

Exploring The Thematic Structure of Youth Financial Literacy Research: A Co-Word Analysis (2005–2025)

Emiza Tahar*, Yusliena Yusoff, Inayah Abdul Aziz, Rohayati Jusoh

Faculty of Accountancy, Universiti Teknologi MARA (UITM) Terengganu Branch, Terengganu, Malaysia.

*Corresponding Author

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ABSTRACT

This study traces the themes and development of youth financial literacy research over a 20-year period by using co-word analysis. The systematic text-based bibliometric method is used to analyze 432 articles from the Scopus database published between 2005 and August 2025 in this fast-growing research area, and to identify key concepts, semantic relationships, and new research frontiers. A keyword co-occurrence network was built around the 61 substantive keywords with the highest frequencies that appeared at least 8 times in the text using the VOSviewer software package (version 1.6.20). This semantic network was divided into four thematic layers using the clustering algorithm: educational and behavioral, demographic and gender-based, age and developmental, and economic and disciplinary approaches. We found a dramatic change in focus over the last 20 years from assessing basic financial literacy to a more multidimensional and integrated approach. Youth financial capability is the contemporary conceptualization of a developmental process that includes active behavioral practices, psychological self-control and digital skills. These keyword relationships show that the characteristics themselves are closely linked to each other such as age, gender and personal attitude, including the environmental socialization forces like parental influence, financial education in school and socioeconomic status. In conclusion, the co-word mapping offers a holistic picture of literature, highlighting key research gaps and future directions for academic research, especially in the areas of digital financial literacy, fintech adoption and the longitudinal effects on behavior. By structuring these shifting research dynamics, this study provides valuable, data-driven insights to help educators build experiential curricula, assist policymakers in developing equitable, localized programs, and guide financial institutions with secure and user-friendly digital tools. These integrated and coordinated actions can truly strengthen the financial capacity, economic resilience and future health of today's youth.

Keywords: financial literacy, youth, co-word analysis, science mapping, financial behavior, financial education

INTRODUCTION

Financial literacy is the basis of good financial choices, financial health and financial security. It covers the core knowledge and competencies needed to make key decisions in life related to saving, spending, debt management, and investing. This ability has far-reaching consequences on the young people's transition to adulthood and their socio-economic responsibilities. Young people must make important decisions about financing their education, accessing credit and employment, and managing their own finances and are also confronted with a much more complex digital financial environment that presents new opportunities and new and unique dangers. In the last 20 years, there has been a growing body of research on youth financial literacy. Early empirical studies mostly focused on the relationship between financial literacy and socio-demographic characteristics like age, gender, education and household income. As the years went on, however, researchers expanded this exploration to include psychological characteristics, money values, financially active behavior and the early socialization of family life. Recently, new research fields like digital financial literacy, digital financial inclusion, the adoption of fintech, subjective well-being and the unique traits of Generation Z have

been added to the scholarly agenda. The conceptual expansion has aided in a rich, interdisciplinary field, but has also fragmented and complicated literature. Given the multitude of variables that are often studied in relation to youth financial literacy, boundaries and thematic structures are often lost in the noise, and the structural relationships between these core concepts are not well established. To fill this important void, the powerful and system-oriented approach of bibliometric science mapping, namely keyword co-occurrence (co-word) analysis is proposed. Co-word analysis of a large literature collection can be performed by looking at the frequency and co-occurrence patterns of words, which enable the identification of the conceptual architecture and semantic networks of a research area. Theoretical dimensions and conceptual overlaps can be identified by concepts that commonly occur in the same publications. The mapping of these semantic networks is especially well suited to the aim of disentangling the multi-faceted development of the field of youth financial literacy research, tracking the emergence of theme(s) from the various sub-themes over time. Hence, this study employs a systematic co-word analysis on the refined dataset of 432 peer-reviewed journal articles in Scopus available in the period from 2005 to August 2025. The main purpose of the paper is to identify the most prominent keywords in literature, analyze the co-occurrence relationships among these keywords and finally provide a description of the thematic dimensions that have marked the evolution of the field over the last two decades. In doing so, this study serves as a clear conceptual map of the field of youth financial literacy research, drawing on existing data to offer strategies for future empirical research and support stakeholders in the development of context-specific and targeted interventions.

LITERATURE REVIEW

The importance of financial literacy has grown significantly in the modern context of economic research because of its direct impact on the individual's ability to make decisions in the intricate world of finance and achieve a long-term healthy financial situation. Lusardi and Mitchell (2014) defined financial literacy as the ability to apply the knowledge and cognitive abilities necessary to make informed and effective financial decisions, especially in saving, borrowing, personal investing, and retirement planning. This ability is essential for youth, because the transition into adulthood is accompanied by a sudden move towards financial independence and greater on-the-spot decision making regarding funding for higher education, employment options, consumer credit, and personal budgeting. Therefore, financial experiences and the underlying ideas that develop in early life have a significant impact on people's financial behaviors and outcomes in their lifetime.

