

Constructing Financial Literacy Indicators for Students: A Conceptual Mapping Approach

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Abstract

Financial literacy is an essential life skill that should be developed from an early age, especially amid growing digital economic complexity and increasing financial risks. However, existing indicators for assessing students' financial literacy remain fragmented and lack alignment with the evolving conceptual landscape in global research. This study aims to construct a conceptual framework of financial literacy indicators for school-age students using a Conceptual Mapping approach supported by bibliometric analysis. Metadata from Scopus-indexed publications (2015–2025) were analyzed using VOSviewer to identify thematic structures and interconnections among key concepts. The analysis revealed that financial literacy, school children, and financial knowledge serve as central nodes, forming four main clusters: cognitive, affective, strategic, and instructional. The resulting framework highlights the multidimensional nature of financial literacy and offers a structured foundation for developing context-responsive assessment tools, curriculum models, and educational interventions. This study contributes to refining the theoretical understanding of financial literacy while providing practical implications for educators and policymakers.

Keywords: *financial literacy, conceptual mapping, bibliometric analysis, student education, financial knowledge, competency framework*

Abstrak

Literasi keuangan merupakan keterampilan hidup penting yang perlu dikembangkan sejak dini, terutama di tengah meningkatnya kompleksitas ekonomi digital dan risiko keuangan yang semakin besar. Namun, indikator yang ada untuk menilai literasi keuangan siswa masih terfragmentasi dan belum selaras dengan perkembangan konseptual dalam penelitian global. Penelitian ini bertujuan untuk membangun kerangka konseptual indikator literasi keuangan bagi siswa usia sekolah dengan menggunakan pendekatan Conceptual Mapping yang didukung oleh analisis bibliometrik. Metadata dari publikasi terindeks Scopus (2015–2025) dianalisis menggunakan perangkat lunak VOSviewer untuk mengidentifikasi struktur tematik dan keterkaitan antar konsep utama. Hasil analisis menunjukkan bahwa financial literacy, school children, dan financial knowledge berperan sebagai simpul sentral yang membentuk empat kluster utama: kognitif, afektif, strategis, dan instruksional. Kerangka yang dihasilkan menyoroti sifat multidimensional dari literasi keuangan serta memberikan dasar terstruktur untuk pengembangan alat asesmen, model kurikulum, dan intervensi pendidikan yang kontekstual. Penelitian ini berkontribusi dalam memperkuat pemahaman teoretis tentang literasi keuangan sekaligus memberikan implikasi praktis bagi pendidik dan pembuat kebijakan..

Kata Kunci: *literasi keuangan, conceptual mapping, analisis bibliometrik, pendidikan siswa, pengetahuan keuangan, kerangka kompetensi*



INTRODUCTION

Financial literacy has become an essential competency in 21st-century education, reflecting the growing complexity of the digital economy and the increasing demand for sound financial decision-making from an early age. The OECD, through its PISA framework, positions financial literacy as a core domain of student assessment, encompassing risk awareness, money management, and the ability to make responsible financial decisions in real-world contexts (OECD, 2022). Financial literacy goes beyond factual knowledge, it involves behavior, attitudes, and resilience against financial traps such as consumer debt and online fraud.

In international literature, financial literacy is widely understood as a multidimensional construct that integrates cognitive (knowledge), affective (attitude), strategic (decision-making), and instructional (curriculum) dimensions. Bibliometric mapping of recent studies shows that financial literacy, school children, and financial knowledge form the conceptual core of the field, surrounded by related terms such as education, financial well-being, and curriculum. This network illustrates that financial literacy among students should be viewed as a complex and interconnected framework rather than a purely declarative body of knowledge.

Despite the rapid digitalization of the economy and growing access to formal financial services, financial literacy levels among Indonesian students remain significantly low. The 2022 National Survey on Financial Literacy and Inclusion (OJK & BPS, 2022) revealed that the financial literacy index for the 15–17 age group stood at only 51.86%, compared to over 65% among adults. This disparity suggests that greater financial inclusion does not necessarily lead to improved literacy, particularly among adolescents who are economically active but lack the knowledge and attitudes required for responsible financial behavior.

