Digital Financial Literacy and Financial Behavior: Pathways to Inclusion and Resilience

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ABSTRACT

The rapid growth of digital financial services has made the ability to understand and use online money tools essential for everyday financial decisions. This systematic literature review explores how digital financial literacy affects behaviors related to saving, spending, investing, and borrowing. This systematic literature review addresses these shortcomings by consolidating findings from 35 empirical studies published between 2010 and 2025. Following PRISMA 2020, the review identifies, evaluates, and thematically synthesizes quantitative, qualitative, and mixed-method research obtained through a rigorous search in a major academic database. Results show that higher digital financial literacy consistently promotes regular saving, disciplined budgeting, confident and diversified investing, and more responsible credit use. The positive effects are strongest for saving and investment, while spending and borrowing outcomes are more context-dependent, influenced by self-control, psychological biases, gender, income, and regulatory support. Seamless digital transactions can encourage impulsive spending or over-indebtedness when literacy is insufficient or safeguards are absent. These findings underscore the need for standardized digital financial literacy education within national inclusion strategies, gender-sensitive training programs, and fintech designs that incorporate behavioral nudges and fraud prevention features.

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***Keywords**: Digital Economy, Digital Financial Literacy, Financial Behavior, Financial Education, Financial Inclusion, Financial Well-Being, Fintech.*

ABSTRAK

Pertumbuhan pesat layanan keuangan digital telah menjadikan kemampuan untuk memahami dan menggunakan perangkat keuangan daring penting bagi keputusan keuangan sehari-hari. Tinjauan pustaka sistematis ini mengeksplorasi bagaimana literasi keuangan digital memengaruhi perilaku terkait menabung, membelanjakan, berinvestasi, dan meminjam. Tinjauan pustaka sistematis ini mengatasi kekurangan tersebut dengan mengkonsolidasikan temuan dari 35 studi empiris yang diterbitkan antara tahun 2010 dan 2025. Mengikuti PRISMA 2020, tinjauan ini mengidentifikasi, mengevaluasi, dan secara tematis mensintesis penelitian kuantitatif, kualitatif, dan metode campuran yang diperoleh melalui penelusuran ketat dalam basis data akademis terkemuka. Hasil menunjukkan bahwa literasi keuangan digital yang lebih tinggi secara konsisten mendorong tabungan rutin, penganggaran yang disiplin, investasi yang percaya diri dan terdiversifikasi, serta penggunaan kredit yang lebih bertanggung jawab. Efek positifnya paling kuat pada tabungan dan investasi, sementara hasil pengeluaran dan peminjaman lebih bergantung pada konteks, dipengaruhi oleh pengendalian diri, bias psikologis, gender, pendapatan, dan dukungan regulasi. Transaksi digital yang lancar dapat mendorong pengeluaran impulsif atau utang berlebih ketika literasi tidak memadai atau tidak adanya perlindungan. Temuan ini menggarisbawahi perlunya pendidikan literasi keuangan digital yang terstandarisasi dalam strategi inklusi nasional, program pelatihan yang peka gender, dan desain fintech yang menggabungkan dorongan perilaku dan fitur pencegahan penipuan.

***Kata kunci**: Ekonomi Digital, Literasi Keuangan Digital, Perilaku Keuangan, Edukasi Keuangan, Inklusi Keuangan, Kesejahteraan Finansial, Fintech.*

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INTRODUCTION

The rapid digitalization of financial services has transformed how people interact with money, highlighting the increasing importance of Digital Financial Literacy (DFL). DFL represents the connection between financial literacy and digital skills, including the ability to access, interpret, and manage financial information using digital tools (Karwowski, 2019; Lyons & Kass-Hanna, 2021; Kausar, 2025). In a time when online banking, fintech apps, and digital investments are prevalent, DFL has become crucial for making informed financial choices and maintaining long-term financial health. As digital financial systems grow worldwide, people's capability to navigate these platforms effectively influences their inclusion, stability, and resilience in the modern economy (Koskelainen et al., 2023; Kumar et al., 2023).

Individuals with higher DFL levels tend to save more regularly, invest with greater confidence, and borrow more responsibly (Joshi & Rawat, 2024; Yadav & Banerji, 2025). DFL also strengthens financial self-efficacy and reduces anxiety about future financial security (Farrell et al., 2016; Riaz et al., 2022). Moreover, digitally literate people are better at using fintech tools and making decisions that improve their overall financial well-being (Mishra et al., 2024; Zaimovic et al., 2025). However, low DFL can lead to impulsive spending, over-indebtedness, and vulnerability to online fraud, especially among women, young adults, and low-income groups (Rahayu et al., 2022; Yue et al., 2022; Kusumawardhani et al., 2025).

Despite the growing number of empirical studies on DFL, several important gaps remain in the literature. According to Lyons and Kass-Hanna (2021), there is still no universally accepted definition or measurement of DFL, which makes it hard to compare results across studies. Many researchers use different scales and focus only on one or two financial behaviors instead of looking at the full picture (Choung et al., 2025; Koskelainen et al., 2023). Most existing studies rely on cross-sectional data, so they cannot clearly show cause-and-effect relationships between DFL and long-term behavior changes (Mishra et al., 2024; Bhat et al., 2025). Although some narrative reviews exist, no systematic literature review has yet synthesized empirical evidence across the four main financial behavior domains, saving, spending, investing, and borrowing, while following the strict PRISMA guidelines (Kumar et al., 2023; Zaimovic et al., 2025). This absence limits our understanding of how DFL works in different countries and among different groups of people.

