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# Sustainable Finance Practices and the Role of Digital Financial Literacy: A Content Analysis Approach

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# Sustainable Finance Practices and the Role of Digital Financial Literacy: A Content Analysis Approach


## ABSTRACT

*Digital finance has opened new pathways for inclusion, transparency, and sustainability through broader technology adoption, richer data environments, and expanding digital access. This study examines the relationship between digital financial literacy (DFL) and sustainable finance practices (SFP) through a qualitative content analysis of 132 academic articles, policy reports, and industry documents published between 2021 and 2025. Using a hybrid deductive-inductive coding approach in NVivo 14, the study identifies dominant and emerging thematic linkages among DFL, FinTech innovation, ESG integration, and green finance mechanisms. Inter-coder reliability was assessed using Cohen's Kappa, and the value of 0.81 indicates substantial agreement between reviewers (Landis & Koch, 1977). The findings show that DFL operates as both a cognitive and behavioural enabler by strengthening trust, risk awareness, and the responsible use of sustainable financial technologies, including AI, blockchain, and open banking. The analysis also reveals growing scholarly attention to sustainable digital finance and behaviour-driven adoption mechanisms. Overall, the study argues that DFL is a critical enabler of the safe, informed, and responsible use of green financial technologies and therefore an important driver of sustainable digital banking.*



## KEYWORDS

Digital Finance • Digital Financial Literacy (DFL • Sustainable Digital Financial Practices • Content Analysis.


## 1. Introduction

The rapid expansion of digital finance has transformed the way individuals and organisations interact with financial systems, creating new possibilities for transparency, inclusion, and sustainability. Digital platforms, mobile applications, and open-banking ecosystems are widening access to digital financial services (DFS), particularly for underserved groups (OECD, 2023). At the same time, FinTech platforms are increasingly supporting ethical and green finance by connecting users with environmentally responsible financial products and businesses (Li & Wang, 2023). In developing economies such as India, rising smartphone penetration and internet usage have further accelerated the growth of FinTech solutions that support financial inclusion and sustainable development (World Bank, 2022).

The potential of sustainable digital finance, however, depends substantially on digital financial literacy (DFL). DFL refers to the ability to understand, evaluate, and use digital financial products and services in a responsible manner. Prior research suggests that individuals with stronger DFL are better able to assess green investment opportunities, interpret financial information, avoid scams, and participate more confidently in transparent and ethical digital ecosystems (Fan et al., 2025; Filippini et al., 2024).

DFL also enables users to interpret sustainability-related information and ESG (environmental, social, and governance) disclosures in ways that connect financial decisions with broader environmental and social goals (Roy et al., 2025). Recent studies further highlight the role of technological drivers such as artificial intelligence (AI), open banking, and blockchain in advancing sustainable finance through

greater reliability, accountability, and consumer empowerment (Piotrowska & Piotrowski, 2025; Broby, 2025).

Against this backdrop, the present study examines the relationship between digital financial literacy (DFL) and sustainable finance practices (SFP) in recent academic and policy literature. It identifies key technological drivers, including AI, blockchain, and open banking, and explores how they interact with user capability and governance structures. Through publication trends, thematic mapping, and keyword co-occurrence analysis, the study traces how FinTech, ESG, and DFL are shaping the emerging research landscape. It also considers how digital financial literacy can mitigate risks such as fraud, deception, unethical conduct, and greenwashing. By doing so, the paper offers a clearer conceptual contribution: it develops a literacy-technology-governance view of sustainable digital finance and derives policy and institutional recommendations for strengthening progress toward the UN Sustainable Development Goals (SDGs)

## 2. Literature Review

Digital finance has emerged from rapid technological change that has reconfigured global financial markets. These developments have improved financial accessibility while also creating new possibilities for sustainability. Through FinTech platforms, consumers can access green financial products and participate more easily in environmentally responsible financial activity (Li & Wang, 2023). Mobile applications, peer-to-peer lending, and robo-advisory services have widened access to financial alternatives and investment opportunities (OECD, 2023). In countries such as India, this transformation has been reinforced by the rapid spread of smartphones and internet connectivity (World Bank, 2022).

### *2.1. Conceptual foundations: Sustainable finance, literacy, and digitality*

Sustainable finance incorporates environmental, social, and governance (ESG) considerations into financial decision-making to create long-term value and advance broader societal well-being. Digital financial literacy (DFL) refers to the ability to locate, assess, and use digital financial tools effectively. In app-based, platform-based, and data-driven contexts, DFL shapes how consumers interpret ESG claims and engage with sustainable financial products. A related construct, sustainable finance literacy (SFL), has been defined as the ability to recognise and evaluate the sustainability features of financial products (Filippini et al., 2024). In the present study, SFL is treated as a specialised sustainability-oriented dimension of the broader DFL construct.

### *2.2. Literacy and sustainable investment behavior*

Although overall literacy levels remain uneven, large household surveys indicate that SFL is a statistically significant driver of sustainable investing behaviour (Filippini et al., 2024; Seifert-Palan et al., 2024). These studies suggest that literacy influences not only pro-environmental attitudes but also the ability to identify suitable products, interpret labels and screening mechanisms, and act on ESG information.

