

# Can Artificial Intelligence Identify the Main Themes of Financial Literacy Literature? Evidence from Türkiye

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## Abstract

This study proposes a hybrid methodological framework combining traditional literature review techniques with artificial intelligence to identify the main thematic structure of financial literacy research in Türkiye. A total of 217 Web of Science-indexed articles were analyzed using Keshav's three-pass reading model and Braun and Clarke's thematic analysis, supported by ChatGPT and DeepSeek. Of these, 106 highly relevant studies were further analyzed through coding and thematic clustering. The findings reveal full convergence between AI models in high-relevance classifications, while differences appear in moderate-relevance cases. Eight main themes were identified, highlighting the multidimensional nature of financial literacy. Results are largely consistent with FODER (2019) field data, although a gap is observed in digital financial literacy and measurement limitations exist in Islamic financial literacy. Overall, AI-assisted thematic analysis effectively supports large-scale literature synthesis, while human interpretation remains essential.

**Keywords:** Financial literacy, thematic analysis, artificial intelligence, large language models, Türkiye.

## 1. Introduction

During World War II, the efforts of Polish mathematicians to decipher the Enigma codes, together with the computational systems developed by Alan Mathison Turing, laid the foundations of modern computer science and artificial intelligence. In 1956, the concept of "artificial intelligence" was introduced into the literature with the Dartmouth Conference. This process demonstrates that technological progress is often accelerated by crises and societal needs. As noted by Joseph Weizenbaum, technological developments tend to gain momentum particularly during wartime periods. He also emphasizes that the ethical consequences of such progress should not be overlooked. Today, scientific production -especially in the field of artificial intelligence- has increased rapidly. Data from Web of Science reveal that researchers face significant information overload and time constraints. This situation limits the effectiveness of traditional literature review methods. In the literature, the three-pass reading approach proposed by Keshav (2007) and the thematic analysis method developed by Braun & Clarke (2006) are widely used. However, these methods involve substantial time costs due to the increasing volume of publications.

At this point, artificial intelligence emerges as a supportive tool that accelerates research processes. Alkan & Acer (2025) emphasize that researchers should consider this technology not as an alternative but as an effective assistant. Nevertheless, as stated by Joseph Weizenbaum, the ethical perspective that "not everything that is technically possible should be done" must also be taken into account.

The aim of this study is to propose a methodological framework that integrates literature review and thematic analysis with artificial intelligence in order to reduce time constraints. In this context, scientific studies on financial literacy in Türkiye are analyzed to identify the main themes.

## 2. Conceptual Framework

This section provides a general definition of the concept of financial literacy, discusses the current literature, mentions the effects of financial literacy, and presents information on educational efforts undertaken in this field.

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## **2.1. Financial Literacy**

Financial literacy is a crucial concept for understanding and explaining individuals' financial decisions. It is also used to determine the need for financial education. Therefore, accurately defining and measuring the concept is of great importance for evaluating educational policies in this area and identifying barriers that hinder rational decision-making (Huston, 2010, p. 296). Although there is no single definition in the literature, Lusardi and Mitchell (2011) define financial literacy as the competence of individuals to understand economic information, engage in financial planning, accumulate wealth, manage their debts, and make informed decisions regarding retirement processes (Lusardi & Mitchell, 2011, p. 2). This definition demonstrates that financial literacy is not limited to knowledge alone but also encompasses the translation of knowledge into behavior. Fernandes et al. approach financial literacy as a form of consumer expertise that enables an individual to manage their financial affairs effectively. According to this approach, financial literacy is the ability to understand basic financial concepts, make short-term decisions in response to changing economic conditions, and develop sound long-term plans (Fernandes et al., 2014, p. 1862). Remund (2010), in turn, conceptualizes financial literacy across five dimensions: knowledge of financial concepts, the ability to use these concepts, personal financial management skills, the capacity to make sound financial decisions, and the level of confidence in planning for the future (Remund, 2010, p. 276).

In summary, financial literacy is a multidimensional concept that combines financial knowledge, skills, and attitudes. It encompasses not only the acquisition of knowledge but also its application in making sound and sustainable financial decisions that enhance individual well-being.

## **2.2. Literature Discussion**

Over the past two decades, financial literacy (FL) has evolved from being merely an individual competence into a policy instrument that directly affects the level of national development, stability, and social welfare (Kozol, 2025; Yurtkur et al., 2025). While FL is generally examined across three fundamental dimensions -knowledge, attitude, and behavior (Hamurcu, Hazar, et al., 2025)- recent studies indicate that this tripartite structure does not operate independently and that more holistic approaches are needed.

### ***Behavioral and Economic Outcomes of Financial Literacy***

The traditional approach assumes that higher FL leads individuals to make more rational decisions. This assumption is supported by extensive empirical evidence. For instance, Fong & Mitchell (2025) demonstrate that FL significantly increases the likelihood of holding stocks in individual retirement accounts, while Jahangir et al. (2025) find that FL strengthens the relationship between investor sentiment and Bitcoin returns, suggesting that knowledge is critical in shaping emotional responses. Başar et al. (2025), in their study covering 12 countries, emphasize that FL functions as a threshold condition triggering the positive effect of FinTech tools on savings behavior, indicating that digital tools alone are insufficient.