This gap is compounded by increasing exposure to digital financial risks. Social media platforms, online shopping applications, and digital lending services have become an integral part of students' daily lives, yet are often used without adequate awareness of their financial and security implications. UNICEF Indonesia (2021) reports that children and adolescents are particularly vulnerable to digital fraud, data exploitation, and impulsive spending behaviors triggered by algorithmic advertising. In this context, financial literacy must not only encompass money management skills but also the ability to navigate digital risks and make ethical financial decisions in online environments.

At the same time, financial education in schools remains fragmented and inconsistently integrated into the national curriculum. The financial education modules developed by the Financial Services Authority (OJK) have been implemented in several schools, yet they lack standardized, developmentally appropriate indicators that reflect students' social and cognitive contexts. Much of the existing material remains declarative, focused on definitions of money, savings, and investment without sufficiently addressing affective and strategic dimensions such as attitudes toward risk, budgeting skills, or reflection on consumer behavior.

This condition underscores the need for developing financial literacy indicators that are contextual, comprehensive, and evidence-based. Such indicators must capture the complexity of students' financial behaviors, integrate digital dimensions, and remain relevant to diverse socio-economic contexts. Consequently, financial literacy education should not only serve as a vehicle for knowledge acquisition but also as a protective and empowering tool that equips young people to navigate contemporary financial challenges.

Despite growing policy attention and an expanding body of research, existing indicators of financial literacy specifically designed for school-aged children remain limited and largely unstandardized. Available frameworks tend to be generic, often more applicable to adult populations, and insufficiently aligned with the cognitive, social, and digital characteristics of children and adolescents. For instance, financial literacy modules developed by Indonesia's Financial Services Authority (OJK) continue to emphasize declarative knowledge—such as definitions of money, saving, and investment, while paying limited attention to strategic, affective, and digital protection dimensions (OJK, 2020).

Previous studies have also highlighted that measurement instruments used in primary and secondary education fail to capture the full complexity of students' financial behavior. Romadoni (2015) observed that assessments of elementary students' financial literacy remain focused on simple activities like saving or managing pocket money, without incorporating elements such as decision-making, risk perception, or social influences like parental guidance and digital exposure. This creates a persistent gap between the practical needs of student financial literacy and the evaluative instruments available to measure it.

To address this gap, a contextually grounded and evidence-based conceptual approach is required. Such an approach enables the construction of indicators that are both academically robust and adaptable to the social and digital realities faced by students. Through a bibliometric analysis of global literature, this study identifies the conceptual structure of financial literacy among school-aged learners, revealing four main thematic clusters: cognitive (knowledge, understanding), affective (attitude, perception), strategic (decision-making, risk, planning), and instructional (curriculum, teaching, gamification). These clusters provide a conceptual foundation for developing a more comprehensive and operational indicator framework.

Given the urgency of strengthening financial literacy among students and the limitations of existing measures, this research aims to construct a contextual and evidence-driven framework of financial literacy indicators for schoolchildren. The study adopts a Conceptual Mapping approach grounded in bibliometric analysis, utilizing metadata from Scopus-indexed publications between 2015 and 2025. The analysis was conducted using VOSviewer to map the relationships among key terms in the academic discourse on financial literacy.

The mapping results reveal that financial literacy, school children, and financial knowledge form the central nodes of the literature network, surrounded by thematic terms such as decision making, education, financial well-being, and curriculum. This conceptual structure converges around four principal dimensions such as cognitive, affective, strategic, and instructional which are synthesized into an indicator framework suitable for developing assessment tools, curriculum design, and adaptive educational interventions that address both social and digital challenges.

