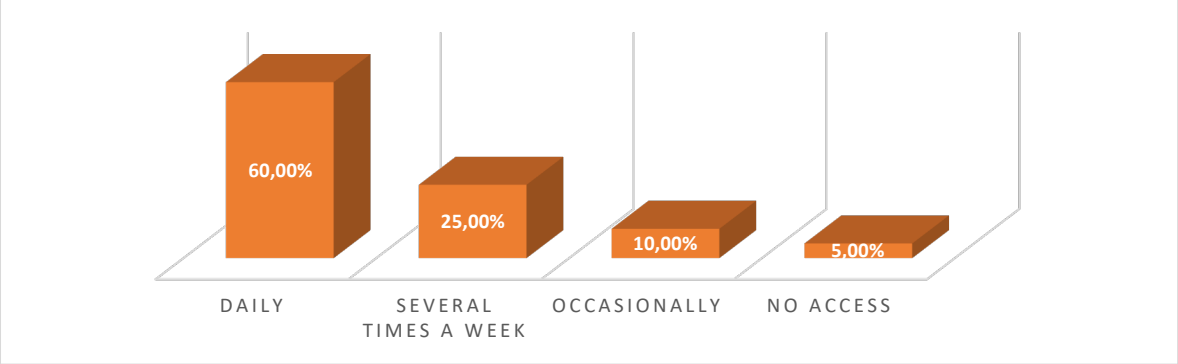

Figure 2. Frequency of Internet Access Among Users.

Table 3. Digital Literacy Skills of Participants in Afghanistan

Digital Literacy Skill	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean Score (1-5)
I can turn on and use a smartphone or computer	5 (1.7%)	10 (3.3%)	15 (5%)	120 (40%)	150 (50%)	4.32
I can connect my device to Wi-Fi or mobile internet	7 (2.3%)	13 (4.3%)	20 (6.7%)	115 (38.3%)	145 (48.3%)	4.23
I can search for information using Google or other search engines	10 (3.3%)	15 (5%)	25 (8.3%)	110 (36.7%)	140 (46.7%)	4.16
I know how to send and receive emails or messages	12 (4%)	18 (6%)	30 (10%)	105 (35%)	135 (45%)	4.11
I can distinguish between true and false information online	15 (5%)	25 (8.3%)	40 (13.3%)	100 (33.3%)	120 (40%)	3.89

I know how to change privacy/security settings on devices/apps	20 (6.7%)	30 (10%)	50 (16.7%)	90 (30%)	110 (36.7%)	3.75
I feel confident learning and using new digital tools or apps	10 (3.3%)	20 (6.7%)	40 (13.3%)	110 (36.7%)	120 (40%)	3.99
I can keep my personal information safe when online	12 (4%)	22 (7.3%)	35 (11.7%)	115 (38.3%)	116 (38.7%)	3.97
I know how to install, update, or uninstall mobile apps/software	15 (5%)	25 (8.3%)	35 (11.7%)	110 (36.7%)	115 (38.3%)	3.91
I can help others learn how to use digital tools	20 (6.7%)	30 (10%)	40 (13.3%)	100 (33.3%)	110 (36.7%)	3.76

Note: Mean score is calculated on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 3 indicates the level of digital literacy skills of 300 individuals from Afghanistan. The data shows that the majority of the individuals held basic skills in digital literacy, as evidenced by 90% of respondents agreed or strongly agreed they could operate a smartphone or computer, with a mean score of 4.32. Similarly, 86.6% who were able to connect their device to Wi-Fi or mobile internet (mean = 4.23).

The ability to search for information online and send and open email both received relatively higher mean scores of 4.11 and 4.16. However, only 62.3% of individuals reported confidence with evaluating whether information online is accurate, which received a mean score of 3.89 and 62.3% with managing their privacy or security on online platforms or with digital devices with a mean score of 3.75, these areas are potential areas trustworthy digital literacy could be addressed.

