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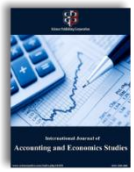

Fintech Adoption and Financial Inclusion: The Mediating Role of Digital Financial Knowledge

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Abstract

This study investigates the relationship between FinTech use, digital financial knowledge, and financial inclusion among digitally active individuals. A descriptive research design with a quantitative approach was employed, utilizing an online structured questionnaire that yielded 623 responses. After rigorous screening for completeness and consistency, 478 valid responses were retained for analysis. Constructs were measured using a five-point Likert scale to assess engagement with digital financial platforms, awareness of digital financial tools, and access to financial services. Findings indicate that FinTech use significantly enhances both digital financial knowledge and financial inclusion, while digital financial knowledge serves as a partial mediator between FinTech use and financial inclusion. The study underscores the importance of strengthening digital literacy to maximize the economic and social benefits of FinTech adoption. These insights offer valuable implications for policymakers, financial institutions, and regulators seeking to leverage technology for broader financial inclusion.

Keywords: *Financial Inclusion; FinTech Adoption; Digital Financial Knowledge; Financial Literacy; Fintech use.*

1. Introduction

Financial inclusion refers to the procedure of making a formal financial system available, usable, and useable to all segments of a society. Financial inclusion is widely considered a foundation stone for poverty alleviation and economic empowerment worldwide (Kamble et al., 2023; Churchill et al., 2020; Saha & Qin, 2022; Erlando et al., 2020; Pal et al., 2021). The improvement in access to financial services fosters resilience against economic shocks. Despite the progress, roughly 1.4 bn people globally remain unbanked (World Bank Group, 2022), underscoring the need for innovative approaches to bridge this access gap (Ha et al., 2025; Demirguc-Kunt et al., 2018).

FinTech has rapidly evolved into a key catalyst for financial inclusion by lowering barriers to financial services by leveraging its digital platform to access and use financial services. Mobile banking, digital wallets, peer-to-peer lending, and crowdfunding platforms have allowed billions of users to save, transact, and borrow without physically visiting a traditional bank (Ha et al., 2025; Amnas et al., 2024; Ozili, 2018). The growing penetration of affordable smartphones and data services has amplified the accessibility and potential for inclusive finance, especially when the FinTech solutions are scalable, interoperable, and have user-centric features. In India, the adoption of the Unified Payment Interface and other digital payment innovations has lifted the formal financial participation from 60% to 90% of adults between 2016-2023 (Kushwaha & Malpani, 2025; Sharma et al., 2022).

Effective FinTech adoption requires the populace to be digitally financially literate, i.e., to be proficient in navigating, evaluating, and utilizing the available digital financial tools. Studies have shown that users with basic financial knowledge struggle to benefit from FinTech services available at their disposal without a targeted digital financial literacy program; this is more of a concern among low-income users (Goyal & Kumar, 2020; Hasan et al., 2022). Digital literacy initiatives like community workshops and in-app tutorials have been found to improve usage and increase engagement, signifying educational efforts along with technology can drive financial inclusion (Amnas et al., 2024). FinTech can also address the significant gender disparities in financial access. Women remain 20-30% less likely than men to hold bank accounts or have access to credit, which limits access to economic opportunities as well as negatively affects their resilience (Kamble et al., 2023b; Demirgüç-Kunt et al., 2022, Chapter 1). Offering low-cost digital wallets, women-focused saving groups, micro-finance platforms, and FinTech applications can provide custom products to meet its female users' needs, narrowing the gender gap in financial inclusion and women's empowerment (Kushwaha & Malpani, 2025; Salman & Nowacka, 2020).