The literature has become increasingly aware of the need to shift the focus from a narrow definition of financial literacy to a broader definition of financial knowledge. Financial literacy is now commonly understood as a multidimensional construct involving financial knowledge, attitudes, behavior, and the ability to apply financial information in real-life situations (Potrich et al., 2016). This broader conceptualization has contributed to the expansion of research into behavioral, psychological, demographic, educational, and socioeconomic dimensions of financial literacy. Goyal and Kumar (2021), in their systematic review and bibliometric analysis, identified a number of financial literacy research areas that have been addressed. This includes financial knowledge, financial behavior, financial education, financial capability, financial inclusion and gender differences. Their review indicates that financial literacy is a multifaceted concept that encompasses not only the financial knowledge of individuals but also how they put their financial knowledge to use when making financial decisions and managing their money. More recent bibliometric evidence continues to demonstrate the prominence of financial literacy, financial knowledge, financial behavior, financial education, financial attitude, and financial capability as closely connected concepts in the field (Rahiem et al., 2025).

Among youth populations, the research agenda has similarly expanded from the measurement of financial knowledge towards a broader consideration of behavioral, educational, demographic, and social factors. Early research in this area tended to be on the effects of specific structural characteristics (age, education, SES) on personal financial literacy (Agarwala et al., 2015). Subsequent research, however, extended this paradigm to account for the active social processes that contribute to youth financial capacities, adding important additional factors like parental socialization, structured financial education and peer influences as well as localized socialization pathways (Jorgensen & Savla, 2010; Shim et al., 2010). At the same time, researchers set about

building strong empirical connections between cognitive financial knowledge and real-world financial behaviors, which showed that initial levels of literacy were related to financial practices such as saving, household budgeting, credit management, and personal investment decisions (Robb & Sharpe, 2009; Xiao & O'Neill, 2016). This scholarly focus is very strong; for instance, Kurniasari et al. (2024) noted in their study that the most central and active topics of the academic discussion today were “targeted educational approaches”, “behavioral decision-making models”, and “social influence frameworks”.

As a result, there is a growing need to consider financial education and financial socialization as two fundamental concepts to understand youth financial development. But rather than developing in isolation, a youth's financial knowledge and practices are continually negotiated in a network of formal classroom learning, parental modeling, peer relationships, early work experiences and social and environmental contexts (Jorgensen & Savla, 2010; Serido et al., 2013; Shim et al., 2010). The family unit is a key player in shaping early life financial attitudes and lifelong financial saving habits, as emphasized by financial socialization research. However, as important as it was found that empirical evidence suggests that classroom financial education is not necessarily associated with lasting behavioral changes in the real world (Fernandes et al., 2014). This complexity is further evidenced by recent research on teen cohorts, which demonstrates that formal training is most effective when it helps to reinforce on-the-job decision-making skills and confidence in decision-making. (Karim et al., 2025) The literature, when read together, does not suggest that financial literacy is a one-time assessment of young people's knowledge or cognitive ability, but rather that it is a behavior that is continually influenced by a complex mix of educational, social, behavioral, and environmental factors.

Demographic and socioeconomic characteristics have also been studied in financial literacy literature. There have been reports that age, gender, educational levels and income are related to variation in financial literacy (Agarwalla et al., 2015; Sohn et al., 2012). Gender differences have been widely documented, with studies suggesting that women tend to have lower levels of financial knowledge and confidence in making financial decisions across different countries (Lusardi et al., 2020). Kusumawardhani et al. (2025) stated that socio-economic factors can also influence young people's exposure to financial information, their education, and financial services. The link between socioeconomic status and digital financial literacy among Generation Z has been the focus of more recent studies. Overall, the results in this study underline the strong linkage between financial literacy, socio-economic factors, financial behavior, and demographic factors in understanding the financial behavior of the Indonesian Generation Z.

The developmental approach has also deepened our knowledge of financial literacy among youth. Financial capability is not a single event, but a gradual process that develops as children, adolescents and young adults have new financial tasks to perform. Drever et al. (2015) pointed to the importance of early financial experiences and socialization in shaping financial capability, while Chowa and Despard (2014) found that a key role that financial socialization by parents can play in shaping financial behaviors. Over the last few years, it has been noted that more research studies have been using terms like students, teenagers, young adults, and Generation Z, all of which indicate that there has been an increase in interest in age and developmental stages in relation to financial literacy. In recent years, there has been an increasing focus on the financial education and financial development of youths, with Vanian & Pathiyan (2025) exploring the factors affecting youth financial literacy.

The rise of digital finance has added new dimensions to research on youth financial literacy. With the increasing adoption of online banking, mobile payment, fintech and decentralized digital financial services, digital financial capability has become a prominent topic in youth-focused research. Digital financial literacy is no longer optional but a necessary precondition for the economic security of younger generations in these complex systems. The need for this is reinforced by empirical evidence from developing financial markets like Malaysia, as evidenced by recent research that illustrates how digital financial competencies directly influence and mediate the financial behaviors of university students in relation to their daily spending, saving and borrowing habits (Ali et al., 2024; Ali et al., 2025). In this virtual environment, factors like technological awareness, financial expertise, and the perceived digital risk play significant roles in shaping users' trust and sense of security when making decisions (Nawang & Shukor, 2023). The discussion has been extended further

in more recent investigations, to link to longer-term life outcomes, providing evidence that digital literacy is a significant predictor of daily financial habits and subjective wellbeing, across a range of generations (Mahdzan et al., 2026). In summary, these technological developments create new conceptual combinations in literature that integrate financial literacy, behavioral actions, technological integration, financial inclusion and holistic well-being in a single, unified research field.

