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Exploring the Nexus of Digital Financial Literacy and Financial Inclusion: A Critical Review and Conceptual Framework

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Abstract

Purpose: As digital transformation reshapes the global financial architecture, the "human" element of technology adoption—Digital Financial Literacy (DFL)—has emerged as a critical determinant of sustainable financial inclusion (FI). This paper critically reviews the extant literature (2011–2025) to deconstruct the relationship between DFL, trust, and self-efficacy in the context of developing economies like India.

Design/Methodology: A thematic review of empirical and conceptual studies was conducted to identify structural patterns, mediating variables, and theoretical gaps. The review specifically analyses the "access-usage gap" in Punjab, a region characterized by high agrarian wealth but uneven digital proficiency.

Findings: The synthesis reveals that DFL is not a monolithic construct but a dynamic capability moderated by demographic variables (age, gender) and mediated by psychological factors (trust in FinTech). The review identifies a critical research gap: while 'access' to digital finance is well-documented, the behavioural impact of DFL on 'active usage' remains under-theorized in rural contexts.

Originality/Value: The paper proposes an integrated

"DFL-Inclusion Capability Model," positioning DFL as a necessary antecedent to economic resilience. It offers actionable policy frameworks for bridging the digital divide in transition economies.

Keywords: *Digital Financial Literacy (DFL), Financial Inclusion, FinTech Adoption, Trust Architecture, Digital Divide, India.*

1. Introduction

The digitization of financial systems has democratized access to banking, yet a paradox persists: while account ownership has surged due to initiatives like *Pradhan Mantri Jan Dhan Yojana (PMJDY)*, "active usage" remains stagnant in many developing regions (World Bank, 2024). This phenomenon, often termed the **"dormancy rate,"** suggests that infrastructure alone cannot drive inclusion. The missing link is **Digital Financial Literacy (DFL)**—defined not just as the ability to use a device, but the competency to evaluate, trust, and utilize digital financial products safely (OECD, 2020b).

Historically, financial literacy was viewed as a static skill set (Lusardi & Mitchell, 2014). However, the advent of the Unified Payments Interface (UPI) and AI-driven FinTech has transformed it into a dynamic survival skill. In India, where digital transactions have outpaced traditional banking, the lack of DFL has exposed vulnerable populations to cybersecurity risks and fraud, creating a "new exclusion" where only the digitally savvy can participate in the formal economy (Bhati et al., 2024).

This paper argues that DFL is the "software" required to run the "hardware" of financial infrastructure. By critically reviewing literature from 2011 to 2025, this study aims to:

1. To examine the concept of financial inclusion as discussed in prior studies, with particular attention to access, usage, and quality of digital financial services.
2. To identify key digital skills, knowledge, and competencies that influence individuals' ability to effectively use digital financial services.
3. Analyse the mediating role of **Trust** and **Self-Efficacy** in FinTech adoption.
4. Propose a conceptual framework that guides future empirical research in Punjab.

2. Theoretical Underpinnings & Evolution

The concept of financial literacy has evolved from basic debt management (Danes & Hira, 1987) to complex digital capability. Early definitions focused on "budgeting" (Atkinson et al., 2007). However, the OECD (2020b) redefined it for the digital age, emphasizing **awareness of digital risks** (phishing, data privacy) as equally important as understanding interest rates.

