

Digital Financial Literacy: Insights from Bibliometric Review based on SPAR-4-SLR ADO Model and Future Research Direction

Janani M^{1*}, Mohamad Fazli Sabri², Amirah Shazana Magli³, Law Siong Hook⁴, and Siti Fahazarina Hazudin⁵

¹Department of Professional Accounting and Finance, School of Commerce, Accounting and Finance, Kristu Jayanti (Deemed to be University), 560077 Bangalore, India

²Faculty of Human Ecology, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

³Department of Political Science, Public Administration and Development Studies, Faculty of Business and Economics, Universiti Malaya, 50603 Kuala Lumpur, Malaysia

⁴School of Business and Economics, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

⁵School of Business and Banking Studies, Universiti Teknologi MARA Cawangan Pahang Kampus Jengka, 26400 Bandar Tun Abdul Razak Jengka, Pahang, Malaysia

ABSTRACT

This study combines a systematic literature review with bibliometric analysis to provide both qualitative and quantitative insights in the field of digital financial literacy (DFL), which integrates the concepts of financial literacy and digital literacy. With the increasing penetration of digital devices and internet usage, the need for digital financial literacy among individuals has become more noticeable. The study draws on data collected from the Scopus database, comprising 743 documents published between 2015 and 2025 for bibliometric analysis and 119 articles for in-depth content analysis. Bibliometric analysis was conducted using the Biblioshiny package in R and VOSviewer to identify emerging research areas and thematic structures within the DFL literature. This was followed by content analysis guided by the SPAR-4-SLR model. Based on this integrated approach, a conceptual framework was developed using the Antecedents–Decisions–Outcomes (ADO) framework. The framework identifies key antecedents of digital financial literacy namely demographic characteristics, financial capacity, behavioural factors, and institutional influences and links them to outcomes such as financial stability, empowered decision-making, investment growth, fintech development, and digital financial inclusion. The study offers valuable insights for policymakers, individuals, and academics seeking to better understand and advance digital financial literacy.

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E-mail addresses:

janani.m@kristujayanti.com (Janani M)

fazli@upm.edu.my (Mohamad Fazli Sabri)

amirahshazana@um.edu.my (Amirah Shazana Magli)

lawsh@upm.edu.my (Law Siong Hook)

fahazarina@uitm.edu.my (Siti Fahazarina Hazudin)

* Corresponding author

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INTRODUCTION

Financial literacy also has an important role in understanding the level of one's financial well-being (Atkinson & Messy, 2012; Mokhtar et al., 2015) because it has a great impact on savings and retirement outcomes (Bucher-Koenen & Lusardi, 2011). In a situation of increased economic development and a constantly growing population, there has also been a focus on optimising the management of financial resources. It has also been realised that there has been a need for maximising financial literacy in this regard, and therefore, the OECD has taken certain steps in this respect (Recommendation of the Council on Financial Literacy, 2020). Financial literacy has been discovered to have a significantly positive effect on the degree of individuals' financial inclusion. As the delivery of financial services continues to move to online platforms, there has been an expansion in the scope related to financial literacy, including the emergence of digital financial literacy. Digital financial literacy can be identified as the use of knowledge, skills, attitudes, and behaviours related to finance, which help people understand digital technology, as well as use digital financial services in a manner contributing to their overall financial health (OECD, 2024).

Considering digitalisation, the vast use of digital devices and better penetration of the internet have, therefore, fast-tracked the adoption of digital financial services (Shen et al., 2018; Yao et al., 2022), thus promoting digital financial inclusion. Most prior studies have only considered

bibliometric analysis in separation; hence, this study extends the literature by integrating bibliometric analysis with content analysis in developing a predominant conceptual framework. RQ1 identifies the main clusters of digital financial literacy using keyword co-occurrence analysis, while RQ2 seeks to identify the emerging, established, and future themes on digital financial literacy using overlay visualisation and thematic evolution techniques. RQ3 focuses on the identification of critical research gaps and goes ahead to propose future research agendas in the domain of digital financial literacy. The subsequent section undertakes a review of the theoretical underpinnings, which is then followed by bibliometric and content analysis in detail to formulate future research directions on digital financial literacy.

THEORETICAL BACKGROUND

Financial Literacy

Financial literacy has become a necessary life skill in the rise of increasing economic growth and a growing workforce. It involves knowledge and the capacity to handle numbers to obtain, gain access to, and manage resources with efficiency (The National Adult Literacy Agency, 2005) and cognitive and mental abilities for good financial management (Remund, 2010). An individual's personal finances are partly dependent on their financial literacy level (Lusardi, 2015b; Sabri & Zakaria, 2015), and basic financial literacy is very relevant for making major financial decisions (Lusardi, 2015a). Particularly,

one's readiness for old age depends on one's knowledge and awareness of personal finances (Bucher-Koenen & Lusardi, 2011).

Digital Literacy

Digital literacy entails the capacity of an individual to possess and use required skills for information technology, thus enabling the ability to engage effectively with the digital economy with the goal of meeting the criteria for the Sustainable Development Goals (Reddy et al., 2020). Digital literacy is frequently measured using criteria such as the usage of information technology with the ability to use computers, laptops, as well as mobile phones effectively for their intended purpose. This includes the use of mobile technology for the sending and receiving of information as well as the use of social media platforms for access and participation (Lyons & Kass-Hanna, 2021b; Mahdzan et al., 2022). Digital literacy is conceptualised using three stages: the first stage is the acquisition of digital skills with the emphasis on the knowledge and the attitude towards technology; the second stage is the effective use of the technology; and the last stage is the culmination of innovation with the emphasis on digital transformation (Martin & Grudziecki, 2006).

Digital Financial Literacy

Digital Financial Literacy (DFL) is an important area of convergence of financial literacy and digital literacy (Lyons & Kass-Hanna, 2021a), which has become increasingly important in influencing

financial technology diffusion and financial behaviour (Nurkholik, 2023). Digital financial literacy is a component that is understood to be an integration of knowledge, attitudes, skills, and behaviour competencies that aim to empower people to effectively understand, access, and use financial services and technology for the end goal of improved financial well-being.

