Khwopa Journal
ISSN: Print 2392-4845
Vol. 8 Issue 1, 2026 (June)
DOI: https://doi.org/10.3126/kjour.v8i1.96076

Research Article
Received Date:Dec. 25, 2025
Revised Date:June 6, 2026
Accepted Date:June 16, 2026

Enhancing Digital Literacy Among Indigenous Senior Citizens: A Necessity for Inclusive Empowerment

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Abstract: In the modern, technology-centric era, senior citizens, especially in developing nations like Nepal, frequently encounter obstacles when trying to integrate digital tools into their lifestyle. The purpose of this study is to explore how senior citizens engage with digital platforms and to identify the specific challenges and lived experiences related to the acceptance of digital technology among the senior citizens in Bhaktapur. The study adopted a qualitative research approach to examine participants' perceptions and experiences regarding digital tool usage. Data were collected through semi-structured interviews with eleven participants selected through purposive sampling, including six males and five females senior citizens and from the indigenous Newar community of Bhaktapur. Among the participants, seven were literate, and four were illiterate. The collected data were analyzed using thematic analysis to identify major themes and patterns.The findings revealed seven major themes: intergenerational digital support; cultural and linguistic barriers; digital exclusion and social isolation; self-directed motivation and adaptive learning strategies; perceived benefits of digital use and infrastructural access constraints. Most participants commonly used digital payment systems and social media applications through mobile phones. While some participants revealed enthusiasm toward digital technologies, others were reluctant to use digital platforms. Interestingly, some educated retired participants conveyed anxiety regarding digital tools, whereas several illiterate elders were comfortable using QR codes and mobile banking services. Language barriers, poor internet connectivity, and high device costs were identified as major difficulties to digital adoption.The study concludes that targeted training programs, culturally and linguistically applicable digital content, community-based support systems, and age-friendly policies are essential to promote digital inclusion among senior citizens in Nepal.

Keywords: Digital inclusion, Digital literacy, Indigenous communities, Intergenerational support, Senior citizens

1. Introduction

Digital transition is an unprecedented process in the twenty first century, which has transformed the way people access information, communicate and engage in socio-economic activities. According to UNESCO (2018), digital literacy refers to the ability to find, assess, use, create, and share information through digital technologies. In the twenty-first century, digital transformation has significantly changed how individuals access information, communicate, and participate in socio-economic activities. Warschauer (2004) argued that as services central to social and economic participation become increasingly mediated by digital platforms, individuals with limited digital competence experience greater disadvantages.

Over the last decade, a huge transformation has taken place in the digital landscape in Nepal. In the context of the Digital Nepal Framework (Government of Nepal, 2019), the country has committed itself to using technology throughout governance, education, health, and trade. The overall Internet reach at the national level is over 90%, largely thanks to mobile broadband expansion (Nepal Telecommunications Authority, 2021). Yet, in spite of this development, digital inclusion is highly unequally distributed, along socio-economic, geographic, and generational divides. Senior citizens are still one of the most digitally excluded groups of people, especially in indigenous and rural communities.

Senior citizens' access to digital engagement is hindered by a cross-cutting set of barriers. Large numbers of senior citizens, particularly women, lack the necessary skills to interact with digital interfaces due to unequal access to education in the past (Shrestha & Khatri, 2020). Physical and cognitive shifts with aging, such as loss of sight, motor coordination, and memory, also make digital adoption more difficult (Heart & Kalderon, 2013). Thapa (2021) revealed that the COVID-19 pandemic further compounded existing inequalities: as COVID-19 vaccines, telehealth consultations, and other services became increasingly digital, large groups of senior citizens were effectively left behind from essential services, further worsening their social isolation and psychological suffering.

Intergenerational learning and community support have also become important factors mediating the adoption of digital technology by older adults (Chen & Chan, 2014; Poudel & Devkota, 2020). Children and grandchildren sometimes assist as informal mentors when it comes to guiding senior citizens in using smartphones, social media, and other online platforms. However, knowledge regarding the digital experience of Nepalese-origin community elders is not well developed at present. As

far as scholarly writings go, most attention has been paid to infrastructural aspects, while other dimensions are disregarded.