As the range and variety of concepts grows in youth financial literacy research, there is a need for sophisticated analytical tools that can systematically represent conceptual relationships across the growing and now more fragmented literature. Qualitative literature reviews are useful for summarizing the results of any given study but have difficulty producing a “big picture” of the conceptual structure of a rapidly expanding and interdisciplinary field. To overcome this shortcoming, bibliometric science mapping provides an objective and quantitative alternative that allows for the visualization of structure relationships and the evolution of research over a large number of publications in academic literature. In such a methodological toolbox, keyword co-occurrence (co-word) analysis is a very powerful method for breaking down the semantic space of a field. Co-word analysis of the frequency and co-occurrence of the terms in publication metadata reveals the conceptual network of a domain, which in turn also illustrates the major research dimensions.

Co-word analysis is based on the idea that keywords that frequently appear together are likely to reflect concepts or themes that are closely related within a particular research field (Callon et al., 1983; Callon et al., 1991). By analyzing patterns of keyword co-occurrence, researchers can identify clusters of concepts and examine how different themes are connected. Unlike citation-based approaches, which primarily examine relationships among publications, authors, or references, co-word analysis focuses directly on the substantive content of research through the terminology used by researchers. It is therefore particularly useful for examining the conceptual evolution of a research field and identifying relationships among its major themes.

Recent bibliometric studies demonstrate the continuing value of keyword co-occurrence analysis in financial literacy research. Rahiem et al. (2025), using Scopus data and VOSviewer, examined author-keyword co-occurrences in financial literacy research and found financial literacy and financial knowledge to be among the most prominent concepts. Their analysis further highlighted the connections between financial literacy and related concepts such as financial behavior, financial education, financial attitude, and financial capability. Similarly, recent research mapping financial literacy and financial behavior has shown that keyword co-occurrence analysis can reveal conceptual relationships among financial literacy, financial knowledge, financial behavior, financial education, financial attitude, financial capability, and financial inclusion.

The application of bibliometric methods to youth financial literacy is also becoming more prominent. Vanian and Pathiyan (2025) examined the bibliometric characteristics of youth financial literacy research using Scopus data and incorporated keyword analysis alongside other bibliometric techniques. Their findings demonstrate the increasing research attention given to young people's financial literacy and the presence of interconnected themes relating to financial education and young people's financial development. Kurniasari et al. (2024) similarly reported substantial growth in research concerning financial literacy among young people and identified financial education, financial decision-making, and social influences as important areas of research. Recent bibliometric research on financial inclusion, fintech, and financial literacy among young people also highlights the growing connection between financial literacy, technology, financial inclusion, and youth participation in economic activities (Elmasmari & Amaghous, 2024).

However, in existing bibliometric studies, keyword analysis has been used together with other techniques such as citation analysis, co-citation analysis, co-authorship analysis and bibliographic coupling. These approaches provide valuable knowledge of the intellectual, social and structural characteristics of a research domain, but are not as directly concerned with the relationships between the concepts that are denoted by the keywords. Furthermore, some modern studies have not focused exclusively on conceptual structures of youth financial literacy but rather seen financial literacy as a vast research field. It indicates that a more targeted co-word analysis is warranted to gain insight into the interrelationships and evolution of key concepts found in the literature of youth financial literacy research.

Thus, the articles used in this study are 432 articles published from 2005 to August 2025 from Scopus investigates the co-occurrence of keywords to generate the main concepts, the thematic relationship between them and identify the conceptual dimensions in which financial literacy research for the last two decades has been defined. Instead of describing the patterns in citations or similarities among publications, the analysis is based on the terms mentioned in the literature and the relationships among those terms. This gives a better sense of the relationships between key concepts, as well as of the development of the research field over time. The study therefore contributes to a better understanding of the conceptual development of youth financial literacy and highlights emerging themes and potential directions for future research.

