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Prioritization of factors affecting behavior and financial literacy based on non-linear Bayesian approaches

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ABSTRACT

Background: In this article, considering the growing complexity of financial products and services and the significance of behavior and financial literacy in this process, it is necessary to identify and prioritize the influential factors affecting financial behavior and literacy. Therefore, the aim of this study is to prioritize the factors influencing financial behavior and literacy using non-linear Bayesian approaches.

Methodology: This research is conducted as a quantitative study in the field of applied research. It is of a descriptive nature with a survey method in terms of approach and execution. The study population includes students in accounting vocational schools and universities, university graduates, and individuals who have participated in accounting training courses. The sample size of 384 individuals was determined based on the Cochran formula and using the convenience sampling method.

Findings: Based on the research results, 58 variables influencing financial literacy and behavior were examined and categorized into 8 groups (macro factors, personal characteristics, family characteristics, financial activities, geographical location, teaching method, type of education, and education level). In this study, the prioritization of factors influencing financial behavior and literacy was conducted using Bayesian averaging models.

According to the results, the teaching method had the highest impact (0.611) and the highest probability level (0.916) on the financial literacy variable. The results indicated that macro factors (0.177), personal characteristics (0.245), family characteristics (0.208), financial activities (0.327), geographical location (0.113), type of education (0.457), and education level (0.408) also influenced financial literacy.

Furthermore, the results showed that the education level had the highest impact (0.705) and the highest probability level (0.943) on the financial behavior variable. According to the results, macro factors (0.115), personal characteristics (0.476), family characteristics (0.299), financial activities (0.412), geographical location (0.199), teaching method (0.555), and type of education (0.612) were also influential on financial behavior.

Conclusion: Among the 8 groups of variables, the teaching method had the highest impact and probability on financial literacy, while the education level had the highest impact and probability on financial behavior.

Keywords: Financial literacy, Financial behavior, Financial education, Bayesian averaging.

1. Introduction

Financial literacy and behavior play a crucial role in empowering individuals to gain insights into the financial system (Bantia & Dee, 2022; Akpan Akakpo et al., 2022). Proper financial literacy and behavior can reduce individuals' vulnerability to making poor investment choices regarding hard-earned financial resources (Loomer, 2012; Mirco et al., 2023). Making sound financial decisions has gained increasing importance in the current world (Khawar & Sarwar, 2021), and financial literacy and behavior significantly influence individuals' financial choices (Groman & Menkhoff, 2015; Groman, 2018; Januar et al., 2017).
The 2008 economic recession heightened the focus on financial literacy and education in this area, prompting changes in government approaches and policies to increase awareness of individuals' long-term financial needs (Arianti, 2018; Henager & Kyoud, 2016).

Proper financial behavior requires appropriate education and training in this field (Horvath et al., 2018). According to Sochik (2015), financial literacy is a growing collection of information, skills, and methods that individuals develop throughout their lives. Financial literacy is more than just financial knowledge; it involves the utilization of skills, attitudes, and rational and practical enthusiasm (Serrado & Dinanath, 2016).

Most of the research has found a significant and positive relationship between financial education and financial knowledge (Borden et al., 2008; Labord & Mottner, 2016; Popovich et al., 2020; Harvey, 2019; Kaiser & Menkhoff, 2017; Kaiser et al., 2020; Mandell & Hanson, 2009; Menkhoff, 2019; Stoddard & Urban, 2020; Urban et al., 2018).

The term "financial behavior" refers to the skill of understanding and perceiving the overall impact of financial decisions on an individual's circumstances, such as personal, family, community, and national aspects, as well as decision-making regarding proper cash management, precautionary measures, and planning opportunities (Prasada, 2020). Financial literacy helps individuals with financial knowledge manage household budgets and make tactical investment decisions (Vachira & Kihiu, 2012). Given the aforementioned explanations, the importance of financial literacy education in various stages of education, including primary, secondary, and higher education, becomes evident (Seria et al., 2020; Betty et al., 2020; Clooijz & et al., 2019; Mishra & Kumar, 2019; Koda Moscaroval & Clovia, 2018; Betty & et al., 2015).

The complexity of multiple factors influencing financial literacy and behavior becomes more apparent. Therefore, predictive models must decide on the type of prediction to be employed: 1) point prediction, 2) interval prediction, or 3) probability density prediction. Classical forecasting methods are used in predicting outcomes or specific event times, using interval prediction for future values of variables. In contrast, Bayesian models deal with probability density prediction of future values for the desired variable. It appears that in this case, compared to classical methods, more information about the variable to be predicted will be available.

The main objective of the current research is to prioritize the factors influencing financial behavior and literacy using non-linear Bayesian approaches. The article is structured into 6 sections. After the introduction, which provides an overview, the second section examines the theoretical foundations and theoretical discussions in the area under investigation. The third section explores internal and external empirical foundations. The fourth section presents the research methodology, and in the fifth section, the model estimation and results analysis are performed. Finally, the sixth section presents policy recommendations based on the research findings.

2 -Theoretical

Previous literature consistently considers financial literacy as a reliable and direct predictor of individuals' economic decisions (Houston, 2010; Arn & Zengin, 2016; Strackeljahn et al., 2022). Numerous studies have shown that individuals with higher financial literacy are more likely to engage in desirable financial behaviors, such as savings, mutual fund investments, and stock ownership (Yang et al., 2022). Moreover, individuals with higher financial literacy tend to make more cautious retirement plans (Lusardi & Mitchell, 2007; Clark et al., 2017), exhibit higher levels of self-employment (Rostamkalaei et al., 2019), and make more sustainable investments (Habibi et al., 2020). Financial literacy is considered as a representative of an individual's understanding of financial markets (Boutheina et al., 2021), and families with higher financial complexity perform better in this regard (Abreu, 2010, 2019, 2023). Additionally, some studies have shown that individuals with higher financial

literacy have higher and more relevant levels of education (Xiao et al., 2017).

On the other hand, the lack of financial literacy is associated with undesirable financial behaviors, such as low participation in financial markets (Young, 2010; Van Rooij et al., 2012) and poor investment decisions (Lusardi & Mitchell, 2014). Given the relationship between financial literacy, financial behavior, and well-being, some research has focused on financial education programs with the general goal of increasing individuals' financial literacy (Lusardi, 2019; Kaiser et al., 2021). Considering the significant diversity in individuals' levels of financial literacy, researchers have found that personalized financial education programs tailored to specific groups are more effective than traditional educational approaches (Lusardi & Mitchell, 2014; Cordova et al., 2020).