The present study is limited to one of the culturally distinct indigenous group of people in Bhaktapur District who have tight relationship with their local language, festivals, professions and local ritual. The uniqueness of the community's sociolinguistic and cultural interactions make it an important location to explore older indigenous adults' perceptions and interactions with digital technologies in their specific sociocultural ecologies. The study aimed to explore the perceptions of the digital technologies among senior citizens in Bhaktapur and how do they use it in their everyday life. Also, the study aim to find whether younger family members contribute to intergenerational support for digital participation. The study investigate whether local community structures influence the ways in which older adults experience digital learning opportunities or not. This study also explore the key factors engaged with individual, socio-cultural, and infrastructural that hinder meaningful engagement with this group through digital means.

2. Literature Review

Digital literacy has been recognized as one of the most important skills for twenty-first century citizenship, with access to key services, health communication, banking, and e-governance increasingly being conducted digitally (Warschauer, 2004). Even as the Internet becomes more pervasive around the globe, older adults are the most disenfranchised group not being connected online. Cognitive decline, decreased vision, decreased motor control, and low digital self-confidence are key barriers (Quan-Haase et al., 2018). Internet access barriers remain, and only 45% of citizens aged 65–74 are regular Internet users in the European Union as of 2023 (Eurostat, 2023). This trend is confirmed worldwide by data from the International Telecommunication Union (ITU, 2023), which shows that in both developed and developing countries, individuals aged 65 and older are the least connected to digital technologies.

Senior digital inclusion is being achieved in certain countries, including South Korea, Japan, and Finland, with long-term, government-backed digital literacy initiatives for older people (UNESCAP, 2021). In the United States and Europe, community-based programs have proven to be effective through delivery at libraries and senior centers that provide individualized, hands-on, and patient-centered training (Tsai et al., 2015). However, digital exclusion of adults is a global problem, and the need for the continuous development of inclusive pedagogical approaches is still a pressing issue.

Digital literacy in seniors is not just about the skills of learning and doing technology; it is about access to technology, motivation, confidence, and purposeful use. Van Dijk (2020) distinguishes between four stages of access: motivational, material, skills-based, and usage, which can all be markers of exclusion. In practice, older people in disadvantaged contexts often have deficits in each of the four domains. According to Friemel (2016), educational level, income, and social support are key factors that affect digital inclusion among seniors, and Zimmerman's (2000) Empowerment Theory helps to clarify the connection between digital literacy and self-efficacy, autonomy, and civic involvement among ageing populations.

Digital literacy has been identified as one of the most critical skills for twenty-first century citizenship that can be acquired through digital means such as accessing important services, health communication, banking, and e-governance (Warschauer, 2004). Internet connectivity has increased significantly at a global level, but seniors continue to be the most excluded people in the world from the Internet. Cognitive impairment, decreased visual acuity, motor impairment, and low digital self-confidence are key factors (Quan-Haase et al., 2018). As recently as 2023, 45% of people aged 65–74 were regular Internet users in the European Union's advanced digital infrastructure (Eurostat, 2023). This appears to be the worldwide situation, as adults aged 65 and over are the least digitally connected group, both in developed and developing nations, according to data from the International Telecommunication Union (ITU, 2023).

There is evidence that countries comprising those with measurable advances in senior digital inclusion, such as South Korea, Japan, and Finland, have achieved them through continuous and state-led digital literacy initiatives specifically aimed at older adults (UNESCAP, 2021). Community-based programs in the United States and Europe that provide training in libraries and senior centers have proven effective with patient-centered, individualized, and practical training (Tsai et al., 2015). However, despite this development, the occurrence of digital exclusion of older adults continues to be a common issue across different countries, and an uninterrupted process of renewal of inclusive pedagogical approaches is needed.

Theoretical Framework: Cultural-Historical Activity Theory

This study is constructed on the Cultural-Historical Activity Theory (CHAT), developed by Leont'ev (1978) based on the work of Vygotsky (1978) and significantly extended by Engeström (1987, 2001). One advantage of CHAT is that it offers a rich explanation of how senior citizens engage with technological artifacts in their sociocultural ecologies. The theory commences with human activity as a systemic phe-

nomenon and views it in terms of subjects, tools, objects, rules, community, and division of labor (Engeström, 1987).