To fill these gaps, this study conducts a systematic literature review that consolidates and analyzes empirical findings on the relationship between Digital Financial Literacy and financial behavior. Following the PRISMA 2020 protocol, the review includes 35 empirical studies published between 2010 and 2025. This review is based on behavioral and capability frameworks, especially the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and the Financial Capability Model. These frameworks highlight that knowledge, attitudes, perceived control, and self-efficacy shape financial behavior (Riaz et al., 2022; Kumar et al., 2023). In this context, DFL acts as both a cognitive and behavioral facilitator that boosts individuals' confidence, skills, and control in digital financial settings. By drawing on these theories, the review sees DFL as a complex construct that affects not just financial decision-making but also wider financial inclusion outcomes (Gosal & Nainggolan, 2023; Yadav & Banerji, 2025).

The objective of this Systematic Literature Review (SLR) is threefold. First, it aims to synthesize existing empirical findings regarding the relationship between Digital Financial Literacy (DFL) and financial behaviors such as saving, spending, investing, and borrowing. Second, it seeks to identify the underlying mechanisms, mediating variables, and moderating factors that influence the nexus between DFL and individual financial behavior. Third, this review endeavors to highlight theoretical, methodological, and contextual gaps within the current body of literature, thereby providing direction for future research agendas and informing policy interventions aimed at enhancing financial literacy and behavioral outcomes in the digital economy.

LITERATURE REVIEW

Digital Financial Literacy

Digital Financial Literacy (DFL) integrates traditional financial literacy with digital competence, reflecting individuals' ability to manage financial activities through technology-driven platforms (Charron-Chénier, 2024). According to Huston (2010), financial literacy basically covers knowledge of budgeting, saving, investing, and borrowing, while DFL adds the skills to use online tools safely and effectively. DFL encompasses the skills and knowledge required to understand, evaluate, and apply financial information in digital contexts (Lyons & Kass-Hanna, 2021; Choung et al., 2023). Unlike conventional financial literacy, which focuses only on basic money principles, DFL also includes the ability to navigate digital platforms, interpret algorithmic recommendations, and protect personal data from cyber risks (Steen et al., 2024; Muat et al., 2024).

Koskelainen et al. (2023) propose four main dimensions: awareness of digital financial products, understanding digital risks, managing online exposure, and knowing consumer rights. Choung et al. (2025) developed a multidimensional DFL scale that combines cognitive knowledge, behavioral indicators, and confidence levels, which allows better comparison across countries. Other studies add self-protection and decision-making competence as key parts (Zaimovic et al., 2025; Mazzoli & Baiocco, 2025). Measurement of DFL usually uses self-reported surveys or performance tests, but inconsistency remains a big problem because tools differ in scope and cultural fit (Kass-Hanna et al., 2022).

The rapid growth of fintech has made DFL more important than ever. Joshi & Rawat (2024) explain that people need advanced digital skills to handle robo-advisors, cryptocurrencies, and mobile payments without falling into traps. Kumar et al. (2023) argue that DFL is not just about knowing finance but also about feeling confident and capable in digital environments. Without strong DFL, individuals may avoid useful financial tools or become victims of fraud (Respati et al., 2023). Overall, DFL is seen as a multidimensional and evolving concept that bridges old financial knowledge with new digital realities (Lilian, 2022; Riaz et al., 2022). This understanding forms the foundation for exploring how DFL shapes everyday financial behavior.

Financial Behavior Factors

Financial behavior covers the actions people take when saving, spending, investing, and borrowing money in daily life. According to Farrell et al. (2016), financial self-efficacy, or the belief that one can control money matters, plays a central role in turning knowledge into positive actions. The relationship between DFL and financial behavior is supported by three main theories: the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and the Financial Capability Model. In TPB, intention comes from attitudes, social norms, and perceived control, so higher DFL strengthens control over digital tools and leads to better decisions (Riaz et al., 2022; Kumar et al., 2023).

Social Cognitive Theory focuses on self-efficacy as the key driver. People with high DFL feel more confident using apps and platforms, which encourages disciplined budgeting and goal-oriented saving (Lilian, 2022; He & Wen, 2025). The Financial Capability Model combines knowledge, confidence, and access to opportunities (Huston, 2010). In digital settings, access to reliable internet and user-friendly fintech becomes crucial for good behavior (Kass-Hanna et al., 2022). Mediating factors like impulsivity control and financial attitudes also matter. For example, strong self-regulation helps DFL users avoid overspending even when transactions feel painless (Respati et al., 2023).

Moderating factors make the relationship more complex. Gender, income, age, and cultural values can strengthen or weaken DFL effects (Muat et al., 2024; Gupta et al., 2025). Zaimovic et al. (2025) show that positive digital attitudes mediate the link between DFL and inclusion, especially for underserved groups. Emotional factors such as financial anxiety or overconfidence can override knowledge and lead to poor choices (Choung et al., 2025). Regulatory support and consumer protection laws also moderate outcomes by building trust in digital systems (Koskelainen et al., 2023). These theories and factors

together explain why DFL does not always guarantee good behavior, it depends on personal, social, and environmental conditions.

Pathways to Inclusion

Digital Financial Literacy opens pathways to greater financial inclusion by empowering people who were previously left out of formal banking systems. According to Kass-Hanna et al. (2022), DFL helps low-income households and women in developing regions access mobile banking, micro-loans, and insurance through simple apps. This inclusion reduces poverty and builds economic resilience, especially in areas with limited physical bank branches. Gosal and Nainggolan (2023) found that Indonesian SMEs with higher DFL manage cash flow better and achieve stronger financial well-being. DFL also promotes responsible behavior that supports long-term stability.