Emerging research indicates that DFL is associated with improved ESG performance at the company level. This suggests that digital competences (data usage, platform navigation, and disclosure interpretation) spread sustainable practices among consumers and inside enterprises (Fan et al., 2025). According to related research, investors' comprehension of sustainability information and the quality of ESG disclosures are both enhanced by more financial and digital literacy (Jia et al., 2025; Whelan et al., 2021).

### *2.3. FinTech–ESG interface and green fintech mechanisms*

The FinTech-ESG literature explains several ways in which technology can facilitate sustainable finance, including digital identity systems for inclusive finance, robo-advisory tools for sustainable portfolios, and payments data for carbon accounting. Bibliometric and thematic studies consistently identify clusters around sustainable investment, financial inclusion, and climate or impact analytics, while also noting the need for stronger micro-level evidence on literacy as a linking mechanism (Trotta et al., 2024; Roy et al., 2025). Broby (2025) defines green FinTech as the use of financial technology to promote environmental sustainability. Consumer-focused studies further show that uneven understanding of environmental claims in FinTech offerings increases the relevance of DFL and SFL for meaningful adoption and for reducing the risks of greenwashing (Piotrowska & Piotrowski, 2025).

### *2.4. Methodological precedent for content analysis*

Recent review-based studies use bibliometric and qualitative content-analysis approaches to map intellectual structures in emerging research fields. This methodological precedent suggests that content analysis is well-suited to theory-driven codebook development and to heterogeneous corpora that combine journal articles, policy reports, and market white papers (Trotta et al., 2024; Roy et al., 2025; Salem et al., 2025; Jafri et al., 2025).

### *2.5. Gaps and contribution*

Three gaps motivate the present study. First, although prior research links DFL or SFL with behaviour and organisational outcomes, relatively few studies synthesise how literacy is conceptualised across academic and policy sources. A focused qualitative content analysis can help standardise these definitions and indicators. Second, the mechanisms connecting DFL to sustainable practices - such as platform preference, label-evaluation capability, and trust in ESG information - remain underexplored. Third, the broader contextual conditions surrounding sustainable digital finance, including digital inclusion, policy support, and data infrastructure, are dispersed across academic, policy, and regional sources. This study addresses these gaps by mapping core mechanisms, clarifying conceptual components, and proposing a literacy-to-practice framework for sustainable digital banking.

## 2.6. *Theoretical Framework*

This study is anchored in the Technology Acceptance Model (TAM), systems theory, and behavioural finance to explain how digital financial literacy (DFL) shapes sustainable finance practices (SFP). TAM suggests that technology adoption depends on perceived usefulness and ease of use. In sustainable digital finance, tools such as FinTech platforms, AI-driven ESG analytics, blockchain, and open banking require user competence for effective adoption. Higher DFL strengthens understanding, trust, and perceived usefulness, thereby increasing the likelihood of responsible adoption.

From a systems perspective, sustainable finance operates within an interconnected ecosystem of individuals, institutions, and regulatory frameworks. DFL functions as a foundational capability linking individual financial behaviour with broader ESG and SDG outcomes. Behavioural finance further suggests that literacy improves risk awareness and reduces vulnerability to fraud and greenwashing. Taken together, these perspectives position DFL as the key enabling mechanism that connects technological innovation with sustainable financial outcomes.

## 2.7 *Research Contribution*

This study contributes to the literature in three ways. First, it integrates digital financial literacy and sustainable finance within a single qualitative content-analysis framework. Second, it develops a conceptual explanation linking DFL, FinTech innovation, governance mechanisms, and sustainable finance outcomes. Third, by synthesising recent evidence from 2021 to 2025, it highlights emerging

themes in sustainable digital finance and derives policy implications for financial inclusion and the Sustainable Development Goals (SDGs).

### 2.8 Research Objectives

1. To examine the growth trend and publication pattern of research on sustainable finance and digital financial literacy between 2021 and 2025.
2. To identify the dominant and emerging thematic clusters linking Digital Financial Literacy (DFL), FinTech, ESG, Green Finance, and SDGs using keyword co-occurrence and strategic mapping.
3. To investigate the relationship between sustainable finance practices (SFP) and digital financial literacy (DFL) in recent academic publications and policy literature.
4. To study how FinTech and technologies such as AI, blockchain, and open banking improve access to ethical and green financial services, and how Digital Financial Literacy (DFL) helps users avoid fraud, greenwashing, and unsafe financial practices.
5. To suggest recommendations for educational, institutional, and policy measures that can improve DFL frameworks and promote the UN Sustainable Development Goals (SDGs).

## 3. Research Methodology

### *3.1. Research Design*

This study examines the relationship between sustainable finance practices (SFP) and digital financial literacy (DFL) in the digital era using a qualitative content-analysis approach. Content analysis is a well-established method for identifying underlying concepts, processes, meanings, and patterns in textual material (Mayring, 2019). It is especially appropriate here because the literature spans peer-reviewed studies, policy reports, industry reports, and institutional documents. The research design is therefore descriptive and interpretive, with the aim of identifying conceptual linkages rather than statistical associations. In line with Krippendorff (2018) and Vaismoradi and Snelgrove (2019), the study is organised around the following research questions:

I. RQ1: How does digital financial literacy influence the adoption and implementation of sustainable finance practices among individuals and institutions?