The mean score for confidence with learning and using new digital tools was also relatively high, at a score of 3.99. The average scores for skills with installing or updating software (3.76) and helping others use digital devices and applications (3.71) were scored slightly lower. Overall, these results indicate basic digital skills are relatively common in this population. Yet, issues of digital security and information checking could easily fill a gap between trustworthy digital literacy, and worthy learnings with digital literacy in Afghanistan.

Table 4. Frequency of Technology Use and Adoption

Activity	Never	Rarely	Sometimes	Often	Always	Mean Score (1-5)
Using phone/computer to attend online classes/trainings	15 (5%)	40 (13.3%)	70 (23.3%)	90 (30%)	85 (28.3%)	3.61
Using technology (apps/websites) for business/trade	80 (26.7%)	70 (23.3%)	55 (18.3%)	50 (16.7%)	45 (15%)	2.54
Using apps/websites for banking, bill payments, or transfers	50 (16.7%)	60 (20%)	70 (23.3%)	60 (20%)	60 (20%)	3.16
Using internet to interact with government services	90 (30%)	80 (26.7%)	55 (18.3%)	40 (13.3%)	35 (11.7%)	2.39
Using social media to learn or share ideas	20 (6.7%)	40 (13.3%)	70 (23.3%)	90 (30%)	80 (26.7%)	3.61
Trying new digital tools/apps when found useful	25 (8.3%)	35 (11.7%)	65 (21.7%)	95 (31.7%)	80 (26.7%)	3.56

Table 4 shows the frequency of technology activities that participants take part in, and indicates their use, and degree of adoption of technology. It should be noted that the use of their phone or computer for attending an online class or training (HR on Table 4) had a comparatively "high" use frequency mean score (HR= 3.61%), and 58.3% of the participants reporting the use of their phones or computer at "often" or "always" (i.e., point ERP) frequency levels. This implies that the participants have a high level of acceptance of digital educational platforms in Afghanistan. Likewise, social media is a means of learning, idea development and sharing because 56.7% of the respondents indicated they "often" used a social media in their work in Extension and Public Engagement (mean score 3.61). This also indicates that social media can be a valuable forum for knowledge sharing and community engagement.

On the other hand, fewer people use digital technology for business or trade purposes, with over half of the participants saying they "never" or "rarely" use apps or websites for this (mean score 2.54). This may reflect barriers such as lack of infrastructure, trust, or familiarity with e-commerce.

Banking or financial transactions via apps or websites are moderately adopted, with 40% of respondents often or always using it (mean score 3.16). Online access to government services was also the least adopted action, with 56.7% of respondents never or rarely establishing their identities online with government services (mean score 2.39), which indicated less ability or practice for digital interaction with public institutions.

Overall, the willingness to try new digital tools when perceived as valuable is optimistic with 58.4% of respondents often or always seeking new apps or technologies (mean score 3.56). To sum up, these results show that while there has been positive correlation to digital literacy and use of digital technologies, greater adoption in e-government and business technologies are possible through additional interventions in these areas to increase technology adoption.

Table 5. Digital Literacy Mean Scores by Demographic Groups

Demographic Factor	Category	Mean Digital Literacy Score	Std. Deviation
Gender	Male	4.05	0.48
	Female	3.78	0.52
Age Group	18 – 24	3.95	0.46
	25 – 34	4.10	0.44
	35 – 44	3.85	0.50
	45 or older	3.50	0.60
Education Level	No formal education	3.10	0.52
	Primary education	3.50	0.48
	High school	3.95	0.44
	Bachelor's or higher	4.30	0.38
Place of Residence	Urban	4.05	0.47
	Rural	3.60	0.55

Table 5 shows differences in digital literacy scores amongst demographic groups in the study population. The most significant is gender. Males have a mean digital literacy score of 4.05 compared to females at 3.78. The difference suggests that males may have more access to or confidence using digital technologies, consistent with common gender differences identified in studies of digital inclusion.