Nevertheless, a growing body of criticism suggests that FL does not always produce the desired behavioral outcomes. İlbaşmış et al. (2025) imply that while a short-term educational intervention increases objective FL, continuous support is required for this increase to translate into long-term behavioral change. More importantly, Merter & Balcioğlu (2025) and Tahir (2025) show that when combined with overconfidence, FL may render individuals more vulnerable. These studies reveal that the knowledge-action gap is moderated by metacognitive factors, and that even individuals with high FL may experience financial difficulties.

### ***Digital Financial Literacy: Opportunities and Threats***

Digitalization has introduced a new dimension to the FL literature. "Digital financial literacy" (DFL) encompasses not only traditional financial knowledge but also the ability to use digital tools and the capacity to manage online risks. One of the most striking findings in this area is the paradox identified by Zhou et al. (2025): individuals with digital skills experience a decline in their financial well-being when their smartphone addiction is high. In other words, the positive effect of DFL is attenuated by behavioral disruptors.

Ergüzel et al. (2025) note that while FinTech awareness increased during the COVID-19 pandemic, the protective role of FL became even more critical. Umar (2025) states that, particularly in developing countries, FL is one of the most important determinants of central bank digital currency (CBDC) adoption and the transition to digital payments over cash.

### ***Islamic Financial Literacy***

An important subfield of FL involves the development of models sensitive to religious and cultural contexts. Particularly in countries such as Turkey and Malaysia, Islamic financial literacy (IFL) exhibits a structure distinct from conventional FL. Yenice & Orhan (2025), in their SWOT analysis of participation banking in Turkey, note that low levels of IFL constitute one of the sector's greatest weaknesses. Ergün (2025) finds that knowledge plays a full mediating role in the relationship between Islamic financial attitudes and behaviors, with awareness exerting a moderating effect in this process. Mahdzan et al. (2024), using an IFL scale developed in the Malaysian context, demonstrate that knowledge in this area is associated not only with religious sensitivity but also with mathematical skills and financial protection knowledge. These findings indicate that adapting FL principles to local and religious norms is imperative for the effectiveness of educational programs.

### ***Pathological Boundaries of Financial Literacy***

Perhaps the most neglected yet rapidly growing area in FL is its intersection with pathological behaviors and mental health. According to the studies by Hamurcu, Hazar, et al. (2025) and Hamurcu, Mutlu, et al. (2025), financial literacy is not a stable and immutable skill. It can transform into a fragile competence that may weaken, particularly in conditions such as gambling disorder. Although individuals with gambling disorder possess the same level of financial knowledge as normal individuals without the disorder, severe impairments are observed in the attitudinal and behavioral dimensions. This constitutes the most striking evidence that “knowing does not mean doing.”

Feng et al. (2025), when examining the determinants of financial anxiety during the COVID-19 pandemic, found that FL had only a modest direct effect on anxiety, and that the primary determinants were positive financial behaviors (saving, budgeting). These findings suggest that FL education should encompass not only the transmission of knowledge but also emotion regulation strategies and behavioral mechanisms (Özçelik & Kurt, 2024).

In conclusion, the current literature demonstrates that financial literacy can no longer be measured simply by “how many correct answers are given”; rather, it is a dynamic process that interacts with a range of individual factors, including digital addiction, overconfidence, cultural norms, and psychological vulnerabilities.

## **3. Methodology**

The methodological approach employed in this study is based on Acer & Alkan (2025). This approach first identifies keywords related to the topic of interest in the WoS database. It performs a search across all fields in the Core Collection and lists all studies relevant to the topic as complete criteria (publication title, abstract, authors, DOI, journal of publication, year, issue, etc.). Subsequently, it exports these studies as output in the “Export Records to Excel” environment under “Record Content: Full Record.” Additionally, for the purpose of conducting a bibliometric analysis, it separately exports the data in the “Export Records to Tab Delimited File” environment under “Record Content: Full Record and Cited References.”

Subsequently, the approach integrates Keshav’s three-stage reading approach with Braun and Clarke’s six-phase framework (Table 1). Through prompts prepared for this purpose, the publications are analyzed using artificial intelligence in terms of pre-processing, coding and theme proposals, consistency analysis, and reporting support. In this study, “ChatGPT” and “Deepseek” were used as AI tools. There are currently paid AI tools that identify themes as well. However, one of the key aspects highlighted in this research is the use of free versions of LLMs. Thus, researchers will not be required to incur additional costs.