II. RQ2: What are the dominant themes and conceptual linkages between DFL and SFP in recent academic and policy studies?

III. RQ3: To what extent do existing sustainable finance frameworks incorporate digital literacy as a prerequisite for responsible financial behavior?

IV. RQ4: How has research on sustainable finance and digital financial literacy evolved between 2021 and 2025 in terms of publication trends, thematic clusters, and intellectual structure?

V. RQ5: How are Digital Financial Literacy (DFL), FinTech innovations, technological enablers (AI, blockchain, open banking), and ESG/SDG outcomes interconnected in shaping sustainable finance practices, and what policy and educational implications emerge from these relationships?

### *3.2. Data Sources and Sampling Criteria*

To ensure that recent developments in digital literacy, FinTech, and sustainability were adequately captured, the study focused on a five-year corpus covering 2021-2025. A total of 132 documents were analysed, including peer-reviewed articles drawn from ScienceDirect, SpringerLink, Wiley Online Library, and MDPI, with a focus on FinTech, sustainability, ESG, and financial education.

- Policy reports (n = 10) from international institutions such as the IMF (2024), UNEP Finance Initiative (2021), OECD (2023), and World Bank (2022).
- Eight industry working papers and white papers were obtained via the OECD iLibrary, McKinsey Sustainability Insights, and SSRN.

Included were documents that:

1. Discussed FinTech, digital finance, or ESG practices,

2. Examined digital or financial literacy, and

3. Were released in English between 2021 and 2025.

Documents were excluded if they were unrelated to digital or sustainable finance or if they relied solely on quantitative financial datasets without conceptual relevance to the study objectives.

Database Search Strategy
The literature search was conducted across major academic databases, including Scopus, Web of Science, ScienceDirect, SpringerLink, Wiley Online Library, and Google Scholar. Policy reports were additionally collected from international organisations such as the World Bank, OECD, IMF, and UNEP Finance Initiative.

The search keywords included combinations of:

- Digital Financial Literacy
- Sustainable Finance
- FinTech
- Green Finance
- ESG
- Digital Finance
- Financial Inclusion

Boolean operators such as AND and OR were used to refine the search results.

#### 3.2.1. *Study Selection Process*

A structured screening process was followed in line with PRISMA guidelines to ensure transparency and replicability.

An initial search across Scopus, ScienceDirect, SpringerLink, Wiley, MDPI, Google Scholar, OECD iLibrary, and SSRN yielded 387 records published between 2021 and 2025. After removing duplicates (n = 56), 331 records remained for title and abstract screening.

During screening, 192 records were excluded because they were not relevant to digital financial literacy or sustainable finance, lacked a clear conceptual linkage, were not in English, or were not fully published. A total of 139 full-text articles were then assessed for eligibility. After excluding 7 studies that did not sufficiently address either literacy or sustainability constructs, the final sample comprised 132 documents: 114 journal articles, 10 policy reports, and 8 industry papers.

### *3.3. Data Collection and Organisation*

Search strings included combinations such as "digital financial literacy" or "FinTech literacy" AND "sustainable finance," "green finance," or "ESG" AND "inclusion" or "digital transformation."

Sources were collected from the OECD iLibrary, Scopus, and Google Scholar to ensure both institutional and scholarly representation. Microsoft Excel and NVivo 14 were used to organise the documents chronologically and thematically and to support the coding process.

**Table1**. Year and Number of Publications

| Year | Publications |
|---|---|
| 2021 | 16 |
| 2022 | 39 |
| 2023 | 25 |
| 2024 | 20 |
| 2025 | 32 |

Source: Authors

Table 1 shows an overall increase in publications on sustainable finance and digital financial literacy between 2021 and 2025, indicating growing academic interest in the field. The noticeable rise in 2022 and renewed increase in 2025 suggest periods of intensified research activity, likely influenced by stronger policy attention to ESG and digital-finance adoption. Although there are modest fluctuations in 2023 and 2024, the broader trend points to sustained scholarly engagement with sustainable digital finance.

### Data Analysis Procedure

**Table2.** Illustration of Coding Procedure

| Sample Text | Code | Theme |
|---|---|---|
| Users lack understanding of ESG financial products | Lack of awareness | Literacy |
| AI improves transparency in digital financial systems | Technology support | FinTech |

Source: Authors

Sentences and paragraphs from the selected sources served as the unit of analysis. Keywords and meaningful text segments were coded in NVivo 14 and then organised into broader thematic categories. The codebook was developed iteratively throughout the coding process, which helped ensure consistent theme identification across the corpus.