Review studies in the relevant field

A review of literature is important for any research to be carried out and as a result, many researchers have undertaken literature review studies including bibliometric review, structured review and systematic literature studies, where majority of the studies conducted is bibliometric study and review (20), followed by a few structured literature review (3) whereas (6), article where a combination of bibliometric review. While prior reviews in the digital financial literacy domain have predominantly employed PRISMA-based systematic procedures and, in some cases, the TCCM framework to organise extant knowledge, these approaches largely remain descriptive and classificatory in nature. PRISMA-based reviews ensure transparency and methodological rigor in study selection but offer limited guidance for theory building. Similarly, the TCCM framework structures literature across theories, contexts, characteristics, and methods. However, it does not explicitly explain how or why relationships among constructs evolve within a behavioural decision-making process.

In contrast, the Antecedents–Decisions–Outcomes (ADO) framework adopted

in this study provides a process-oriented and causal lens that enables deeper theoretical insight. By explicitly linking structural and behavioural antecedents to individual decision mechanisms and subsequent financial outcomes, the ADO framework reveals dynamic pathways that remain obscured in traditional thematic or classificatory reviews. This approach allows for the identification of underexplored mediators and contextual moderators, thereby advancing digital financial literacy research from thematic aggregation towards explanatory theory development. The ADO-based synthesis not only complements existing PRISMA and TCCM reviews but extends them by offering a conceptual architecture through which future empirical studies can systematically test behavioural and institutional mechanisms shaping digital financial literacy.

Thus, Table 1 represents the consolidation of major reviews in this field.

As shown in Table 1, a brief overview of recent reviews on DFL by various researchers tends to indicate that two streams have emerged, which are intrinsic to DFL studies, measuring DFL, and its determinants. Although early empirical research, such as that carried out by (Lyons & Kass-Hanna, 2021b), helped to establish a foundation of financial literacy measures by merging financial literacy and digital literacy on a validated scale, other exploratory factor research has more recently steered a course in a direction that focuses on structural mapping, rather than empirical analysis, to discern paradigms of important authors, keyword correlation, and knowledge voids,

as seen in a recent bibliometric analysis by (Yadav & Banerji, 2023) followed by another by (Ishak et al., 2024). This body of research tends to suggest that while DFL has become a rapidly growing field, it remains largely atomised from a theoretical viewpoint.

Subsequent reviews include the determinants and enabling factors of digital financial literacy in their assessment, often embedding DFL studies within the wider context of digital financial inclusion in the digital economy. These reviews represent the increasing attempt to include the concept of DFL in the context of the increasing financial technology environment. Nevertheless, most reviews mentioned represent an exploratory level of inquiry, which tends more to classify and thematic map rather than provide causal analysis. The application of integrative reviews using PRISMA and TCCM frameworks, developed recently by (Paul et al., 2024), represents a significant step forward to better identify the underlying theoretical perspectives, which range from Behavioural Economics, Human Capital Theory, Agency Theory, to the Diffusion of Innovation Theory, and so forth. Nevertheless, most reviews have tended to use these models on a descriptive level rather than critically evaluating the ways in which the models intersect or contrast to explain digital financial conduct.

As compared to the previous literature reviews that emphasised the use of bibliometric mapping as the methodology, the current literature review incorporates

Table 1
Summary of reviews in digital financial literacies from 2021 to 2025

No	Authors	Focus	Type
1	Lindez-Macarro et al. (2025)	Financial frauds	BR
2	Argade et al. (2024)	Financial literacy and SME	BR
3	Azaria & Noviani (2024)	Digital financial literacy and accounting research	BR
4	Baheti et al. (2024)	Digital financial inclusion	BR
5	Ishak et al. (2024)	Digital finance	BR
6	Jose & Ghosh (2024)	Digital financial literacy and financial behaviour	SLR
7	Jin Liu (2024)	Digital financial inclusion	BR
8	Kaweesa et al. (2024)	Islamic financial literacy	BR
9	Rani & Mittal (2024)	Financial literacy and financial inclusion	BR + SLR
10	Rehman & Mia (2024)	Financial literacy	SLR
11	Sari et al. (2024)	Digital Economy, Entrepreneurship and Financial Literacy	BR
12	Satiti et al. (2024)	Financial Technology Literacy	SLR + BR
13	Sharma et al. (2024)	Financial Satisfaction	BR + SLR
14	Suryavanshi et al. (2024)	Financial Inclusion	BR
15	Yadav & Banerji (2024)	Digital Financial Literacy	SLR
16	Yuvaraja & Perumandla (2024)	Financial Literacy	BR
17	Arruum & Lestari (2023)	Digitalisation and Financial Literacy	BR
18	S. Damayanti & Rahmawati (2023)	Financial Literacy and Investment Decision	BR
19	DerMesrobian (2023)	Financial Literacy	BR
20	Fadilla et al. (2023)	e-wallets	BR
21	Fengwen & Ali (2023)	Women Financial Inclusion and Literacy	BR
22	Kiky (2023)	Financial Literacy and Fintech	BR
23	Nathie et al. (2023)	Financial Literacy	BR + SLR
24	Senduk & Djatmika (2023)	Financial Education in Digitlized Era	BR
25	Yadav & Banerji (2023)	A bibliometric analysis of digital financial literacy	BR
26	Zaimovic et al. (2023)	Financial Literacy	SLR
27	Lajuni et al. (2022)	Financial Literacy and Knowledge	BR
28	Aziz et al. (2021)	Digital Banking and Financial Inclusion	BR
29	Gálvez-Sánchez et al. (2021)	Financial Inclusion	BR
30	Kaur et al. (2021)	Financial Satisfaction	BR + SLR

BR- Bibliometric Review; SLR – Systematic Literature Review

the use of the ADO model to address the theoretical linkages entailed between the antecedents of DFL, the decision-making processes associated with financial literacy of individuals, and the consequences or outcomes that come with such processes. As a result of integrating methodology for the first time in the literature review, the literature review contributes to the area of methodology through the use of the SPAR for

SLR protocol in conjunction with the use of the ADO model for conceptual contributions through the theoretical underpinning for the area of DFL studies based on the cause-and-effect model of analysis.

Digital financial literacy is rapidly acknowledged to be an interdisciplinary concept that transcends conventional notions of financial literacy. Findings from behavioural economics studies and consumer education elucidate in-depth explanations regarding individual learning processes of digital financial information. On behavioural economics, individual cognitive biases like overconfidence, mental accounting, and loss aversion are shown to greatly impact digital financial behaviour. In fact, individual behaviour patterns themselves inform about the requirements for digital financial literacy to not only focus on gaps in knowledge but also to overcome decision-making challenges. On the other hand, by drawing on the perspectives of consumer education studies, experiential learning strategies for digital financial literacy must enable individuals to cultivate critical competence regarding digital tools, financial products, and online security. Conversely, drawing on multiple perspectives will further consolidate DFL as a concept by conveying that for successful financial literacy programs to occur simultaneously, one must consider behaviourism, learning theories, as well as technological feasibility.