CHAT's analytical power comes from its ability to consider the personal, social, cultural, and structural aspects of digital experience in an interdependent manner. The digital artifact's affordances or constraints are a function of its capacity to either support or hinder particular forms of action, as noted by Kaptelinin and Nardi (2006). CHAT also helps researchers uncover contradictions between system elements, such as between an elderly person's motivation to participate digitally and the lack of Nepali-language interfaces. These contradictions help explain the origins of structural barriers and the conditions under which successful digital participation is possible (Engeström & Sannino, 2010).

Digital Exclusion of Senior Citizens in South Asia

The digital divide in South Asia is exacerbated by a combination of social, geographic, gender, and educational disparities. In India, only 11% of older adults in rural areas can use digital devices independently, and less than 10% use smartphones for health-related purposes (Faridi & Shaheen, 2024). Gender gaps are significant: approximately 80% of male seniors in the region use the Internet, compared to only 20% of female seniors, indicating that the interaction of age and gender contributes substantially to digital exclusion (Faridi & Shaheen, 2024).

Digital Literacy in Nepal

Nepal has promoted digital transformation through increased mobile penetration, Internet connectivity, and the Digital Nepal Framework (Government of Nepal, 2019). However, an enduring digital divide persists across age, geographic, ethnic, and gender groups (Poudel & Sthapit, 2022). Although Internet penetration is high at the national level, meaningful digital engagement among senior citizens remains limited (Nepal Telecommunications Authority, 2021). Gurung and Thapa (2019) reported that older people often have limited prior experience with digital technologies, dislike digital devices, and fear making irreversible mistakes. Digital adoption is also hampered by physical disabilities such as vision problems, reduced motor ability, and hearing loss (Rana et al., 2020). In some districts, illiteracy rates among women aged 60 years and older reach as high as 90%, severely limiting digital engagement (Shrestha & Khatri, 2020).

Community-level studies also reveal that younger family members play a significant role in helping older relatives complete digital tasks, making intergenera-

tional support one of the most importantthough structurally problematicaspects of digital inclusion in Nepal (Poudel & Devkota, 2020). Familial support, however, may also foster dependency among older adults (Shrestha & Manandhar, 2021).

Digital Literacy Among Indigenous Senior Citizens

Linguistic marginalization, cultural erasure, and economic deprivation create unique forms of digital exclusion for Indigenous communities. Indigenous seniors who speak Nepal Bhasa or other local dialects as their first language face substantial difficulties in accessing digital platforms and services because of the dominance of Nepali and English in digital interfaces. Adhikari (2021) noted that culturally relevant frameworks are not incorporated into most digital literacy programs, reducing their relevance for Indigenous peoples. For older Indigenous adults, digital exclusion does not refer only to access but also to a form of cultural invisibility (Mohamed & Ragnedda, 2021). Nepal is home to more than 125 Indigenous communities, many of which reside in areas with limited infrastructure (NEFIN, 2020). Kshetri (2021) stated that a significant number of digital literacy initiatives in Nepal have focused on youth and business owners while largely overlooking the needs of elderly and Indigenous populations.

From the review of the existing literature, five critical gaps emerge. First, most studies are quantitative in nature and provide limited insight into the lived experiences of participants. Second, very few studies have focused specifically on Indigenous senior citizens. Third, insufficient attention has been paid to understanding intergenerational learning processes. Fourth, cultural considerations remain largely absent from pedagogical approaches to digital literacy. Finally, Indigenous seniors have been largely excluded from digital policy-making processes in Nepal.

3. Methodology

Research Design

The research adopted a qualitative interpretive research design, which is well suited for the systematic examination of lived experiences, situational meanings, and sociocultural forces that impact digital literacy within Nepal’s indigenous elder community (Creswell & Poth, 2018). It is pertinent to note that this type of research was suitable to be conducted as it considers various sociocultural processes, which were impacting the usage of technology among indigenous elders. The processes were beyond numerical understanding and thus called for a qualitative research approach

(Denzin & Lincoln, 2018). In this regard, qualitative research design was used for this study.