The content analysis proceeded in three stages (Mayring, 2019):

i. Preparation: Each document was read carefully to identify meaning units, namely phrases or paragraphs related to DFL, sustainability, or technology.

ii. Categorisation: Recurring ideas such as financial inclusion, ESG integration, green FinTech awareness, and policy frameworks were first identified through keywords and then refined into broader analytical categories, including:

- Technology Facilitators (open banking, blockchain, artificial intelligence)
- The effects of behavioral literacy (responsible investing, ethical use, and trust)
- Policy and Institutional Drivers (rules, educational initiatives).

iii. Synthesis and Interpretation: The coded data were then examined to identify patterns linking DFL with sustainable finance practices. Representative statements were extracted from the sources to support conceptual interpretation. NVivo's text-frequency and co-occurrence tools were used to visualise the main themes and assess conceptual overlap across the literacy, sustainability, and technology domains.

### 3.3 . *Reliability and Validity*

To enhance methodological rigour, several validation strategies were used. Triangulation was achieved by combining academic literature, policy documents, and industry reports, thereby allowing thematic findings to be cross-checked across different source types. Peer review was also incorporated: a subset of coded documents was independently examined by two academic colleagues to improve consistency and reduce subjective bias in theme classification. Transparency was maintained by clearly documenting the inclusion criteria, search strategy, keywords, and analytical procedures, which supports replicability. The analysis was also intentionally limited to the most recent five-year period in order to preserve contextual relevance in a rapidly evolving field.

Theme validation followed a hybrid deductive-inductive approach. Initial coding categories were derived from prior literature on digital financial literacy, ESG integration, and FinTech sustainability. During iterative coding in NVivo 14, additional sub-themes such as the literacy-trust-adoption cycle and greenwashing-risk awareness were identified. The coding framework was refined across multiple review rounds until theoretical saturation was reached and no new conceptual categories emerged. This process strengthened conceptual coherence and internal consistency.

To enhance reliability, two independent academic reviewers coded 25% of the corpus (n = 33 documents) using the predefined coding framework. Discrepancies in theme allocation were identified and discussed in review meetings, and the coding definitions were refined through consensus before the final framework was applied to the remaining documents. Inter-coder reliability, assessed through Cohen's Kappa, indicated substantial agreement. Although the analysis is based on English-language secondary sources and qualitative interpretation, these structured reliability procedures improve the credibility and transferability of the findings.

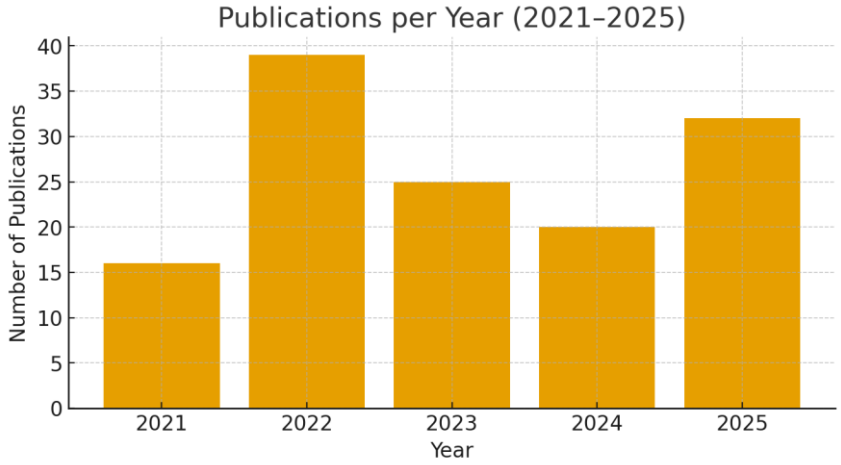

**Figure 1.** Publications per Year

Source: Authors

Figure 1 shows an overall upward trend in publications on sustainable finance and digital financial literacy between 2021 and 2025, indicating growing research interest in the field. The sharp increase in 2022 is followed by a moderate decline in 2023 and 2024 and then a renewed rise in 2025. Despite these fluctuations, the overall pattern reflects sustained and increasing academic attention to sustainable digital finance.

## 4. Results

The qualitative content analysis of 132 documents produced a structured thematic framework consisting of three primary domains and eight sub-themes. Coding frequency, co-occurrence patterns, and conceptual clustering were derived using NVivo 14. Literacy-related themes appeared in 71.2% of the corpus, followed by FinTech infrastructure (59.1%), ESG integration (51.5%), and governance drivers (46.2%). Co-occurrence analysis further shows strong linkages among literacy, technological innovation, and sustainability outcomes. Overall, the results indicate that digital financial literacy frequently intersects with ESG evaluation, fraud mitigation, and sustainable FinTech adoption across the reviewed literature.

### *4.1. Overview of Thematic Structure*

The analysis identified three dominant thematic domains:

1. Literacy as a Cognitive Behavioral Enabler
2. FinTech and Technological Infrastructure
3. Governance and Institutional Reinforcement

**Table 3. Final Thematic Framework Derived from Content Analysis**

| Main Theme | Sub-Themes | Frequency (n=132) | % of Corpus |
|---|---|---|---|
| Literacy as Enabler | Risk awareness, ESG evaluation, fraud prevention, trust formation | 94 | 71.2% |
| FinTech Infrastructure | AI analytics, blockchain transparency, open banking integration | 78 | 59.1% |
| ESG & Sustainable Outcomes | Green investment behavior, SDG alignment, disclosure quality | 68 | 51.5% |
| Governance & Policy Drivers | Regulation, literacy programs, consumer protection | 61 | 46.2% |
| Green FinTech Adoption | Carbon tracking, sustainable apps, eco-scoring tools | 47 | 35.6% |

Source: Authors

The dominance of literacy-related coding (71.2%) suggests that digital financial literacy (DFL) functions as a central enabling factor across the corpus.