This study suggests a layered model of connection between FinTech usage, digital financial literacy as well and financial inclusion outcomes. This study seeks to examine how exposure to and engagement with FinTech platform could enhance digital financial knowledge (H_2), whether such knowledge independently contributes to inclusive financial behaviours (H_3), and whether it mediated the influence of use of FinTech platforms on financial inclusion.H_1 assumes a direct link between use of FinTech platforms as well as financial inclusion, building on empirical findings that demonstrate positive correlations between digital financial access and formal participation. Digital financial knowledge functions as both a capability and a confidence driver. It encompasses skills such as interpreting account balances,

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recognizing scams, optimizing app features, and evaluating credit options (Lusardi & Mitchell, 2014; OECD, 2022). Individuals with high digital literacy are most likely to use advanced financial services such as recurring savings schemes, micro-investments, or insurance. On the other hand, an individual with low digital proficiency.

This study situates itself within this evolving landscape, offering both empirical and theoretical contributions. Examining the four proposed hypotheses, H1 through H4, it provides a structured lens to understand the pathways through which FinTech adoption translates into financial empowerment. If digital financial knowledge proves to be a statistically significant mediator, the study may highlight the importance of integrating literacy programs into product design and outreach strategies. These insights would be particularly valuable for FinTech developers, government agencies, and nonprofit organizations committed to inclusive growth.

Financial inclusion cannot be reduced to a matter of access alone. It must incorporate dimensions of knowledge, trust, usability, and sustained engagement. In an era where digital technologies increasingly define the contours of economic participation, the ability to use financial tools wisely is as important as having access to them. This research adopts a multi-level approach examining user behavior, technological interfaces, and enabling environments to explore how a Digital Bridge can be built, empowering individuals not just to connect but to thrive.

2. Literature Review

The global financial system has been reshaped by the unprecedented growth of financial technology (Anagnostopoulos et al.,2025; Arner et al., 2015). The use of innovative and digital solutions by FinTech platforms has made financial transactions more affordable, accessible, and efficient (Gomber et al., 2017). FinTech platforms have become a vital driver of financial inclusion by extending formal financial services to individuals who were previously excluded (Ozili, 2018). The ability to disregard procedural, economic, and geographical barriers is evident in tools like mobile banking, digital wallets, and online lending platforms. The existing FinTech platforms are insufficient to ensure comprehensive financial inclusion, as tasks related to digital literacy, infrastructure, and regulatory gaps continue to exclude vulnerable populations (Arner et al., 2020; Gabor & Brooks, 2016). Addressing these systemic challenges would be essential for synergy between FinTech usage, digital knowledge, and inclusive financial participation.

2.1. Fintech and financial inclusion

FinTech plays a significant role in providing financial services to unbanked and underserved individuals through digital channels (Jha and Dangwal, 2025). They have a very significant impact in areas where traditional banking and financial institutions are absent. Digital payment systems have significantly boosted financial access in parts of Africa (Evans, 2018; Santos & Kvangraven, 2017; Shipalana, 2019) and Asia (Morgan, 2022; Koh et al., 2017; Soejachmoen, 2016) by enabling users to open accounts and conduct transactions easily and reliably. Emergent technologies like AI and blockchain are transforming and redefining financial inclusion (Alenizi et al., 2024). The use of AI for credit scoring has provided lending opportunities to individuals without conventional credit histories/ credit scores (Addy et al., 2024; Raji et al., 2024). The integration of blockchain has enhanced transparency as well as reduced transaction costs for FinTech platforms (Renduchintala et al., 2022). Obstacles such as regulatory ambiguities and limited digital literacy must be addressed for these innovations to achieve their full potential.

H_1: FinTech use positively impacts financial inclusion

2.2. Fintech and digital financial knowledge

FinTech applications help in improving financial literacy by providing individuals with an immersive and real-time experience (Feyen et al., 2021; Jha and Jangwal,2025). The use of FinTech platforms makes complex financial work simpler and more accessible. By providing users with the necessary abilities to harness digital products and services like mobile banking and robo-advisors, FinTech platforms enhance users' financial capabilities to make sound monetary decisions and manage their finances confidently (Bunnell et al., 2020). Greater access through intermediaries' removal, particularly in developing markets, closes the literacy gap and introduces the underprivileged into the formal financial system. Gamification and AI-based assistance features make learning finance more enjoyable and inclusive, promoting lifelong learning. As people get increasingly digitally financially literate, they develop sound financial habits and engage actively in the financial system, benefiting from better financial health (Bunnell et al., 2020). Yet to truly achieve these advantages, it is important to couple digital tool use with core financial education to avoid thin knowledge and realize substantial inclusion.