Indeed, the determinants of financial literacy and behavior are numerous and diverse. These determining factors act as motivators for financial decisions (Jean-Lor & colleagues, 2022). Some major factors have been identified in this area. Psychological factors of individuals have been studied as influential factors (Rammal et al., 2022), as well as family-related factors (Gray et al., 2021). Additionally, some research has focused on the impact of political factors (Kim et al., 2021), while others have explored the role of education (Gray et al., 2021; Duy et al., 2020) and the learning process (Jean-Lor et al., 2022; Damian et al., 2020) in shaping financial literacy and behavior.

Financial education

Financial literacy education is a process that expands consumers' and providers' knowledge of financial products and concepts through information, education, or counseling. By developing their skills and confidence, individuals become more aware of risks and opportunities, enabling them to make better choices and identify effective actions to improve their financial well-being. Each country is currently working on its national strategies for financial literacy education, indicating a systematic approach to enhancing citizens' financial literacy (Kazempour Dizaji et al., 2020).

The educational system in most developing countries has undergone transformation. However, creating instructional and learning methods for success within their frameworks and boundaries requires new specifications. Technology is becoming increasingly crucial in responding to and enabling innovative training and learning outcomes, such as flipped classrooms, Massive Open Online Courses (MOOCs[1]), and intelligent learning. As shown in Diagram (1), the learning revolution is divided into four groups: traditional, digital, e-learning, and intelligent learning (Verma & Singh, 2021; Verma et al., 2021). In traditional education, printed books are used, and students used to go to school with those books, and teachers taught them on blackboards. This method involved physical learning, similar to traditional classroom-based learning (Zhong et al., 2016). Then, digital learning brought significant changes to the educational path, introducing virtual learning. Students were able to learn from various internet resources (Sousa et al., 2017).

3- Empirical foundations

Mirkou et al. (2023) conducted a study on financial literacy and its impact on financial behavior among individuals. They found that financially literate individuals exhibit healthier financial behaviors compared to financially illiterate individuals. The study employed logistic regression techniques on a sample of 3932 students at various educational levels in Ghana. The results indicated that financial literacy is a significant predictor of financial behavior. Additionally, variables such as family characteristics, especially the father's educational background, and discussions about financial issues at home were notable predictors of sound financial behavior.

Veronica (2023) examined the short-term and medium-term effects of financial education on financial behavior. The results revealed that financial education had a modest effect in the short term and a substantial 20% improvement in the long term on the financial behavior of the respondents. Rob and colleagues (2023) found that financial education provided in university settings had a significant impact on the financial behavior of students, but it did not significantly affect their well-being and financial anxiety levels. Khelishrani et al. (2022) investigated the relationship between financial literacy, financial attitudes, and financial behavior among students in Malaysia and Indonesia. The results confirmed a correlation between these two variables and observed a

[1] Massive Open Online Courses

significant difference between the two groups. Marli et al. (2022) concluded that financial education had positive and significant effects on mathematical confidence and financial behavior, with financial behavior being more strongly influenced than self-confidence in the financial domain. Kaiser et al. (2022) conducted a meta-analysis of 76 randomized experiments with a sample size of over 160,000 individuals. Many of these experiments were published in reputable economic and financial journals. The evidence showed that financial education programs have positive effects on financial knowledge and behaviors at the micro-level. Kouladé et al. (2022) demonstrated the relationship between financial literacy and financial behavior among undergraduate students in Nigeria. Prasad and John (2022) confirmed this relationship in Pakistan, and the results showed that financial literacy levels were higher among males compared to females in the context of economic conditions. Eloreaga et al. (2022) examined the relationship between financial literacy and financial behavior in Manila. Popovich and colleagues (2020) found that students who followed a series of self-learning online modules focused on digital learning showed changes in financial attitudes and behaviors.

Tajmir et al. (2022) explored the identification and prioritization of strategies to enhance financial literacy in the capital market. They identified three main variables: changes in financial attitudes, changes in financial behavior, and financial knowledge enhancement, which were the most influential factors in enhancing financial literacy in the capital market.

Alipour et al. (2022) investigated the effect of influential factors on the financial literacy of university students in Gilan province, considering the macroeconomic conditions. Results indicated that factors such as pocket money, lifestyle, parental income, and the university's financial learning system had a significant impact on students' financial literacy. Moreover, gender did not have a significant impact on financial literacy in the context of economic conditions. Khodaparast et al. (2022) designed a financial literacy curriculum for elementary students. Through qualitative research with 12 professors and experts in curriculum planning, economy, and financial affairs at Tehran universities, the proposed model included five factors: curriculum backgrounds, objectives, content, methods, and learner characteristics. The theoretical foundation of this model is the "Tyler rationale." Mohaghegh Kia et al. (2021) explored financial literacy and its relationship with financial behavior and attitudes. They used a descriptive-correlational research method and surveyed all students of the Parandak Higher Education Institute. The findings revealed that students at Parandak Higher Education Institute had relatively good financial literacy levels, and there was a significant relationship between financial literacy, financial behavior, and financial attitudes. Ghaisari et al. (2021) aimed to design a model of behavioral and financial knowledge features of real investors in the stock market. This qualitative research was based on grounded theory, and interviews were conducted with 20 professors from accounting, business management, and finance departments at universities and senior managers and experts at the Tehran Stock Exchange Hall. The model comprised 18 dimensions related to personal beliefs, personality traits, behavioral characteristics, financial knowledge, contextual factors, personal and social values, emotional factors, information and awareness, financial intelligence, intervention conditions, financial institutions, verbal communication, financial anxiety, behavioral biases, risk management, investment decisions, financial education, and the consequences of financial behavior. The findings demonstrated that this model predicted investors' decision-making behavior in the stock market. Kazempour Dizaji et al. (2020) presented a model for financial literacy education in Iran using the grounded theory approach. The sample consisted of experts and professors in accounting and finance. The data were collected through semi-structured interviews, and snowball sampling was used. The model included five main categories: personal, structural, interventionist, and strategies for financial literacy education, as well as the consequences of implementing a sound financial literacy education system. In summary, the studies presented above shed light on the significance of financial literacy in influencing financial behaviors and attitudes among different populations, including students and investors. They highlight the importance of financial education and the design of effective financial literacy programs to promote sound financial decision-making and behavior.