### *4.2. Domain I: Literacy as Cognitive Behavioral Enabler*

DFL emerged as the most recurrent theme, appearing in 94 documents. Coding revealed four recurrent sub-mechanisms:

- Risk comprehension and fraud mitigation
- Evaluation of ESG disclosures
- Trust formation in digital systems
- Responsible financial decision-making

Co-occurrence analysis showed that DFL most frequently intersected with ESG-related themes (51.5%) and FinTech adoption (48%). This indicates that literacy is not treated as an isolated educational variable, but rather as a connecting construct linking technology with sustainability outcomes.

Analytically, the data indicate that literacy operates at two levels:

I. **Cognitive level** – enhancing comprehension of sustainability metrics and digital tools.

II. **Behavioral level** – influencing ethical investment and responsible usage patterns.

This pattern supports the conceptualisation of DFL as a behavioural activation mechanism rather than merely a knowledge-based construct.

### *4.3. Domain II: FinTech and Technological Infrastructure*

Technological enablers were coded in 78 documents (59.1%), primarily under:

- Artificial Intelligence (39.4%)
- Blockchain-based transparency mechanisms
- Open banking and API ecosystems

However, co-occurrence mapping shows that technological themes rarely appear independently. More than 65% of AI-related references were coded alongside literacy or governance constructs, indicating that technological innovation is generally framed as effective only when supported by user capability and regulatory alignment.

This suggests that technology is positioned in the literature as enabling infrastructure whose sustainability impact depends on literacy alignment.

### *4.4. Domain III: ESG Integration and Sustainable Finance Practices*

ESG-related outcomes appeared in 68 documents (51.5%). Coding revealed three recurring mechanisms:

- Green investment allocation
- Sustainability disclosure interpretation
- SDG-linked financial behavior

Thematic density analysis indicates that ESG-related discussions cluster strongly around literacy themes rather than purely technological themes. This reinforces the interpretation that sustainability outcomes are behaviourally mediated rather than determined by technology alone.

### *4.5. Governance and Institutional Reinforcement*

Governance and policy themes were present in 61 documents (46.2%). These included:

- Consumer protection regulation
- ESG taxonomy standardization
- National literacy programs
- Public–private sustainability initiatives

Thematic mapping shows that governance themes frequently co-occur with both literacy (62%) and FinTech (54%) nodes. This points to a triangular relationship in which literacy, innovation, and regulation form an interdependent structure.

### *4.6. Thematic Interconnections and Conceptual Synthesis*

Cross-theme comparison reveals a consistent structural pattern:

- Literacy themes act as foundational nodes.
- Technological themes function as operational enablers.
- Governance themes provide institutional stabilization.
- ESG outcomes represent performance-level effects.

This layered relationship suggests a literacy-technology-governance configuration rather than a simple linear causality model.

Co-occurrence network analysis confirms that Digital Financial Literacy (DFL) occupies the most central position in the conceptual network, linking FinTech, ESG, transparency, SDGs, and policy constructs. FinTech acts as an infrastructural bridge, while governance themes reinforce institutional legitimacy.

### *4.7. Analytical Interpretation*

Across the corpus, three consistent patterns emerge:

a) Literacy Dominance
DFL is treated as the primary behavioural driver of sustainable finance adoption.

b) Conditional Technology Effect
Technological innovation contributes to sustainability only when mediated by literacy and regulatory safeguards.

c) Systemic Interdependence
Sustainable finance practices are framed as outcomes of interconnected cognitive, technological, and institutional drivers.

These findings move beyond descriptive reporting by showing that literacy functions as the key integrating mechanism within the sustainable digital finance ecosystem.