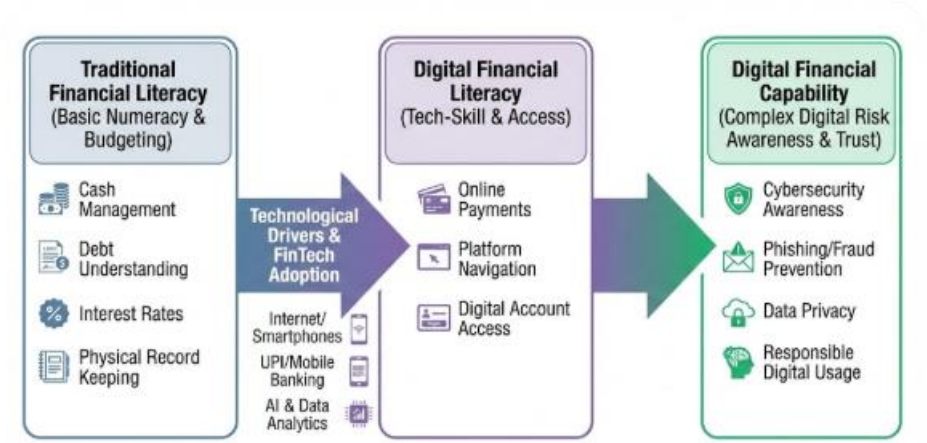

Figure 1: Evolution from Traditional Financial Literacy to Digital Financial Capability

(Source: Authors' Synthesis)

The figure illustrates the progression from traditional financial literacy to digital financial capability. Traditional financial literacy focuses on basic numeracy and budgeting skills relevant to cash-based systems. Advances in financial technology and digital access drive the transition toward digital financial literacy, which emphasizes the ability to use online platforms, digital payments, and financial accounts. The final stage, digital financial capability, extends beyond functional use to include awareness of digital risks, cybersecurity, data privacy, and responsible digital financial behaviour, reflecting a more comprehensive and resilient engagement with digital financial systems

In the Indian context, the Reserve Bank of India (RBI) has shifted its focus from "Financial Literacy" to "Digital Financial Literacy," recognizing that in a cashless economy, the inability to use a smartphone is synonymous with financial exclusion (NCFE, 2019b).

3. Literature Review: Themes and Gaps

A synthesis of recent studies reveals four dominant themes that shape the current discourse.

3.1 The "Literacy-Trust" Nexus in FinTech Adoption

A recurring theme in recent literature is that **literacy builds trust**. Anwar et al. (2025) and Rehman (2023) provide empirical evidence that users with higher DFL scores perceive FinTech platforms as "safer."

- **Critical Insight:** Trust is not inherent in the technology; it is a derivative of the user's confidence (self-efficacy). When users understand *how* a transaction works (literacy), they trust the system more.
- **Gap Identified:** Most studies measure "institutional trust" (trust in banks). Fewer studies measure "technological trust" (trust in the app itself), which is crucial for rural users in Punjab.

3.2 DFL as a Tool for Social & Gender Equity

Widyastuti et al. (2024) and Joshi et al. (2025) highlight DFL as a leveler. In patriarchal societies, digital finance offers women privacy and control over their earnings.

- **Critical Insight:** Digital platforms can bypass social restrictions on women's mobility. However, without targeted DFL, women remain dependent on male family members to operate these devices, negating the empowerment benefit.

3.3 The Informal Economy & Entrepreneurship

Chibesa and Mwange (2025) focus on the "unorganized sector." They find that for street vendors and small traders, DFL is directly linked to business survival.

- **Gap Identified:** Existing literature focuses heavily on *consumer* adoption. There is a scarcity of research on how DFL affects the *business performance* of rural entrepreneurs in agrarian states like Punjab.

3.4 Demographic Determinants: The "Digital Divide"

Chhillar et al. (2024) and Orlov et al. (2024) confirm that DFL is unequally distributed. Age and Education are the strongest predictors.

- **Critical Insight:** The "digital native" generation (Gen Z) adopts FinTech intuitively, while older generations experience "techno-stress." This creates an inter-generational gap in financial resilience within the same household.

The following table presents a consolidated summary of key national and international studies reviewed above, highlighting their focus areas, major findings, limitations, and relevance to the present study.