Looking across the groups, the age demonstrated the most difference with the 25–34 age group having the highest mean score of 4.10 suggesting young adults in their prime working age are better equipped to tackle digital skills. Similarly, the youngest cohort, 18–24, also has a reasonably high mean score of 3.95. Digital literacy seems to decline with greater age with participants aged 45 years and older scoring the lowest mean score of 3.50. This trend is consistent with generational gaps in familiarity with technology.

Overall education level seems to be a powerful predictor of digital literacy. Participants with degrees scored much higher (4.30) than participants with no schooling (3.10), which points to a most important role of formal education in creating digital skills. College graduates, and even high school graduates, still score positively and consistently as a function of

educational attainment which supports the relationship we found for competence in formal education.

Place of residence also influences digital literacy scores. Urban respondents scored higher (mean 4.05) than rural respondents (mean 3.60). Unquestionably, differences between urban and rural infrastructure, internet access, exposure to digital tools provided a wide range of responses.

Table 6. ANOVA Analysis of Digital Literacy Scores by Educational Level

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F Statistic (F)	p-value
Between Groups	25.42	3	8.47	12.34	< 0.001*
Within Groups	198.30	296	0.67		
Total	223.72	299			

*Note: *$p < 0.05$ indicates statistically significant differences between groups.*

The one-way Analysis of Variance (ANOVA) was conducted to determine if digital literacy scores varied significantly for the different levels of educational attainment for the participants, which included, no education, primary education, high school education, and a bachelor's degree or higher.

As shown in Table 6, there was a statistically significant difference in the mean digital literacy scores for educational attainment levels, $F(3, 296) = 12.34$, $p < 0.001$ which indicates that the population studied strongly connected educational attainment to digital literacy skills.

Table 7. Tukey's HSD Post Hoc Comparisons of Digital Literacy Scores by Educational Level

Comparison	Mean Difference	p-value	Significance Level
No Formal Education vs. Primary Education	-0.40	0.042	*Significant*
No Formal Education vs. High School	-0.85	< 0.001	Highly Significant
No Formal Education vs. Bachelor's+	-1.20	< 0.001	Highly Significant
Primary Education vs. High School	-0.45	0.018	*Significant*
Primary Education vs. Bachelor's+	-0.80	< 0.001	Highly Significant
High School vs. Bachelor's+	-0.35	0.034	*Significant*

Table 7 shows the results of Tukey's HSD post hoc analysis to identify specific differences in digital literacy scores for four levels of education. The analysis confirmed the

previous results of the ANOVA, but the analysis also found significant differences between nearly all levels of educational attainment. Most notably, participants with no formal education had the lowest mean score for digital literacy and had a mean score significantly lower than those with primary education ($p = 0.042$), high school ($p < 0.001$), and a bachelor's degree or higher ($p < 0.001$). The steep slope illustrates a strong relationship between digital competence and education level. Although education wasn't an explicit part of the study, it is like school & education; they are just two building blocks of digital competency contributing to gaining digital skills. The difference between students from primary education and high school education was significant ($p= 0.018$), lending weight to the cumulative effect being demonstrated. Additionally, the degree educated group performed at a higher level than all other group and again even the difference from the high school education was significant ($p = 0.034$).

This evidence, aligned with three significant research trends globally (Nikou et al., 2022; Feerrar, 2019), can help indicate a significant positive relationship between education and digital literacy. It highlights the immediate need for contextually relevant digital literacy programs for individuals with little or no formal education, particularly in rural or impoverished situations in Afghanistan. If the education gap can be eliminated, the digital divide will also be narrowed, providing even greater access to information, digital services, and economic opportunities for more individuals in Afghanistan.