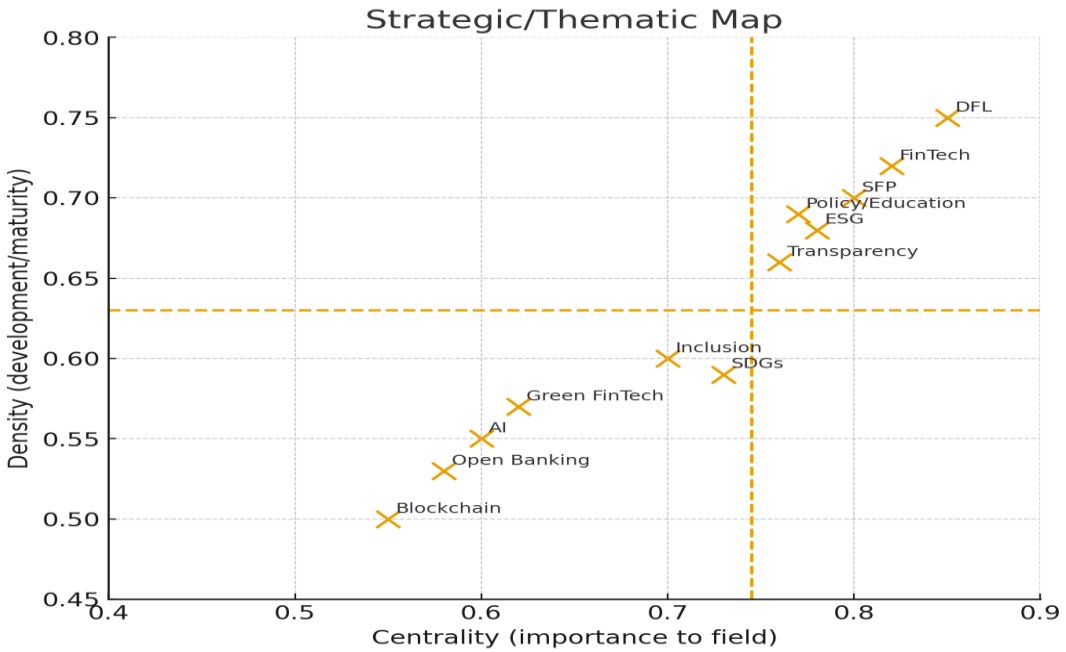


**Figure 2**. Strategic / Thematic map

Source: Authors

The strategic map classifies research themes according to their centrality (importance to the field) and density (level of development or maturity). Themes such as Digital Financial Literacy (DFL), FinTech, Sustainable Finance Practices (SFP), ESG, Policy, and Education appear in the upper-right quadrant, indicating that they are both well developed and highly central to the field. By contrast, Green FinTech, AI, Open Banking, and Blockchain occupy lower-left or central positions, suggesting that they remain emerging or moderately developed themes with growing relevance. Overall, the map indicates that literacy- and governance-oriented themes currently dominate the field, while technology-driven innovations are likely to shape future research directions.

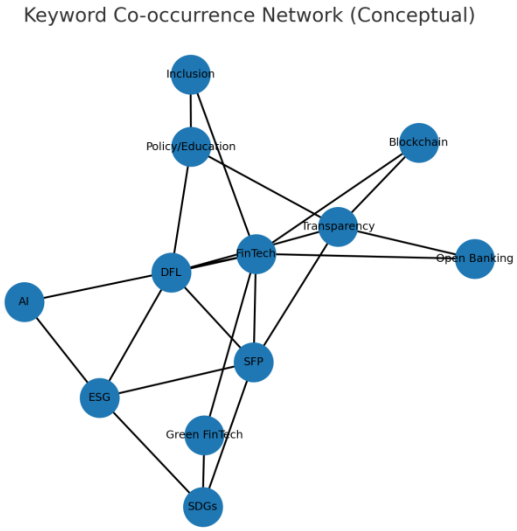


**Figure 3.** Keyword Co-occurrence Network (Conceptual)

Source: Authors

The network illustrates how major research keywords are interconnected through their joint appearance in the reviewed publications. FinTech and Sustainable Finance Practices (SFP) appear as central hubs with strong linkages to DFL, ESG, Transparency, Green FinTech, and SDGs, highlighting their integrative role in the research landscape. Digital Financial Literacy (DFL) is closely connected to both technological themes (AI, FinTech) and governance-related topics (Policy/Education, Inclusion), underscoring its bridging role between technology adoption and sustainable outcomes. Technologies such as Blockchain, Open Banking, and AI are connected mainly through FinTech and transparency, suggesting that they function as enabling infrastructures rather than standalone themes. Overall, the network reflects a tightly connected ecosystem in which sustainability goals, financial innovation, and user capability jointly shape the direction of sustainable digital finance research.

## 5. Discussion

### 5.1. *Policy, Institutional, and Educational Implications*

The evidence from 2021 to 2025 strongly supports a multi-stakeholder policy approach to sustainable digital finance. Policymakers, financial institutions, and educational authorities need to work together to close literacy gaps, strengthen ESG transparency, and support responsible innovation.

a) Regulatory frameworks.
The OECD (2023) and IMF (2024) call for comprehensive digital-finance governance frameworks that integrate consumer protection, standardised ESG taxonomies, and data-ethics rules. Such frameworks should ensure that FinTech developments align with the Sustainable Development Goals (SDGs), particularly SDG 8 (Decent Work and Economic Growth) and SDG 13 (Climate Action).

b) Educational initiatives.
Integrating digital financial literacy into national curricula and public-awareness programmes is essential. Initiatives such as India's Digital Saksharta Abhiyan and the European Commission's Digital Education Action Plan suggest that formal literacy interventions can significantly improve safe and informed use of digital financial services (World Bank, 2022; OECD, 2023).

c) Institutional capacity building.
Financial institutions can incorporate sustainability into product design and staff training. Banks and FinTech firms are increasingly introducing green training modules to strengthen employees' ESG evaluation skills (Roy et al., 2025).

d) Public-private partnerships.
Collaboration among governments, FinTech companies, and non-governmental organisations (NGOs) can expand literacy programmes and community-based sustainability initiatives. Such partnerships have proved useful in improving awareness of ethical investment in parts of Southeast Asia and Sub-Saharan Africa (World Bank, 2022).