Author(s) & Year	Focus of Study	Study Context	Key Findings	Limitations	Relevance to Present Study
Gumilar et al. (2024)	Digital Financial Literacy (DFL) & Digital Financial Inclusion (DFI)	Systematic review (Scopus, 2020–2024)	DFL is essential for optimizing DFI; digital services reduce inequality but practical usage faces obstacles	Review-based; lacks primary empirical validation	Establishes conceptual linkage between DFL and DFI
Chhillar et al. (2024)	Demographic impact on DFL	Survey of 499 individuals, NCT India	DFL varies by age, gender, income, education; males, young adults, educated individuals show higher DFL	Limited geographical scope	Supports demographic analysis in DFL research
Song & Valencia (2024)	DFL & financial behavior	Conceptual/empirical analysis	DFL enhances risk mitigation and financial security; education improves outcomes	Limited focus on specific populations	Links DFL with financial behavior outcomes
Widyastuti et al. (2024)	DFL–DFI relationship (gender perspective)	Empirical study	Stronger DFL impact on DFI among females	Context-specific	Highlights gender-sensitive policy relevance
Orlov et al. (2024)	Financial literacy & financial inclusion	Global Financial Literacy Survey (2014/15)	Literacy significantly affects digital and	Secondary data limitations	Shows literacy as determinant of financial tool adoption

Author(s) & Year	Focus of Study	Study Context	Key Findings	Limitations	Relevance to Present Study
			conventional tool usage		
Arora (2024)	Digital banking innovations & inclusion	Developed & developing countries comparison	Infrastructure, regulation & digital literacy key to inclusion	Comparative, not micro-level	Highlights structural determinants of DFI
Uchenna Nnaomah et al. (2024)	Digital banking & inclusion	US & Nigeria comparative study	Progress differs due to infrastructure & regulation	Country-specific comparison	Emphasizes contextual variation in DFI
Mamta Yadav et al. (2024)	E-banking & DFL	Empirical study	DFL crucial for online fund management & e-banking adoption	Limited behavioral analysis	Connects DFL to digital banking usage
Rehman (2023)	FinTech, banking access & inclusion	Empirical study	Financial literacy mediates FinTech and inclusion relationship	Sector-specific	Demonstrates mediating role of literacy
Mushtaq et al. (2023)	Literacy & household financial behavior	Survey (409 households, Pakistan)	Advanced literacy improves savings & budgeting	Limited to low/middle income households	Links literacy to financial behavior
Koskelainen et al. (2023)	Digitalization & financial understanding	Conceptual review	Need digital learning tools & curriculum reforms	Lacks primary data	Suggests educational reforms for DFL
Br (2023)	Technology & financial inclusion	Developing economies	ICT reduces transaction costs & increases inclusion	Generalized findings	Supports technological integration argument
Gharbi & Kammoun (2022)	FinTech & digital banking	Tunisia banking sector	Bank digitization enhances inclusion	Focused on banking staff	Shows institutional perspective
Sahay et al. (2021)	Digital inclusion & economic growth	52 developing countries	Digital inclusion positively linked to GDP growth	Macro-level study	Shows macroeconomic relevance of DFI
Bathula & Gupta (2021)	Digital services & socio-economic factors	India	Education & workforce participation increase digital usage; women use mobile banking less	Gender gap unexplored deeply	Highlights socio-economic determinants

Author(s) & Year	Focus of Study	Study Context	Key Findings	Limitations	Relevance to Present Study
Begum (2018)	Digital finance & poverty reduction	India	Digital services provide safe, affordable banking; Digital India crucial	Policy-focused	Shows role of national initiatives
Chandran (2014)	Regulatory reforms & inclusion	India	Less restrictive regulations improve banking access	Pre-digital era focus	Provides policy foundation
Radcliffe & Voorhies (2012)	Digital economy stages	Global perspective	Market development stages required; 2.5B still excluded	Conceptual	Framework for digital inclusion development
Ramakrishnan (2011)	Financial literacy & inclusion	Conceptual	Financial education empowers access & informed decisions	Theoretical approach	Foundational linkage between literacy & inclusion

4. Conceptual Framework

Based on the synthesis above, this paper proposes the **"DFL-Inclusion Capability Model"** to guide future research.