H_2: Digital financial knowledge positively influences financial inclusion

2.3. Digital financial knowledge as a mediator

Financial digital literacy acts as a mediating factor of central importance between FinTech adoption and financial inclusion, since it shows how well people can use digital channels to gain access to and take advantage of financial services (Loaba et al.,2025). Empirical research identifies FinTech products like robo-advisors and mobile banking that improve the financial literacy of users through experiential digital exposure, closing the knowledge gap and enhancing decision-making processes (Lusardi & Mitchell, 2014b). Theoretical models explaining technology adoption, like the Technology Acceptance Model (TAM), propose that perceived ease of use and usefulness, both determined by user knowledge, play significant roles in determining adoption outcomes. FinTech improves financial literacy and user involvement by incorporating AI-driven tools and gamification (Chauhan et al., 2021; Rodrigues et al., 2016; Çera et al., 2020). Improved financial self-efficacy and behavior among users of FinTech have been shown to intermediate the pathway from digital engagement and equitable financial access (Mindra & Moya, 2017). Without the knowledge of financial understanding, technology and gamification may hinder in drive for financial inclusion, calling for cohesive solutions that combine literacy training with FinTech engagement.

H_3: Digital financial knowledge mediates the relationship between FinTech use and financial inclusion.

The studies highlight that through features like real-time financial tools and gamification, FinTech improves decision-making capabilities and learning of individuals. This engagement is especially useful in increasing confidence and financial inclusion in the underserved population. Active use of FinTech has been associated with enhanced financial self-efficacy and inclusion performance, mainly in underserved areas (Pei et al., 2024; Liu et al., 2023). Nonetheless, one significant limitation in the extant literature is the possibility of excessive dependence on technology, thus precipitating shallow comprehension instead of profound financial capability. Furthermore, whereas the linking between the use of FinTech and financial inclusion is extensively documented (Azmeh & Al-Raeei, 2024), less empirical research

has explored the intervening role of digital financial literacy in this relationship, mainly in the context of emerging economies. There is a gap that is intended to be filled by this study, exploring how digital financial literacy not only increases the individual but also bridges the use of FinTech as well as overall financial inclusion.
Based on this literature, we proposed a framework shown in Figure 1.

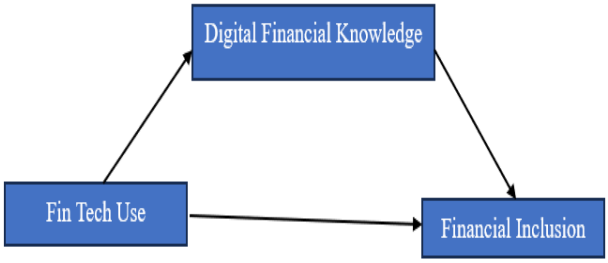

Fig. 1: Proposed Conceptual Model.

This conceptual model Figure illustrates the relationship between FinTech use, digital financial knowledge, and financial inclusion. It proposes that FinTech use directly enhances financial inclusion by providing access to digital financial services, while also indirectly influencing it through digital financial knowledge. In other words, greater use of FinTech tools improves individuals' financial knowledge, which in turn strengthens their ability to effectively participate in the financial system, thereby fostering financial inclusion.