The primary contribution of this study lies in constructing a framework of financial literacy indicators for schoolchildren that is not only theoretically grounded but also operational and context-sensitive. The proposed framework serves as a reference for policymakers, educators, and researchers in designing assessment instruments and literacy programs that are responsive to the evolving financial realities of the digital age.

METHOD

Research Design

This study adopts a Conceptual Mapping Study design under a bibliometric framework to systematically identify and visualize the conceptual structure of *financial literacy among school-aged students*. The design was selected to generate an evidence-based foundation for constructing operational financial literacy indicators that reflect global academic trends and conceptual developments. Unlike narrative or systematic reviews, bibliometric mapping enables a quantitative examination of conceptual relationships, co-occurrence patterns, and thematic clustering across a large body of scholarly literature (Zupic & Cater, 2015).

Bibliometric mapping was conducted using VOSviewer software, which constructs and visualizes co-occurrence networks among keywords and terms extracted from publication metadata (Van Eck & Waltman, 2010). Through this approach, the study identifies the most influential terms and clusters that form the multidimensional structure of financial literacy. The analytical design allows for both quantitative validation and conceptual synthesis, producing a framework that is empirically grounded and contextually relevant for financial education.

Data Source and Selection Process

The study utilized metadata from the Scopus database, chosen for its extensive multidisciplinary coverage, indexing rigor, and compatibility with bibliometric tools (Donthu et al., 2021). The dataset encompassed publications from 2015 to 2025, capturing a decade of evolving discourse influenced by digitalization, educational policy reforms, and the growing inclusion of youth in financial ecosystems.

A structured search strategy was employed using combinations of the following keywords: “*financial literacy*”, “*school children*”, “*financial knowledge*”, “*financial education*”, and “*youth finance*.” Searches were restricted to titles, abstracts, and author keywords to ensure thematic precision. Inclusion criteria consisted of:

1. Publications in English;
2. Articles or conference proceedings indexed in Scopus;
3. Focus on financial literacy, education, or decision-making among school-age or adolescent populations.

Exclusion criteria included clinical, medical, or non-educational contexts, which were filtered through manual screening and the application of a customized thesaurus file in VOSviewer to merge semantically similar terms and remove irrelevant ones. The final dataset contained a validated corpus of metadata suitable for quantitative and semantic analysis.

Bibliometric Analysis Procedure

The analytical process followed four sequential stages designed for transparency and replicability:

- a. Data Extraction and Cleaning: Metadata were exported in .csv format from Scopus and manually screened to confirm relevance.
- b. Term Standardization: Using the thesaurus approach, redundant or synonymous terms were unified (e.g., *students* and *school children*), while non-conceptual words were excluded.
- c. Co-occurrence Mapping: VOSviewer was used to generate a co-occurrence network of author keywords, applying the *association strength normalization* method with a minimum term frequency threshold of five occurrences.
- d. Cluster Identification and Visualization: Terms were automatically grouped into thematic clusters represented by color-coded nodes, with node size indicating frequency and link strength representing semantic proximity.

This procedure enabled the identification of dominant conceptual clusters within the financial literacy literature, visualized as interconnected domains that reflect the intellectual structure of the field.

Semantic Interpretation and Indicator Synthesis

Following the visualization, clusters were qualitatively interpreted and aligned with established theoretical frameworks in financial literacy research. The resulting conceptual network revealed four dominant clusters:

- a. Cognitive Dimension : Terms such as *knowledge*, *understanding*, and *concept*;
- b. Affective Dimension: Terms including *attitude*, *confidence*, and *perception*;
- c. Strategic Dimension: Terms related to *decision-making*, *risk*, and *planning*;
- d. Instructional Dimension: Terms such as *curriculum*, *teaching*, and *gamification*.

Each cluster was analyzed for semantic coherence and cross-referenced with existing frameworks (OECD, 2022; Zupic & Čater, 2015) to ensure conceptual validity. The process of semantic confirmation and triangulation allowed the transformation of co-occurrence data into an operational indicator framework.

