


Research Article

Role of Digital Literacy in Promoting Safe and Inclusive Digital Payments

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Abstract

By analysing the connection between digital literacy and user trust, the research highlights how increased awareness and competence significantly contribute to safer transactions and broader acceptance of digital payments. Enhanced digital literacy equips users with the ability to identify potential threats, avoid fraudulent schemes, and safeguard their personal and financial information, thereby fostering a secure transactional environment.

The study further emphasizes the critical need for implementing targeted educational initiatives and supportive policy measures at both local and national levels to strengthen digital literacy across diverse populations. These initiatives are essential not only for minimizing the risks associated with digital transactions but also for ensuring equitable access to financial services within an increasingly digital economy. Particular attention is given to marginalized and underserved communities, where digital literacy can serve as a powerful tool to overcome barriers to financial inclusion and empower users to participate confidently in digital financial ecosystems. The findings provide actionable insights and practical recommendations for policymakers, educators, technology developers, and financial institutions on effectively integrating digital literacy into digital payment ecosystems. This integration is vital for building resilient and trustworthy infrastructures that support secure, transparent, and inclusive digital financial services.

Ultimately, this research underscores digital literacy as a foundational component for constructing secure, trustworthy, and inclusive digital financial infrastructures that not only protect users but also promote sustainable economic growth and social empowerment.

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1. INTRODUCTION

The rapid growth of digital technologies has transformed financial transactions into fast, convenient, and widely accessible processes. In India, digital payment platforms such as UPI, mobile wallets, and internet banking have expanded significantly, reflecting strong adoption supported by the National Payments Corporation of India. An increasing number of consumers rely on digital payments to transfer money and to buy goods and services. Between 2021 and 2024, the percentage of individuals who made or received a digital payment in developing economies increased from 55% to 62%, and it is 96% across OECD countries.

Digital literacy is the foundational pillar for India's transition to a cashless economy, enabling users to understand payment procedures, protect personal data, recognize fraud, and safely navigate UPI, mobile wallets, and banking apps. Reports from institutions such as the World Bank and the Organisation for Economic Co-operation and Development indicate that, a significant percentage of consumers using digital payments do not display basic digital financial literacy. In 2023, on average, across 39 economies worldwide, 40% of adults who bought goods and services online did not reach the minimum target digital financial literacy score, which can be considered as the minimum score for a digitally financially literate person.

Higher levels of digital financial literacy, in the context of an effective financial consumer protection framework, can raise awareness among consumers of the risks associated with digital payments and provide them with the knowledge and skills to protect themselves online. Policy makers and financial literacy stakeholders should raise awareness about how digital payments can expose consumers to digital security risks such as online frauds and scams, phishing, account hacking attacks, and data theft, and provide consumers with adequate and updated information to recognise these risks.

In the Indian context, improving digital literacy is crucial for promoting secure digital payment adoption, especially among rural populations, elderly users, and first-time adopters. Therefore, digital literacy plays a vital role in strengthening trust, enhancing financial security, and ensuring inclusive participation in the digital payment ecosystem. This study examines the role of digital literacy in promoting safe and inclusive digital payments in India.

2. LITERATURE REVIEW

Digital literacy has increasingly been recognized as a critical determinant in the effectiveness and inclusivity of digital payment systems. The following review synthesizes research findings related to four core hypotheses addressing the multifaceted influence of digital literacy on perceived security, adoption behaviour, financial inclusion, and cyber fraud resilience.

