The Role of Social Capital on Acquiring Technological Literacy in Sri Lankan Estate Communities

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1. Introduction

The purpose of the present study is to explore the role of social capital in fostering technological literacy among students in marginalized estate communities in Sri Lanka. Estate areas, predominantly inhabited by tea plantation workers, have long faced socio-economic disadvantages, including limited access to quality education and infrastructure (Udayanga, 2023, 2024; Warschauer, 2004). These challenges contribute to a persistent digital divide, with students in these regions lacking the resources necessary to engage meaningfully with technology, a critical asset in both education and employment (Selwyn, 2004). Social capital, defined as the networks, relationships, and shared norms within a community, can significantly impact how individuals' access and utilize resources like technology (Putnam, 2000). In this context, the study will investigate how family connections, peer networks, and support from local institutions, such as schools and community organizations, influence students' technological literacy. By examining these social structures, this research aims to assess the extent to which social capital can serve as a buffer, potentially mitigating the disadvantages estate communities face and providing alternative routes for skill development. This study sets out three main goals: first, to explore how social capital shapes access to technology and digital skills within estate communities; second, to understand whether social capital offers compensatory benefits that alleviate educational disparities in these areas; and third, to propose targeted interventions that could bridge the digital divide and support educational mobility (Baker & LeTendre, 2005). This research thus seeks to inform policymakers and educators about effective strategies to empower marginalized communities, helping to create more equitable opportunities for students' technological and educational advancement.

2. Materials and Methods

A case study approach was employed to provide an in-depth understanding of how community relationships and networks shaped students' access to technology and digital skills. The research was conducted in selected estate areas in Matara Akuressa, particularly targeting Tamil schools that historically faced limited access to technology and education.

Participants were purposively selected to capture diverse perspectives within these communities, including students, parents, teachers, and local community members. The purposive sampling criteria included several specific factors: (1) students aged 12 to 18 currently enrolled in local schools, ensuring an age range where technological skills are increasingly relevant for academic and personal development; (2) a mix of students from various socio-economic backgrounds within the estate community, to reflect different levels of access to technological resources; (3) parents and teachers who could provide insights into the support and limitations faced by students in accessing technology; and (4) local leaders and community members who play roles in shaping community resources and norms around technology. A total of 30 participants were selected to allow for an in-depth exploration of varied perspectives on social capital and technological literacy.

Data were collected through semi-structured interviews and focus group discussions (FGDs) with students, parents, teachers, and local leaders. These methods provided insights into participants' experiences and perceptions regarding the role of social capital in technological access. Additionally, observations of school and community settings were conducted to understand the contextual factors influencing technological access and usage.

Thematic analysis was used to analyze the data. Interviews and FGDs were transcribed, coded, and organized into key themes based on participants' narratives, with particular focus on family support, peer networks, and institutional engagement with technology. Informed consent was obtained from all participants, ensuring their voluntary involvement. Anonymity and confidentiality were strictly maintained to protect participants' identities throughout the research process.

3. Results and Discussion

The findings reveal five key themes: *Limited Access to Digital Resources and Poor Infrastructure*, *Parental Knowledge and Technology Networks*, *External Networks as Bridging Social Capital*, *Challenges Faced by Teachers and Administrators*, and *Community-Driven Collaborative Learning*. These themes illuminate how social capital influences technological literacy in estate communities and highlight critical areas for intervention.

Results indicate that limited access to digital resources and poor infrastructure severely hinder students' technological development. For instance, one participant stated,

"We are not allowed to use the computers either in Tamil School; some children even do not know how to switch on a computer" (Respondent 10, 27 years, female, laborer, in-depth interview).

This statement illustrates a systemic issue where students are not only deprived of resources but also lack foundational skills necessary for digital engagement. Investing in digital infrastructure, such as providing computers and reliable internet access in schools, is essential for fostering educational equity (Warschauer, 2004). Such investments would not only improve access but also empower students to develop crucial technological skills necessary for their academic and future professional lives.

The study reveals that many parents lack awareness of the importance of IT education. One participant highlighted**,**

"Most of the parents of these estate children work abroad due to financial issues, and these left-behind children are looked after by their grandparents, who have very limited social connections with their neighborhood" (Respondent 06, 35 years, female, housewife, in-depth interview).

This lack of awareness among caregivers about the value of digital literacy can create a gap in support for students' learning. Schools should implement community outreach programs aimed at educating parents and guardians about the significance of digital skills. Workshops or informational sessions can help parents understand how technology is integrated into education and its importance in today's job market (Putnam, 2000). For example, highlighting success stories of students who have benefitted from digital skills could motivate families to prioritize IT education.

Students who managed to connect with external networks, such as NGOs or social organizations, demonstrated improved digital skills. One participant noted,

"5% of the parents of this community send their children to private tuition classes to provide IT knowledge, all of them are well supported by the Church Community" (Respondent 15, 40 years, female, housewife, in-depth interview).