METHODOLOGY

Analysis using bibliometrics is instrumental in creating a conceptual framework for

research, structuring existing research studies, making research whole, analysing research gaps, and future research focus in a research discipline. Thus, bibliometric research when properly employed allows for a systematic approach to a literature review that brings about accurate results from a vast bibliographic database. In this research, article selection and elimination were done in accordance with (Paul et al., 2021) Scientific Procedures and Rationales for Systematic Literature Review model, also known as SPAR-4-SLR, that includes stages of assemble, arrange, and assess mending a systematic approach towards filtering research studies, hence commonly enhancing research precision (Yadav & Banerji, 2023). Thus, when applied in systematic research, the assemble process entails identifying, procuring, arranging by organising and purifying a research database, and finally, arranging entails analysing by evaluating a research process followed by information-reporting (Donthu et al., 2021). The resulting database was used for research analysis focused on the research questions, while steps involved in a systematic review process can be seen in Figure 1.

Data Assembling

The data was obtained from the Scopus database, which was chosen as a singular source for bibliometric data, owing to its wide coverage, strong indexing criteria, and wide discipline base that includes social sciences, management, and business studies. It is a well-known database for having a

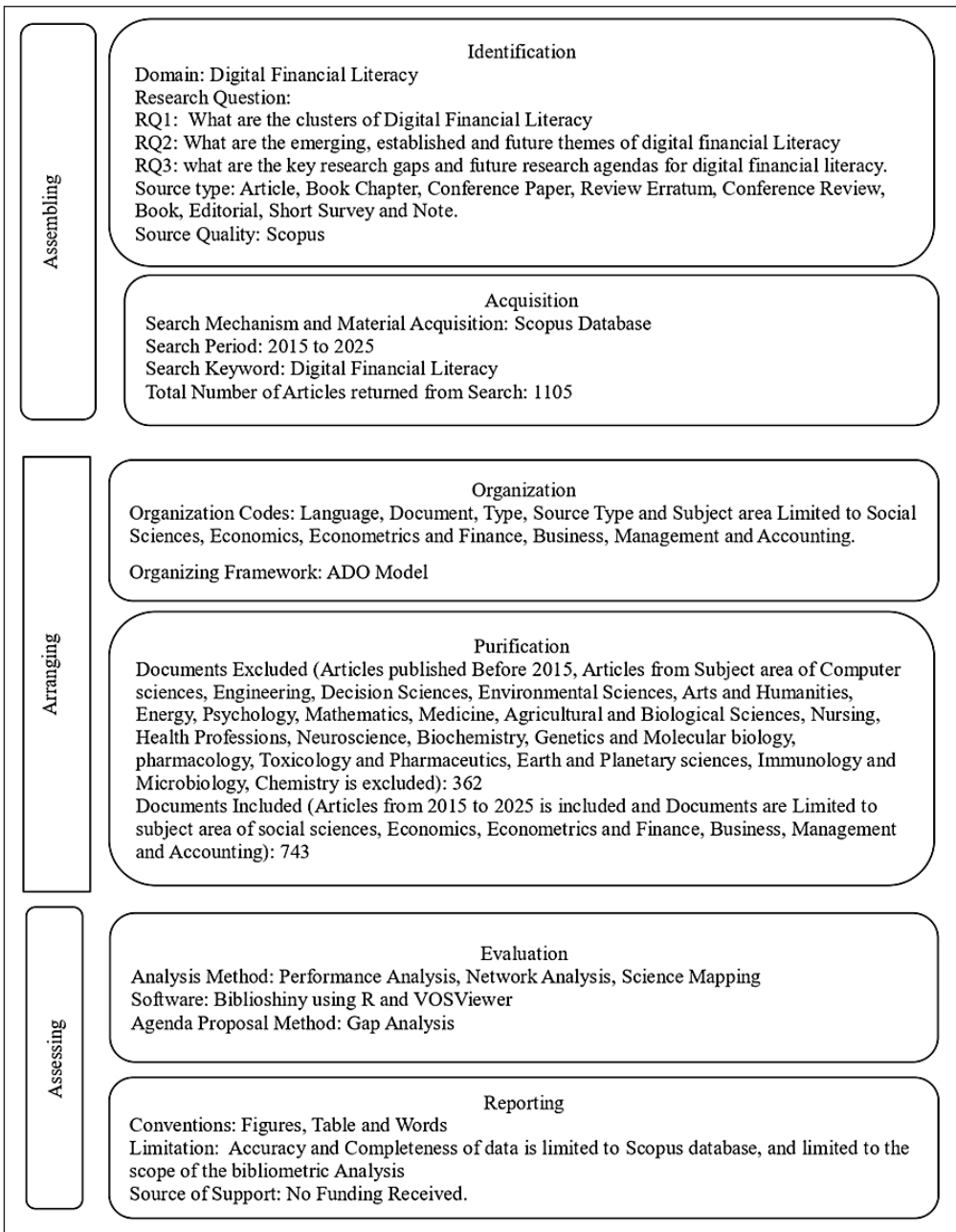


Figure 1. The SPAR-4-SLR protocol adapted from (Paul et al., 2021)

strongly peer-reviewed journal base with a good citation index, thereby being a much more accurate source for bibliometric

studies compared to Web of Science, Mendeley, and other databases. The search for literature used the following keywords:

TITLE-ABS-KEY (digital AND financial AND literacy) AND PUBYEAR > 2014 AND PUBYEAR < 2025 AND (LIMIT-TO (SUBJAREA, "ECON") OR LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "BUSI")).

Data Arranging

After initial filtration, the subject area was limited to specified field, with the publication period from 2015 to 2025, Covering a span 10 years.

Data Assessing.

Using SPAR-4-SLR, the assessment has been carried forward, where the bibliometric analysis has been carried using R studio with Biblioshiny Package, and VOS Viewer to Clustering and analysing (Donthu et al., 2021).

After bibliometric mapping, a systematic content analysis was conducted to understand the thematic clusters and derive the most prominent antecedents and outcomes from the literature. The shift from quantitative mapping to qualitative synthesis was facilitated by the SPAR-4-SLR protocol (Paul et al., 2021). The ADO (Antecedents–Decisions–Outcomes) model was used as the conceptual analytical template for content integration. This model was chosen against alternative models including TCCM and IMO because it can holistically obtain the causal chain of relationships in capturing antecedent variables (socio-economic and psychological enablers) to decision processes (fintech usage behaviour)

and resultant outcomes (digital financial inclusion and empowerment).