In the final conclusion, theoretical and empirical foundations of the factors influencing financial behavior and literacy can be categorized into 8 main

groups: macroeconomic factors, personal characteristics, family characteristics, financial activities, geographical location, educational methods, type of education, and level of education.

4- Research Methodology

This research is categorized as an applied study based on its objectives. In terms of nature and method, it falls under descriptive research, and in terms of the execution method, it is a survey. The study encompasses two populations. The first population includes students in accounting vocational schools and universities, university graduates, and individuals who have completed accounting courses in training institutes. The sample size for this population was determined to be 384 individuals using Cochran's formula for an infinite population. The research process is presented in Diagram (1).

The item scale used to assess financial literacy consists of 21 questions. The questions were modified and adapted from (Hanson & Olson, 2018; Ismail et al., 2017; Januar et al., 2017; and Khawar & Suroor, 2021). The item scale used to measure financial behavior comprises 29 questions. The dimensions of financial behavior were adapted from (Herawati et al., 2018; Ismail et al., 2017; Poterij et al., 2015; and Khawar & Suroor, 2021). Based on expert opinions and factor coding, the variables of each group have been categorized in the following table:

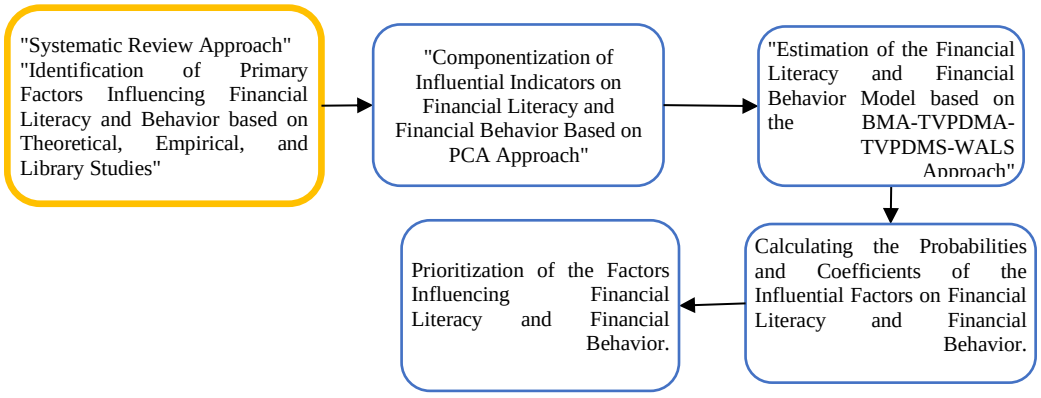


Diagram 1: Conceptual Model of the Research

Table 1: Factors and Sub-factors influencing financial literacy and behavior

Macro factors	1- Inflation 2- Interest rate 3- Economic recession and growth 4- Taxation 5- Savings rate 6- Level of insurance coverage and social security 7- Exchange rate 8- Government size and budget deficit 9- Liquidity
personal characteristics	1- Individual's education level 2- Field of study at university 3- Individual's gender 4- Marital status of the individual 5- Number of children 6- Work experience 7- Age 8- Individual's income 9- Type of occupation 10- Employment status (employed or retired)
Family characteristics	1- Father's education level 2- Father's employment status 3- Father's income 4- Nature of father's occupation 5- Mother's education level 6- Mother's occupation 7- Mother's income 8- Nature of mother's occupation
Financial activity	1- Housing status 2- Car ownership status 3- Participation in financial markets 4- Participation in non-financial markets
geographical location	1- Individual's living location status (city center or suburb) 2- Individual's living location status (living in the 8 metropolises or other cities)
education method	1- Traditional learning 2- Digital learning 3- Electronic learning 4- Intelligent learning
Type of education	1- Family-based education (non-formal education) 2- University education in finance-related fields (non-formal education) 3- On-the-job training (in-service training) 4- National-level education through national media (non-formal education)
Level of education	1- Elementary school 2- Middle school 3- High school 4- Higher education

Unlike the classical method that relies on statistical inference to test statistical significance, the Bayesian method is based on probabilistic analysis and probability distributions. The Bayesian method is founded on Bayes' theorem, which itself is based on inductive logic. Unlike classical logic where "if the hypothesis is true, the conclusion will definitely be true," in inductive logic, the validity becomes probabilistic, and the accuracy of results depends on the number of interpretations and models where the hypothesis holds (Gower, 1997). Considering the introduced variables, one might wonder how the model will be examined in case of potential issues like multicollinearity. The crucial point in this approach is that such issues do not pose a problem for the model. In this method, given that the presence or absence of each variable can impact the effect and even the significance of the variables within the model, Bayesian averaging is utilized to identify the variables that have an impact in the presence of all possible variables. The difference between this approach and the traditional regression approach is illustrated in the following diagram:

As can be observed, in the classical method, only one sampling will be performed, while in the Bayesian approach, due to the property of resampling, this process will be repeated until reaching the optimal threshold level and identifying significant variables. Consequently, model specification errors will be eliminated in this method. The chart below illustrates the coding process of this model based on the flowchart (Nasiri et al., 2023).

As observed, as long as the probability of a variable's presence in the optimal model does not exceed the threshold level, the model estimation will continue. Therefore, only variables that meet the threshold criteria will be present in the model. The optimization process for the optimal model will be conducted as depicted in the following figure.

As observed, the Bayesian Model Averaging (BMA) has the capability to combine three distributions from three optimal models and create a joint distribution from them to increase accuracy and improve estimation.