**Table 1.** A Hybrid Thematic Analysis Approach: Integrating Braun & Clarke, Keshav, and Artificial Intelligence

| Stage   | Keshav (2007) – “Three-Pass Reading Approach”                                                                   | Braun & Clarke (2006) – Thematic Analysis                                                                  | Role of Artificial Intelligence (Examples)                                                                                                                                                                                                           | Researcher’s Role                                                                                                                                                                                                                            |
|---------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stage 1 | <b>Rapid Scanning:</b><br>Reading abstracts, introductions, conclusions, and headings to grasp the overall idea | <b>Familiarization with Data:</b> Repeated reading of data to gain an overall understanding                | <b>Pre-processing and summarization:</b> <ul style="list-style-type: none"> <li>• Scans thousands of texts within seconds.</li> <li>• Identifies initial themes and trends.</li> <li>• Reports keywords, summaries, and general patterns.</li> </ul> | <b>Management of AI outputs:</b> <ul style="list-style-type: none"> <li>• Determines analytical focus.</li> <li>• Selects data for in-depth analysis.</li> <li>• Evaluates initial thematic tendencies.</li> </ul>                           |
| Stage 2 | <b>Selective Reading:</b><br>Careful reading without focusing on full detail to understand the text             | <b>Initial Coding and Theme Generation:</b><br>Coding important features of the data and developing themes | <b>Coding and theme suggestion:</b> <ul style="list-style-type: none"> <li>• Automatically generates codes by analyzing texts.</li> <li>• Semantically clusters similar codes.</li> <li>• Maps possible themes and relationships.</li> </ul>         | <b>Critical evaluation and interpretation:</b> <ul style="list-style-type: none"> <li>• Evaluates AI-generated codes and themes within a theoretical framework.</li> <li>• Finalizes thematic structure.</li> </ul>                          |
| Stage 3 | <b>Critical Evaluation:</b><br>Expert analysis of strengths and weaknesses of the paper                         | <b>Reviewing, defining, and naming themes:</b><br>refining and reporting themes                            | <b>Coherence analysis and reporting support:</b> <ul style="list-style-type: none"> <li>• Assesses semantic consistency among themes.</li> <li>• Suggests summaries and visualizations.</li> <li>• Supports reporting of findings.</li> </ul>        | <b>Final synthesis and interpretation:</b> <ul style="list-style-type: none"> <li>• AI outputs are critically interpreted.</li> <li>• Themes are positioned within the theoretical framework.</li> <li>• Final report is written.</li> </ul> |

**Source:** Acer & Alkan (2025), s. 158

In this study, we aimed to identify the main themes emerging in the field of financial literacy in Türkiye. For this purpose, a dataset was constructed using an AI-assisted thematic analysis approach. The data collection process was conducted on April 12, 2026, using the WoS database. The search strategy was carried out using the keywords “financial literacy,” “financial education,” “financial capability,” “financial knowledge,” “financial awareness,” “financial numeracy,” “money management,” “personal finance,” and “household finance,” in combination with the terms “Turkey,” “Türkiye,” “Turkish,” “Borsa Istanbul,” “Istanbul,” and “Ankara.” Within this scope, a total of 230 academic publications were retrieved from the WoS Core Collection. Since the year 2026 was not yet complete at the time of analysis, publications from 2026 were excluded, resulting in a final dataset of 217 studies.

The resulting dataset was directly included in the analytical process. Given the relatively limited size of the dataset, all publications were included in the analysis without additional filtering.

The analytical procedure of the study was conducted within a hybrid framework integrating Keshav’s (2007) three-pass reading model and Braun and Clarke’s (2006) thematic analysis protocol, supported by artificial intelligence. Accordingly, the analysis was implemented in three main stages.

In the first stage (first pass), the abstracts of all 217 articles were analyzed using two different AI models. At this stage, each study was classified into three categories—“high,” “moderate,” and “low”—based on its relevance to financial literacy. In addition, a conceptual paradox was defined as the

inconsistency between individuals' possession of financial knowledge and their inability to translate this knowledge into financial behaviors (e.g., saving, budgeting, investing, and debt management). Furthermore, each article was assigned between two and four preliminary thematic codes generated by the AI system. This stage primarily corresponded to data familiarization and the identification of initial thematic tendencies.

In the second stage (second pass), a more in-depth analysis was conducted on the subset of studies identified as having a “high” level of relevance. At this stage, AI-assisted code generation and thematic clustering procedures were applied. Using an open coding approach, analytical codes were extracted from each study and subsequently grouped into higher-order themes based on semantic similarity. In constructing themes, particular attention was given to structures emphasizing the effects of financial literacy on individual behaviors, financial decision-making processes, and economic outcomes. As a result, between four and six overarching themes were identified, explaining the relationship between financial literacy levels, financial behaviors, and economic well-being.

In the third and final stage (third pass), a coherence analysis was conducted on the generated codes and themes. At this stage, semantic similarities, overlaps, and hierarchical relationships among themes were systematically evaluated. Core and sub-themes were distinguished accordingly. Additionally, thematic maps illustrating inter-theme relationships were developed, and descriptive summaries were prepared for each theme. The analysis further examined how these themes explain the impact of financial literacy on individual financial decision-making, behavioral patterns, and economic outcomes in detail. In the final phase, the findings were situated within the theoretical framework, and the overall synthesis of the study was conducted by the human researcher.

During this process, artificial intelligence played an active role in data screening, code suggestion, thematic clustering, and coherence analysis. However, final interpretation, meaning-making, and theoretical positioning were conducted by the researcher. In this way, a hybrid analytical model was implemented by combining the depth of human interpretation with the speed and scalability advantages of artificial intelligence.

#### 4. Findings

This section presents the findings obtained from the implementation of an AI-assisted hybrid thematic analysis model designed to investigate financial literacy research in Türkiye. The findings are structured in line with the three analytical stages (first, second, and third passes), following the presentation of the annual publication distribution (Table 2).