ADO allows for more processual and dynamic understanding of how DFL develops at individual and institutional levels. For the methodological transparency, the inclusion criteria were limited to Scopus-indexed English language journal articles, published during 2015-2025, and thematically connected with DFL. Non-empirical studies that were not in the digital form or without full-text access were excluded. The steps provided for both conceptual accuracy and replicability in the review process.

The highest-cited and thematically core papers in each cluster were studied using manual coding in Excel to discover conceptual patterns. In order to provide reliability, two independent coders coded the extracted data, and differences were negotiated until consensus. This allowed bibliometric findings to be combined with qualitative depth, providing a thematic interpretation that is coherent.

RESULTS AND DISCUSSION

Main Information

The Table 2 represent the details regarding the data considered for the Bibliometric analysis.

Table 2 depicts the overall development in research papers on digital financial literacy from 2015 to January 2025 on various publication dynamics, document types, authors, and collaboration networks. It includes a total of 743 research papers from 494 sources, with a healthy annual

Table 2
Main Information about the Bibliometric data

Description	Results
Main information about data	
Timespan	2015:2025
Sources (Journals, Books, etc)	494
Documents	743
Annual Growth Rate %	35.59
Document Average Age	2.16
Average citations per doc	9.68
References	36580
Document contents	
Keywords Plus (ID)	974
Author's Keywords (DE)	2062
Authors	
Authors	2054
Authors of single-authored docs	102
Authors collaboration	
Single-authored docs	108
Co-Authors per Doc	3.04
International co-authorships %	21.4
Document types	
Article	563
Book	4
Book chapter	91
Conference paper	42
Conference review	5
Editorial	2
Erratum	8
Note	1
Review	26
Short survey	1

growth rate of 35.59 percent. The average age of a research paper is 2.16 years, with a total of 9.68 citations per document and a cumulative total of 36,580 references.

There are also 563 articles from journals, 91 book chapters, 42 conference articles, 26 review articles, 8 errata, 5 conference reviews, 4 books, 2 editorials, and 1 note and

short survey. Looking at the distribution of the keyword, the dataset has information on 974 keywords and 2,062 author-submitted keywords. There are also 2,054 authors in the dataset, with the single-author document number being 102. There is an average of 3.04 co-authors per document, while the number of documents that had international co-authorship is at 21.4%.

To determine the most relevant sources for the articles related to digital financial literacy, Figure 2 represent the most relevant source of articles regarding Digital Financial Literacy.

Most Relevant Source

Figure 2 shows that the leading publishing outlet or journal for research related to Digital Financial Literacy (DFL) is Sustainability (Switzerland), with 18 published articles. This is trailed by Finance Research Letters with 12 articles and the Journal of Risk and Financial Management and Studies in Systems, Decision and Control with more than 10 articles each. Other journals that follow include Finance: Theory and Practice, Investment Management and Financial Innovations, and Journal of Infrastructure, Policy and Development and Research in International Business and Finance with eight articles each. Also included in the sources and with fewer articles published are the International Journal of Bank Marketing and Cogent Business and Management with seven and six articles respectively.

To know the Co-occurrence of the Keyword relating to digital financial literacy, Figure 3 shows the Co-occurrence analysis using fractional counting.

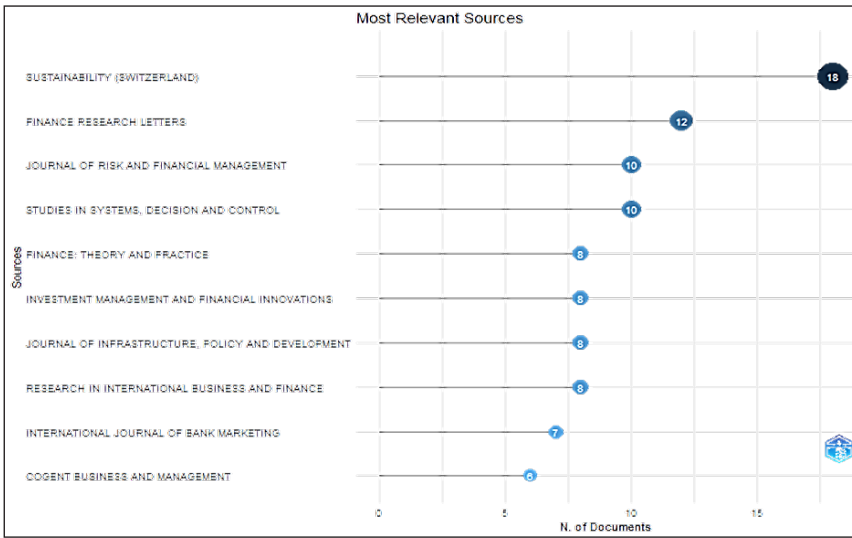


Figure 2. Most Relevant Sources

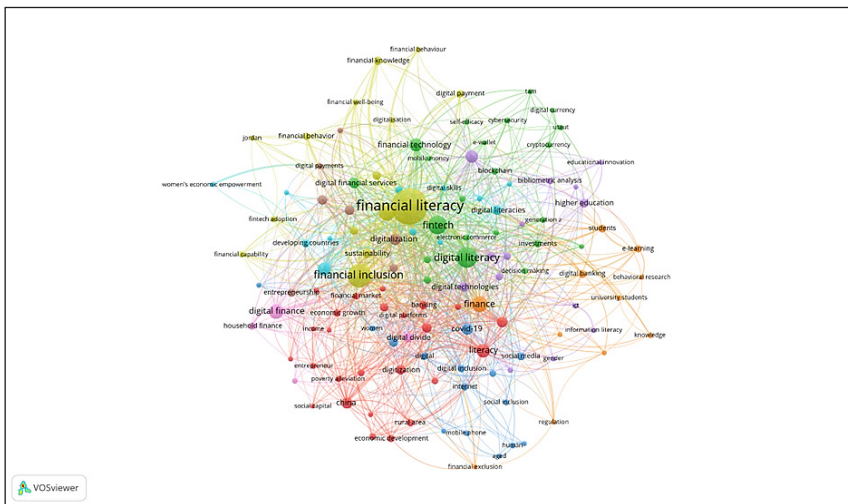


Figure 3: Co-occurrence Analysis

Co-occurrence Analysis

The co-occurrence analysis carried with “all keywords” with “fractional counting” resulted in 125 keywords out of 2724 keywords met the threshold of keywords repeated more than 5 times

(Donthu et al., 2021). Co-occurrence analysis determines the frequency with which keywords occur together in the same documents and describes conceptual relationships as well as prevalent research themes within a field. Through clustering

related keywords, it can visualize the intellectual structure of the field and identify emerging or related topics.