The synthesized framework integrates both quantitative (frequency and network strength) and qualitative (semantic meaning and thematic relevance) dimensions, producing a multi-layered indicator structure that captures the cognitive, behavioral, and pedagogical aspects of financial literacy among students.

Validation and Reliability

To enhance methodological robustness, validation was performed on two levels:

- a. Internal Validation, by assessing the thematic consistency across clusters and link strength within the co-occurrence network; and
- b. External Validation, by comparing the identified dimensions with established frameworks from OECD, OJK (2020), and leading financial education studies.

This triangulated validation ensures that the resulting conceptual map not only reflects global academic consensus but also possesses practical relevance for educational policy, curriculum development, and student assessment..

RESULT AND DISCUSSION

Bibliometric Mapping Overview

The bibliometric analysis of publication metadata retrieved from the Scopus database provides a comprehensive conceptual overview of financial literacy among school-aged children. From a total of 215 documents meeting the inclusion criteria (2015–2025), 1,247 unique keywords were identified. These keywords were refined using a thesaurus file to remove redundant and overlapping terms, as well as to consolidate semantically similar expressions. After refinement, 132 keywords were analyzed further using the *co-occurrence of keywords* function in VOSviewer software.

The resulting network visualization illustrates a dense and well-structured conceptual landscape, with the terms *financial literacy*, *school children*, and *financial knowledge* positioned at the center of the network. These central terms are surrounded by thematic nodes such as *education*, *decision making*, *curriculum*, *attitude*, and *risk*, indicating a high degree of interconnection. The pattern suggests that financial literacy in school contexts has evolved as a multidimensional domain encompassing cognitive, affective, strategic, and instructional dimensions.