3. Methodology

3.1. Research design and data collection

This study implemented a descriptive research design using a quantitative approach (Priya & Sivakumar, 2024) to examine the relationship between FinTech use, digital financial knowledge, as well as financial inclusion (Priya & Saravanakumar, 2025). The data was collected through an online structured questionnaire distributed to individuals who have access to digital financial services. The target population consisted of digitally active individuals across various age groups and occupational backgrounds. The survey yielded 623 responses, of which 478 valid responses were retained after excluding incomplete and inconsistent entries. This rigorous filtering ensured the quality and reliability of the final dataset used for analysis.

3.2. Sampling procedure and measurement

The constructs in this study were measured using a five-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). FinTech Use and Digital Financial Knowledge were each assessed using four items, adapted from the validated models of Venkatesh et al. (2003) and Sushma (2020), capturing the level of engagement with digital financial platforms and the level of awareness and understanding of digital financial tools. Financial Inclusion was measured using four items drawn from Sushma (2020), reflecting access to usage of satisfaction with proper financial services facilitated by digital channels. These measurement items were pre-tested for clarity and contextual relevance, ensuring construct validity and alignment with the theoretical foundation provided by the Unified Theory of Acceptance and Use of Technology (UTAUT) context (Venkatesh et al., 2003).

3.3. Common method bias and data integrity

To mitigate common method bias (CMB), practical remedies were adopted during survey design, such as assuring respondent anonymity and randomizing question order. Additionally, Harman's single-factor test was conducted post hoc to statistically examine the presence of CMB, confirming that no single factor accounted for the majority of variance (Priya and Alur 2025). The structured methodology and scale validation, along with careful screening for response consistency, strengthened the integrity of the data, supporting the robustness of subsequent analysis.

4. Results and Interpretations

4.1. Collinearity and factor loadings

Table 1: Collinearity Statistics and Factor Loadings

Items	VIF	Items	Outer loadings	VIF
DFK1	2.184	DFK1	0.866	2.184
DFK2	2.048	DFK2	0.845	2.048
DFK3	2.886	DFK3	0.892	2.886
DFK4	2.129	DFK4	0.824	2.129
FI1	1.861	FI1	0.823	1.861
FI2	2.892	FI2	0.896	2.892
FI3	2.802	FI3	0.89	2.802
FI4	1.792	FI4	0.79	1.792
FU1	1.753	FU1	0.795	1.753
FU2	1.841	FU2	0.778	1.841
FU3	2.119	FU3	0.83	2.119
FU4	1.875	FU4	0.836	1.875

Note: DFK - Digital Financial Knowledge, FI - Financial Inclusion, FU - FinTech Use.

Table 1 represents VIF and factor loadings, also called outer loadings. The VIF is done to check for Multicollinearity among the variables. As per the table, the values range between 1.753 to 2.832, which are well below the required limit of 5.0 as recommended by Hair et al. (2019). This indicates that no significant multicollinearity exists among the indicators. This satisfies the assumption for the indicator independence required to frame structural equation modeling (Priya et al.,2024; Shabu et al.,2025). The outer loadings among the variables should exhibit above the value above the minimum value of 0.7 to showcase a strong convergent validity of the measurement model (Fornell & Larcker, 1981). In our case, the variables ranged between 0.778 to 0.896, indicating a high level of correlation between each indicator and its corresponding latent construct. This indicates that the variables reliably represent their underlying theoretical dimensions.

4.2. Measurement model investigation

4.2.1. Cronbach's alpha, composite reliability, and average variance extracted

Table 2: Construct Reliability and Convergent Validity Results

Constructs	CA	CR	AVE
Digital Financial Knowledge	0.88	0.917	0.735
Financial Inclusion	0.872	0.913	0.724
FinTech Use	0.826	0.884	0.656

Note: Cronbach's Alpha (CA), Composite Reliability (CR) & Average Variance Extracted (AVE).

Table 2 helps in analyzing the questions on Digital Financial Knowledge, Financial Inclusion, and FinTech Use. It checks if they're reliable and measures what we want using Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE). The CA scores are between 0.826 and 0.88, which is above the standard of 0.70, so the questions are consistent. CR is also above 0.70, meaning the constructs are dependable. AVE is over 0.50, showing more than 50% of the results are specific to the study, not random noise. So, our measurement model holds good.