The Red cluster concentrates on “Digital Finance and Economic development” with 25 items. On closer examination, the keywords in cluster 1 include digital inclusive finance, digital platforms, digitisation, economic growth, economic development, microfinance, social capital, financial market, financial provision, financial services and financial systems all relating to digital finance and economic development. Cluster 2 spotted in green colour with 22 items is relating to “financial literacy and inclusion” as the sub-theme include block chain, crypto currency, digital currency, digital literacy, digital financial services, financial services and financial inclusion, cluster 3 with 15 items represented in blue colour is “Social Inclusion and regulation”, further interrogation the sub-category identified as empowerment, digital inclusion, internet, social media, technology and social inclusion. The cluster 4 differentiated in yellow colour with 15 items “FinTech and digital payments” indicate major sub-themes as financial knowledge, financial literacy, financial inclusion and well-being, fintech adoption, and digitalisation. Cluster 5 with 14 items in violet colour named as “digital technology”, segregates sub-themes artificial intelligence, educational innovation, ICT, education technology and digital technologies. Cluster 6 with 12 items indicated in Light Blue colour, named as “Digital Financial

Empowerment” with sub-categories of decentralised finance, digital financial inclusion, digital libraries, digital literacies, digital skills and sustainable development, Cluster 7 with 11 items indicated in orange colour concentrates on “education and digital banking”, includes sub-categories of e-learning, information and communication, knowledge and regulation. cluster 8 with 7 item concentrates on “Innovation”, as further scrutiny results in sub themes of digital economy, digital transformation, digital payments, MSME and Entrepreneurship, cluster 9 with four items Concentrates on “digital divide”, identified in pink colour as Household finance and household consumption. This addresses the RQ1 of determining the clusters of DFL, where the clusters have been identified with the co-occurrence analysis of keywords.

To determine the conceptual structure of the Keyword of digital financial literacy, Figure 4 Represent the conceptual structure.

Conceptual Structure

The Co-word analysis as a conceptual structure shows the themes including area of research and growth trend, taking into consideration the research area of the articles and identify the key research items, and the keywords are presented, (Li et al., 2018), as the keyword structure is from R software, using bibliometrix, under MCA (Greenacre & Blasius, 2006), The keyword cluster created using Louvain’s cluster with default parameter, with automatic layout and normalisation.

The Relationship with the source of articles and the Keywords with the Authors Country is plotted in the Figure 5 indicating the Three Field Plot.

Three field Plot

Figure 5 presents a Sankey diagram illustrating the interrelationships among three key bibliometric dimensions: authors'

countries, keywords, and publication sources (journals). This visualisation captures the flow of research influence by showing how scholarly contributions from different countries are associated with specific thematic keywords and disseminated through journals. The relative size of each node reflects its proportional contribution within the dataset (Riehmann et al., 2005).



Figure 4. Word Cloud

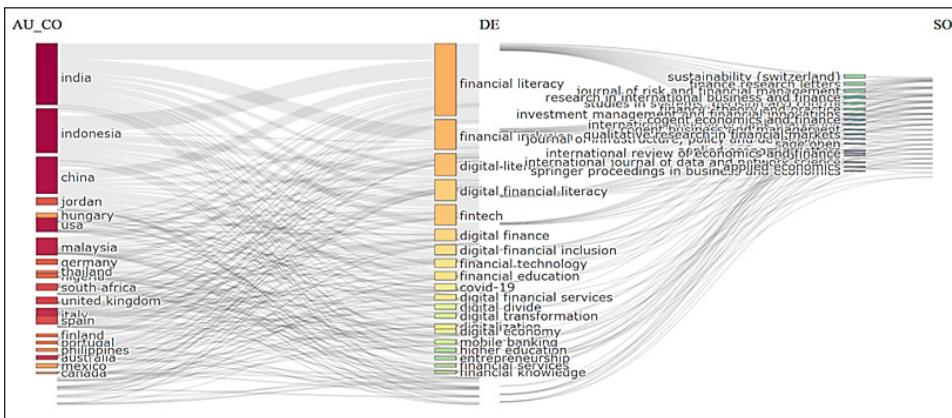


Figure 5. Three-field plot

The diagram is structured with authors' countries on the left, keywords positioned centrally, and sources on the right. The analysis indicates that most contributions originate from India, followed by Indonesia and China. Across these contributions, twenty dominant keywords emerge, including financial literacy, financial inclusion, digital literacy, digital financial literacy (DFL), fintech, digital finance, digital financial inclusion, financial technology, financial education, COVID-19, digital financial services, digital divide, digital transformation, digitalisation, digital economy, mobile banking, higher education, entrepreneurship, financial services and financial knowledge.

Evolution of Themes

The thematic map represents how research themes have developed over five differing time periods, namely 2015-2018, 2019-2020, 2021-2022, 2023-2024, and 2025 as shown in Figure 6. Through a study of thematic change over a period, it reveals how new research topics come into focus, how traditional topics fade, and how ideas about digital financial literacy change.

The themes for the initial period (years 2015 to 2018) are digital literacies and literacy, marking the early stages of concept development for digital competence. These themes are also prevalent in the second period (years 2019 to 2020), signifying continuous research interests. The third period (years 2021 to 2022) sees the inclusion of themes such as financial services, electronic money, and finance, marking the transition towards application-level research. The fourth period (years 2023 to 2024) signifies the development of increasingly complex themes such as decentralised finance, along with financial literacy and e-learning, marking the assimilation of fintech innovations and digital education. Lastly, the final period (year 2025) marks the consolidation of themes decentralised finance and literacy, signifying the ever-increasing interface of digital competence with fintech innovation.

To assess the conceptual maturity and relevance of themes in digital financial literacy research, a strategic thematic map based on centrality and density is presented in Figure 7.