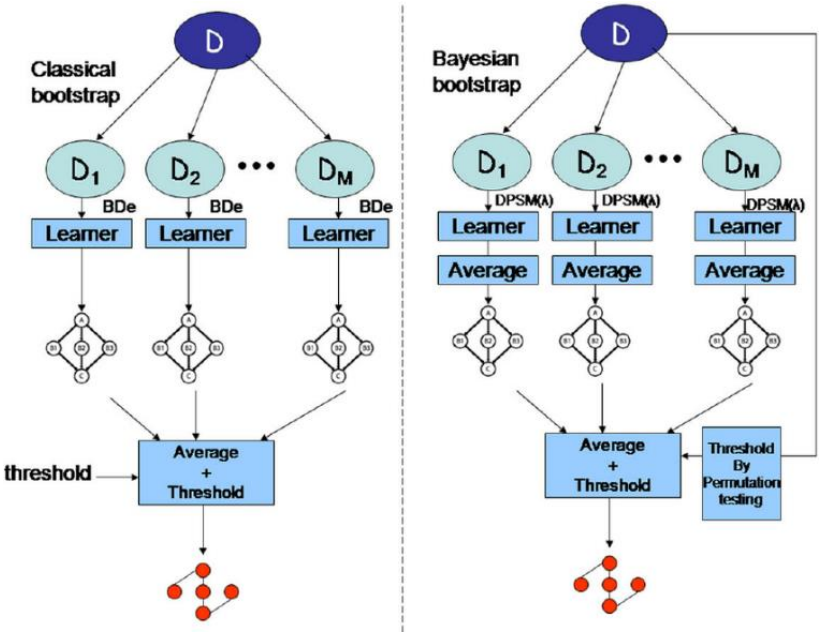


Diagram 2 : Comparison between BMA and Traditional Models

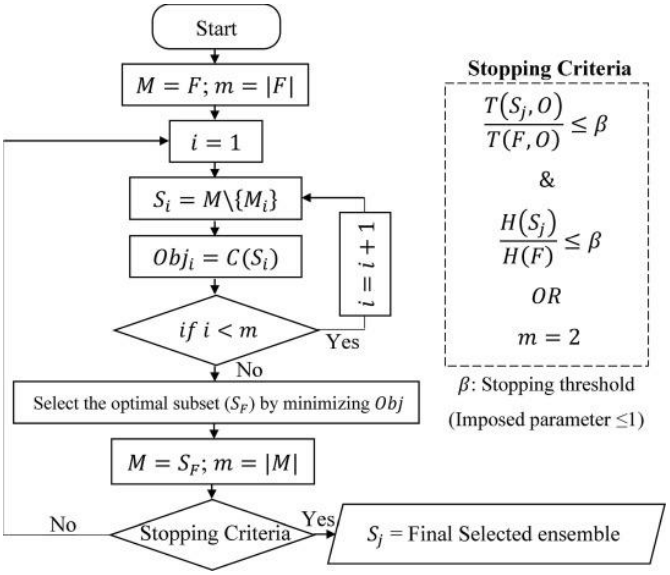


Diagram 3: Algorithm of BMA model

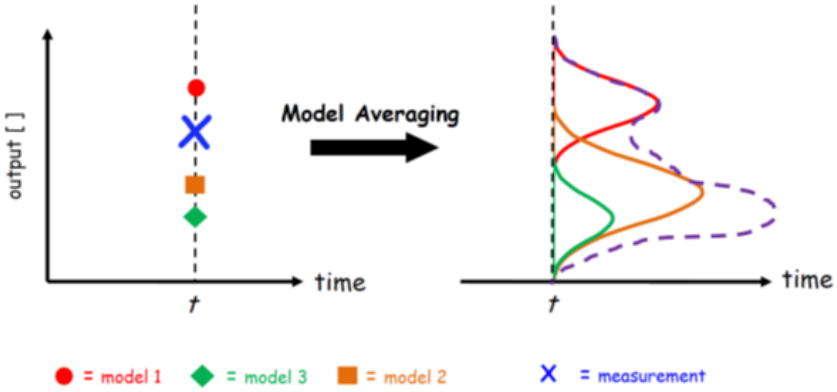


Diagram 4: Average process in optimal models by BMA model

5- Estimation of the model

PCA (Principal Component Analysis) will be utilized for indexing the 8 major variables from the variables of macroeconomic factors, personal characteristics, family characteristics, financial activities, geographical location, teaching method, type of education, and level of education. The software used for this purpose is EViews 12. The number of extracted components in each model is equal to the number of variables under investigation; however, a specific number of these components can be selected. Usually, the first two or three components capture a considerable amount of data variability, making the selection of two or three first components sufficient for further analysis. Nevertheless, in some cases, it is necessary to consider other criteria for finding the required number of components. These criteria include:

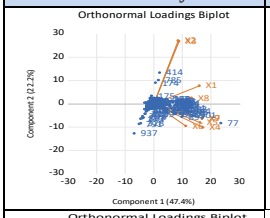
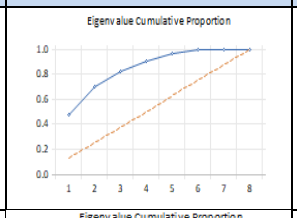
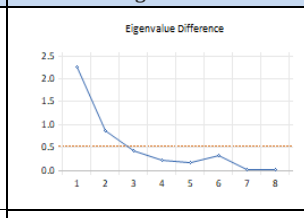
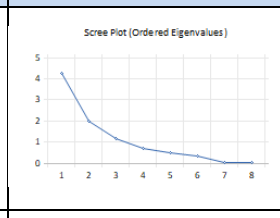
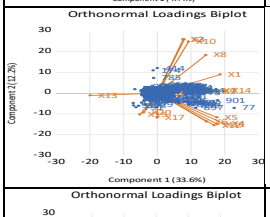
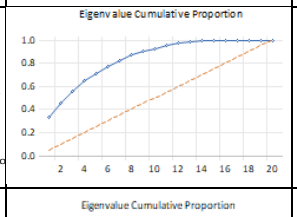
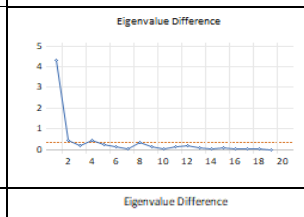
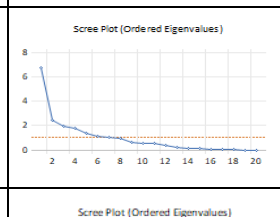
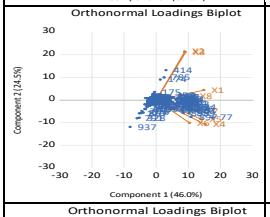
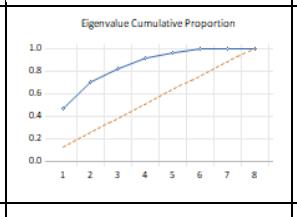
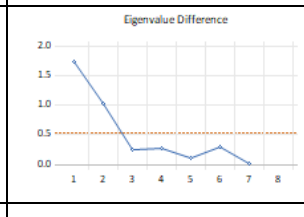
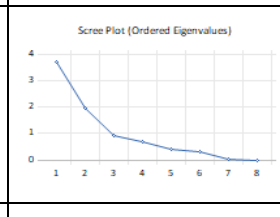
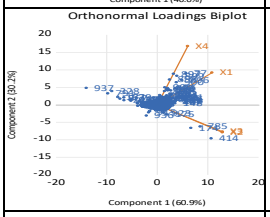
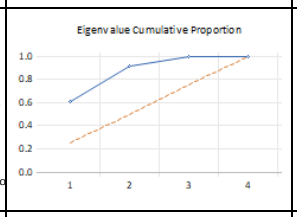
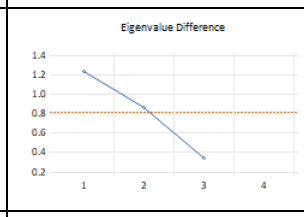
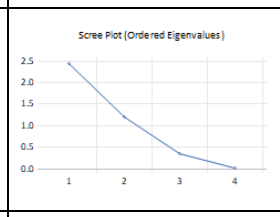
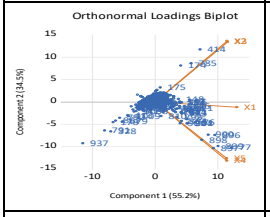
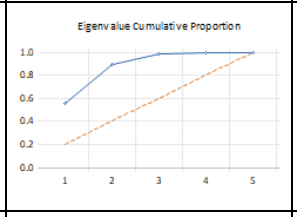
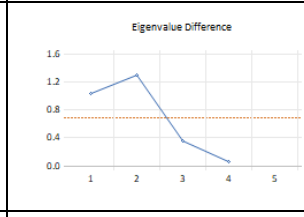
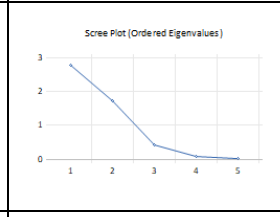
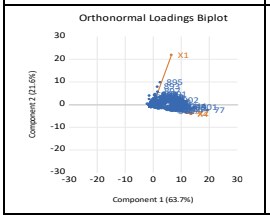
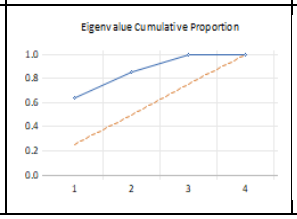
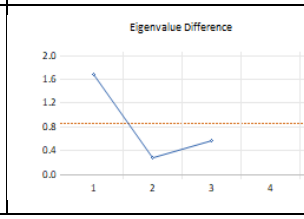
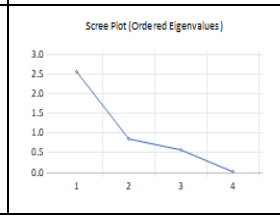
Scree Plot: It illustrates the eigenvalues against the associated principal components. This plot shows the variation in the importance of the eigenvalues for each principal component. The breaking point indicates the maximum number of principal components that should be considered. Choosing one PC less than the breakpoint value can also be appropriate. Based on Table (2), one can select either