Education and policy play important roles in these pathways. Targeted DFL programs in schools, workplaces, and communities can close the digital divide (Kumar et al., 2023; Yadav & Banerji, 2025). Mishra et al. (2024) emphasize that gender-sensitive training improves women's decision-making and reduces their financial vulnerability. Regulatory frameworks that require clear information and fraud protection make users more confident to join digital finance (Zaimovic et al., 2025). Fintech companies can add nudges like spending alerts or saving reminders to guide positive behavior (Choung et al., 2023).

However, barriers still exist. Low digital access, cultural resistance to cashless systems, and weak regulations can limit DFL benefits (Rahayu et al., 2023; Koskelainen et al., 2023). Steen et al. (2024) warn that without proper risk awareness, people may face cyber threats that push them back into exclusion. Combining DFL with broader financial inclusion strategies, such as affordable internet and supportive laws, creates sustainable pathways (Lyons & Kass-Hanna, 2021). In the end, DFL is not just a personal skill but a tool for building fairer and more resilient economies where everyone can participate safely and confidently.

RESEARCH METHODS

This study employs a Systematic Literature Review (SLR) methodology to provide a structured and transparent synthesis of empirical research on Digital Financial Literacy (DFL) and its influence on financial behavior. The review strictly follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines to ensure methodological rigor, reproducibility, and completeness. All stages of the process, identification, screening, eligibility assessment, and inclusion, were documented and independently verified by two reviewers to reduce bias and error.

The search was conducted in Scopus using a combination of keywords and Boolean operators. Search terms included "Digital Financial Literacy," "Fintech Literacy," "e-banking literacy," "financial behavior," "saving behavior," "investment behavior," and "borrowing and credit management". The publication period was limited to January 2010–October 2025. From the initial search, 81 records were identified. After removing duplicates and applying successive filters (document type limited to article, language limited to English, subject area limited to economics-related fields, and exact keywords containing Digital Financial Literacy, Financial Literacy, Financial Behavior, or Digital Literacy), the number was reduced step by step until 35 studies were finally included in the synthesis (Figure 1).

Rigorous criteria were applied to ensure only relevant and high-quality studies were included. Inclusion criteria required empirical studies with quantitative, qualitative, or mixed-method designs, studies explicitly examining DFL and financial behavior, publications in peer-reviewed journals or reputable conference proceedings, and availability of operational definitions for DFL constructs. Exclusion criteria removed non-empirical papers such as commentaries, editorials, and conceptual discussions, studies lacking clear measurement instruments for DFL, and grey literature or unpublished theses without peer review.

Figure 1 presents the PRISMA flow diagram that visually details the identification, screening, eligibility, and inclusion phases. Reports excluded at early stages consisted of older or non-relevant publications, and after manual full-text screening for scope and relevance, 35 studies were finally included. Quality appraisal was performed using adapted criteria focusing on clarity of DFL measurement, sample representativeness, and validity of analysis. No studies were excluded solely on quality grounds. Data extraction covered author(s), year, country/context, sample size, DFL measurement tool, financial behavior domains examined, key findings, mediators, moderators, and theoretical framework. The extracted data formed the basis for thematic synthesis across the four financial behavior domains presented in the Results section.