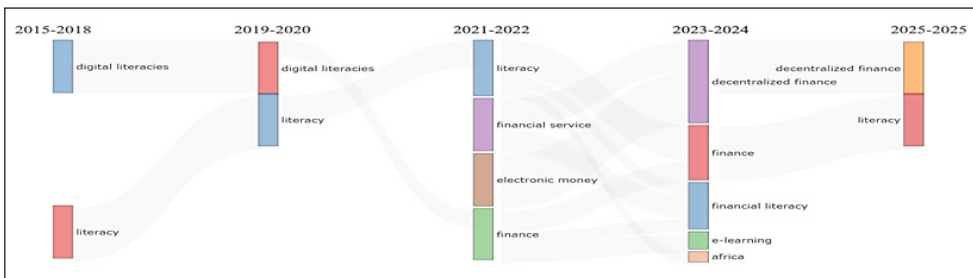


Figure 6. Thematic Evolution of Digital Financial Literacy

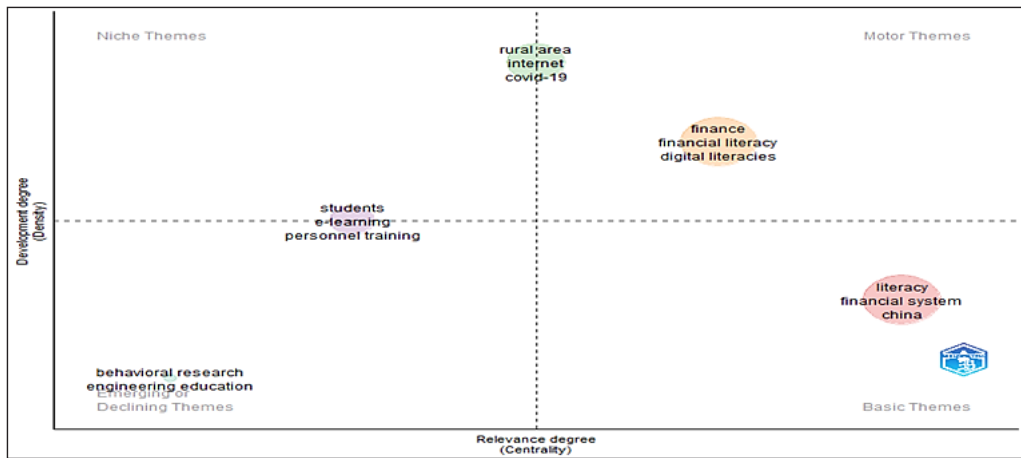


Figure 7. Strategy Map

Strategy Map

The thematic map shows that finance, financial literacy, and digital literacies act as motor themes in the graph, which are distinguished for their high density and central value, pointing to their prime significance in the subject area that has received considerable attention from academia. On the contrary, themes like the internet, rural areas, and e-learning are identified as niche themes in the graph, which receive high levels of internal development but are less interconnected to the subject area itself. Behavioural research, engineering, and education are identified in the quadrant III area, acting as themes that are either newly emerging or potentially declining. Lastly, the basic themes in Quadrant IV involve literacy, financial systems, and China, which act as basic yet less developed areas that support the subject area of digital financial literacy.

Conceptualisation and Measurement of Digital Financial Literacy

There are growing literature which is combining the digital literacy and financial literacy from incorporating the DFL. In this digital era, it is gaining importance, that the DFL is essential in making financial decision and to use the Digital Financial Services.

Content Analysis

For content analysis, 119 Articles from Scopus Database has been selected after filtration, that helped in identifying the Antecedents and outcomes of the DFL as indicated in Figure 8.

Antecedents

Antecedents are the factors that influence the development of digital financial literacy and act as the foundational influences on the engagement of individuals with

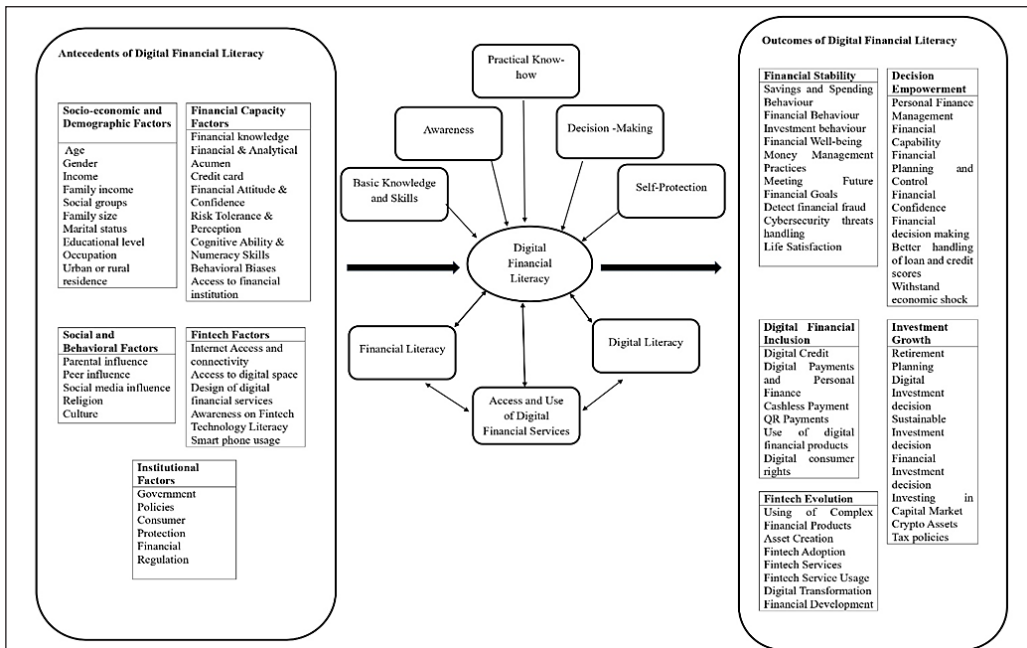


Figure 8. Conceptual framework developed from reviews

digital financial services. Socio-economic variables (Setiawan et al., 2022) such as age, gender, marital status, place of residence, income, occupation, educational attainment, family size, religion, and social group affiliation. These also include institutional factors such as access to formal financial services, awareness of financial knowledge, ownership of bank accounts and credit cards, and financial and analytical knowledge, which act as a significant predictor of digital financial literacy (Kumar et al., 2023).

Besides, social and behavioural influences stand significance. Key factors include parental influence, peer influence and social media influence, which, within a broader perspective, are considered as important societal determinants in shaping digital financial literacy (Adnan et al., 2023).