4.2.2. Discriminant validity

Table 3: Fornel & Lorcker Criteria

	Digital Financial Knowledge	Financial Inclusion	FinTech Use
Digital Financial Knowledge	0.857		
Financial Inclusion	0.672	0.851	
FinTech Use	0.682	0.764	0.81

The Fornell and Larcker criterion (Priya & Sivakumar, 2024) was used to assess discriminant validity. As shown in Table 3, the square roots of AVEs (diagonal values) are greater than the corresponding inter-construct correlations (off-diagonal values) for each construct. For example, the square root of the AVE for Digital Financial Knowledge is 0.857, which is higher than its correlation with Financial Inclusion (0.672) and FinTech Use (0.682). This satisfies the condition for discriminant validity (Fornell & Larcker, 1981), indicating that each concept is empirically separate from the others.

Table 4: Heterotrait-Monotrait Ratio HTMT Results

	Digital Financial Knowledge	Financial Inclusion	FinTech Use
Digital Financial Knowledge			
Financial Inclusion	0.754		
FinTech Use	0.783	0.898	

HTMT values further support discriminant validity. All HTMT values are below the 0.90 threshold (Henseler et al., 2015), with the maximum being 0.898 between Financial Inclusion and FinTech Use. This confirms that discriminant validity is not a concern in this model, as the constructs are sufficiently distinct from one another.

4.3.3. R-squared, effect size, and confidence intervals

Table 5: R Square

	R Square	R Square Adjusted
Digital Financial Knowledge	0.465	0.464
Financial Inclusion	0.626	0.624

Table 5 presents the R^2 and adjusted R^2 values, which represent the sum of variance described in the endogenous constructs. The model explains 46.5% of the variance in Digital Financial Knowledge and 62.6% of the variance in Financial Inclusion. These values indicate moderate to substantial explanatory power of the structural model (Chin, 1998).

Table 6: Effect Size (F Square)

	Digital Financial Knowledge	Financial Inclusion	FinTech Use
Digital Financial Knowledge		0.114	
Financial Inclusion			
FinTech Use	0.87	0.465	

Table 6 outlines the effect sizes (f^2) (Priya and Jaidev, 2022) of the exogenous variables on the endogenous constructs. According to Cohen's (1988) guidelines, FinTech Use exhibits a large effect on both Digital Financial Knowledge ($f^2 = 0.87$) and Financial Inclusion ($f^2 = 0.465$). The outcome of Digital Financial Knowledge on Financial Inclusion is small ($f^2 = 0.114$). This indicates that FinTech Use is the dominant predictor in the model.

Table 7: Direct Effect Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Digital Financial Knowledge -> Financial Inclusion	0.283	0.282	0.046	6.169	0
FinTech Use -> Digital Financial Knowledge	0.682	0.681	0.027	25.586	0
FinTech Use -> Financial Inclusion	0.571	0.572	0.043	13.365	0

The path coefficients presented in Table 7 reveal that all hypothesized relationships are statistically significant at $p < 0.001$, with T-statistics well above the critical value of 1.96. Specifically, the FinTech Use to Digital Financial Knowledge was found to have a β of 0.682 and T of 25.586. The FinTech use for financial inclusion had a β of 0.571 and a T of 13.365. Lastly, the digital financial knowledge for financial inclusion had a β of 0.283 and a T of 6.169. These results confirm strong and significant positive relationships among the constructs, supporting the proposed hypotheses.

Table 8: Mediation Results Analysis

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
FinTech Use -> Digital Financial Knowledge -> Financial Inclusion	0.193	0.192	0.033	5.817	0

Table 8 presents the mediation effect of Digital Financial Knowledge in the relationship between FinTech Use and Financial Inclusion. The indirect impact ($\beta = 0.193$, $T = 5.817$, $p < 0.001$) is statistically significant, representing partial mediation. This implies that the Usage of FinTech contributes to Financial Inclusion both directly and indirectly through enhanced Digital Financial Knowledge.