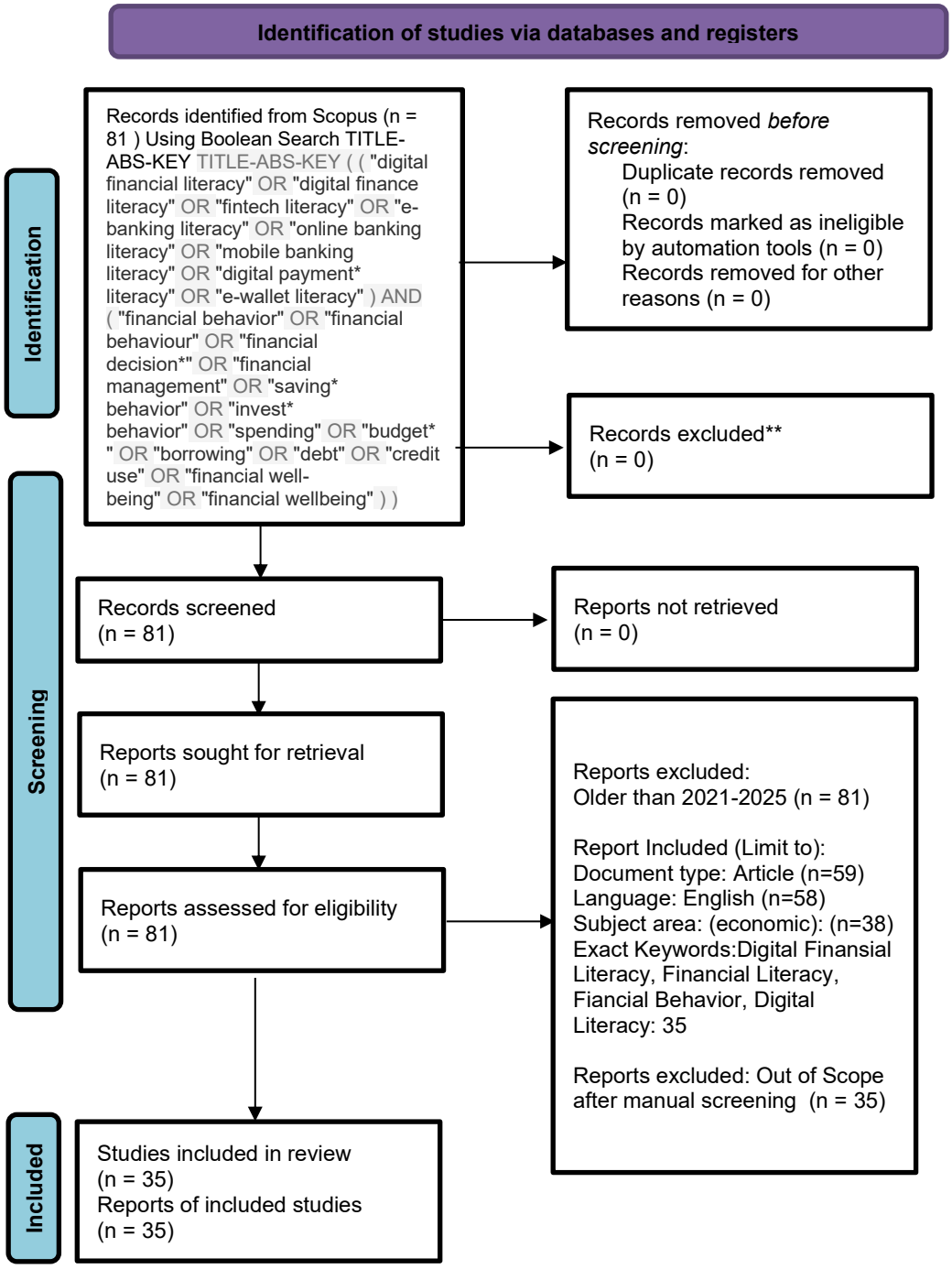

Figure 1. The PRISMA Flow Diagram

RESULTS

Saving and Budgeting Behavior

The systematic review includes 35 empirical studies published between 2021 and 2025, with the majority conducted in emerging economies such as Indonesia, India, China, and Pakistan. Most studies adopt quantitative designs using surveys and structural equation modelling (PLS-SEM or CB-SEM), while a few employ multilevel or econometric approaches. Samples range from university students and millennials to households, women entrepreneurs, and large nationally representative panels. The studies consistently show that higher Digital Financial Literacy (DFL) is associated with better financial outcomes, though the strength and direction vary across behavioral domains and contexts. Self-efficacy, financial attitudes, impulsivity control, gender, income, and regulatory awareness frequently emerge as mediators or moderators.

Digital Financial Literacy (DFL) plays a pivotal role in enhancing individuals' saving and budgeting discipline, particularly through the use of mobile apps, e-wallets, and automated saving tools. Higher DFL levels foster greater financial awareness, encourage regular savings, and improve long-term financial stability (Rahayu et al., 2024; Yadav & Banerji, 2025). Individuals with stronger practical DFL components, such as know-how and decision-making skills, report lower retirement anxiety and more consistent saving habits (Amarsanaa et al., 2025). Studies also highlight that DFL boosts self-control and reduces impulsivity, leading to more effective budgeting and goal-oriented saving (Bhat et al., 2025; Respati et al., 2023; Kumar et al., 2023). In emerging markets, DFL acts as an empowerment tool for low-income and rural households where traditional banking access is limited (Kass-Hanna et al., 2022; Meng, 2024).

Self-efficacy and financial confidence serve as key mediators between DFL and saving behavior. People who feel capable of using digital financial tools are more motivated to set and meet savings goals (Respati et al., 2023; Nurkholik, 2024). Socio-economic factors and digital infrastructure moderate these effects; higher income and better internet access strengthen the positive impact of DFL on saving (Kusumawardhani et al., 2025; Yadav & Banerji, 2025). In contrast, low digital access or weak regulatory awareness can limit DFL benefits, especially among Gen-Z and women (Mishra et al., 2024; Kaur & Sahni, 2024). The reviewed studies confirm that DFL, when combined with practical skills and supportive environments, significantly promotes disciplined saving and budgeting practices that contribute to financial resilience. Table 1 summarizes the characteristics and key findings from nine studies focused on saving and budgeting outcomes.

Table 1. DFL and Saving/Budgeting

Author(s), Year (Country)	Sample / Population (n)	DFL dimensions / measure (as reported)	Behavioral / outcome focus	Design / method	Key finding(s) on DFL → outcome	Mediators / Moderators / Context notes
Shah, Khan and Khan, 2025 (Pakistan)	503 adult users of digital payments	DFL (composite); mental accounting lens	Spending / overspending	Survey; PLS-SEM (SmartPLS 4)	Digital payments raise spending more than cash; DFL positively moderates payment method → spending	Moderator: DFL; policy relevance for cashless design

Author(s), Year (Country)	Sample / Population (n)	DFL dimensions / measure (as reported)	Behavioral / outcome focus	Design / method	Key finding(s) on DFL → outcome	Mediators / Moderators / Context notes
Shah et al. 2025 (Pakistan)	1,208 payers	DFL (composite)	Spending / overspending (current & future payments)	Survey; PLS-SEM	Current & future payment methods ↑ spending; DFL strongly moderates current payment method → spending; gov't support moderates future	Moderators: DFL; government support
Amarsanaa et al. 2025 (Japan)	94,695 adults (40–64)	Five DFL components (know-how, decision, self-protection, etc.)	Old-age anxiety (retirement well-being proxy)	Ordinal logistic regression	Higher practical DFL dims ↓ anxiety; basic awareness alone may ↑ anxiety	Dimensional nuance: practical skills matter most
Yadav and Banerji, 2025 (India, Delhi NCR)	500 adults (24–45)	DFL (composite)	Saving & investment behaviors	SEM (AMOS)	DFL → Saving & Investment (positive, significant)	Income ↑ DFL; age/education not significant
Kaur and Sahni, 2024 (India, Punjab women)	385 women	DFL sub-dims: awareness, usage, self-protection	Personal financial management behavior	Multiple regression (SPSS)	All DFL dims ↑ PFMB	Digital financial socialization mediates
Abdallah et al. 2025 (Kuwait)	Customers (n.r.)	DFL dims: knowledge, awareness, decision-making	Financial behavior (multi-dimensional)	PLS-SEM (SmartPLS 4)	DFL → Financial behavior (β=0.542; $p<.001$; R^2=0.581)	Strongest DFL drivers: knowledge, awareness, decisions
Zaimovic et al. 2025 (Bosnia and Herzegovina)	1,096 adults (rep. sample)	Digital financial knowledge (DFK) within DFL	Financial inclusion (FI); digital attitudes & behavior	Logistic/ordinal models; PROCESS mediation	DFK → DFB (partly via digital financial attitudes); DFK → FI fully mediated by attitudes	Mediators: DFA, DFB (serial & parallel)