METHODOLOGY

Bibliometric approach

This study employs keyword co-occurrence (co-word) analysis, a quantitative science mapping technique specifically designed to uncover the conceptual and thematic structure of a research domain (Zupic & Čater, 2015; Donthu et al., 2021). While co-citation analysis and bibliographic coupling are methods that describe the intellectual and social pattern of a discipline by analyzing the similarity between citations or co-authorship patterns, co-word analysis is a direct analysis of the content and semantic relationships of keywords in publications (De la Hoz-Correa et al., 2018; Tan Luc et al., 2022). This approach assumes that when the keywords occur together in titles, abstracts or author-supplied keywords, they indicate a strong conceptual relationship between them. As such, co-word analysis is not only well-suited to represent the thematic development of youth financial literacy over time, by means of the evolution of specialist terms, their clustering and the emergence of new research fields, but also offers the potential to reveal the dynamics of this development. This study aims to bring together the overwhelmingly scattered and interdisciplinary youth financial literacy literature through a systematic analysis of the co-occurrence patterns to create a coherent conceptual taxonomy (Donthu et al., 2021). To operationalize this approach, we use a specialized software platform, VOSviewer (version 1.6.20) that is specifically designed for building, analyzing, and visualizing complex bibliometric networks (Van Eck & Waltman, 2010). VOSviewer converts large-scale co-occurrence networks into easily interpretable science maps with multiple dimensions by visualizing complex semantic relationships on a two-dimensional, color-coded network. In this visualization, the actual size of the nodes representing each keyword is directly proportional to how many times the keyword appears in the collection, and the relative size of the conceptual relationship between two nodes is indicated by the distance between them. Thematic boundaries and cluster assignments are defined by objective, mathematically sound layout algorithms in order to ensure consistent mapping of the network in accordance with the protocol.

Data Collection and Search Strategy

The Scopus database was chosen as the key bibliographic data source for this study because it covers more than 100 million indexed documents from several decades of peer-reviewed literature and is one of the largest and most reputable databases of its kind (Elsevier, 2023). The literature search was carried out on 27 August 2025, in the topic search field (TS), which allows the search for the specified keywords in the titles, abstracts and author defined keywords of publications. The search query was designed in a systematic and comprehensive way to capture the desired dimensions of the domain, that is, the concepts of core financial competency, targeted younger population, and behavioral or cognitive scopes. The search string used to identify articles was (TITLE-ABS-KEY("financial literacy" OR "financial knowledge" OR "financial capability" OR "financial education") AND TITLE-ABS-KEY("youth" OR "young adult*" OR "college student*" OR "university student*" OR "undergraduate*" OR "higher education student*") AND TITLE-ABS-KEY("behavior*" OR "behaviour*" OR "attitude*")).

To ensure high quality, academic validity and comparability of the data, stringent screening and document filtering techniques were incorporated into the research design (Kumar et al., 2021). The process of collection was transparent and multi-stage screening, in the way of flow in the study selection in PRISMA. When searching for records in the initial identification stage, a broad search was conducted using the core competency and youth population keywords and 1,039 records were returned. During the second stage, the

search string was refined and narrowed down by including the attitudinal and behavioral search string, and this brought the number of eligible publications down to 509 publications. Finally, the inclusion/exclusion criteria were very strict and only peer-reviewed journal articles were included, with the exclusion of conference proceedings, book chapters, full books, editorials, and white papers. Further, only studies written in English between 2005 and August 2025 were included in the sample. All these final parameters led to a very clean dataset of 432 journal articles that were exported for further co-word network analysis. The design of the search terms and conceptual rationale for each is described in Table 1, which shows how each dimension reflects the targeted focus on youth financial decision-making, socialization, and on overall behavioral outcomes.

Table 1: Scopus Search Strategy and Keyword Justification

No.	Field / Concept	Keywords Used in Scopus Search Query	Justification for Inclusion
1	Competency Core	"financial literacy" OR "financial knowledge" OR "financial capability" OR "financial education"	To capture the various conceptualizations of core financial competencies in literature.
2	Target Population	"youth" OR "young adult*" OR "college student*" OR "university student*" OR "undergraduate*" OR "higher education student*"	To restrict the sample to younger cohorts at a formative stage of financial socialization.
3	Behavioral Scope	"behavior*" OR "behaviour*" OR "attitude*"	To capture a multidimensional perspective encompassing both action and cognitive traits.

PRISMA Selection Stage	Screening Process & Database Filtering Criteria	Remaining Sample (N)
Stage 1: Identification	Initial database records identified through Scopus using core competency and target population search terms.	N = 1,039
<i>Step-down Filter 1</i>	<i>Intersection of behavioral and attitudinal search filters ("behavior*" OR "behaviour*" OR "attitude*").</i>	↓
Stage 2: Screening	Records screened to isolate studies capturing cognitive financial traits, attitudes, and active behavior.	N = 509

Step-down Filter 2	<i>Exclusion of: conference proceedings, books, book chapters, editorials, white papers, and non-English language publications.</i>	↓
Stage 3: Inclusion	Final, peer-reviewed journal articles published between 2005 and August 2025 selected for co-word network analysis.	N = 432