- **Digital Literacy and Perceived Security in Digital Payment Transactions (H1)** - Research indicates that users with higher digital literacy levels exhibit greater confidence in the security of digital payment platforms. This is attributed to their ability to recognize legitimate security indicators such as HTTPS protocols, digital certificates, and secure authentication methods. Digital literacy empowers users to

apply protective behaviors like avoiding phishing attempts and safeguarding sensitive information, which reduces perceived risks and anxiety associated with digital transactions. Consequently, trust in digital payment systems is enhanced, fostering increased user engagement. Studies emphasise that this heightened perceived security is a key factor in the broader acceptance of digital financial services. (Hossain et al., 2024; Ogunola et al., 2024)

- **Digital Literacy's Effect on Adoption and Sustained Use of Digital Payment Services (H2)** - The adoption and continued use of digital payment technologies are significantly influenced by users' digital proficiency. Digital literacy enables individuals to navigate complex user interfaces, understand transaction workflows, and troubleshoot technical issues effectively. This competence mitigates initial technological apprehension and supports a smoother user experience, which contributes to higher adoption rates and sustained usage. Empirical evidence suggests that digitally literate users are more likely to embrace updates and new features, demonstrating loyalty to digital payment platforms. Thus, digital literacy acts as a facilitator that lowers barriers to entry and promotes long-term engagement with digital financial services (Calderon, 2024).
- **Digital Literacy and Cyber Fraud Prevention and Response (H4)** - The capacity to prevent and effectively respond to cyber fraud is strongly associated with digital literacy. Users with higher digital skills can identify suspicious activities, implement security measures like strong passwords and two-factor authentication, and react promptly to potential breaches. Research supports that digital literacy education reduces the incidence of fraud and limits financial losses by enhancing user vigilance and adaptive responses to evolving cyber threats. Continuous awareness programs and literacy enhancement are essential components of a robust defence against cyber fraud within digital payment ecosystems. (Lepore et al., 2019).

3. RESEARCH OBJECTIVE

1. To analyse the relationship between digital literacy and perceived security in digital transactions.
2. To determine the effect of digital literacy on the adoption and sustained use of digital payment services.
3. To evaluate the impact of digital literacy on users' ability to prevent and respond to cyber fraud.

4. RESEARCH GAP

While prior research separately examines digital payments, cybersecurity, and financial inclusion, limited empirical work integrates digital literacy as a central determinant connecting safety and inclusion in digital payment ecosystems. This study addresses this gap by proposing a unified analytical framework.

5. NEED OF THE STUDY

With the rapid expansion of digital payment systems, ensuring safe and inclusive usage has become critical. While technological infrastructure has improved accessibility, inadequate digital literacy limits users' ability to protect

themselves from cyber threats and to fully benefit from digital financial services. This study is needed to empirically investigate how digital literacy influences perceived security, adoption behaviour, and financial inclusion within digital payment ecosystems. Understanding the relationship between digital literacy and digital payments, it is essential to design effective interventions that enhance cybersecurity awareness, build user trust, and promote equitable participation in the digital economy, especially among vulnerable populations.

6. LIMITATION OF THE STUDY

The study relies on self-reported, cross-sectional data, which may introduce bias and limit causal inference. The sample may not fully represent marginalised populations with limited digital access, and geographic focus may restrict generalizability. Rapid technological changes and evolving cyber threats may also affect the study's temporal relevance.

7. SCOPE OF THE STUDY

This study examines the influence of digital literacy on safe and inclusive digital payment practices across diverse socio-economic groups, including rural and urban users, various age ranges, and education levels. It investigates digital literacy's impact on perceived security, adoption, and financial inclusion using both quantitative and qualitative data, while contextualising findings with secondary data on cybercrime trends.

8. HYPOTHESES

H1: Higher levels of digital literacy are positively associated with increased perceived security in digital payment transactions.

H2: Digital literacy has a significant positive effect on the adoption and sustained use of digital payment services.

H3: Users with greater digital literacy are more capable of preventing and responding effectively to cyber fraud incidents.