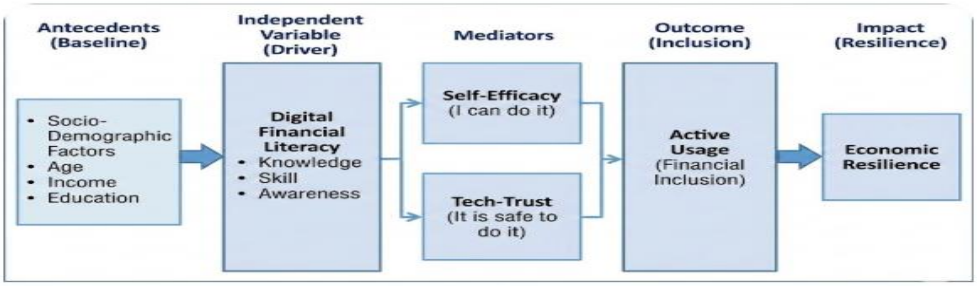

Figure 2: The DFL-Inclusion Capability Model (Source: Authors)

The Logic of the Model:

1. **Antecedents:** Socio-Demographic factors (Age, Income, Education) act as the baseline.
2. **Independent Variable:** Digital Financial Literacy (Knowledge + Skill + Awareness).
3. **Mediators:** DFL does not lead to inclusion directly. It first enhances **Self-Efficacy** (I *can* do it) and **Tech-Trust** (It is *safe* to do it).
4. **Outcome:** These mediators lead to **Active Usage** (Financial Inclusion), which eventually results in **Economic Resilience** (Impact).

The above figure (Figure 2) presents the Digital Financial Literacy–Inclusion Capability Model, which explains the mechanisms through which digital financial literacy contributes to economic resilience. Socio-demographic characteristics, including age, income, and educational attainment, are treated as antecedent conditions that shape individuals' baseline financial capacity. Digital financial literacy—operationalized through knowledge, skills, and awareness of digital financial services—is specified as the primary independent variable. Its influence on financial inclusion is transmitted through two mediating constructs: self-efficacy, capturing individual's perceived capability to use digital financial technologies, and

technology trust, reflecting confidence in the security and reliability of digital financial systems. These mediators facilitate active usage of digital financial services, which represents the outcome variable and a practical manifestation of financial inclusion. Active usage, in turn, enhances individual's ability to manage financial risks and absorb economic shocks, thereby strengthening economic resilience as the ultimate impact

5. Research Gaps & Future Directions

Despite the extensive literature, critical gaps remain that justify further empirical study in Punjab:

1. **The "Vernacular Gap":** Most DFL tools are in English/Hindi. There is limited research on how language barriers in Punjab (Punjabi script) affect UPI adoption.
2. **Behavioural vs. Cognitive:** Most studies measure what people *know* (cognitive). Few measure what people *actually do* (behavioral) when faced with a digital fraud attempt.
3. **Regional Specificity:** Punjab has high physical infrastructure (4G/5G) but varying utilization rates. This "infrastructure-usage paradox" needs localized investigation.

6. Conclusion and Policy Implications

Digital Financial Literacy is no longer a luxury; it is a prerequisite for citizenship in a digital economy. The review concludes that "access" (having an account) is the starting line, not the finish line.

Strategic Recommendations:

- **For Policymakers:** Shift from generic "Financial Literacy Camps" to "Digital Simulation Workshops" where users practice on dummy apps.
- **For Banks:** Embed "Just-in-Time" education—short video tutorials that play *inside* the banking app before a transaction is authorized.
- **For Researchers:** Future studies must move beyond cross-sectional surveys and employ longitudinal designs to test if DFL interventions lead to sustained behavioral change over time.

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