Data Analysis

To explore the thematic landscape of financial literacy research in the field of youth we first performed a co-word analysis with the use of VOSviewer version 1.6.20. Addressing the limitations of raw database exports, we used a strict protocol of keyword cleaning and standardization in order to create a network visualization without noisy data and conceptual confusion. The first process of merging words by keywords was performed based on a custom thesaurus file that is used to find the singular and plural of identical concepts (e.g., "adolescent" and "adolescents") and to find the representative word for regional variations (e.g., "behavior" and "behaviour"). The second step involved systematically eliminating generic indexing terms such as "human," "humans," "article," "controlled study," "major clinical study," "female," and "male" and was designed to remove indexing terms that are not the substantive content of the research from the database. Lastly, we adopted the idea of a thematic threshold of eight minimum number of appearances for the keyword to extract the most salient, persistent, and representative concepts in the literature. This comprehensive cleaning procedure then yielded the finalized, substantive data set of high-relevance keywords which were then imported into the VOSviewer and used to create the keyword co-occurrence matrix. The software normalized these co-occurrence frequencies using the association strength method, which mathematically places words in a two-dimensional visualization space that are associated with each other more closely together. This semantic network was then segmented into thematic dimensions by means of the built-in heuristic clustering algorithm of VOSviewer. To ensure that these dimensions were interpreted without any subjectivity and using criteria that were explicit and transparent, the final cluster labels were given using three criteria. The main anchor of each label was identified based on the conceptual dominance; that is, the keyword that had the highest number of links in the cluster and the most occurrences in the cluster. This was further refined by analyzing network centrality in order to find out the central nodes which played a conceptual bridge role between isolated sub-themes. Finally, the thematic groupings were anchored to existing international theoretical frameworks, such as the OECD dimensions of financial competency and Lusardi's dimensions of financial competency (knowledge, attitudes, behaviour and structural context), providing solid academic and empirical foundations for the labels used within the thematic groupings.

FINDINGS AND DISCUSSION

Following the systematic screening process, we analyzed the finalized dataset of 432 peer-reviewed journal articles published between 2005 and August 2025. All these publications have been cited 10,149 times, and without self-citations, 9,410 times, reflecting a high average of 23.49 citations per article, and a combined H-index of 51. The annual frequency of the publications and citations over the twenty-year period is shown in Figure 1. The publication count and number of citations have steadily increased and increased more rapidly since 2015, reflecting a trend of increased academic interest in youth financial literacy. The expansion of this growth reflects the recognition of financial competence as an important skill for young people making the transition to their first independent socio-economic roles, and thus the growing interest of empirical and theoretical studies from the international academic world.

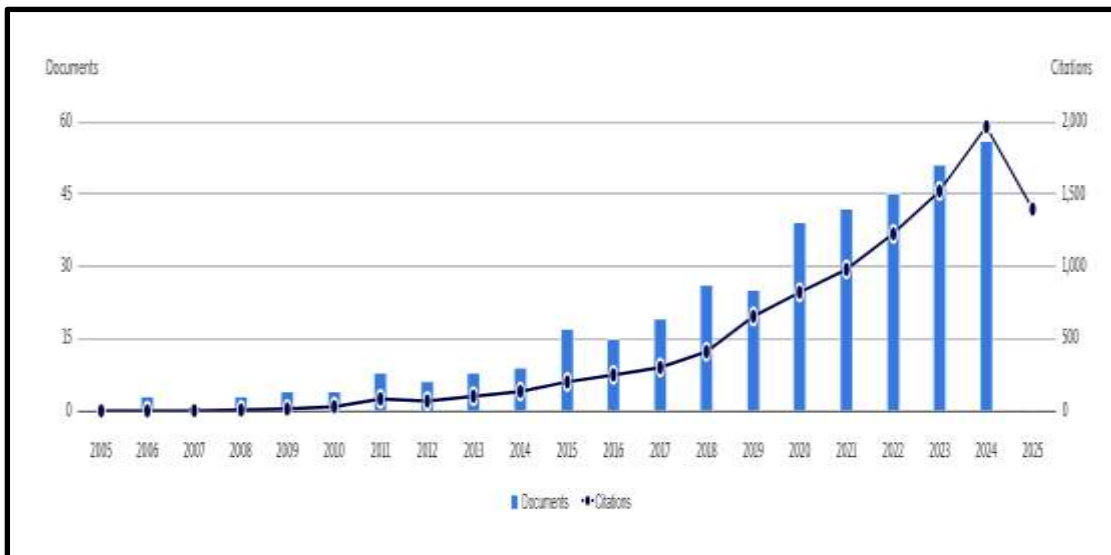


Figure 1: Number of publications and citations in financial literacy.

(source: Scopus)

Co-word analysis

The co-word analysis presents 61 out of 1,661 keywords that met an eight-occurrence threshold, resulting in four clusters. This threshold was chosen due to various experiments conducted on cut-off values, between six and ten, to get the best clarity, cohesion, and general interpretability of the final semantic network. These 61 keywords were clustered by means of the heuristic clustering algorithm built into VOSviewer to four thematic clusters using the colors red, yellow, green, and blue as shown on the network map in Figure 2. The highest co-occurred keywords are human (68 occurrences), female (59 occurrences) and male (56 occurrences). Table 2 presents the top 15 keywords in the co-word analysis. These top 3 and other significant keywords reflect the fundamental link toward humans, females and males. Meanwhile, Figure 2 presents the co-word analysis of financial literacy. The size of each node reflects the strength of co-occurrence, showing how often two keywords appear together (Baker et al., 2020). Each cluster is described and labelled to highlight its theme and research focus, based on the authors' qualitative interpretation.