These coordinated efforts can accelerate the mainstreaming of sustainable digital finance, backed by informed individuals, ethical businesses, and proactive regulators.

### 5.2. *Synthesis and Theoretical Implications*

Synthesising evidence from journal articles, policy documents, and reports published between 2021 and 2025 reveals a cyclical relationship among DFL, FinTech innovation, and sustainability performance.

a) **Cognitive dimension:** DFL equips individuals with the knowledge to understand financial tools and ESG frameworks.

b) **Behavioural dimension:** Literate users demonstrate ethical, transparent, and responsible financial conduct.

c) **Institutional dimension:** Literate consumers pressure organizations and governments to maintain higher sustainability standards.

This multi-layered framework aligns with systems theory in sustainability studies, where individual literacy can trigger collective behavioural change that, in turn, reshapes institutional norms (Creswell &Poth, 2018).

The evidence also supports the Technology Acceptance Model (TAM): when individuals possess stronger DFL, the perceived usefulness and ease of use of sustainable FinTech tools become stronger, thereby encouraging adoption (Piotrowska & Piotrowski, 2025).

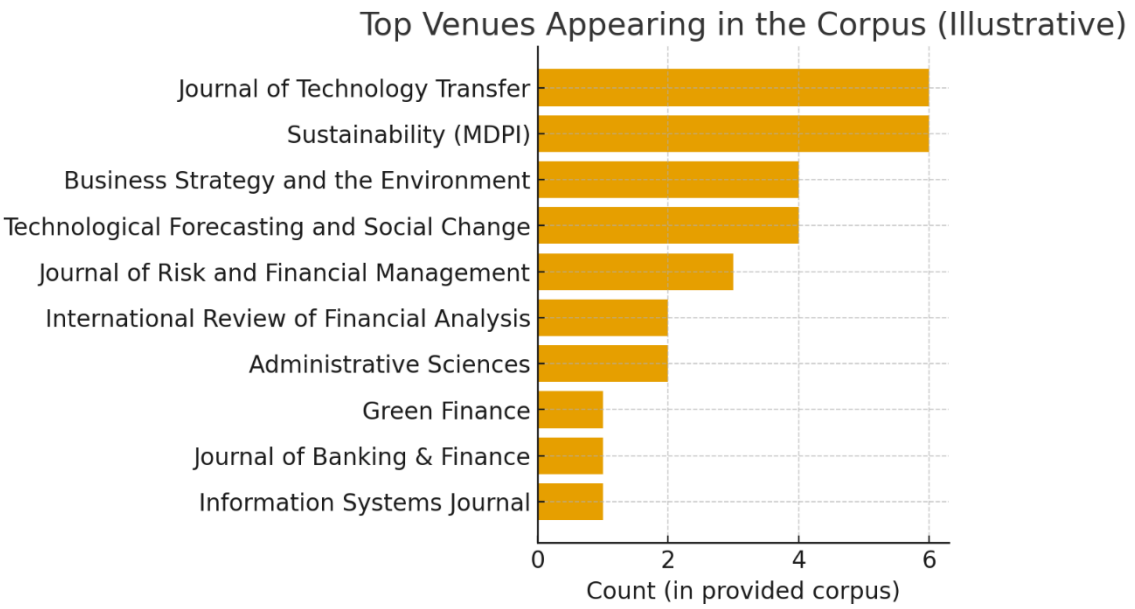


**Figure 4**. Top Venues Appearing in the Corpus

Source: Authors

The chart suggests that research on sustainable finance and digital financial literacy is concentrated in interdisciplinary journals dealing with sustainability, technology, and business strategy. Journals such as Sustainability, Journal of Risk and Financial Management, and Green Finance appear more frequently in the corpus, indicating that the field is being shaped by cross-disciplinary outlets rather than by a single specialised stream.

### *5.3. Theoretical Implications*

This study extends the Technology Acceptance Model (TAM) by incorporating sustainability considerations into digital-finance adoption. The findings suggest that DFL enhances both perceived

usefulness and perceived ease of use in relation to sustainable financial technologies, thereby encouraging responsible engagement with green financial products.

The findings also support systems theory by showing that sustainable finance practices emerge from the interaction among technological infrastructure, user capability, and institutional governance.

### 5.4. *Summary of Findings*

Across the five-year corpus, digital financial literacy appears consistently alongside FinTech innovation and governance frameworks in shaping sustainable finance practices. The evidence supports an interconnected structure rather than isolated effects.

Across the five-year review period, three dominant insights emerge:

i. **Digital financial literacy appears to be a central enabling factor of sustainable finance.**
It promotes educated decision-making, ethical investing, and the effective use of digital tools.

ii. **FinTech innovation drives accessibility but requires literacy alignment.** Technology democratizes money only when consumers learn how to utilise it responsibly.

iii. **Multi-stakeholder policy and education amplify sustainability outcomes.** Integrating DFL training and ESG standards into regulatory and business frameworks improves public trust and speeds up progress toward the SDGs.