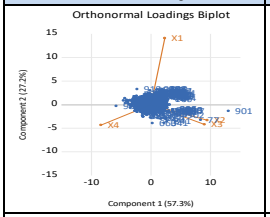
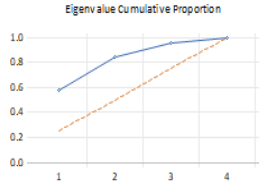
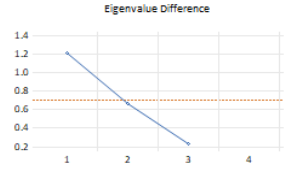
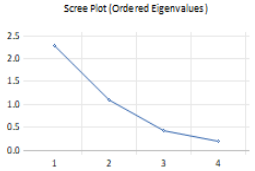
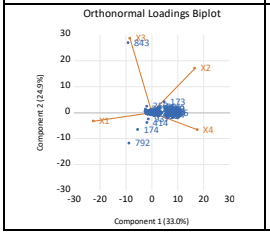
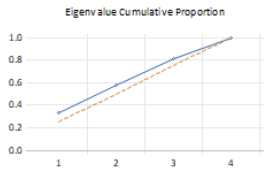
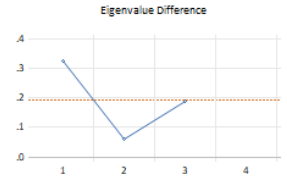
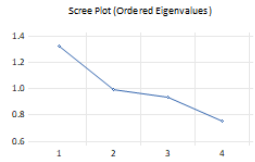
the first principal component or the first two principal components.

Eigenvalue: It considers the components whose eigenvalue is greater than one and disregards the others.

Variance: It considers the components that explain a higher percentage of the variability and are usually sufficient for further analysis. Typically, the first component captures the most variance.

Table 2: Output results of principal component analysis of 8 factors

variance analysis	Variance	Eigenvalue	Scree Plot	Test type
				*Macro factors*
				*personal characteristics*
				Family characteristics
				Financial activity
				geographical location
				education method

variance analysis	Variance	Eigenvalue	Scree Plot	Test type
				Type of education
				Level of education

After indexing the research variables, the relationships between these variables and financial literacy and financial behavior will be simulated. In recent decades, a part of the financial literature has examined the amount of information necessary to achieve robust estimates for predicting economic and financial variables (numerous researches). Among the significant achievements in this regard is the use of various econometric methods for harnessing information from large datasets (big data) for prediction purposes. In such an approach, factor models have received much attention, and their use has become quite common. Factor models condense information from a large dataset (big data) of indicators into a small number of unobservable underlying factors. The process of combining Bayesian models is described in the following diagram:

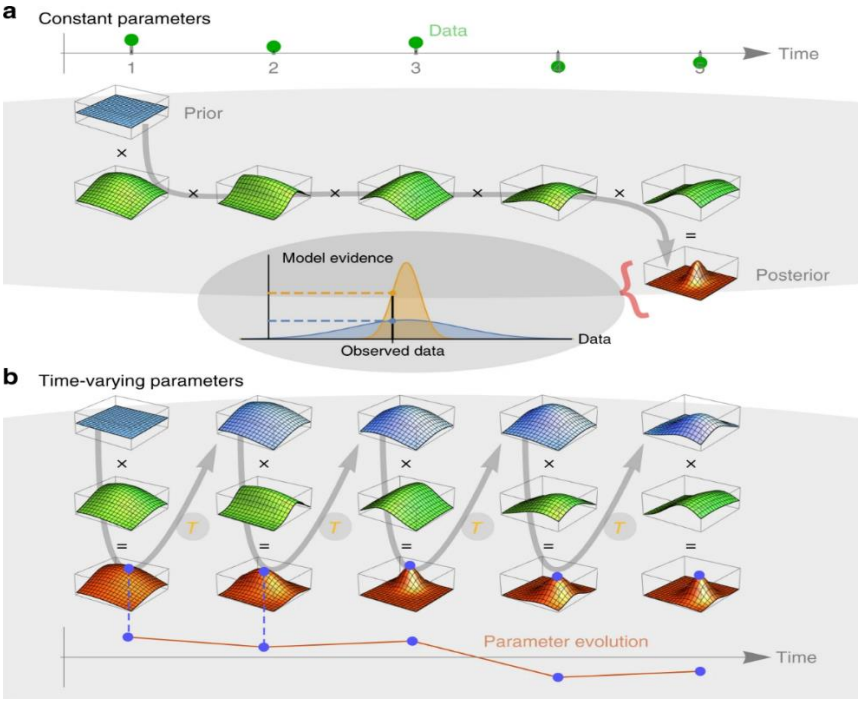


Diagram 5: The formation process of Bayesian models
Source: Mark et al. 2018

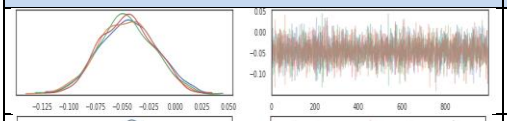
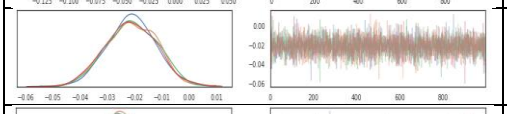
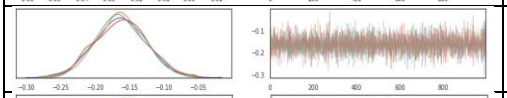
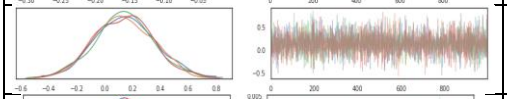
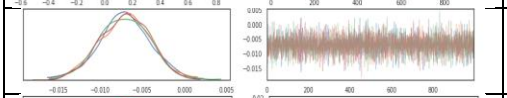
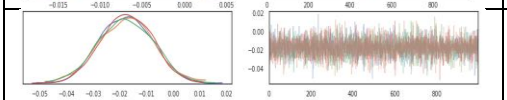
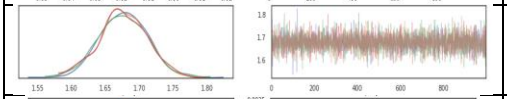
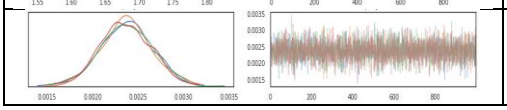
A. In Bayesian models, using the Bayes' theorem, for a model with fixed parameters, the prior distribution (blue) is multiplied by the likelihood function (green; new data) to obtain the posterior distribution (red) directly.

B. For a model with time-varying parameters, the multiplication of the prior distribution (blue) and the likelihood function (green) is performed separately for each time step. Between time steps, the posterior distribution (red) is transformed according to the model in the next time period to reflect the probabilistic changes in the parameters. The results of the Bayesian model are presented in the table and chart below.

In the above table, a simulation of the behaviors of influential components on financial literacy has been conducted using the Bayesian averaging approach. In this approach, we increased the number of simulation iterations to assess the impact of variables on financial literacy. The results indicate that with an increase in the number of simulations, the accuracy of matching simulated data with actual data has improved. Based on the results, the teaching method has the highest impact (0.611) and the highest probability level (0.916) on the financial literacy variable. Regarding the macroeconomic factors, it has a 0.177 impact; personal characteristics have a 0.245 impact; family characteristics have a 0.208 impact; financial activities have a 0.327 impact; geographical location has a 0.113 impact; type of education has a 0.457 impact; and education level has a 0.408 impact on financial literacy.

To ensure the stability of coefficient signs, the estimation has been repeated 1000 times and the results are displayed. Insignificant coefficients in the variables are observed with white dots. Therefore, the research results for variables with the fewest white dots are considered to be more reliable and dependable.

Table 3: Bayesian averaging model results for financial literacy

Distribution	Priority	The second sample includes 1000 simulation repetitions		The first sample includes 200 simulation repetitions		variable
		posterior probability	posterior coefficient	Previous probability	previous coefficient	
	7	0.511	0.177	0.417	0.165	*Macro factors (X1)*
	5	0.674	0.245	0.534	0.223	*personal characteristics (X2)*
	6	0.588	0.208	0.442	0.177	Family characteristics (X3)
	4	0.745	0.327	0.453	0.309	Financial activity (X4)
	8	0.493	0.113	0.442	0.087	geographical location (X5)
	1	0.916	0.611	0.794	0.556	education method (X6)
	2	0.862	0.457	0.543	0.409	Type of education(X7)
	3	0.823	0.808	0.698	0.387	Level of education (X8)

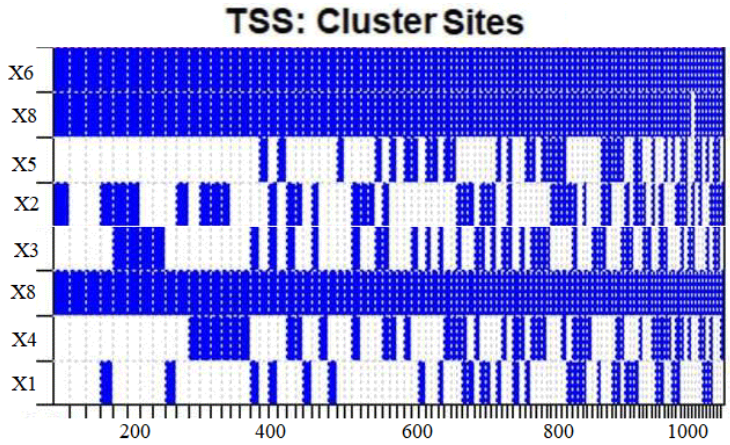
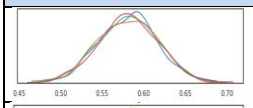
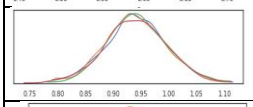
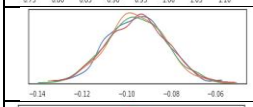
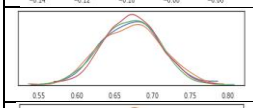
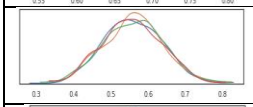
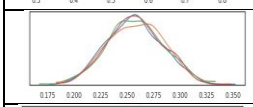
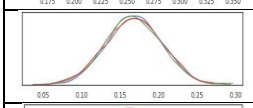
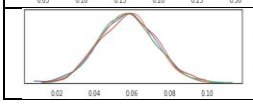