Table 2: Top 15 keywords in the co-words analysis

Rank	Keyword	Occurrences	Total link strength
1.	Human	68	777
2.	Female	59	709
3.	Male	56	693
4.	Adult	54	634
5.	Humans	52	624
6.	Article	48	565
7.	Young Adult	42	523
8.	Adolescent	40	463

9.	Financial Literacy	195	445
10.	Major Clinical Study	26	352
11.	Literacy	33	328
12.	Financial Management	25	256
13.	Controlled Study	18	254
14.	Economics	19	246
15.	Psychology	18	246

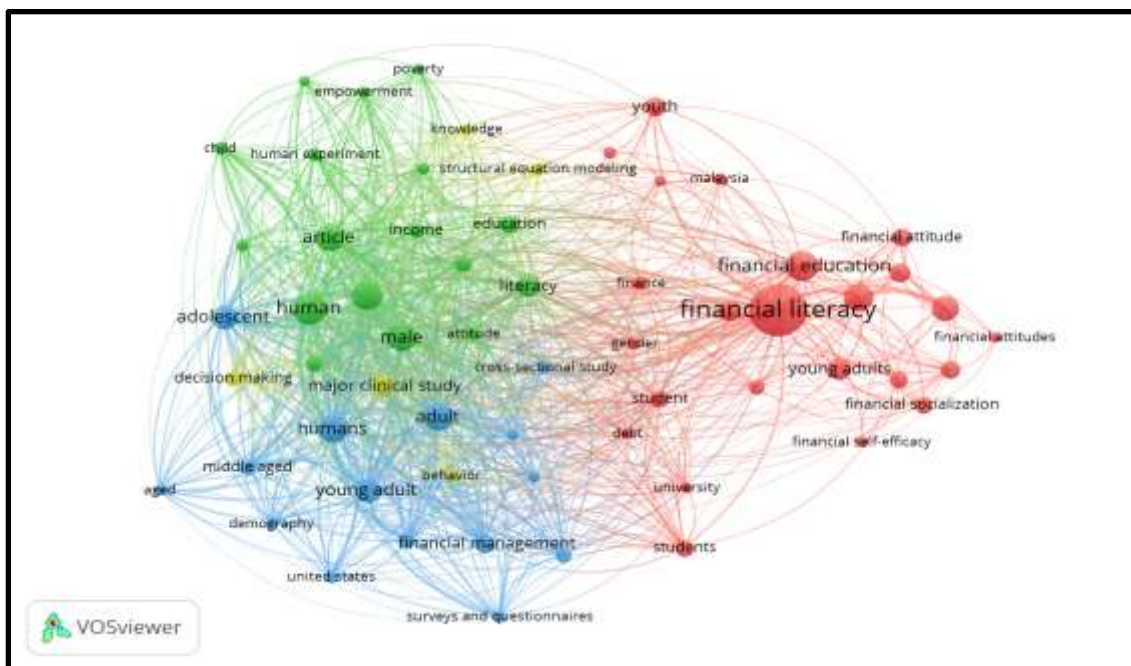


Figure 2: Co-word analysis on financial literacy

Analysis of Thematic Clusters

Cluster 1 (Red): This cluster is composed of 24 keywords and is identified as “*Educational and Behavioral Dimensions of Financial Literacy*”. Growing recognition in recent years of the importance of financial literacy as a key determinant of the financial choices and financial wellbeing of individuals. Its importance has been underscored as a cornerstone of good financial habits and sustainable financial practices. Sirait et al. (2025) revealed that financial literacy, lifestyle and self-control make significant contributions to personal financial management both directly and interactively, indicating that strengthening financial literacy, adopting a planned lifestyle, and enhancing self-control can help students better manage their personal finances. Potrich et al. (2025) also emphasized that financial literacy is not just about learning but also about implementing lessons and inspiring behaviour change, particularly among young people, to make a financially literate society. They did mention, however, that the Youth Financial Literacy Short Scale has not been cross culturally validated, which prevents its generalizability. This was complemented by Abdallah et al. (2025) who found that digital financial literacy has a significant impact on financial behavior, with financial knowledge, awareness, and decision-making being the most important factors. They also noted that digital transformation offers constant challenges in maintaining the relevance and adaptability of financial literacy measures.

Cluster 2 (Green): It consists of 17 keywords labeled *"Demographic and Gender Perspectives in Financial Literacy"*. This thematic dimension examines the effects of socio-demographic factors on financial literacy at key life stages and on financial behaviors. Empirical studies in this cluster include the interaction between financial socialization and gender, age, family background, and socioeconomic status (Agarwalla et al., 2015; Sohn et al., 2012). As an example, Berlinger et al. (2025) found a persistent gap in the behavioral area, as while the same number of female and male finance students possessed the same amount of basic financial knowledge, there was a 10% difference in the likelihood of female students taking highly beneficial financial actions, likely due to differences in risk preference and confidence in decision-making. Additionally, Sarathi and Kalyan's (2025) study emphasizes a family environment's significant impact, revealing that family education and income levels are among the key factors shaping a youth's financial socialization, thereby calling for tailored education efforts to address demographic differences.