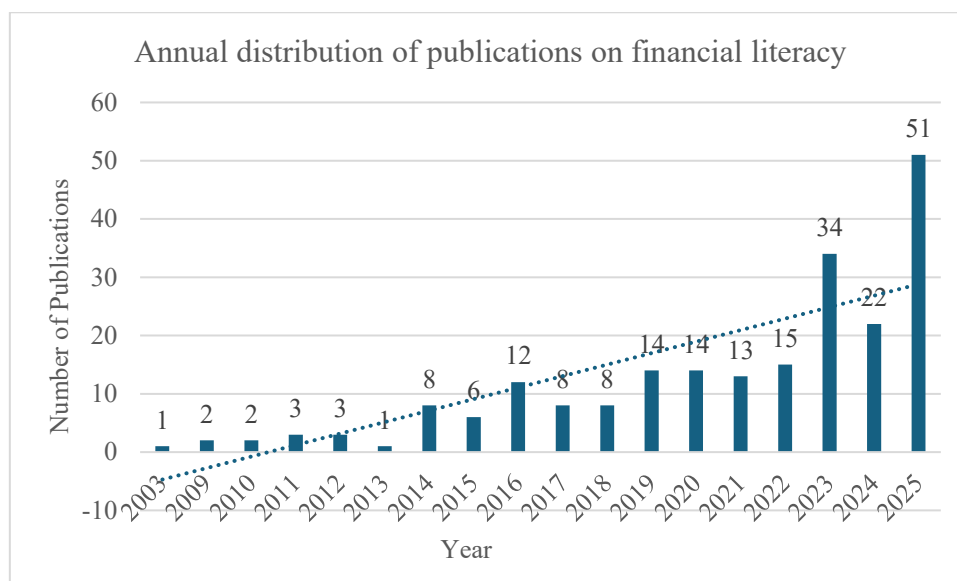
First, results regarding the classification of publications by relevance level using artificial intelligence models, as well as the construction of the intersection dataset, are presented. This is followed by a detailed presentation of the codes developed and the emerging thematic structures in the second pass. Finally, the third pass presents the coherence analysis and the preliminary synthesis of the final interpretive framework.

The section concludes with a comparative evaluation in which the themes derived from the AI-based analysis are juxtaposed with the findings of the Financial Literacy and Inclusion Association (FODER) 2019 Financial Literacy Survey of Türkiye & II. Period Report.

**Table 2.** Distribution of Publications on Financial Literacy by Year

| Year | Number of Publications | Year | Number of Publications |
|------|------------------------|------|------------------------|
| 2003 | 1                      | 2017 | 8                      |
| 2009 | 2                      | 2018 | 8                      |
| 2010 | 2                      | 2019 | 14                     |
| 2011 | 3                      | 2020 | 14                     |
| 2012 | 3                      | 2021 | 13                     |
| 2013 | 1                      | 2022 | 15                     |
| 2014 | 8                      | 2023 | 34                     |
| 2015 | 6                      | 2024 | 22                     |
| 2016 | 12                     | 2025 | 51                     |

The most remarkable growth occurred between 2021 and 2025. The number of publications peaked particularly in 2023 (34 publications), 2024 (22 publications), and 2025 (51 publications). This indicates that academic interest in financial literacy has increased significantly in recent years, with the topic attracting growing attention from researchers.



**Figure 1.** Annual Distribution of Publications on Financial Literacy

#### 4.1. First Transition: Use of AI Models and Determination of Relevance Levels

The first pass of Keshav’s three-pass reading model corresponds to the “familiarization with data” stage in Braun and Clarke’s framework. This stage represents the researcher’s process of becoming acquainted with the dataset. At this point, artificial intelligence was employed to scan large-scale datasets, generate summaries, identify frequently recurring concepts and expressions, and report preliminary thematic tendencies. In order to accelerate the thematic analysis process and minimize human error, two large language models (LLMs) were used in the study: ChatGPT and DeepSeek. A shared analytical prompt was designed for both models:

Prompt 1:

*“Project: AI-Assisted Identification of Main Themes in Financial Literacy Literature in Türkiye  
Dataset: 217 academic articles (Web of Science Core Collection)*

*Task Description:*

*You will be provided with groups of 20 article abstracts at a time. For each abstract, perform the following tasks:*

*Relevance Level Assessment:*

*Evaluate the article’s relevance to the topic of ‘financial literacy’.*

*Categories:*

*High: Financial literacy is the central focus of the study*

*Medium: Financial literacy is related but not the main focus*

*Low: Financial literacy is mentioned superficially or the study focuses on a different topic*

*Coding:*

*Generate 2–4 short and conceptual thematic codes for each article.*

*Coding Rules:*

*Codes must be concise, clear, and academically appropriate*

*Codes should reflect financial knowledge, behavior, education, awareness, and economic outcomes*

*Example Codes: “financial knowledge,” “financial behavior,” “financial education,” “financial awareness,” “investment behavior,” “saving tendency,” “debt management,” “financial decision-making,” “digital financial literacy,” “financial attitude,” “financial inclusion.”*

*Output Format (MANDATORY):*

*[Article ID] - Relevance: [High/Medium/Low] - Codes: [code1, code2, code3]*

*Example:*

*ART023 - Relevance: High - Codes: financial behavior, saving tendency, financial education*

*Start with the first 20 abstracts:*

*[ART001 – ART020]”*

Using this prompt, both models were instructed to read the abstracts of 217 articles, determine their relevance levels, and generate thematic keywords.