Diagram 6: The sign process of the estimated coefficients in the Bayesian averaging model in 1000 iterations

Table 4: Results of Bayesian averaging model for financial behavior

Distribution	Priority	The second sample includes 1000 simulation repetitions		The first sample includes 200 simulation repetitions		variable
		posterior probability	posterior coefficient	Previous probability	posterior probability	posterior coefficient
	8	0.452	0.115	0.422	0.104	*Macro factors (X1)*
	4	0.761	0.476	0.682	0.443	*personal characteristics (X2)*
	6	0.552	0.299	0.521	0.281	Family characteristics (X3)
	5	0.701	0.412	0.622	0.375	Financial activity (X4)
	7	0.288	0.199	0.465	0.173	geographical location (X5)
	3	0.805	0.555	0.794	0.501	education method (X6)
	2	0.882	0.612	0.693	0.542	Type of education(X7)
	1	0.943	0.705	0.712	0.687	Level of education (X8)

The table above examines the simulation of factors influencing financial behavior using the Bayesian averaging approach. In this approach, we increased the number of simulation iterations to assess the impact of variables on financial literacy. The results indicate that with an increase in the number of simulations, the

accuracy of matching simulation data with real data has improved. Based on the results, Education Level has the highest impact (0.705) and the highest probability (0.943) on financial behavior. Moreover, the findings show that Macro Factors (0.115), Personal Characteristics (0.476), Family Characteristics (0.299), Financial Activities (0.412), Geographic Location (0.199), Educational Approach (0.555), and Type of Education (0.612) significantly affect financial behavior. The model stability results are provided over 1000 iterations.

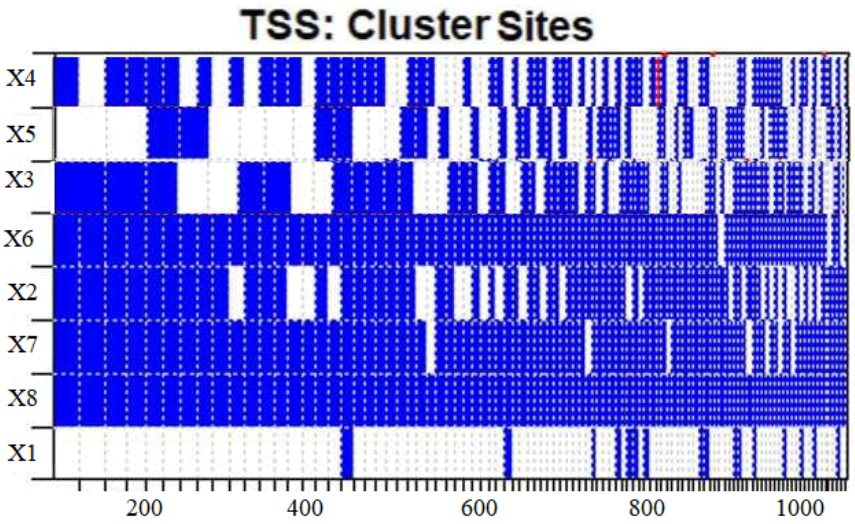


Diagram 7: The sign process of the estimated coefficients in the Bayesian averaging model in 1000 iterations

6-Summary and suggestions

Based on the research results, 58 variables affecting financial literacy and behavior were investigated within 8 groups (Macro Factors, Personal Characteristics, Family Characteristics, Financial Activities, Geographic Location, Educational Approach, Type of Education, and Education Level) using the Bayesian averaging model approach. The findings indicate that Educational Approach has the highest impact (0.611) and the highest probability (0.916) on financial literacy. The results suggest that Macro Factors (0.177), Personal Characteristics (0.245), Family Characteristics (0.208), Financial Activities (0.327), Geographic Location (0.113), Type of Education (0.457), and Education Level (0.408) significantly affect financial literacy. Additionally, the research reveals that Education Level has the highest impact (0.705) and the highest probability (0.943) on financial behavior. The results suggest that Macro Factors (0.115), Personal Characteristics (0.476), Family Characteristics (0.299), Financial Activities (0.412), Geographic Location (0.199), Educational Approach (0.555), and Type of Education (0.612) significantly affect financial behavior. As can be seen, the education process plays an important role in promoting financial literacy and behavior. The importance of this index is such that in some countries the content of financial literacy is included in subjects such as mathematics, social sciences, economics, politics, and economics, and financial literacy is taught in combination with other subjects. In some other countries, financial literacy is considered as an independent curriculum unit and separate from other subjects. However, whether financial literacy is considered as an independent subject or is taught in the form of other subjects, the educational system needs a model that draws a framework for the content of financial literacy in each level of education in order to create a coherent and planned approach. Determine the curriculum elements and determine the content. In other words, considering that education is the main pillar of learning; It is necessary to pay special attention to this element. Considering the significance of the influence of personal and family factors on financial literacy and behavior, policies of internalizing genuine religious and moral values in the

economic and professional field, such as the value of work and effort, lawful acquisition, avoiding extravagance and wastage; 2. Attention to the formation and development of the correct consumption pattern; 3. Attention to entrepreneurship; 4. Paying attention to the acquisition of general competencies, a prerequisite for professional and economic growth; 5. Emphasizing the acquisition of moral qualifications; 6. Acquiring appropriate skills in order to solve their individual and group problems in relation to family, society and work environment should be considered. On the other hand, due to the significant impact of macroeconomic variables on the process of knowledge and financial literacy, the implementation of policies to create economic stability and improve the business environment should be on the agenda of the government. Reducing the level of uncertainty in the economy provides the possibility of predicting and benefiting from the level of financial literacy and knowledge in the society. Because uncertainty in the economic environment eliminates the possibility of calculating risk and return distribution by investors; which practically causes the financial literacy and behavior of investors and economic activists to be ineffective in analyzing financial issues. What can be inferred from the research results; The multidimensionality of the influencing factors on financial literacy and behavior; As a result, in order to improve the situation of these components in the society, it is necessary to take advantage of a systemic perspective; The system perspective is based on the thinking that the characteristics of a system arise from the combinations between its components, not from their activities. Therefore, based on a systemic point of view, it is possible to design a process in the society in the field of improving financial literacy and behavior so that the performance of its components are not in contradiction with each other. Based on the results of this research, in order to improve the components of financial literacy and behavior, there is a need for a coordinated and collective movement of actors in this field (educational system, society, family, government and the individual). This research is in line with the findings of other studies conducted by Mirko et al. (2023), Veronica (2023), Rob et al. (2023), Khalishrani et al. (2022), Marley et al. (2022), Koladeh et al. (2022), Prasada and John (2022), Eloriaga et al. (2022), Kaiser et al. (2022), Popovic et al. (2020), Khodapanah et al. (2021), Mohaghegh Kia et al. (2021), Ghaisari et al. (2020), and Kazempour Dizaji et al. (2020), confirming their results. Based on the research findings, the following recommendations can be proposed.