Table 8. Reported Challenges in Using Digital Technologies

Challenge / Barrier	Not a Barrier	Minor Barrier	Moderate Barrier	Major Barrier	Mean Score (1-4)
Lack of internet access	50 (16.7%)	60 (20%)	90 (30%)	100 (33.3%)	2.83
Limited digital skills	40 (13.3%)	55 (18.3%)	100 (33.3%)	105 (35%)	2.88
High cost of devices/internet	45 (15%)	70 (23.3%)	90 (30%)	95 (31.7%)	2.78
Lack of relevant digital content	60 (20%)	75 (25%)	85 (28.3%)	80 (26.7%)	2.47
Language barriers	70 (23.3%)	85 (28.3%)	75 (25%)	70 (23.3%)	2.25
Privacy/security concerns	90 (30%)	80 (26.7%)	60 (20%)	70 (23.3%)	2.03

Table 8 indicates some of the most important barriers that Afghans face when using technology. This was an important finding which demonstrates barriers to acceptable technology acceptance and use.

The most important barrier reported was lack of internet access where 63.3% reported this as a moderate to major barrier (mean score of 2.83). This underscores the infrastructural difficulties prevalent in Afghanistan, especially in rural and underserved areas where internet connectivity remains limited or unreliable.

Closely related is the limited digital skills barrier, rated as moderate or major by 68.3% of participants (mean score 2.88). While more people are now able to access devices, there is still a major deficiency of necessary skills needed to use digital tools, which necessitates a greater need for digital literacy projects. Another significant barrier to access to the internet and devices is the cost of the internet and devices, which 61.7% rated as either moderate or extreme (mean score of 2.78). Economic barriers prevent many Afghans, for instance, to use smartphones, computers, or a regular internet subscription for extended periods, limiting their ability to interface with digital platforms.

Other barriers include a limited abundance of relevant digital content specific to the localized needs and languages, which was rated as either moderately of exceedingly challenging by 55% of participants (mean score 2.47), suggesting a lack of digital resources that are locally useful for the meaningful use of digital technologies. Despite the reported barriers, others included student and teacher lifestyle limiting access to technology, lack of awareness of available resources, language, and privacy and security concerns. These were perceived as less likely to severely limit a user's ability to access digital devices or use the internet. Privacy problems noted the lowest mean score (2.03) suggesting some recognition although lower overall impact than the other barriers given.

DISCUSSION

The results of this study show the main points of digital literacy and technology adoption in Afghanistan, both advancement and current challenges. The demographic data show a high proportion of young respondents (18–34 years) consistent with the population age profile of Afghanistan being comparatively youthful (Jauhiainen et al., 2022). This trend of younger individuals and urban individuals having a higher digital literacy rate reflects global trends with respect to general relationships of digital literacy declining with age and rural living due to inequitable access and exposure (Nikou et al. 2022; Spante et al. 2018).

In developing countries, including Afghanistan, technology is central to social, economic, and political change. Digital technologies serve as change agents for development by increasing access to information, improving education, increasing access to finance, and enabling citizen engagement. In a post-conflict context, such as Afghanistan, where traditional approaches are often disrupted, digital instruments can provide other ways to reconstruct governance structures and empower marginalized communities(Edwards, 2014).

Education was considered the most dominant predictor of digital literacy, with more educated individuals indicating a much higher level of competence. This quality is also evidenced in the findings on schooling and digital literacy (Feerrar 2019; Mohammadyari & Singh 2015). The analysis of variance followed by post hoc tests indicated that some

educational workshops might be significant factors in bridging digital divides, especially when literacies of persons with little or no formal education are concerned. This leads to Edwards' (2014) appeal for context-specific digital literacy training in Afghanistan to bring all marginalized groups into the fold.

Despite having high rates of smartphone ownership (75%), digital literacy disparities continue to exist, particularly in the most critical ones, such as verifying information and privacy management. Such disparities have the potential to limit the use of technology and put the users at risk of misinformation or invasion of privacy (Tour, 2017; Cetindamar et al., 2021). The findings emphasize the need for digital literacy interventions that go beyond the level of functional competencies to cover critical thinking and security awareness (Peng & Yu, 2022). Technology adoption patterns indicate a positive skew towards using digital resources for learning and social interaction, wherein over half the respondents use digital resources to learn and use social media very frequently. As the actual use and acceptance of technology are strongly associated with digital literacy (Yu et al., 2017; Churchill, 2020), all of these offer opportunities for digital inclusion. Putting aside those slowdowns, they may point to more systemic infrastructure barriers, a decline in trust, and possibly relevant content regarding digital business, digital financial services, and e-government plans for the same (Neumeyer et al., 2020; Jauhiainen et al., 2022). The strong mentioned barriers lack of internet access, affordability barriers, and poor digital skills—indicate deep-rooted structural and socio-economic constraints that are holding digital transformation back in Afghanistan (Nazari & Musilek, 2023).