5. Implication

The practical implications of these results are numerous. First and foremost, FinTech providers must understand that the success of their platforms, particularly in disadvantaged countries, is dependent not just on access but also on user competency. As a result, adding user-friendly features like tutorials, help bots, gamified learning, and local language support can significantly boost user engagement and retention. Authorities working to increase financial inclusion should supplement digital infrastructure development with targeted digital literacy measures. Community-level financial education campaigns, workshops, and public-private partnerships can help to increase digital financial capacity. It is also important for the government and financial authorities, such as the RBI and SEBI, to encourage the inclusion of digital literacy modules in financial products aimed at low-income people.

This study provides useful information for non-governmental organizations (NGOs) and development organizations working on inclusive growth. They can improve the efficiency of financial aid and microcredit programs by focusing on building a stronger digital literacy bridge. Women, farmers, and rural businesses, who have historically been underrepresented in the formal financial ecosystem, could benefit from tailored training programs focused on mobile banking, digital payments, and personal finance management. The consequences apply to academic curriculum design. Incorporating FinTech literacy and financial decision-making into higher education, particularly in commerce, economics, and management disciplines, can equip future professionals to be digitally and financially literate, providing a skilled workforce for India's rapidly digitizing economy.

6. Conclusion, Limitations, and Direction for Future Research

The research indicates that FinTech significantly contributes to financial inclusion, particularly where individuals possess sound digital financial literacy. It noted that applying FinTech tools significantly impacts an individual's digital financial competence and chances of accessing financial services. This translates to the fact that access to the tools alone is not sufficient; individuals must also know how to effectively utilize them. Theoretically, the research advances literature on the relationship between technology use, financial education, and inclusive finance. It demonstrates how digital financial literacy aids in transforming technology access into actual financial empowerment. The results validate the TAM, which posits that individuals utilize technology more when they perceive it as helpful and easy to use something enhanced with digital competencies. Based on experiences from 478 real users, the research verifies that if implemented correctly, FinTech can enhance individuals' money management skills and improve financial inclusion. It favors a gradual model in which FinTech not only offers access but also increases consumers' confidence and capability, enabling those who were excluded from the formal financial sector to participate more intensely.

7. Limitation

The study presents good results based on solid measurement tools; it does not lack limitations. For starters, because the data was gathered at a single moment in time (cross-sectional), it's difficult to conclude long-term cause-and-effect patterns. Subsequent studies applying long-term (longitudinal) approaches may provide more insights into how individuals' financial behavior evolves. Most participants were already familiar with digital technology. This implies the findings may not be representative of those less conversant or less confident with digital technologies, like older people, those with low literacy, or those in rural communities. Therefore, the findings may not present the whole picture of the most at-risk groups. The fact that the study employed established theories and self-reported information, there's always a possibility of participants having provided socially desirable responses, particularly about their financial knowledge or usage. Furthermore, India's cultural and linguistic pluralism may have affected how individuals perceived and utilized digital instruments, which this research was unable to thoroughly study.

8. Future Research Directions

Future research can investigate comparative assessments of rural and urban populations to establish the contextual facilitators and challenges of financial inclusion through FinTech. Digital finance gender-based behaviors, such as the specific boundaries and drivers that women face when using FinTech services, can also be a subject of study. Qualitative studies, like interviews or focus groups, might be able to provide more in-depth insights, real-life experiences, motivations, and concerns related to digital financial products. Studies may also examine how some FinTech technologies (e.g., blockchain-based savings applications and AI-driven microloans) influence financial literacy in the long run. In addition, a multidisciplinary solution incorporating behavioral economics would enhance the extent to which digital nudges, financial incentives, and app architecture affect usage patterns among various user groups. To apply this model to other South Asian or African emerging economies to determine if digital financial information plays a mediating role in different cultural and legal environments.

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