Cluster 3 (Blue): This cluster has a total of 15 keywords labelled as *"Age and Developmental Dimensions of Financial Literacy"*. The literature in this line focuses on the variation of financial literacy in different life ages, that is, between childhood and old age, and generational variation in financial literacy and behaviour. According to Boyle et al. (2025), financial and health literacy decreases gradually by the year, by almost one percentage point per year, and this indicates the susceptibility of the elderly generation in coping with complicated financial choices. Exploring the younger end of the spectrum, Mancone et al. (2024) proved that properly designed financial education initiatives among children and adolescents can lead to the development of positive financial behaviour when they are accompanied by the elements of experiential learning, the use of digital technologies, and parental engagement. To this, a study by Hrulkha and Tandan (2025) determined that more financially literate young adults were more confident, improved in terms of tolerating balanced financial risks, and more willing to diversify their investments, which demonstrates the role of literacy in shaping economic behaviour at a young age of adulthood.

Cluster 4 (Yellow): This cluster includes 5 keywords, titled *"Economic and Disciplinary Approaches to Financial Literacy"*. While this cluster is less keyword dense, it is a very specific disciplinary strand which links individual financial actions, at the micro-level, with macro-economic outcomes and financial well-being. In this field, academic research highlights the strong positive correlation between financial literacy and prudent saving patterns, budgeting, and responsible debt management practices among university students, highlighting the importance of financial skills as a fundamental requirement for good personal financial management (Ratnasari et al., 2025). Evidence shows that the cognitive financial knowledge aspect of financial literacy, when paired with some behavioral factors like self-control and mental budgeting, forms an important pathway to improving financial well-being of the individual, as Bai (2023) has shown. Moreover, Darwish (2025) provides evidence that high financial literacy is strongly associated with positive results of personal investments, but that the individual results are influenced by 6 and socialization pathways in the family have a significant influence on both the ways in which younger generations acquire and utilize financial skills. On the journey through the lifecycle, Cluster 3, age & developmental dimensions, points to the fact that financial capability is dynamic and continuous throughout the life course. The financial pressures faced by younger generations, emerging adults, and older age groups are fundamentally different, and targeted, developmentally appropriate, educational programs are needed. Lastly, Cluster 4 focused on economic and disciplinary strategies, links microeconomic outcomes of financial literacy to macroeconomic outcomes, thereby showing that strong personal financial management and sound investment decisions allow individuals to effectively engage in larger economies. The academic literature conceptualizes youth financial literacy as a multidimensional and well-integrated construct, as can be seen from the structural interconnections of the four clusters. Thematic overlaps suggest that financial capability is a dynamic development process, rather than a stand-alone cognitive ability. This process is actively initiated by educational interventions (Cluster 1), is much influenced by the demographic characteristics and early familial socialization forces (Cluster 2), is shaped by the successive developmental milestones (Cluster 3), and is finally expressed in real life economic choices and long-time financial health (Cluster 4). This concept of synergy highlights that these four dimensions cannot be separated and should be addressed during a policy, curriculum design, or educational intervention if it is to be successful. The analysis of co words, e.g. clusters number, cluster color, cluster label, number of keyword and representative keyword, is summarized in table 3.

Table 3: Summary of Co-Word Clusters

Cluster No and color	Cluster label	Number of keywords	Representative Keywords
1 (red)	Educational and behavioral dimensions of financial literacy	24	Financial literacy, financial education, financial socialization, financial attitudes, financial self-efficacy
2 (green)	Demographic and gender perspectives in financial literacy	17	human, male, female, humans, article
3 (blue)	Age and developmental dimensions of financial literacy	15	Adult, young adult, adolescent, financial literacy, psychology
4 (yellow)	Economic and disciplinary approaches to financial literacy	5	Economics, financial management, controlled study, major clinical study literacy

Discussion

A comprehensive co-word analysis of 432 peer-reviewed journal articles from 2005 to August 2025 shows a dramatic conceptual change in the academic field on financial literacy among young people. In the last two decades, the focus of research in this area has shifted from a very limited, one-dimensional approach to assessing financial literacy knowledge, to an integrated, multidimensional approach. The links between them are evident across the four identified clusters and reflect this conceptual shift. The educational and behavioral aspects of Cluster 1 conclude that formal financial education is most useful when it has an impact on real-life behaviors, on digital skills, on behavioral self-control. These learning trajectories, however, are not standard, because the individual demographic characteristics and familial socialization processes outlined in Cluster 2 produce different levels of financial confidence and risk taking among the different youth cohorts, which consequently produce a variety of trajectories of learning. In addition, the developmental perspective of Cluster 3 conceptualized the youth financial capability as an ongoing process and not as a fixed set of skills. Financial habits, cognitive skills, and socialization experiences in childhood, adolescence, and emerging adulthood are the critical foundation for financial resilience throughout the life course. These individual, social and developmental inputs all become real world economic applications within Cluster 4, having direct impact on budgeting, investment, debt management and long-term financial wellbeing. This co-word analysis, which presents the literature in these four dimensions that are not mutually exclusive, gives a clear and coherent direction for future studies. It serves as a call to action for digital financial literacy, sociodemographic interventions in local contexts, and cross-cultural longitudinal studies as the key areas needed to consolidate and improve the field and safeguard the financial health of the next generation.