Author(s), Year (Country)	Sample / Population (n)	DFL dimensions / measure (as reported)	Behavioral / outcome focus	Design / method	Key finding(s) on DFL → outcome & behavior	Mediators / Moderators / Context notes
Bhat et al. 2025 (India, students)	475 university students	DFL dims: knowledge, experience, skills	Financial well-being (FWB) via impulsivity/self-control	CFA + SEM	DFL dims ↓ impulsivity; ↑ self-control; impulsivity ↓ FWB, self-control ↑ FWB	Mediators: impulsivity, self-control
Bhuvaneshwari and Vinitha, 2025 (India)	180 lending-app users	Digital finance / literacy + FK, awareness, decisions	Financial behavior & satisfaction (fintech lending)	SEM (AMOS) + NCA + fsQCA	Knowledge, digital finance, decisions, awareness ↑ satisfaction; financial attitude negative	Configurational insights via fsQCA
Mazzoli and Baiocco, 2025 (Italy)	>5,000 HH finance managers	DFL (PCA; confidence/behaviors)	Sustainable investing holdings	Probit (robustness & endogeneity checks)	Advanced DFL (behavioral skills) ↑ ESG asset holding; awareness alone less predictive	Role of optimism/overconfidence noted
Başar et al. 2025 (12 countries)	>30,000 adults	Financial literacy with digital/fintech use	Savings behavior	Multilevel modeling	FinTech use ↑ saving, especially when financial literacy high; stronger effects in rural with good infrastructure	Context: regulation, culture, income shape effects
Peter et al. 2025 (India, women entrepreneurs)	214 women entrepreneurs	DFL (entrepreneur context)	Financial inclusion; firm performance	Hayes PROCESS (Model 8)	DFL → FI → Firm performance (partial mediation);	Gendered inclusion gap focus

Author(s), Year (Country)	Sample / Population (n)	DFL dimensions / measure (as reported)	Behavioral / outcome focus	Design / method	Key finding(s) on DFL → outcome	Mediators / Moderators / Context notes
					financial behavior negatively moderates DFL → performance	
Kusumawardhani et al. 2025 (Indonesia Gen-Z)	312 (age 15–27)	DFL (composite)	Financial behavior (general)	Quantitative survey; regression	Income is only significant predictor of DFL; (link to behavior examined)	Socioeconomic gradient emphasized
Tomasi and Ilankadhir, 2024 (Uganda, rural SMEs)	215 SME entrepreneurs	DFL: services/products, risks/control, rights/reporting	Current saving → future saving foresight	SEM + Hayes PROCESS	DFL ↑ current saving; current saving ↑ future saving foresight; Govt regulation awareness strengthens indirect path	Moderator: regulations awareness
Mishra et al. 2024 (India, women)	385 women	DFL + TPB factors	Financial decision-making → investment intention	SEM	DFL, attitude, SN, PBC, access ↑ decisions (71% var. explained); decisions ↑ investment intention; financial resilience moderates	Mediator: FDM; Moderator: resilience
Rahayu et al. 2024 (Indonesia, Java HH)	900 households	DFL as TPB extension	Saving behavior (via intention)	PLS-SEM	All TPB predictors + DFL significant for	Policy: household DFL programs

Author(s), Year (Country)	Sample / Population (n)	DFL dimensions / measure (as reported)	Behavioral / outcome focus	Design / method	Key finding(s) on DFL → outcome	Mediators / Moderators / Context notes
					saving; intention partially mediates	
Nurkholik, 2024 (Indonesia, Jakarta millennials)	425 workers	DFL (composite)	Subjective financial well-being	PLS-SEM (R)	DFL → digital financial behavior → SFWB (mediation)	Mediator: digital financial behavior
Meng, 2024 (China)	CHFS 2017	Digital financial capability (DFC) index (related to DFL)	Total & online consumption	Econometric analysis	Higher DFC ↑ consumption & ↑ share online via easing credit constraints & info search	Mechanisms: credit access, online shopping
Choung, Chatterjee and Pak, 2023 (Korea)	Adults (online survey)	DFL (knowledge + anti-fraud)	Financial well-being	Survey; regression	DFL ↑ FWB; marginal effects larger than conventional FL; anti-fraud ability key	Cross-group robustness
Respati et al. 2023 (Indonesia students)	353 students	DFL (composite)	Financial behavior & FWB	SEM-PLS	DFL → financial behavior → FWB	Mediator: financial behavior
Kumar et al., 2023 (India, Delhi/NCR)	512 adults	DFL with skills/autonomy/capability	Decision-making & perceived FWB	PLS-SEM + PLS-Predict	DFL directly & as mediator predicts decision-making; skills & capability matter	Impulsivity not mediating
Hapsoro et al. 2022 (Indonesia, market traders)	278 traders	DFL (composite)	Financial vulnerability	Survey; hierarchical regression	Higher DFL & good behavior ↓ vulnerability; gender interaction present	Gender interacts with effects