Addressing these issues requires multi-dimensional solutions which embed infrastructure development, access affordability, local content creation, and mass digital literacy. Better digital skills are an empowerment tool promoting entrepreneurship and, thus, provide access to social avenues for further digital uptake (Nikou et al., 2022; Marín & Castaneda, 2022). Based on current numbers that identify the gender gap in digital literacy, a gender-sensitive approach would have to be centered in order to provide an inclusive approach to access (Nazari & Musilek, 2023).

CONCLUSION

This study sought to explore the degree and extent of digital literacy among Afghans and how it impacts the use and adoption of digital technologies. Evidence demonstrates that there is a foundation of digital literacy, particularly among youth and in urban centers, but there is a significant gap in the higher-level digital skills. These findings confirm the hypothesis that digital literacy is not uniformly distributed across demographic fault lines such as age, gender, education, and geography. The research objectives were met by delineating these differences and by demonstrating how they impact individuals' ability to meaningfully engage in digital technologies beyond communication and leisure.

As well, the study highlighted the connection of access - to infrastructure and formal schooling - as key factors driving digital literacy. Schooling was highlighted as an especially strong predictor of greater digital capability and higher order/advanced digital use. However, the opposite is true for groups like women, rural villagers, and the lower-educated, who continue to suffer restrictions which prohibit their capacity for digital engagement. This is a clear indication that there are structural challenges that need to be remedied in order to support inclusive digital transformation.

In light of these findings, a series of recommendations are made. First, curricula for all elements of education must be redesigned to provide thorough digital literacy training that goes beyond competencies to include online safety, critical reflection and checking information. The curriculum is to be localized based on the appropriate infrastructures and cultural factors relevant to Afghanistan.

Second, it is vital to make digital infrastructure more pervasive particularly to rural and otherwise under-served places. Reliable and low-cost access to internet must be available to support greater use of digital technologies in education, health care, governance, and business. Third, gender-specific programs are critical to closing the digital divide. Programs that get women digital access and literacy can help support more equitable participation in the digital economy and society.

Policy and Practical Applications

To ensure these conclusions are more policy-relevant, they should be considered in terms of the practical application in targeting interventions. This means that policymakers in Afghanistan can use these conclusions to create digital literacy programs that will help fill gaps within the population, particularly, when the gaps are in relation to managing privacy and security, verifying information accessed online, and digital ability related to older or rural groups.

Initially, policies should focus on covering the spread of internet facilities to rural communities and digital resources being affordable to access, as at present it is the largest hindrance for 30% of interviewees. Second, the formal curriculum should include digital literacy education, especially for students who do not have access to digital resources or the internet. Given the noted gender differences, there is a necessity for programs that enable women to engage and subsequently address the constraints preventing women from fully appropriating digital technology.

In addition to explaining the gender differences and the need for a pathway for women in Afghanistan, lofty confidence levels in learning new digital technologies suggests that quality workshops or other training programs to develop digital literacy at the community level could improve the digital literacy capability of citizens in Afghanistan quite considerably Policymakers can work with local NGOs and educational institutions to expand these initiatives at scale.

Lastly, cybersecurity and privacy should be an area of emphasis in the future, given that a large part of the population does not have confidence in managing these aspects. Bridging this gap will lead to a more secure and inclusive digitally enabled society.

Finally, research will be needed in the future to further develop and evaluate discrete digital literacy programs, especially for mobile technology and community solutions. Understanding the longer-term effects of comparable interventions on their economic and social outcomes will be extremely useful to inform recommendations to policy-makers and practitioners.

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