Participants and Sampling

For this study, the subjects of interest were indigenous senior citizens 60 years and older from Bhaktapur district. The participants were selected using purposive sampling technique, which resulted in eleven subjects; six men and five women, implying that all subjects had diverse levels of education. Seven subjects were literate while four were illiterate. The use of purposive sampling method could be justified because this study sought to gather informative cases related to the research objectives (Palinkas et al., 2015). Sampling adequacy was ensured using the criterion of saturation of data where additional interviews did not contribute any new themes (Saunders et al., 2018). All subjects were multilingual speakers of Nepal Bhasa (Newari), Nepali, and local languages, and were engaged in community cultures.

Data Collection

Data from primary sources was collected using individual in-depth semi-structured interviews that served as a framework for gaining insights into perceptions and experience of digital technology use by participants. Interviews were conducted in either Nepal Bhasa or Nepali, according to participants' preference, with translators present when necessary. Fieldnotes were taken to document any non-verbal cues, contextual issues, and environmental factors related to digital technology use. Observations were made during interviews to gain additional insights into digital technology use by participants, with detailed notes kept about non-verbal behavior, contextual issues, and environmental factors surrounding their use.

Data Analysis

The data analysis was conducted according to the principles of reflexive thematic analysis proposed by Braun & Clarke (2006). The analysis entailed a number of stages which included the following: data familiarization (reading and note taking); the generation of initial codes (a systematic procedure); theme identification (codes were organized into potential thematic groupings); theme review (comparison between data extracts coded and all the data in their entirety); definition of themes; and presentation of the themes as part of a narrative description with illustrative quotations from participants. Throughout the process, an inductive coding scheme was used so as not to predetermine themes based on theoretical categories but rather to allow themes to emerge out of the data themselves. The triangulation of researchers was

utilized during the analysis, including the independent coding by two members of the research team and subsequent discussion to reconcile differences in interpretations.

Ethical Considerations

Each individual involved in the research process was well briefed on the objectives, methods, and ethics surrounding the research process before conducting the actual data collection. In cases where there was poor literacy among the participants, the participant consent and participant information sheets were translated into a language that the participant could understand through the use of an interpreter, who would take any questions from the participants. Participation in the study process was completely voluntary, and the participant knew that he/she had the right to pull out at any time without being penalized.

4. Findings and Discussion

Thematic analysis of the interview resulted in seven key themes related to the sociocultural, linguistic, and infrastructural aspects of digital literacy among senior members of the indigenous communities in Bhaktapur. The themes identified are analyzed further in the discussion that follows.

Theme 1: Intergenerational Digital Support

All participant accounts acknowledged intergenerational digital support as the most prevailing facilitating factor, which involved informal guidance from younger family members, especially grandchildren. Participants often reported having learned to use digital devices from the slow and careful mentoring of younger family members, and how to use mobile telephones, social media and other online services in the context of family relationship. The priority of family-led learning is in accordance with the findings of Poudel and Devkota (2020) who point to the key role of intergenerational learning in Nepal's household environment.

There is a common experience expressed by one participant, Shyam (pseudonym): *"My grandson is teaching me how to do mobile banking to send money, but he is often very busy with school, and I don't do it because I forget the steps."* It highlights a structural weakness pertinent to the Nepalese context, that is, the out-migration of young people for education and employment leaves empty spaces for the leadership and guidance of the elders. This Nepal-specific youth migration in an informal digital mentoring relationship is comparatively less studied in the regional literature and a significant contribution in this study.

Most participants reported themselves as relative newcomers to digital environment, operating technologies that were designed for and by the younger generation, in line with Prensky's (2001) categorisations of digital immigrants and digital natives. Most of their interactions occurred through trusted social networks, which suggests that social capital and interpersonal trust act as important preconditions for using digital technologies among this population.

Theme 2: Cultural and Linguistic Barriers to Digital Engagement

Barriers to digital literacy were identified as language and cultural norms, which proved to be strong and interconnected challenges. Large percentages of participants found language barriers in English-language interfaces and struggled to understand digital language in a mobile or mobile application environment. Participants who spoke Nepal Bhasa as their primary language also found the Nepali-language interfaces challenging, which is consistent with Mohamed and Ragnedda (2021) who note that linguistic mismatch is a major challenge of digital usability for indigenous language speakers.