The five research questions were addressed through the structured thematic analysis of 132 documents. RQ1 is addressed in Sections 5.2, 5.7, and 6.2, where the findings show that digital financial literacy shapes sustainable finance adoption by improving risk awareness, trust, and responsible technology use. RQ2 and RQ3 are addressed through the thematic and co-occurrence analyses, which demonstrate that DFL is deeply embedded in contemporary sustainable-finance frameworks and is closely linked to ESG interpretation, governance, and behavioural outcomes.

RQ4 is addressed through the publication-trend analysis and thematic mapping presented in Table 1 and the strategic and venue analyses, which indicate steady growth and increasing interdisciplinary consolidation of research between 2021 and 2025. RQ5 is addressed through the conceptual synthesis and framework presented in Sections 5.6, 6.2, and Figure 5, which show how DFL, FinTech innovation, governance, and ESG-SDG outcomes interact within a unified sustainable digital finance ecosystem.

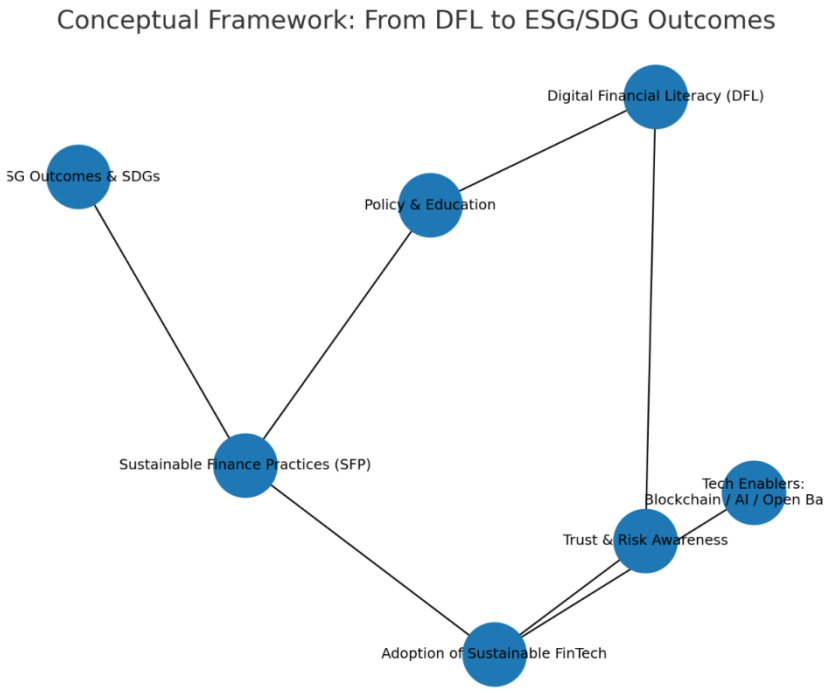


**Figure 5.** Conceptual Framework: From DFL to ESG/SDG Outcomes

Source: Authors

The framework shows how Digital Financial Literacy (DFL) functions as a foundational driver that enables individuals and organisations to understand digital financial tools, assess risks, and build trust in sustainable financial systems. In turn, this capability supports the effective use of FinTech, AI, blockchain, and open banking for improved transparency, greener financial behaviour, and stronger ESG-SDG alignment.

## 6. Conclusion

This study contributes to the sustainable-finance literature by systematically synthesising recent research and clarifying the enabling role of digital financial literacy within digitally mediated financial ecosystems. Rather than treating literacy, technology, and governance as separate streams, the study shows how they interact to shape sustainable finance practices.

The study demonstrates that digital financial literacy (DFL) is a foundational component of sustainable finance practices (SFP) in an increasingly digital and FinTech-driven financial environment. Across the reviewed literature from 2021 to 2025, DFL consistently emerges as the mechanism through which users are able to understand digital financial tools, evaluate ESG-related information, manage risk, and participate responsibly in sustainable financial systems.

Technologies such as blockchain, artificial intelligence (AI), open banking, and data analytics can enhance transparency, accountability, and user empowerment. Their sustainability potential, however, is realised more fully when users possess the literacy needed to interpret information, evaluate claims, and avoid misuse.

Green FinTech developments - including carbon-footprint tracking tools, sustainable investing applications, and AI-supported eco-loan assessment - further demonstrate how technology can integrate environmental concerns with financial decision-making. Yet the findings suggest that these tools are most effective when supported by literacy, governance safeguards, and institutional trust.

Accordingly, the study highlights the need to strengthen DFL through education, targeted policy measures, and institutional capacity building. Financial regulators, governments, educational institutions, and industry actors must work together to promote responsible digital-finance use and support a more inclusive and sustainable financial system. The paper's central contribution lies in showing that DFL is not merely a supporting variable, but a core enabling condition in the literacy-technology-governance architecture of sustainable digital finance.

### *6.1. Limitations*

This study is limited to English-language secondary sources published between 2021 and 2025 and may therefore omit relevant regional or non-English perspectives. Although systematic screening and inter-coder reliability procedures were applied, the study remains interpretive in nature and does not empirically test the proposed framework.

### *6.2. Future Research Directions*

Future research can extend this work by empirically testing the proposed framework through quantitative or mixed-method designs across countries and demographic groups. Longitudinal and comparative studies could further examine how DFL shapes sustainable finance behaviour over time and under different regulatory and technological conditions.

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