These external networks act as a form of bridging social capital, enabling students to acquire essential skills that may not be available through traditional educational paths (Baker & LeTendre, 2005; Hsieh, 2014). Expanding partnerships between local schools and organizations can enhance students' access to technology and training. For example, NGOs could offer workshops that provide hands-on experience with digital tools, helping to build a stronger technological foundation for students from marginalized backgrounds.

Teachers and school administrators face significant challenges in incorporating technology into the curriculum due to inadequate training and resources (Ertmer, 1999). For instance, educators

may feel overwhelmed by the rapidly changing technological landscape and lack confidence in their ability to teach digital skills. Professional development programs should be prioritized to equip teachers with the necessary skills and resources. Training that focuses on integrating technology into existing curricula, along with ongoing support, can empower teachers to foster a more technologically adept student body. For example, collaborative training sessions could facilitate knowledge sharing among educators, leading to improved confidence and innovative teaching methods.

The community-driven initiatives focusing on collaborative learning, such as peer support networks, have shown promise in enhancing digital skills. Participants noted that more tech-savvy students often assist their peers, creating a culture of collective learning. Structuring peer mentoring programs within schools can formalize these efforts, allowing students to benefit from each other's strengths. Schools could develop a mentorship framework where older or more skilled students help younger peers navigate technology, thereby reinforcing their own learning and fostering a supportive educational environment.

Overall, these findings suggest that a multi-faceted approach is necessary to improve technological literacy in estate communities. By addressing issues of access, parental engagement, teacher training, and community collaboration, stakeholders can work towards bridging the digital divide. Future policies should emphasize enhancing digital infrastructure, fostering external partnerships, and promoting community-driven initiatives that empower students and families alike. Monitoring and evaluation of these interventions will be essential to ensure they effectively meet the community's evolving needs and lead to sustainable change.

Table 1. Summary of Findings and Recommendations

Key Theme	Findings	Recommended Interventions
Limited Access to Digital Resources and Poor Infrastructure	Students lack access to computers and internet, hindering technological skills development.	Invest in digital infrastructure in schools to provide essential resources.
Parental Knowledge and Technology Networks	Many parents are unaware of the importance of IT education, resulting in gaps in student support.	Implement community outreach programs to educate parents on digital skills.
External networks and Bridging Social Capital	Students connected with NGOs or social organizations show improved digital skills.	Expand partnerships with local organizations for technology access and training.
Challenges Faced by Teachers and Administrators	Teachers face challenges in integrating technology due to inadequate training and resources	Prioritize professional development programs focusing on technology integration.
Community-Driven Collaborative Learning	Peer support networks enhance digital skills among students.	Formalize peer mentoring programs to foster collaborative learning.

4. Conclusion

This research highlights the critical role of social capital in shaping technological literacy among students in Sri Lanka's estate communities. A key principle derived from the results is that students from middle-class families benefit from stronger social networks and access to resources, leading to significantly higher levels of technological literacy compared to their peers from lower socioeconomic backgrounds. However, exceptions exist, as some students in marginalized communities have successfully accessed external networks, indicating potential pathways for overcoming barriers. Despite the overarching trends, the challenges faced by estate students-including limited access to devices, internet connectivity, and guidance—persist. These issues reflect a complex interplay of socio-economic factors that can undermine educational equity. Furthermore, while some students benefit from external networks, it is

essential to recognize that not all individuals within marginalized communities can leverage these opportunities. This variability suggests that the effectiveness of social capital in enhancing technological literacy may depend on various contextual factors, including individual motivation, parental support, and the specific nature of community resources available (Bourdieu, 1986; Putnam, 2000).

In discussing potential limitations, this study primarily focused on estate communities in Sri Lanka, which may limit the generalizability of the findings to other contexts. Additionally, the reliance on qualitative methods may introduce subjectivity in interpreting participants' experiences. Future research could employ a mixed-methods approach to provide a more comprehensive understanding of the nuances in social capital and technological literacy across diverse populations. The theoretical implications of this study suggest that social capital can serve as a valuable framework for understanding educational disparities in technology access. Practically, there is an urgent need for interventions aimed at improving digital infrastructure in estate areas and enhancing the social capital of these communities. Programs fostering stronger connections between students, schools, and external organizations, along with affordable technology and training initiatives, are critical. In conclusion, collaborative efforts among government agencies, NGOs, and community leaders are essential for creating a more equitable educational landscape. Specific recommendations include establishing mentorship programs, enhancing community access to technology, and developing policies that support inclusive educational practices. By prioritizing these strategies, stakeholders can empower students and families, ensuring all children have the opportunity to thrive in an increasingly digital world.

5. Key words

Estate Community, Marginalized, Social Capital, Technological Literacy

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