This was how one of the respondents phrased the issue: *"I am literate in Nepali, but I do not know what button to hit in case there are words from the English language on my phone*". The cultural attitudes related to the use of digital technologies were another factor affecting the situation. Several individuals mentioned that they regarded the use of digital devices as being unsuitable for their cultural traditions and associated the use of technology with youth culture. In this way, generational connection along with the fear of making 'mistakes' like accidentally deleting a file or performing a financial transaction directed to certain avoidance behavior.

Theme 3: Digital Exclusion and Social Isolation

People had some tough times when they were not able to use digital things. They felt like they did not belong because more and more things were happening online. When they could not join family groups on messaging apps it made them very upset. They said they felt left out and excluded.

One person told us about this on a video call. They said *"Everyone is using Messenger, Viber, WhatsApp and they are all talking on it. I am not able to join in I feel left out."* What we found out is similar to what Tsai found out in 2015. They said that when older people do not use things they can feel very alone.

In Nepal people who are older and from groups have a harder time with digital things. This is because of where they live and how they used to communicate with each other. The COVID-19 pandemic made things even worse. Some important ser-

vices started happening and this made it very clear how big the problem of digital exclusion was, for many people.

Theme 4: Motivation and Self-Directed Learning Strategies

While the challenges presented above exist, a notable group of participants engaged in various ways in the acquisition of digital skills with self-directedness and agency. Participants spoke of a process of trial and error exploration of mobile devices in response to curiosity, necessity or the need to stay connected with migrant family members.

Participant Shanti (pseudonym) explained this self-teaching process: *"I follow my grandchildren and try to copy them; sometimes I can and sometimes I can't"*. This is the account of how Nepalese seniors have been resilient and how they have adapted and become resourceful as described by Shrestha and Manandhar (2021). The reasons for remittance and necessity monitoring of data from outside and health information during the pandemic were the most important motivators, reflecting a functional rather than exploratory approach to digital engagement. The results indicate that it is important that digital literacy interventions are built on real and life relevant tasks that older students know is directly beneficial to them.

Theme 5: Perceived benefits and risks of digital use

Digital technology was appealing to participants because it provided them with better ways to communicate and transact money. But they feared online security and the possibility of being cheated and scammed. Most participants said they use mobile phones mostly to call family members abroad, as well as use them to recharge the phone credit and for other basic financial services, such as mobile banking, and for social media apps like Messenger, WhatsApp and Viber.

One particularly counterintuitive outcome of this context was that some of the non-literate participants were more proficient using digital wallets, QR codes, ATM cards and mobile banking, while some of the literate retired participants were feeling anxious and avoidance about the same. Such a deviation from the norm of ability and competence in relation to digital skills and confidence raises questions about the direct correlation between educational level and digital competence, and indicates that experience and need are more likely to predict functional skills than education.

Participant Laxman (pseudonym) expressed a common concern*: "I am afraid when I click on a wrong button and lost money, I have a sight problem and have sent money wrongly 2 or 3 times"*. Often based on rumors spread in community networks, worries about fraud, data breaches and scams were effective as obstacles to continued

digital exploration. Helsper and Deursen (2017) find that perceived risk can have a significant impact on the uptake of digital solutions: in the context of Nepal, this impact is further exacerbated because there is still limited access to reliable digital guidance and a low baseline of digital literacy.

Theme 6: Infrastructure and Device Access Constraints

In all the groups things like infrastructure and not having devices were big problems that stopped people from using digital things. Many people did not have their smartphones so they had to use other phones in their homes, which made it hard to practice and get better at using them. The cost of buying smartphones and paying for internet was a problem for many people, especially those who had a fixed income and could not afford it.

Participant Sanumaya (pseudonym) said: *"The internet is so slow sometimes I have to wait until my grandson comes home to make a phone call it is really hard."* The internet connection was not stable. The power went out a lot, which made it hard for people to learn and use digital things especially in areas that were far from the city center. This is similar to what Poudel and Sthapit found in 2022 and Faridi and Shaheen found in 2024 that bad infrastructure is a problem for older people who want to use digital things in South Asia. The fact that internet connections are not the same, in all areas of Bhaktapur shows that we need to invest in infrastructure in a way that targets areas.