Social media is also being recommended as a strong predictor (Subburayan et al., 2023). Fintech awareness and acquiring the related digital skills further improve individuals' capability to make more effective use of digital financial services (Amnas et al., 2024). In addition to that, the access to and availability of infrastructures leading to digital spaces (Csizsarik-Kocsir & Lentner, 2023), the design, and usability of digital financial services (Zhang, 2021) has a great impact on building up and practicing financial literacy in a digital way.

Decision

In the ADO framework, the decision dimension represents how digital financial literacy is conceptualised and operationalised within the empirical research. Digital

financial literacy (Miranti et al., 2024) has been conceptualised as an integrated construct that encompasses digital literacy, financial literacy, and the proper use of digital financial services (OECD, 2024). Many studies capture DFL in terms of its higher-order dimensions, such as financial literacy, financial capability, and digital literacy, as measured separately (Ravikumar et al., 2022). Practical knowledge of personal finance and one's ability to make appropriate financial decisions have also been highlighted as core aspects of DFL measurement (Lyons & Kass-Hanna, 2021a). Recently, a study has extended this concept even further by including other measures like basic and advanced digital financial knowledge, digital financial attitudes, and digital financial behaviours, thereby presenting a much broader conceptualisation of the way digital financial literacy can be operationalised (Chhillar et al., 2024).

Outcomes

The principal results or effects associated with the knowledge of digital financial literacy (DFL) are found in the positive changes in the subject's overall financial practices and their improved financial conditions. The adoption and application of DFL lead to the display of prudent behaviour in finance (Özyeşil & Tembelo, 2025), prudent budgeting, and prudent financial behaviour (Respati et al., 2023). People who show stronger awareness and understanding about DFL display more prudent saving and spending behaviours (Islam & Khan, 2024), which in turn enables them to allot

their finances in the most optimal manner for short-term and long-term requirements alike (Rahayu et al., 2024).

Digital financial literacy is also an important aspect that contributes to overall financial well-being by enabling effective money management behaviours (Choung et al., 2025), financial planning, and financial control, as well as financial self-confidence (Nurkholik, 2024). These skills will empower people to handle complex financial products effectively, as well as make right financial decisions (Bhat et al., 2024). Another aspect that is promoted by DFL is financial capability, enabling digital financial inclusion (Mandal et al., 2022), digital payments, digital credit, and personal financial management (Lo Prete, 2021).

As the volume of digital payments increases, the use of cashless payments, as well as QR code payments (Shehadeh et al., 2024), also supports informed investment decisions, including investment in digital investing (Mishra et al., 2024) as well as sustainable investing (Aristei et al., 2024). Higher degrees of DFL will also result in greater participation in capital markets as well as new asset classes such as cryptocurrencies (Gaol et al., 2023). On a broader dimension, DFL promotes digital change in the financial lives of individuals by using fintech (Teslenko & Maslakova, 2024), thereby leading to financial development (Ardini et al., 2024).

In order to determine the emerging areas of research in the area of digital financial literacy Figure 9 represent the overlay visualisation.

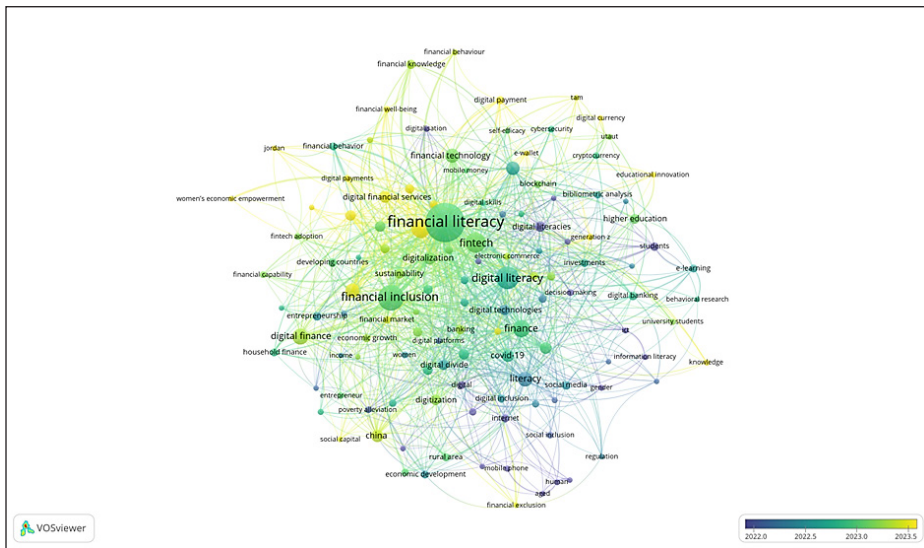


Figure 9. Overlay Visualisation

Emerging Areas of Research

The use of overlay visualisation involves the use of colour gradations in distinguishing different time periods when exploring emerging topics. The co-occurrence approach allows an understanding of how research topics grow over time and thus responds to the second research focus. Some of the themes identified in early 2022 include mobile phones, social inclusion, internet, digital technologies, information literacy, decision-making, and digital literacies, which seem to focus on access and basic digital competences in their early stages. Later in 2022, topics included in research include digital divide, digital technologies, literacy, social media, digital literacy, entrepreneurship, blockchain, and household finance.

Beginning early 2023, the literature moved on to finance topics, focusing on

financial literacy, fintech, and financial inclusion, accentuating the complementarity of financial capability and digital platforms. Approximately mid-way through 2023, the research on digital financial literacy, digital financial inclusion, digital payments, digital financial services, digital currency, mobile banking, and financial well-being dominated the literature, indicating that the area was progressing towards application and result-oriented research themes.

Discussion

In the fintech-driven economy, digital financial literacy (DFL) has emerged as a foundational capability for effective participation in digital financial systems. Although access to digital financial services has expanded globally, levels of DFL remain uneven across populations. Importantly, enhanced access does not

automatically translate into higher digital financial literacy; insufficient DFL caused vulnerability to digital fraud, coercive practices, and financial mismanagement. Existing research has largely emphasised demographic determinants, whereas comparatively limited attention has been paid to cognitive and behavioural drivers, such as financial trust, self-regulatory capacity, and psychological capital.

The rapid evolution of fintech innovations including chatbot-based financial advisory services, crypto-assets, and deferred payment instruments such as 'Buy Now Pay Later' has further complicated financial decision-making. Individuals possessing conventional financial literacy often struggle to navigate these digitally mediated environments, underscoring the need for literacy frameworks that integrate behavioural and technological competencies. Future research should therefore adopt longitudinal and experimental designs to capture behavioural adaptation and learning effects over time. Moreover, DFL interventions must extend beyond individual capability building to encompass regulatory design and digital infrastructure training, which vary significantly across national contexts and critically influence digital financial outcomes.