During the first pass of the analysis, the performance of ChatGPT and DeepSeek was compared in terms of processing speed, response consistency, and error rate. Our observations indicated that, in the fourth batch (set of 20 articles), ChatGPT produced very brief and general summaries of the main ideas of the publications instead of providing relevance classifications and code generation. When the prompt was repeated in a new session, this issue was resolved. DeepSeek, on the other hand, consistently followed the prompt instructions and produced the required outputs. After 100 publications, in the first batch of a new session, ChatGPT again provided general literature synthesis instead of performing relevance classification and coding; after prompt reinitialization, the issue was resolved. DeepSeek, however, consistently adhered to the prompt instructions and delivered the expected outputs. For the ninth batch of 20 articles (ART161–ART180), ChatGPT again produced a brief summary of article ART161 instead of performing relevance assessment and coding. After restarting the session and reissuing the prompt, normal output was restored. DeepSeek continued to comply with the prompt requirements and provided the expected results.

These findings indicate that DeepSeek was technically more consistent and efficient in executing the analytical tasks, whereas ChatGPT occasionally produced output deviations. The relevance levels determined by both models in the first reading stage are presented below (Table 3).

**Table 3.** The Distribution of Articles by Relationship Levels in ChatGPT, DeepSeek, and ChatGPT & DeepSeek

| Relationship Level | ChatGPT | DeepSeek | ChatGPT & DeepSeek |
|--------------------|---------|----------|--------------------|
| High               | 110     | 154      | 106                |
| Medium             | 50      | 12       | 2                  |
| Low                | 57      | 51       | 40                 |
| Total              | 217     | 217      | 148                |

**Source:** Created by the authors

**Note:** The “ChatGPT & DeepSeek” column represents the intersection of relationships detected by both models. Therefore, the total number of articles is lower than in the other columns

Table 3 demonstrates that the ChatGPT and DeepSeek models exhibit notable differences in their approaches to classifying the financial literacy literature. ChatGPT adopts a more conservative strategy, distributing articles in a relatively balanced manner, particularly within the “medium” and “low” relevance categories. In contrast, DeepSeek assigns a greater number of articles to the “high relevance” category, reflecting a more inclusive and broader classification approach.

The 106 articles jointly identified as “high relevance” by both models constitute the core and most reliable segment of the financial literacy literature. This group represents studies that are directly and strongly related to financial literacy.

Model disagreement is particularly pronounced in the “medium relevance” category. ChatGPT classified 50 articles as medium relevance, whereas DeepSeek assigned only 12 articles to this category, with overlap observed in only 2 articles. This finding indicates that the “medium” category represents the least consistent classification area between the models and requires further human review and validation.

In contrast, a higher level of agreement is observed in the “low relevance” category. ChatGPT and DeepSeek classified 57 and 51 articles as low relevance, respectively, with consensus on 40 articles. This result suggests that both models are more consistent in identifying studies with weak relevance to financial literacy.

Overall, ChatGPT produced a more selective and narrower classification, whereas DeepSeek demonstrated a broader and more sensitive approach. Accordingly, ChatGPT is characterized by higher specificity, while DeepSeek is characterized by greater inclusiveness. From a research perspective, the most reliable core literature consists of the 106 jointly identified “high relevance” articles, while the remaining categories—particularly the “medium” group—represent an ambiguous grey area that requires human-coded interpretation and validation.

#### 4.2. Second Transition: Code Development and Theme Search Phase

The “second pass” defined by Keshav represents a deep yet selective reading process. This stage directly corresponds to two key phases of thematic analysis: initial coding and theme generation. At this stage, artificial intelligence supports the researcher by clustering similar expressions, conducting semantic similarity analyses to propose potential codes, and suggesting preliminary themes derived from these codes. The role of the researcher, in turn, is to evaluate these AI-generated codes in terms of theoretical coherence, contextual relevance, and analytical depth, thereby constructing the final thematic framework.

Theoretical coherence refers to the extent to which the generated codes align with the study’s conceptual framework. Contextual relevance refers to whether the codes adequately reflect the context of the phenomenon under investigation. Finally, analytical depth refers to whether the codes provide meaningful and substantive insights.