Theme 7: Functional Digital Uses in Communication, Finance, and Health

Nevertheless these obstacles, participants demonstrated functional digital engagements in three critical areas like communications, managing finances, and accessing healthcare. Notably, the primary factor that motivated continuous engagement with digital technologies was communicating with family members who lived abroad or in other districts. In particular, WhatsApp and Viber proved crucial for this type of engagement. The use of digital technologies for healthcare needs comprised making mobile phone calls to healthcare providers, accessing teleconsultation services, and looking up details about appointments. It is worth emphasizing that such use of technologies became even more evident during and after the pandemic period. The use of digital technologies to manage financial transactions comprised mobile banking transactions, using QR codes for payments, and refilling phone credits. Some individuals needed assistance to engage in more complex transactions.

The identified results validate the fact that senior citizens in Bhaktapur are pragmatic users of digital technologies, selecting those that are most relevant to their

daily activities. In fact, the use of functional digital technologies corresponds to the usage access approach proposed by Van Dijk (2020).

5. Conclusion

The article is a report on the research about how indigenous senior citizens of Nepal's Bhaktapur District experience digital literacy, what challenges they face, and what methods they devise to overcome those challenges. The research is qualitative and interpretive and uses Cultural-Historical Activity Theory for the analysis. The main discovery is that the digital world is very complicated and even contradictory. The elder people are seriously motivated and able to do some things but the structural and sociocultural exclusion remain very strong.

The article contributes to several areas of the research. Firstly, it points out that the youth migration to cities creates very serious problems for the elderly in getting digital support from their grandchildren coming to help them, a source that is very common among the elderly and at the same time is very rare in the current literature. Secondly, it shows the rise and fall of digital confidence is not dependent in a straight line on the level of formal education and even some illiterate participants were more digitally capable than the educated ones. Thirdly, it highlights the double whammy of digital exclusion of the indigenous elders in Nepal through showing that language marginalization, cultural norms, lack of infrastructure, and poverty constitute a system of barriers that reinforce each other.

The report argues that these results matter far beyond the Bhaktapur case. Due to the advent of Nepal’s digital system as well as the digitization of various services, older Nepali people belonging to indigenous communities will have to face exclusion to an even greater degree. Digital inclusion among these individuals is not only concerned with making technical facilities available but also involves social justice, aging equitably, and cultural recognition.

6. Implications

Policy Implications

First and foremost, it is a matter of a good digital policy to open up digital literacy programs to youth and indigenous senior populations not only in the cities but also in rural areas. Making local language provisions, Mainly Nepal Bhasa and other indigenous languages, to be included in these programs are the minimum requirements. The programs can be centered on the local culture And to the already existing one of the community recognized pedagogical practices. It is imperative that age-sensitive provisions should be also integrated in the national digital policy

structures, including the Digital Nepal System, that are capable to meet the needs and contexts of older adults from indigenous communities.

Program Implications

Intergenerational learning programs can be the most effective way to not only teach the elderly digital skills but also to sustain the transfer of knowledge. The pairing of younger volunteers and family members with older learners in organized settings relies on the existing relational trust. Training initiatives at the community level through the use of local gathering spots such as "Falcha", temples, and cultural organizations are offering culturally suitable and dispersible learning environments. The provision of subsidies on smartphones and other mobile gadgets along with extremely cheap data plans to elderly people living on fixed incomes would definitely address access issues related to availability. Tutorial materials have to be made simple enough to be comprehensible even to those who are less technologically savvy; support lines, language-appropriate visual instructions, and peer mentoring programs must because of this be available for assistance.

Research Implications

Future research would involve conducting longitudinal studies to examine the influence of digital literacy interventions specifically aimed at enhancing the well-being of the target population, their social connections, and their ability to access services. Conducting systematic evaluations of existing digital literacy programs implemented by government agencies and NGOs would offer scientific support for improving those programs. Comparisons between digital literacy programs among different indigenous groups within Nepal would help understand the importance of cultural relevance in the process of digitization. Using participatory approaches whereby the indigenous elders help design the intervention programs is highly likely to produce culturally relevant programs.

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