Author(s), Year (Country)	Sample / Population (n)	DFL dimensions / measure (as reported)	Behavioral / outcome focus	Design / method	Key finding(s) on DFL → outcome	Mediators / Moderators / Context notes
Setiawan et al. 2022 (Indonesia millennials)	Urban millennials (25–40)	DFL (composite)	Current saving & spending; future foresight	SEM	DFL ↑ current saving & spending; current behaviors → future foresight	Socio-economic standing influences DFL
Yue et al. 2022 (China; multi-context)	Macro/ HH data	Digital finance access (context for DFL)	Credit participation, debt risk	Econometric evidence	Digital finance ↑ inclusion & consumption but ↑ debt-trap risk	Highlights boundary conditions for DFL's protective role
Lyons and Kass-Hanna, 2021 (methodology)	–	DFL conceptualization & measurement	– (measurement framework)	Survey/methods overview	Proposes frameworks for DFL measurement; notes comparability issues	Use for instrument crosswalk

Spending and Cashless Payment Behavior

Digital Financial Literacy (DFL) significantly reduces impulsive and excessive spending by improving individuals' understanding of budgeting and spending control in cashless environments. Higher DFL is negatively associated with overspending, particularly when digital payments detach users from the tangible "pain of paying" experienced with cash (Shah, Khan, & Khan, 2025; Shah et al., 2025; Setiawan et al., 2022). Individuals with strong DFL demonstrate greater restraint in discretionary purchases and better use real-time transaction alerts to monitor expenses (Respati et al., 2023; Rahayu et al., 2024). Fraud-prevention knowledge, a core part of DFL, further encourages responsible cashless behavior by making users more cautious about scams and hidden fees (Hapsoro et al., 2022).

The convenience of seamless digital transactions can still trigger overspending if self-regulation is weak, even among those with moderate DFL (Shah et al., 2025; Yue et al., 2022). Government support and regulatory awareness moderate these risks by building trust and providing safeguards against predatory practices (Shah, Khan, & Khan, 2025). Vulnerable groups such as informal traders and women benefit most from targeted DFL interventions that address gender-specific barriers in cashless systems (Kass-Hanna et al., 2022). In summary, while cashless systems lower psychological spending barriers, strong DFL, especially when paired with fraud awareness and behavioral nudges, helps consumers maintain discipline and achieve sustainable spending habits. Table 2 presents evidence from eight studies examining spending and cashless payment patterns.

Table 2. DFL and Spending/Payment Behavior

Author/Year	Geographical Scope	Analytical Framework	Results	Implications
Setiawan et al. 2022	Urban millennials, Java (Indonesia)	Structural Equation Modeling (SEM) on survey data	DFL positively affects current saving and spending; current saving/spending shape future saving/spending foresight.	Targeted DFL programs for millennials to steer spending toward goals and strengthen foresight.
Yue et al. 2022	Households exposed to digital finance (macro/HH evidence)	Econometric analysis of digital finance diffusion	Digital finance increases credit participation and consumption but also raises debt-trap risk.	Pair literacy on cashless/credit tools with consumer-protection guardrails to curb overspending and indebtedness.
Respati et al. 2023	University students, Indonesia	SEM-PLS on online survey	DFL → financial behavior → financial well-being (behavior mediates).	Student-focused DFL that builds day-to-day spending discipline can lift well-being.
Rahayu et al. 2024	Households, Java (Indonesia)	TPB extended with DFL; PLS-SEM	All TPB predictors + DFL shape saving behavior; intention partially mediates. (Saving side of spending control.)	Embed DFL into household programs to strengthen intention-to-behavior pathways for prudent cashless use.
Kass-Hanna et al. 2022	Seven countries in South Asia & Sub-Saharan Africa	InterMedia FII multi-country surveys; multidimensional FL & DFL	Both digital and financial literacy are key to resilience-building behaviors (saving/borrowing/risk management); heterogeneity by region and demographics.	Redefine FL to include DFL; tailor cashless literacy to poor, rural, and female segments where risks differ.
Hapsoro et al. 2022	Traditional market traders, Indonesia	Survey + hierarchical regressions	Higher DFL and better financial behavior reduce financial vulnerability; gender interacts with effects.	For cash-heavy informal traders shifting to cashless, DFL training (esp. for women) helps curb fraud/overspending risks.

Investing and Market Participation

Digital Financial Literacy (DFL) encourages greater and more confident participation in digital investment platforms, including robo-advisors, cryptocurrencies, and sustainable (ESG) assets. Higher DFL is linked to increased awareness of investment opportunities, better risk-return evaluation, and higher holdings of diversified or sustainable assets (Mazzoli & Baiocco, 2025; Yadav & Banerji, 2025). Practical and behavioral dimensions of DFL, rather than mere awareness, drive actual market participation and portfolio quality (Amarsanaa et al., 2025). Studies show that digitally literate individuals more effectively use fintech tools and critically evaluate algorithmic advice, leading to improved investment decisions (Peter et al., 2025).

Overconfidence and excessive optimism can moderate the relationship, sometimes causing riskier choices despite high DFL (Mazzoli & Baiocco, 2025). Financial advice quality and digital attitudes mediate the path from DFL to investment behavior (Gupta et al., 2025; Zaimovic et al., 2025). Context matters: effects are stronger in countries with supportive regulation and among users who combine DFL with traditional financial knowledge (Başar et al., 2025). Overall, DFL functions as both a technical enabler and a behavioral protector, fostering inclusive and sustainable participation in modern

investment markets. Table 3 details findings from seven studies on investment-related outcomes.