For this stage, the following prompt was developed:

Prompt 2:

*“Project: Identification of Main Themes in Financial Literacy Literature in Türkiye*

*Dataset: Articles classified as ‘High’ in the first stage*

*Task Description:*

*Conduct an in-depth analysis of the following articles and construct a thematic structure:*

- 1. Open Coding: Generate analytical codes for each article in the format Code 1 | Code 2 | Code 3 | Code 4*
- 2. Code Grouping: Group similar codes based on semantic similarity*
- 3. Theme Development: Identify 4–6 overarching themes for the entire dataset*
- 4. For each theme: provide a brief explanation and list the associated codes*
- 5. Analytical Focus: The themes should address the following dimensions: “financial knowledge level,” “financial behaviors,” “financial education processes,” “financial decision-making,” and “economic outcomes”*

*Output Format:*

*Theme 1: [Theme name], Description and associated codes: ...*

*Theme 2: [Theme name], Description and associated codes: ...*

*(continue)*

*General Commentary (3–5 sentences):*

*Summarize how the themes explain the financial literacy literature*

*Data:*

*[ARTICLES]”*

**Table 4.** Code Development and Thematic Clustering Generated by Artificial Intelligence

| Main Theme                              | Codes                                               | Example Statement                                                                                          |
|-----------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Digital Financial Literacy and Behavior | Digital financial literacy and investment decisions | “Digital financial literacy improves investment decisions; however, financial stress weakens this effect.” |
|                                         | Financial stress and quality of life                | “Financial stress reduces the positive impact of financial knowledge on quality of life.”                  |
| Behavioral Finance and Risk             | Financial knowledge, attitude, and risk tolerance   | “Financial knowledge and attitudes determine investors’ risk tolerance.”                                   |

| Main Theme                             | Codes                                       | Example Statement                                                                                |
|----------------------------------------|---------------------------------------------|--------------------------------------------------------------------------------------------------|
| Financial Education                    | Overconfidence and investment errors        | “Overconfidence leads to irrational investment decisions despite financial knowledge.”           |
|                                        | Financial education and behavioral change   | “Financial education improves budgeting, saving, and investment planning behaviors.”             |
|                                        | Early-age financial awareness               | “Financial education at an early age increases financial awareness.”                             |
| Islamic Financial Literacy             | Islamic financial knowledge and behavior    | “Islamic financial literacy affects financial decisions through attitudes and awareness.”        |
|                                        | Religious factors and financial decisions   | “Religious sensitivities shape financial behaviors and banking preferences.”                     |
| Digital Finance and FinTech            | FinTech usage and saving behavior           | “Digital financial literacy increases FinTech usage and strengthens saving behavior.”            |
|                                        | Digital payments and financial preferences  | “As financial literacy increases, digital payment usage increases and cash preference declines.” |
| Financial Behavior and Decision-Making | Investment behavior and portfolio decisions | “Financial literacy increases stock market and retirement investments.”                          |
|                                        | Self-control and social media influence     | “Lack of self-control and social media negatively affect investment decisions.”                  |
| Socioeconomic Factors                  | Education and financial awareness           | “Education and income level directly affect financial literacy.”                                 |
|                                        | Gender differences                          | “Women generally have lower levels of financial literacy.”                                       |
| Financial Well-being                   | Financial anxiety and financial well-being  | “Saving behavior reduces financial anxiety and increases financial well-being.”                  |
|                                        | Household financial behavior                | “Financial literacy improves household-level financial decision-making.”                         |
| Sustainability and Innovation          | Sustainable financial literacy              | “Sustainable financial literacy supports environmentally responsible investment decisions.”      |
|                                        | Digital transformation and finance          | “Digital and financial literacy together strengthen decision-making processes.”                  |
| Risk and Special Conditions            | Addiction and irrational behavior           | “Addiction prevents rational financial decision-making.”                                         |
|                                        | Credit risk and borrowing behavior          | “Low financial literacy increases borrowing and financial vulnerability.”                        |

**Source:** Created by the authors based on the analyzed data

Table 4 reveals the multidimensional structure of the financial literacy literature, particularly highlighting its intersection with digital transformation, behavioral finance, and Islamic finance. Notably, the themes of digital financial literacy and FinTech adoption reflect the growing research interest in the post-COVID-19 period.

**Table 5.** A Comparative Thematic Analysis of Two Artificial Intelligence Models

| Theme                      | ChatGPT                                                                  | DeepSeek                                                          | Common Insights                                                   |
|----------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|
| Digital Financial Literacy | Digital literacy improves decisions, but is affected by financial stress | Strong emphasis on digital finance, FinTech, and cryptocurrencies | Digital finance is important, but effective usage remains limited |
| Financial Behavior         | Behaviors and attitudes determine decisions                              | Psychological factors and behavioral risks are emphasized         | Financial behavior is a key determinant                           |
| Financial Education        | Education improves financial behavior                                    | Education is viewed as a lifelong process                         | Financial education is critically important                       |

| Theme                     | ChatGPT                                            | DeepSeek                                       | Common Insights                          |
|---------------------------|----------------------------------------------------|------------------------------------------------|------------------------------------------|
| Islamic Finance           | Religious factors influence behavior               | More systematic and measurable approach        | Religion influences financial decisions  |
| Financial Inclusion       | Enhances financial development                     | Linked to economic growth and access           | Literacy increases inclusion             |
| Socioeconomic Factors     | Education, income, and gender are influential      | Demographic differences are analyzed in detail | Inequalities are decisive factors        |
| Investment and Risk       | Literacy increases rational decision-making        | Risk perception and biases are emphasized      | Risk perception is shaped by literacy    |
| Technology and Innovation | Digital tools improve decisions                    | Broader approach to technology adoption        | Technology is transformative             |
| Financial Well-being      | Stress decreases and well-being increases          | Associated with long-term economic outcomes    | Quality of life improves                 |
| Special Conditions        | Addiction and irrational behaviors are influential | Crises and risky behaviors are emphasized      | External factors distort decision-making |

**Source:** Created by the authors based on the analyzed data

Table 5 indicates a high degree of convergence between the two artificial intelligence models regarding the core themes of the financial literacy literature, particularly highlighting their agreement on the central role of financial behavior and financial education. The most notable divergence between the models lies in DeepSeek’s more systematic approach to the themes of Islamic finance and technology adoption.