Financial education programs should have clear objectives and an evaluation method that measures both knowledge enhancement and behavioral changes to ensure that these programs have desirable effects on participants' financial behavior. Therefore, designing AI-based systems that assess the financial education process should be on the agenda of policymakers and managers in this field.

To enhance financial literacy, paying more attention to understanding the capabilities of ATMs, familiarizing children with their parents' insurance coverage, knowing the coverage of various health and service insurances suitable for different occupations, understanding the impact of inflation on purchasing power, and recognizing the effects of mismanagement on individuals' credit history are essential.

Given the impact of educational indicators on financial literacy and behavior, enriching the curriculum in mathematics, social studies, and information technology with financial literacy content, providing access to educational resources, involving teachers in the development of financial literacy curriculum, fostering collaboration between financial organizations and education institutions, promoting exchange of ideas and teaching methods between classrooms and schools, fostering cooperation among organizations to promote educational innovations in financial literacy, engaging with financial education centers and institutions, and expanding and equipping financial education resources and facilities are among the identified strategies for promoting financial literacy and behavior. These strategies should be prioritized and incorporated into the agenda for action.

In the field of social preparedness, changing beliefs and attitudes of people is achieved through awareness-raising and active participation. In terms of facilities, the proper procurement, production, and timely distribution of facilities are of great importance.

Given that the implementation of the financial literacy curriculum requires comprehensive attention to curriculum elements such as objectives, content, methods, and assessment, it is essential that these elements go through a cyclical process. Starting with the objectives, the process should move through content and methods before reaching the assessment

phase. Feedback obtained from the assessment should then be used to review and revise the objectives and content accordingly.

Achieving the goals and expected competencies in the field of financial literacy requires attention to the education system and the provision of educational facilities, among other factors. The design of a suitable model in the domain of financial literacy can serve as a guide for curriculum planning, implementation, and evaluation. The development and design of textbooks for this course should be based on the extracted objectives of financial literacy, including the enhancement of financial knowledge (awareness of market mechanisms, financial services and their characteristics, interest, rent, dividends, shares, etc.), improvement of financial skills (optimal use of new technologies, entrepreneurial and self-employment skills, financial competence, dealing with financial service institutions), enhancement of financial management skills (informed judgment in financial matters, well-planned financial planning, prioritizing and budgeting expenses, investment skills, personal financial problem-solving skills), fostering financial responsibility (controlling personal and financial information for safety, understanding rights and responsibilities for increased financial accountability), improving decision-making skills (financial decision-making power, financial problem-solving skills, career choices and readiness, obtaining and evaluating financial information from various sources, critical thinking and analytical reasoning), and fostering financial confidence (strengthening self-confidence in financial management, nurturing financial capacities and competencies).

The development of content for textbooks in various courses to enhance financial literacy and skills includes both general and specific concepts such as: Incomes and Professions: Familiarization with income generation methods, various occupations, strategies to increase income and job opportunities, entrepreneurship, taxation, social security programs, criteria for career selection, skill development based on individual interests, factors influencing income, and currency exchange. Money Management and Savings: Understanding the concept of scarcity, decision-making and expenditure, the role of advertising and social pressure, fundamental principles of budgeting and financial planning, prioritizing needs and wants, payment methods for goods and services, comparisons, reasons and methods for saving, and banking services. Financial Investment: Understanding the differences between saving and financial investment, exploring various types of investments, and calculating investment returns. Risk Management: Introduction to the concept of risk, providing methods for risk protection or reduction, and discussing insurance and insurance premiums. Credit and Debt Management: Addressing payment and expenditure management, loans, and loan interest. By incorporating these comprehensive and detailed concepts into the curriculum, individuals can enhance their financial literacy and skills, empowering them to make informed and responsible financial decisions in both personal and professional aspects of their lives.

Utilizing teaching-learning activities in financial education involves various methods to enhance engagement and comprehension, including: Participatory Methods: Brainstorming, group discussions, and interactive sessions to encourage active participation and exchange of ideas. Direct Methods: Lectures and question-answer sessions for straightforward information delivery and clarification. Indirect Methods: Using children's stories, literature, songs, proverbs, and case analysis to indirectly introduce financial concepts. Deep Learning: Focusing on personal capabilities and required skills for in-depth understanding and application. Observational Learning: Providing real-life experiences, interactions with different professions and businesses, and increasing social interactions to facilitate learning. Experimental Methods: Role-playing, educational games, and simulations of real-life situations to make learning more practical and enjoyable. Active Learning: Incorporating daily exercises, problem-solving activities, self-awareness of abilities, project-based learning, and individual/group research to encourage active involvement. Visual and Auditory Methods: Utilizing the internet, educational tools such as computer games, slides, etc., to provide visual and auditory aids for effective learning. By employing these diverse teaching-learning methods, individuals can develop a comprehensive understanding of financial concepts and practices, enabling them to make informed financial decisions and manage their financial affairs more effectively.

It is recommended to develop national standards for personal financial literacy education. Additionally, a specific framework should be designed for assessing

and evaluating financial literacy curriculum programs. Furthermore, the obstacles and challenges in implementing financial literacy programs should be examined in line with the structure of the education system and the cultural characteristics of the country.

It is suggested that courses in various educational programs undergo review and the curriculum for subjects like mathematics, social studies, and information technology should be enriched with financial literacy content. Furthermore, establishing collaborations between financial institutions and educational organizations would be beneficial. Considering the significant role of families and teachers in financial literacy education and the impact of their financial literacy level on the effectiveness of financial education, it is recommended to train a skilled workforce for effective implementation of financial literacy curriculum. Additionally, special educational courses on financial literacy should be designed for families to enhance their financial knowledge and behaviors.

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