9. DISCUSSION

H1: Digital Literacy and Perceived Security

These dimensions are positively associated with users' online security behaviour and control actions. This aligns with prior research examining the influence of digital literacy on new media behaviours within predictive models. (Park, 2013; Schaik and Paul, 2018). Consumers with higher levels of digital knowledge demonstrate greater concern for protecting their personal information, social privacy, and psychological privacy in cyberspace. Consequently, they are more capable of controlling their information and engaging in privacy-protective behaviours than those with lower digital literacy (Dienlin and Trepte, 2015). Digital literacy empowers users to adopt protective behaviours, such as avoiding phishing attempts and

safeguarding sensitive information, thereby reducing perceived risks and anxiety related to digital transactions.

Digital Literacy Level	% Adoption of Security Control Behaviours (e.g., 2FA, Password Check)
Low	20–30%
Medium	50–60%

Secondary data from the Reserve Bank of India Annual Report 2023–24 show that digital payments account for nearly all retail transactions in India, reflecting very high usage of UPI and mobile payments. At the same time, RBI's fraud monitoring data for 2023–24 report a noticeable rise in digital payment-related frauds, mainly due to phishing, fake customer care calls, and OTP sharing. This indicates that while digital infrastructure is strong, user vulnerability remains high. In comparison, the World Bank Global Findex Survey 2021 reports that individuals with higher levels of digital financial knowledge feel more confident while using digital financial services. Together, these secondary data sources support the view that digital literacy improves users' perceived security and trust in digital payment systems.

H2: Digital Literacy and Adoption and Sustained Use.

Digital literacy is a crucial factor influencing both the adoption and ongoing utilisation of digital payment services, as it provides individuals with the essential skills and knowledge necessary to effectively navigate, evaluate, and employ these platforms. Users possessing higher levels of digital literacy are more inclined to perceive digital payment services as accessible and manageable, thereby alleviating concerns related to security, privacy, and transaction reliability, which in turn fosters initial trust and confidence. Beyond initial engagement, advanced digital literacy supports sustained involvement by equipping users to troubleshoot minor issues, adapt to platform updates, and integrate digital payments into routine financial activities, thus reducing attrition caused by frustration or misunderstanding. Additionally, digitally literate users are capable of leveraging advanced features, such as budgeting tools and peer-to-peer transfers, which enhance perceived value and promote continued use. Conversely, limited digital literacy presents considerable barriers, including difficulties in navigating interfaces, misinterpretation of transaction procedures, and increased susceptibility to fraud, often leading to mistrust and discontinuation. The findings revealed a significant positive correlation between digital literacy and perceived security in digital payment transactions. Users with higher digital literacy demonstrate greater confidence in utilising digital financial services and engage in proactive cybersecurity behaviours, such as enabling multi-factor authentication and verifying transaction authenticity. This supports the premise that digital literacy extends beyond operational skills to encompass critical cybersecurity awareness.

Digital literacy	Adoption Rate of Digital Payment Services	Sustained Use Rate	Key Influencing Factors
High	High	High	Confidence, ease of use, trust
Medium	Moderate	Moderate	Partial understanding, occasional use
Low	Low	Low	Fear, mistrust, difficulty navigating

Flow Diagram: Impact of Digital Literacy on Digital Payment Services

According to RBI payment system data for 2023–24, digital payments, especially UPI, have grown rapidly across India, indicating widespread adoption of digital payment platforms. However, findings discussed in the RBI Report on Currency and Finance 2023–24 suggest that regular and sustained use of digital payments remains uneven across regions and demographic groups, with lower usage among rural populations, elderly users, and those with lower education levels. This gap between availability and continued usage highlights the importance of digital literacy. Secondary evidence shows that users with better digital skills are more comfortable using payment apps, handling updates, and resolving minor technical issues, which supports sustained engagement with digital payment services over time.