#### 4.3. Third Transition: Consistency Analysis and Final Synthesis

The third stage corresponds to what Keshav defines as the “third pass,” and aligns with Braun and Clarke’s phase of “reviewing, defining, and reporting themes.”

At this stage, artificial intelligence is used to evaluate coherence by analyzing similarities across themes, as well as to generate thematic maps and summary narratives. However, the processes of interpreting the themes, situating them within a theoretical framework, and providing a holistic evaluation of the findings remain the responsibility of the human researcher.

Prompt 3:

*“Project: Final Analysis of Core Financial Literacy Themes in Türkiye  
Dataset: Themes and codes generated in the second stage*

*Task Description:*

- 1. Coherence Analysis: Analyze relationships among themes; identify similarities and differences.*
- 2. Hierarchical Structure: Develop main themes and sub-themes.*
- 3. Redundancy and Overlap: Identify and refine overlapping themes.*
- 4. Positive and Negative Themes: Classify themes as positive (supportive/enhancing effects) and negative (inhibiting/disruptive effects). For each theme, specify both positive and negative aspects.*
- 5. Interpretation: Explain the relationship of each theme to financial literacy and indicate what it represents in the literature.*
- 6. Final Thematic Model: Construct an integrated structure explaining inter-theme relationships.*
- 7. Conclusion: Write a general synthesis of 5–7 sentences.*

*Output Format:*

*MAIN THEME 1 (Positive / Negative): Description: Sub-themes:*

*MAIN THEME 2 (Positive / Negative): Description: Sub-themes:*

*(continue)*

*General Synthesis: [Text]*

*Data: [THEMES AND CODES]”*

**Table 6.** The Final Thematic Model of Financial Literacy: A Third-Stage Analysis

| Main Theme                                               | Description                                                                                                                         |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Digital Financial Literacy and Technology Adoption       | Financial literacy enhances the use of digital financial tools, although limited technological adaptation may reduce effectiveness. |
| Financial Behavior, Decision-Making, and Risk Management | Financial literacy shapes risk perception and decision-making, while psychological factors influence outcomes.                      |
| Financial Knowledge, Attitudes, and Awareness            | Knowledge and awareness are key determinants of behavior, though not always translated into action.                                 |
| Financial Education and Learning Processes               | Financial education transforms behavior and is supported by lifelong learning.                                                      |
| Islamic Financial Literacy and Religious Factors         | Religious values shape financial behavior within a cultural framework.                                                              |
| Financial Inclusion and Economic Outcomes                | Financial literacy drives inclusion, economic growth, and well-being.                                                               |
| Demographic Factors and Target Group Differences         | Financial literacy varies across demographic groups, leading to inequalities.                                                       |
| Special Conditions, Crises, and Risky Behaviors          | Crises disrupt financial behavior, while literacy provides a protective role.                                                       |

An examination of the themes clearly indicates that financial knowledge, financial education, and digitalization occupy a central position within the system. These three core elements emerge as the primary determinants that directly shape individuals' financial behaviors and constitute the fundamental drivers of financial decision-making processes.

The sub-themes derived from the financial literacy literature reveal the coexistence of both enabling (positive) and constraining (negative) effects. On the positive side, financial literacy enhances the effective use of digital financial tools, improves investment decisions, and accelerates the adoption of FinTech and digital payment systems. Moreover, rational investment behavior, saving and planning tendencies, and the development of risk perception represent key individual-level benefits associated with financial literacy. Increased financial knowledge, awareness, and numeracy skills support more informed decision-making, while financial education—particularly when introduced at an early age, integrated into curricula, and reinforced through family influence—plays a critical role in behavioral transformation. In addition, financial literacy facilitates access to finance, enhances financial well-being, and contributes to firm performance, while also promoting women's empowerment and increasing awareness among younger populations. Long-term financial behaviors such as risk management and retirement planning further reflect these positive outcomes.

However, the literature also highlights several limiting factors that constrain the impact of financial literacy. A lack of knowledge, misinformation driven by social media, and decision-making under uncertainty weaken the effective use of digital financial tools. Behavioral and psychological factors, including overconfidence, lack of self-control, and financial anxiety, negatively influence rational decision-making processes. Furthermore, the knowledge-behavior paradox and money illusion demonstrate that financial knowledge does not always translate into actual behavior. Structural issues such as inequality of educational opportunities, limited adoption of Islamic finance due to knowledge gaps, income inequality, and financial exclusion further restrict the effectiveness of financial literacy. From a demographic perspective, gender disparities and socioeconomic inequalities remain significant barriers. Finally, external shocks such as the COVID-19 crisis, along with factors such as addiction, speculative investment behavior, and excessive borrowing, disrupt financial decision-making processes and increase individual vulnerability.