Table 3. DFL and Investing

Author/Year	Country & Sample	DFL Operationalization	Investing/Market Outcome	Method	Effect / Mechanisms
Mazzoli and Baiocco, 2025	Italy; >5,000 households responsible for family finances	PCA-based DFL index (self-reported confidence using digital devices)	Holding ≥1 sustainable (ESG) asset in household portfolio	Probit models with controls	DFL ↑ sustainable investing, but only among investors with advanced digital skills; most predictive DFL facets are behaviour/attitudes vs. awareness; associations also relate to self-assessed FL, optimism & overconfidence.
Yadav and Banerji, 2025	India; Delhi-NCR adults (N≈500, age 24–45)	Surveyed DFL (multi-dimension)	Saving & Investment behaviours	SEM (AMOS)	Higher DFL → stronger saving & investment behaviours; income ↑ DFL; age/education not significant for DFL.
Amarsanaa et al. 2025	Japan; investors aged 40–64 (N=94,695)	Five-dimension DFL (know-how, decision, self-protection, etc.)	Retirement/old-age financial anxiety (investment context)	Ordinal logistic regression on large investor survey	DFL ↓ old-age anxiety; practical DFL components (know-how, decision, self-protection) drive effect; basic knowledge/awareness alone may raise anxiety.
Gupta et al. 2025	India; adults (N=508)	DFL alongside financial advice (Social Cognitive Theory)	Financial decision-making quality (upstream of investing/participation)	Hierarchical regression; mediation (Hayes PROCESS)	DFL → better financial decisions (β=0.369, p<.001); advice → decisions; decisions mediate DFL/advice → well-being. Mechanism relevant to investment choices.
Mazzoli and Baiocco, 2025 (cross-country FinTech–FL study referenced in same export), 2025	12 countries; >30,000 individuals	FinTech use × financial literacy (macro-micro, multi-level)	Savings/market participation enablers (pre-investment pathway)	Multi-level modelling	Active FinTech users save more, especially when FL is robust; effects stronger in rural areas with good digital infrastructure, points to readiness conditions for broader market participation via digital channels.

Author/Year	Country & Sample	DFL Operationalization	Investing/Market Outcome	Method	Effect / Mechanisms
Choung et al. 2023	South Korea; adults (online survey)	DFL emphasizing fraud-protection & knowledge	Financial well-being (proximal to risk-taking/investing confidence)	Survey econometrics	DFL carries larger marginal effects on well-being than traditional FL; ability to protect against digital fraud is a key driver, relevant for safe participation in digital investing.

Borrowing, Credit Use, and Debt Management

Digital Financial Literacy (DFL) promotes more responsible borrowing and repayment discipline while reducing the likelihood of over-indebtedness in digital lending environments. Higher DFL enables users to better understand loan terms, interest costs, and repayment obligations, leading to lower default risk and more productive credit use (Yue et al., 2022; Bhuvaneshwari & Vinitha, 2025; Kass-Hanna et al., 2022). Individuals with strong self-protection and decision-making components of DFL are less vulnerable to predatory digital credit offers and BNPL traps (Abdallah et al., 2025; Shah, Khan, & Khan, 2025). DFL also enhances financial inclusion for women entrepreneurs and informal sector workers by improving access to formal credit without excessive risk (Peter et al., 2025; Hapsoro et al., 2022).

Regulatory awareness and gender act as important moderators; informed users in supportive policy environments show the best debt management outcomes (Tomasi & Ilankadhir, 2024; Mishra et al., 2024). Easy credit availability can still lead to debt cycles when DFL is low or impulsivity is high (Yue et al., 2022). Targeted education that combines DFL with behavioral training is therefore crucial for turning digital credit access into genuine financial resilience rather than vulnerability. Table 4 outlines evidence from eleven studies focused on borrowing and debt outcomes.

Table 4. Borrowing, Credit Use & Debt Management

Author/Year	Discipline/Domain	Methods/Tools Used	Findings (Borrowing/Credit/Debit Angle)	Future Directions
Yue et al. 2022	Household/Development Finance	Empirical analysis of household impacts of digital finance (multi-country dataset)	Digital finance widens credit market participation and lifts consumption but increases households' risk of falling into a debt trap; easier access to credit amplifies financial distress when literacy/capability is limited.	Test causal pathways between DFL dimensions and debt outcomes; policy experiments combining inclusion with consumer-protection nudges (e.g., affordability checks, credit limits).
Bhuvaneshwari and Vinitha, 2025	Consumer Finance/Fintech Lending	Survey of frequent digital lending users (n=180); SEM (AMOS), Necessity-Conciliation Analysis (NCA), fsQCA	Financial knowledge, digital finance use, attitudes and decision-making relate to financial behavior and satisfaction in lending-app contexts; highlights adoption risks for lower-income users and the role of DFL.	Track delinquency/default and over-borrowing in lending apps; evaluate DFL interventions embedded in app onboarding and disclosures.

Author/Year	Discipline/Domain	Methods/Tools Used	Findings (Borrowing/Credit/Debit Angle)	Future Directions
Hapsoro et al. 2022	MSME/Informal Trade Finance	Survey of market traders (n=278), hierarchical regressions with gender interaction	Higher DFL and prudent financial behavior reduce financial vulnerability among traders; gender differences present (men benefit more in reducing vulnerability).	Targeted DFL training for female traders; quasi-experiments to test curriculum effects on credit terms, repayment, and fraud exposure.
Peter et al. 2025	Entrepreneurship Finance/Financial Inclusion	Primary survey of women entrepreneurs (n=214); Hayes PROCESS Macro (Model 8)	DFL → Financial Inclusion → Firm Performance (partial mediation); financial behavior negatively moderates DFL → performance. Implies DFL can ease financing constraints and access to credit, but behaviors shape payoffs.	Longitudinal tracking of credit uptake (loan amounts, interest rates, rejection rates); tailor behavior-centered coaching alongside DFL modules.
Shah et al. 2025	Consumer Payments & Behavioral Finance	Online survey (n=1,208); SmartPLS-4; moderation tests	Digital payments increase spending vs. cash; DFL strongly moderates payment-method effects on spending, potentially buffering overspending that may lead to revolving debt/BNPL burdens.	Link payment choices to objective debt metrics (credit card/BNPL utilization, arrears); test in-app literacy prompts and friction for large/recurring buys.
Kass-Hanna et al. 2022	Development Economics/Financial Resilience	Pooled Financial Inclusion Insights (FII) surveys across 7 countries; robustness checks for endogeneity	Financial and digital literacy jointly predict resilience-building behaviors incl. saving, borrowing, and risk management; heterogeneity by region and vulnerable groups.	Disaggregate "borrowing" into productive (enterprise) vs. distress debt; design inclusive DFL that addresses local risks and gender/rural divides.