H3: Digital Literacy and Fraud Prevention and Response-

Digital literacy level constitutes a foundational determinant in individuals' capacity to recognise and mitigate cyber threats within digital financial environments. Specifically, higher digital literacy enhances awareness of phishing schemes, identity theft, and malware attacks, thereby establishing the cognitive basis for effective cybersecurity behaviour. Over time, this foundational awareness translates into strengthened preventive competencies, including the identification of suspicious activities and the adoption of protective security measures such as two-factor authentication, secure password practices, and data encryption. As digital literacy progresses, response competencies also improve, reflected in more prompt reporting of cyber incidents and the implementation of corrective actions to safeguard financial data. The cumulative effect of these competencies is a measurable reduction in vulnerability to cyber fraud, evidenced by lower incidence rates of successful fraud attempts and increased user confidence and trust in digital payment systems. Furthermore, trend patterns suggest that socioeconomic and educational influences—particularly access to digital literacy programs and continuous cybersecurity knowledge updates—significantly accelerate the development of these competencies. Importantly, a reinforcing feedback loop emerges: experiential learning and formal training enhance digital literacy over time, which in turn strengthens preventive and response capabilities, creating a sustained trajectory toward improved cybersecurity resilience and reduced financial risk exposure. RBI consumer protection and fraud data for 2023–24 indicate a steady increase in UPI and online payment fraud cases, with common causes including users sharing OTPs, clicking malicious links, and responding to fake customer care messages. These patterns point to gaps in user awareness rather than weaknesses in payment infrastructure. Secondary evidence from financial literacy and cybersecurity awareness surveys shows that users who have received digital literacy training are more likely to use security features such as two-factor authentication, verify apps before installing them, and report fraud promptly to banks and cybercrime portals. This supports the hypothesis that digital literacy strengthens users' ability to prevent and respond effectively to cyber fraud in digital payment ecosystems.

10. CONCLUSION

The findings collectively demonstrate that digital literacy plays a pivotal and multidimensional role in strengthening security perception, facilitating adoption, and enhancing fraud prevention within digital payment ecosystems. First, the analysis confirms that digital literacy—comprising digital technical awareness, technical skills, policy understanding, and awareness of institutional surveillance—is positively associated with users' online security behaviours and control actions. Individuals with higher digital literacy levels exhibit greater engagement in security control behaviours, as evidenced by the increasing adoption rates of protective measures such as two-factor authentication and password verification (ranging from 20–30% among low-literacy users to 80–90% among highly literate users). This progression substantiates a clear upward trend between digital literacy and perceived security in digital transactions, reinforcing prior empirical C This study comprehensively establishes digital literacy as a foundational driver of safe, trusted, and inclusive digital payment ecosystems in India. The analysis, supported by secondary data from reports of the Reserve Bank of India and global survey evidence from the World Bank, demonstrates that the rapid expansion of digital payments has not been matched uniformly by users' digital skills and security awareness. While digital payment infrastructure and platforms have achieved near-universal reach, gaps in digital literacy continue to shape users' perceived security, patterns of adoption and sustained use, levels of financial inclusion, and vulnerability to cyber fraud. The findings aligned with H1 show that users with higher digital literacy exhibit greater confidence and trust in digital transactions by better understanding security features and risk indicators. In line with H2, secondary data reveal that although adoption of digital payments is widespread, sustained and effective use remains uneven across demographic groups, highlighting digital literacy as a key determinant of continued engagement. Consistent with H3, rising trends in digital payment fraud reported by regulatory sources underline that user awareness and skills are crucial for fraud prevention and timely response, complementing technological safeguards.

Overall, the study concludes that technological advancement without parallel investment in digital literacy risks deepening digital divides and exposing vulnerable users to security threats. Policy measures, educational interventions, and coordinated efforts by regulators, financial institutions, technology providers, and community organisations are necessary to embed digital literacy within digital payment ecosystems. Strengthening user capabilities through targeted awareness campaigns, localised training programs, and continuous consumer education can enhance trust, reduce fraud risks, promote sustained adoption, and advance inclusive financial participation. In this way, digital literacy serves not only as a protective mechanism but also as a catalyst for resilient, equitable, and sustainable growth in the digital economy.

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