## 5. Comparison of Financial Literacy Literature and FODER (2019) Findings

The Financial Literacy and Inclusion Association (FODER) is a non-governmental organization established in 2012 in Türkiye with the aim of increasing the level of financial literacy and developing the financial awareness ecosystem. FODER's main objective is to build a financially literate society by enhancing savings awareness, strengthening participation in the financial system, and contributing to the expansion of financial education.

In this study, an AI-assisted analysis method was used to identify key themes, and these findings were compared with FODER's 2019 report data. The results largely align with the findings of the 2019 report (Table 7).

**Table 7.** A Comparative Analysis of Financial Literacy Literature and FODER (2019) Findings

| Theme                              | Literature Synthesis                                                                                                          | FODER 2019 (Field Data)                                                                                                                     | Alignment |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Financial Knowledge Level          | Knowledge is a determinant of behavior but does not always translate into action.                                             | Knowledge score is high (75); conceptual knowledge is strong (87%); mathematical knowledge is weak (60).                                    | High      |
| Financial Behavior                 | Behavior is a key determinant of risk tolerance; overconfidence and lack of self-control have negative effects.               | The behavior index declined from 53 to 51 between 2017 and 2019. Although budgeting increased, adherence to the plan decreased.             | High      |
| Financial Education                | Education is a fundamental tool for behavioral change; early and lifelong learning are critical.                              | As education level increases, the financial literacy index rises (No education: 50, Higher education: 57).                                  | High      |
| Socioeconomic Factors              | Education, income, gender, and regional differences directly affect financial literacy.                                       | The index is 57 for employed individuals and 53 for unemployed individuals; perceived knowledge is higher in men (27%) than in women (21%). | High      |
| Financial Inclusion and Well-being | Financial literacy enhances access to finance and well-being; income inequality is a limiting factor.                         | Individuals with no personal income increased from 23% to 30%; 77% of individuals believe an economic crisis is occurring.                  | High      |
| Debt and Savings                   | Low financial literacy increases debt and vulnerability; savings play a protective role.                                      | The proportion of indebted households has increased (48%); the savings rate has changed from 42% to 45%, but methods remain traditional.    | High      |
| Digital Financial Literacy         | Digital tools and FinTech strengthen savings behavior; their importance has increased after COVID-19.                         | Use of internet banking has increased but remains limited to basic transactions (bill payment: 13%).                                        | Moderate  |
| Islamic Financial Literacy         | Religious values provide a cultural framework shaping financial behavior; this is a distinctive theme in the Turkish context. | The report does not include a direct measurement of Islamic financial literacy.                                                             | Scope Gap |

**Source:** Created by the authors.

Table 7 shows that there is a generally high level of alignment between the financial literacy literature and FODER (2019) field findings. In particular, the themes of financial knowledge, behavior, education, socioeconomic factors, financial inclusion, debt, and savings largely overlap between the literature and the empirical data. The most important finding is that a high level of financial knowledge does not always translate into appropriate financial behavior, which supports the “knowledge–behavior gap” phenomenon. In digital financial literacy, a partial divergence is observed; while the literature points to more advanced levels of digital usage, FODER (2019) data show that individuals are mostly limited to basic digital banking transactions. Islamic financial literacy, although present in the literature, is not directly measured in the field data. Overall, the findings indicate that financial literacy is a multidimensional construct involving knowledge, behavior, technology, and cultural dimensions.

## 6. Conclusion

The main objective of this study is to identify the core themes in the financial literacy literature in Türkiye. To this end, it proposes a hybrid methodological framework that integrates traditional literature review methods with artificial intelligence. Based on the analysis of 217 academic articles indexed in the Web of Science Core Collection, it is found that financial literacy is not merely a cognitive

knowledge base, but a dynamic and multidimensional construct shaped by behavioral, digital, and sociocultural factors. The findings indicate that eight main themes emerge: digital financial literacy and technology adoption, financial behavior and risk management, financial knowledge and awareness, financial education, Islamic financial literacy, financial inclusion, demographic differences, and crisis-related and risky behaviors.

The comparative analysis of artificial intelligence models (ChatGPT and DeepSeek) shows that both models achieve full overlap in the “high relevance” category, whereas they exhibit meaningful differences in the “moderate relevance” category. This highlights once again the critical role of the human researcher in classifying borderline studies. In addition, the findings confirm that financial knowledge does not always translate into desired financial behavior, and that the knowledge–action gap is moderated by metacognitive and psychological factors such as overconfidence, lack of self-control, and financial anxiety.

While there is a high level of consistency between the literature synthesis and FODER (2019) field data, a partial divergence is observed in the domain of digital financial literacy, where the literature suggests more advanced levels of usage compared to the basic transaction-level practices observed in the field. Islamic financial literacy, although presented as a distinct theme in the literature, emerges as a conceptual gap in empirical field studies where it is not directly measured.

Overall, the proposed AI-assisted hybrid thematic analysis method is an effective tool for accelerating literature synthesis and identifying preliminary themes in large-scale datasets. However, the interpretation, theoretical positioning, and contextualization of themes still require the critical judgment of the human researcher. Future studies may test the applicability of this hybrid approach across different disciplines and larger datasets, while also contributing to the development of standardized scales in subfields such as Islamic financial literacy and digital financial literacy.

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