DISCUSSION

The findings from the 35 empirical studies reviewed provide robust evidence that Digital Financial Literacy (DFL) serves as a key driver of responsible financial behavior across saving, spending, investing, and borrowing domains. The strongest and most consistent positive effects appear in saving and budgeting, where higher DFL reliably predicts greater savings discipline, reduced financial anxiety, and improved long-term planning (Respati et al., 2023; Rahayu et al., 2024; Yadav & Banerji, 2025; Amarsanaa et al., 2025). Similar benefits extend to investment behavior, with digitally literate individuals showing higher participation rates, better risk management, and increased adoption of sustainable assets (Mazzoli & Baiocco, 2025; Gupta et al., 2025; Zaimovic et al., 2025). These patterns align with the Theory of Planned Behavior and Social Cognitive Theory, as Farrell et al. (2016) and Riaz et al. (2022) earlier emphasized: perceived control and financial self-efficacy transform knowledge into action. In contrast, the relationship between DFL and spending or borrowing proves more nuanced. While strong DFL generally curbs impulsivity and over-indebtedness, frictionless digital payments and easy credit access can still trigger overspending or debt traps when self-regulation or regulatory

safeguards are weak (Yue et al., 2022; Shah et al., 2025; Bhuvaneshwari & Vinitha, 2025). Kass-Hanna et al. (2022) highlight that these negative outcomes are more common among women, rural residents, and low-income groups, underscoring the moderating role of socio-demographic and institutional contexts.

Several contextual and psychological moderators repeatedly shape DFL effectiveness. Gender emerges as a critical factor, Hapsoro et al. (2022) and Mishra et al. (2024), Peter et al. (2025) demonstrate that women often gain larger resilience benefits from targeted DFL programs, yet they start from lower baseline levels due to unequal digital access and socialization. Income, education, and regulatory awareness also consistently strengthen positive outcomes (Tomasi & Ilankadhir, 2024; Kusumawardhani et al., 2025). Overconfidence and financial optimism, however, can distort risk perception even among highly literate users (Mazzoli & Baiocco, 2025; Başar et al., 2025). These findings reinforce Huston's (2010) Financial Capability Model by showing that knowledge alone is insufficient, opportunity structures (infrastructure, regulation) and behavioral traits (impulsivity control, attitudes) determine real-world impact.

Despite substantial progress, important methodological and conceptual gaps persist. Definitions and measurements of DFL remain inconsistent across studies, ranging from simple composites to multidimensional scales that include fraud prevention and self-protection (Lyons & Kass-Hanna, 2021; Choung et al., 2023; Steen et al., 2024). The heavy reliance on cross-sectional, self-reported surveys limits causal claims and raises common-method bias concerns (Bhat et al., 2025; Abdallah et al., 2025). Longitudinal designs, experimental interventions, and objective behavioral data (e.g., transaction records) are urgently needed to establish causality and track long-term effects (Koskelainen et al., 2023; Kumar et al., 2023).

The practical and policy implications are clear and actionable. Governments and financial institutions should integrate standardized DFL modules into national financial inclusion strategies, school curricula, and workplace training, with special attention to women, Gen-Z, and rural populations. Fintech platforms must embed behavioral nudges, spending alerts, cooling-off periods for loans, and mandatory literacy checkpoints, directly into app design. Regulators can amplify these efforts by enforcing transparent disclosure rules and affordable internet policies that close the digital divide. When education, regulation, and technology design work together, DFL can evolve from an individual competency into a systemic tool that promotes equitable participation and lasting financial resilience in the digital economy.

CONCLUSION

This systematic literature review confirms that Digital Financial Literacy plays a central role in shaping responsible financial behavior in the digital economy. Across the 35 empirical studies examined, higher levels of Digital Financial Literacy consistently strengthen saving habits, encourage confident and diversified investing, promote disciplined spending in cashless environments, and support careful borrowing and debt management. While the positive effects are most uniform in saving and investing, outcomes in spending and borrowing remain sensitive to personal self-control, psychological biases, and external safeguards. Overall, Digital Financial Literacy emerges as a multidimensional bridge between knowledge, digital skills, and real-world actions that can turn the opportunities of fintech into genuine financial well-being and resilience.

The findings carry important practical implications for policymakers, educators, and fintech providers who should prioritize accessible and tailored Digital Financial Literacy programs, especially for women, youth, and underserved communities. However, the review is limited by the dominance of cross-sectional designs and inconsistent measurement tools in the existing studies, which restrict strong causal claims and cross-country comparisons. Future research should therefore adopt longitudinal and experimental approaches, develop standardized Digital Financial Literacy scales, and explore the impact of emerging technologies such as artificial intelligence and decentralized finance on required competencies. Addressing these gaps will help

transform Digital Financial Literacy from an individual advantage into a powerful instrument for inclusive and sustainable economic growth.

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