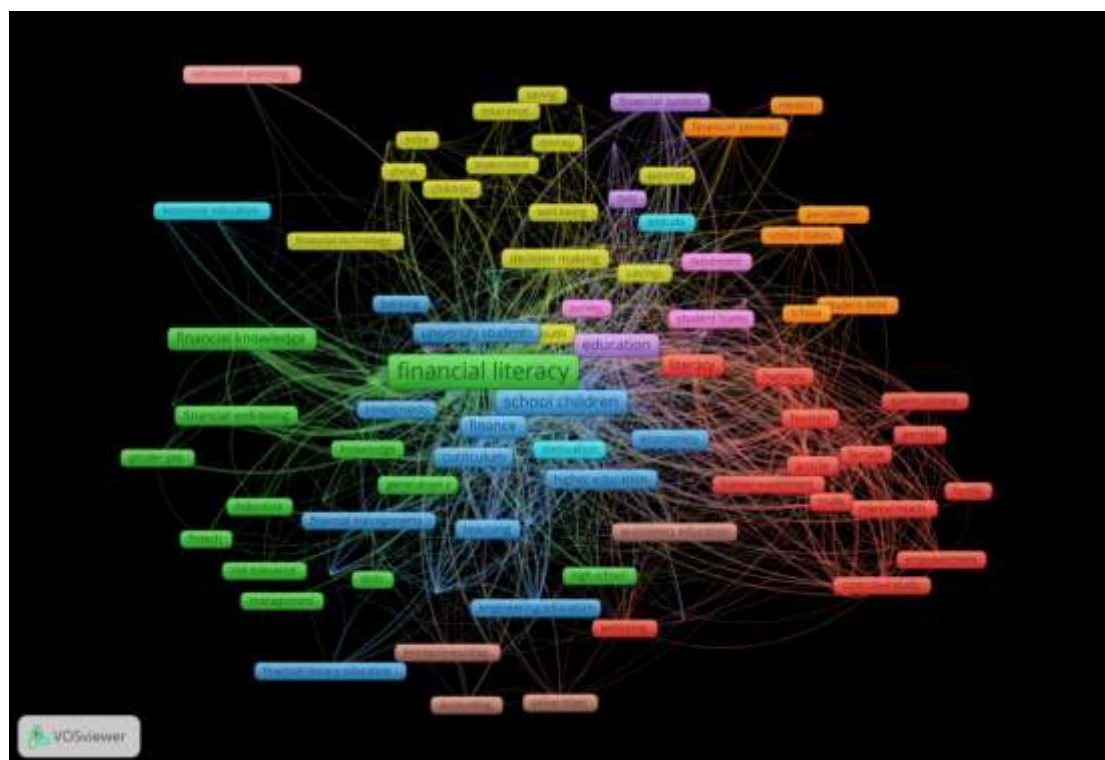


Figure 1. Co-occurrence Network Visualization Generated by VOSviewer

Dominant Keywords and Cluster Structure

The bibliometric mapping results reveal that *financial literacy* is the most dominant node, exhibiting both the highest frequency and the broadest interconnections with other keywords. The terms *school children* and *financial knowledge* occupy subsequent central positions, forming the main axis of research focusing on financial education among children and adolescents. These three core terms represent the conceptual nucleus around which thematic dimensions are organized.

Visually, the *financial literacy* node appears at the center of the network with a larger size and a gradient color indicating cross-cluster linkage. Surrounding it, terms such as *education*, *decision making*, *curriculum*, *attitude*, and *risk* form interrelated thematic paths. This configuration demonstrates that the study of financial literacy among school children extends beyond the understanding of financial concepts, integrating behavioral, pedagogical, and decision-making aspects.

Table 1. Top 10 Keywords by Frequency in the Conceptual Network of Student Financial Literacy

No	Keyword	Frequency	Thematic Cluster	Conceptual Dimension
1	Financial Literacy	87	Red	Cognitive
2	School Children	65	Green	Instructional
3	Financial Knowledge	52	Red	Cognitive
4	Education	48	Yellow	Instructional
5	Decision Making	41	Blue	Strategic
6	Curriculum	39	Yellow	Instructional
7	Attitude	36	Purple	Affective
8	Risk	34	Blue	Strategic
9	Understanding	32	Red	Cognitive
10	Teaching	30	Yellow	Instructional

Thematic Classification and Indicator Framework

The network visualization produced by VOSviewer highlights four primary clusters that represent the conceptual dimensions of school financial literacy. Each cluster is characterized by distinct colors and consists of semantically related terms grouped based on co-occurrence strength and proximity to central nodes.

- a. Red Cluster (Cognitive): Includes *financial knowledge*, *understanding*, *concepts*, and *numeracy*. This cluster represents the cognitive dimension, focusing on students' comprehension of basic financial concepts.
- b. Purple Cluster (Affective): Comprises *attitude*, *confidence*, *motivation*, and *perception*. This cluster captures students' attitudes, values, and emotional responses toward financial decisions and risk.
- c. Blue Cluster (Strategic): Contains *decision making*, *risk*, *planning*, and *behavior*. It emphasizes students' ability to plan, evaluate, and make financial decisions strategically.
- d. Yellow Cluster (Instructional): Includes *curriculum*, *teaching*, *financial education*, and *gamification*. It reflects pedagogical strategies and instructional designs that promote financial literacy in classroom settings.

This thematic classification confirms that financial literacy among school-aged children is not a single-domain construct but a multidimensional competency. Each dimension contributes uniquely to shaping a comprehensive understanding of financial behavior.

Table 2. Cluster Synthesis and Conceptual Dimensions of Student Financial Literacy Indicators

Cluster	Color	Core Terms	Conceptual Dimension	Example Indicator
1	Red	Financial knowledge, understanding, numeracy	Cognitive	Explaining the concepts of saving and interest
2	Purple	Attitude, confidence, perception	Affective	Attitude toward debt and consumption behavior
3	Blue	Decision making, risk, planning	Strategic	Ability to design budgets and make financial choices
4	Yellow	Curriculum, teaching, gamification	Instructional	Participation in classroom financial simulations

Synthesis of Financial Literacy Dimensions

Building upon the cluster analysis and semantic relationships, this study develops an integrated indicator framework that operationalizes the four key dimensions of school financial literacy. Each dimension aligns with specific measurable indicators that can be utilized in curriculum design and assessment instruments.