Implications

The study shows that financial literacy is not merely a cognitive ability but rather a behavior; that personal attitudes and values are a part of financial literacy as well; and that financial socialization influences, or is being influenced by, society and the financial education that the family, peers, and schools provide (Shim et al., 2010; Jorgensen & Savla, 2010). The information for teachers suggests that the way financial education is

delivered needs to be done away with the traditional lecture style. The use of experiential-learning approaches, including interactive budgeting activities and simulations of real-life financial choices, and gamified savings apps in digital learning spaces can give learners valuable opportunities to practice, reinforce learning, and develop financial literacy and confidence in their financial competencies (Abdallah et al., 2025; Xiao & O'Neill, 2016). For policy makers, the results highlight the importance of a one-size-fits-all approach to programmes which do not work. However, approaches will need to be specific because young people are different, and differences among young people are related to gender, socio-economic status and age (Lusardi et al., 2020; Berlinger et al., 2025). For instance, women and students of lower socio-economic status may need extra support to eliminate disparities (Klapper, Lusardi & van Oudheusden, 2015). The results suggest a need for financial institutions to build trust and offer user-friendly financial services, especially in the context of the growing availability of digital finance in recent years (Morgan & Trinh, 2020; OECD, 2020). Overall, enhancing the financial literacy of youth can reinforce the well-being of individuals, as well as foster economic development at a larger scale (Lusardi & Mitchell, 2014; Darwish, 2025).

Limitations

There are several limitations to this study. First, the dataset was only taken from the Scopus database. Scopus is one of the most complete and reliable bibliographic databases, but it is not certain that it will be able to capture all the relevant research that is indexed in other bibliographic databases like Web of Science or Google Scholar (Elsevier, 2023; Kumar et al., 2021). Therefore, there is a possibility that some important studies, particularly in regions or non-English journals, have not been captured. Second, the study is based on bibliometric and science mapping techniques, which are useful to show publication and citation patterns in networks. However, these approaches are unable to judge the quality or practical value of individual studies (Zupic & Cater, 2015; Donthu et al., 2021). Thirdly, the search query may not have captured all the relevant publications. While every effort was made to provide a comprehensive list of terms, other terms used in other studies might have been omitted (Aria & Cuccurullo, 2017). Finally, bibliometric studies are time-sensitive. This data set is from publications up to August 2025, and the research of the latest may quickly change patterns and themes within this data set. Considering the ongoing advancement of financial literacy research, particularly in the context of digital finance, regular updates will be needed to ensure that the results are up to date (Fauzi, 2023; Abdallah et al., 2025).

Future Research

Several important areas for future research are identified in this study, both in terms of methodological developments and novel thematic areas. From a methodological perspective, future research should include as many publications in their databases as possible, using Scopus, the Web of Science, and Google Scholar to include a more representative sample of papers from around the world. Further, as co-word mapping is more of a structural mapping method and does not assess the empirical quality of the individual studies, combining the two approaches with bibliometric science mapping to systematic literature reviews or meta-analysis would give a more extensive and detailed qualitative and quantitative analysis of the literature. Other searches in the future should also target an increased number of alternative terms to cover the new interdisciplinary ideas. Lastly, bibliometric data can be time-sensitive and should be updated frequently to reflect any new publications and technological changes after August 2025. Theoretically, the need is great to integrate and propose a cohesive framework of theories that will encompass the financial knowledge, psychological behaviors and social context, as a single development model, rather than analyzing them individually. Comparative and cross-cultural studies to examine the extent to which financial socialization patterns and habits are generalizable across national boundaries would also be desirable in the literature. Moreover, digital financial literacy is an important frontier of research given the swift digitalization of financial services. Future research should aim to investigate the role of fintech, mobile banking apps, online trading platforms in the financial decisions and risk levels of Gen Z and younger generations. Researchers need to be mindful of longitudinal studies that track the path of financial capability development from childhood to emerging adulthood and offer strong empirical evidence on the long-term effectiveness of school-based and community-based financial capability education programs.

CONCLUSION

A keyword co-occurrence analysis and science mapping methodology are used in this study to examine the 20-year history of youth financial literacy research. Financial literacy is a multidimensional concept that has developed from a dynamic mixture of financial education programs, financial behaviors, demographic features, and developmental experiences, which is now largely influenced by the digitalization of finance. This analysis reveals potential lines of future research as it explores the thematic shifts and identifies key gaps in the research field. In sum, these lessons provide a unified set of principles that can be used to design experiential learning activities for students, guide policy makers in designing and enacting equitable, localized learning programs, and guide the design and development of safe, trustworthy tools for financial capability and long-term financial resilience for today's generation of youth.

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