Future research agenda:

From the literature the following themes are identified as future research agenda answers the third question.

1. The behavioural and psychological factor:

As indicated in the figure 9, there are many psychological and behavioural factors that contribute to the DFL of an individual. As influence of external factors are increased in the digital age (L. Damayanti et al., 2021), having huge impact in deciding the ability of the individual. The psychological factors also play an major role, as the aspects such as fear of missing out, encourages them to get updated and keep in pace with the technology (Thankachan et al., 2024). The behavioural biases and cognitive biases also influence the digital financial literacy, financial risk bearing capacity and behavioural intervention are also areas to be focused in the future research.

2. Digital financial literacy and inclusion among the under privileged: Financial inclusion is the efforts taken to serve the financial products to the unserved section of society (Bongomin et al., 2024), as the DFL act as key to improve the digital financial inclusion, as the increased penetration of smart phone usage and internet even among the lower section community (Zhang, 2021) increases the demand for the DFL, allowing the low income groups and rural population to use the digital financial services. As research can be focused on digital readiness among the underprivileged section of the society.

3. Sustainable digital investment in FinTech:

In the digital age, the role of financial influencers is also increasing, increased DFL enable them to analyse and take better financial decisions, and invest in the capital market, and other various investments like crypto assets. The option of diversifying the investments in the digital platforms exercised by the investors also to be focused on the future research.

Theoretical Implication

This review extends in providing a detailed framework in determining framework for the DFL, as the previous study focused majorly on the bibliometric analysis and the structured review, as no study has taken effort in determine the Antecedents and Outcomes of the DFL. This study adds to the existing literature, by determining the different clusters of DFL and the conceptual understanding of factors influencing the DFL, as this conceptual framework, enables the future researcher to undermine the relationship and test the implication. Further scales can be developed for each framework. The conceptual framework and the factors are evidenced by the reviews, and this highlights the potential theoretical contribution.

Practical Implication

The research offers excellent insights into the determinants of digital financial literacy (DFL) among consumers in a rapidly digitalised financial system. As smartphone penetration expands, consumers have better access to online banking,

investment platforms, and digital payment services. The research underscores the fact that financial capacity is a key determinant of augmenting DFL, as those who are financially literate exhibit higher confidence and acquaintance with digital financial services and instruments. Additionally, combining digital literacy with financial literacy enables easier adoption of digital financial channels, leading to overall financial inclusion.

Another crucial aspect is being conscious of cyber threats and electronic fraud, something that is still low among some user groups. Unaware individuals are subject to digital arrest, a term in this context referring to instances where users' financial liberty or integrity is limited by digital monitoring, scams and phony controls. Thus, national and organisational efforts need to work not only on building DFL but also incorporate holistic training on cybersecurity as well as healthy digital behaviour.

At the policy and institutional level, the paper provides actionable implications for policymakers, educators, and financial institutions. Policymakers can design DFL programs for underprivileged and digitally excluded communities. Educational institutions can integrate DFL modules into commerce and management courses so that students can acquire conceptual and technological knowledge. Financial institutions, especially banks and fintech companies, can use the antecedents–outcomes framework of this study to create customer-designed interventions

that encourage responsible digital financial conduct.

Future studies should expand the present model to various socio-economic and cultural contexts, incorporating cross-country comparisons to elucidate how contextual influences shape DFL outcomes. Such extensions have the potential to further enhance the understanding of how behavioural, financial, and technology antecedents interact with each other to enhance individuals' digital financial abilities worldwide.

Limitation

This study, though it covers a major aspect of determining the ADO Framework, the study also has limitations, as the studied is based on the data collected from the Scopus database, the co-occurrence analysis and network analysis does not include the data that are indexed in other databases. Realising the pitfalls of keyword search approaches, other precautions were also employed to reduce retrieval bias. Synonyms and synonymous terms for the focal constructs were pilot tested to improve recall. The study, however, admits that keyword searches might miss pertinent articles using different verbiage, an incomplete limitation on the comprehensiveness of the study.

This provides way for the future researchers to collect data from the other database and carry out a detailed structured study, and also this study has adopted only the ADO framework to study the antecedents, decision and outcomes, as other frameworks including, TCCM (Theory, Context, Characteristics and

Methodology), 5W +1H (Who, When, Where, How, What and Why) framework also known as 6W framework, IMO (input, moderator, outcome) framework ADO-TCM (antecedents, decision and outcomes – theory, context and methodology) can also be used to for impactful literature review (Paul et al., 2024) and this literature is study of the Articles that are already published, and the future studies can be carried as an empirical studies. The TCCM framework could further highlight underexplored theoretical or contextual dimensions, while IMO could capture dynamic mediating processes within the reviewed literature. Future reviews may employ these models to enrich reflexivity and triangulate insights derived from the present analysis.

CONCLUSION

The proposed work offers a clear theoretical contribution in the existing literature of digital financial literacy (DFL) through the development of a theory-driven synthesis approach based on the model of Antecedents-Decisions-Outcomes (ADO). Unlike existing literature in the form of theoretical reviews, where the focus of existing works was merely on listing themes and trends along with existing influential works, the proposed contribution combines elements of bibliometric synthesis with theoretical structuring to determine the way and reasons for which the phenomenon of digital financial literacy occurs through a series of interconnected paths.

This research offers a synthesis explanation consistent with a theory where structural antecedents shape the outcome of

human decision-making which includes the social, demographic and behavioural factors, financial capacity, FinTech and institutional factors. This research positions a study of financial literacy in a comprehensive and consistent framework that can be measured using the components that combine financial literacy and digital literacy with the access and use of digital financial services.

The findings offer key actionable insights for policymakers, educators, and financial institution stakeholders. Findings are applicably used as a diagnostic aid within the ADO framework, forming a basis for intervention activities that include developing behavioural pushes within digital financial education programs, increasing trust within financial institutions, and adapting fintech development according to the user capability level. These are especially useful emerging market economies where digitalisation is accelerating beyond financial capability upgrade with the financial stability, Decision empowerment, digital financial inclusion, investment growth and fintech evolution.

This conceptual framework gives better understanding about the digital financial literacy. Thus, determining the future research agendas relating to influence of behavioural impact, and to focus on the sustainable digital investment for the under privileged section of the community, as they are excluded from the access and usage of digital financial services.

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