- a. Cognitive Dimension: Measures students' understanding of essential financial concepts such as saving, interest, value of money, and inflation. These indicators can be evaluated through contextual knowledge tests or quizzes.
- b. Affective Dimension: Assesses students' attitudes, perceptions, and values toward money, debt, consumption, and financial responsibility. These aspects are measurable through attitude scales or reflective narratives.
- c. Strategic Dimension: Focuses on students' capabilities in planning, budgeting, and managing financial risks. This can be assessed using simulations, case studies, or project-based tasks.

- d. Instructional Dimension: Examines students' learning experiences related to financial education, including engagement with digital media, classroom simulations, and curriculum integration. Evaluation can be conducted through classroom observations or teacher documentation.

Table 3. Draft Indicators of Student Financial Literacy Based on Cluster Synthesis

Dimension	Initial Indicator	Operational Description	Potential Implementation
Cognitive	Understanding saving and interest	Explaining how savings and interest work	Knowledge test, contextual quiz
Affective	Attitude toward debt and consumption	Evaluating students' spending tendencies	Attitude scale, reflective writing
Strategic	Ability to budget and make financial choices	Designing weekly budgets and spending plans	Simulation, case study
Instructional	Participation in classroom financial simulations	Engaging in digital or game-based financial learning	Observation, teacher documentation

Conceptual Implication

The conceptual mapping and indicator synthesis demonstrate that financial literacy among school children represents a complex, multidimensional construct that integrates knowledge, attitudes, strategic decision-making, and pedagogical engagement. This structure reinforces the argument that financial literacy should be understood as an interconnected *ecosystem of competencies* rather than a single domain of knowledge.

The cognitive dimension provides the foundation for understanding financial principles. The affective dimension shapes students' attitudes and value orientations. The strategic dimension guides their decision-making and financial behavior, while the instructional dimension determines how effectively knowledge and skills are transmitted through educational practice. This structure aligns with the competency-based framework recommended by the OECD and recent international studies (OECD, 2022; Donthu et al., 2021).

Practical and Policy Implication

From a practical perspective, the proposed multidimensional framework offers several potential applications:

- Development of more comprehensive and context-sensitive instruments for assessing students' financial literacy.
- Design of curricula and learning modules that incorporate simulations, reflection, and case-based decision-making.
- Educational policy interventions that position financial literacy as a core competency in primary and secondary education.
- Implementation of digital financial literacy programs responsive to consumerism and online fraud risks among youth.

In conclusion, the findings of this study contribute not only to the academic understanding of financial literacy as a multidimensional construct but also provide an evidence-based framework for educational innovation and policy development aimed at strengthening financial competence among younger generations.

CONCLUSIONS

This study developed a conceptual indicator framework for school-aged children's financial literacy through a bibliometric-based conceptual mapping approach. The analysis of publication metadata from the Scopus database (2015–2025) produced a network structure indicating that financial literacy among school children is a multidimensional domain comprising four main dimensions: cognitive, affective, strategic, and instructional. Each dimension was identified through interrelated keyword clusters and validated through semantic analysis.

The synthesis of indicators derived from the mapping results demonstrates that students' financial literacy encompasses not only an understanding of financial concepts but also attitudes toward risk, decision-making abilities, and supportive learning experiences. The proposed indicator framework is both operational and contextually grounded, offering a foundation for the development of evaluation instruments, curriculum design, and educational policy interventions.

In conclusion, this study contributes both conceptually and practically to the advancement of school-based financial literacy. It provides an evidence-based foundation for the development of evaluative and pedagogical innovations that are more adaptive to the financial challenges faced by younger generations in the digital era.

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