

Opening the black box of students' economic behavior in higher education: do formal and informal education really matter?

Mohamad Arief Rafsanjani¹, Waspodo Tjipto Subroto¹, Luqman Hakim¹, Handri Dian Wahyudi², Prattana Srisuk³

¹Faculty of Economics and Business, Universitas Negeri Surabaya, Surabaya, Indonesia

²Faculty of Vocational Studies, Universitas Negeri Malang, Malang, Indonesia

³Faculty of International Business Program, Thai Global Business Administration Technological College, Samut Prakan, Thailand

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ABSTRACT

Poor economic behavior and low levels of economic literacy (EL) among university students remain persistent concerns in developing countries, where young adults must navigate increasingly complex economic decisions. Previous studies often conceptualize education as a single construct or examine formal education and family-based learning separately, leaving the psychological mechanisms linking these educational experiences to economic behavior insufficiently understood. Drawing on social cognitive theory (SCT), this study examines the influence of instructional quality as a form of formal education and parental economic socialization as a form of informal education on students' economic behavior, while investigating the mediating roles of EL and self-efficacy (SE). Data were collected from 291 undergraduate students from faculties of economics and business in East Java, Indonesia, and analyzed using partial least squares structural equation modeling (PLS-SEM). The results show that instructional quality and parental economic socialization significantly influence students' economic behavior both directly and indirectly through EL and SE. These findings indicate that students' economic behavior is shaped not only by educational environments but also by cognitive and psychological processes. The study highlights the importance of strengthening collaboration between universities and families to foster EL, SE, and responsible economic decision-making among students.

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Corresponding Author:

Mohamad Arief Rafsanjani

Faculty of Economics and Business, Universitas Negeri Surabaya

Street Ketintang No.2, Surabaya, East Java 60231, Indonesia

Email: mohamadrafsanjani@unesa.ac.id

1. INTRODUCTION

The issue of economic behavior has become crucial in developing countries, including Indonesia. This issue is shaped by several factors. According to previous studies [1], [2], this issue is caused by the limited income. Other scholars [3]–[5] explained that developing countries face unequal access to education and limited access to financial services, which leads to economic behavior problems. These situations increase the complexity in economic decision-making. Furthermore, rapid digitalization and innovations of marketplaces are creating choices regarding goods and services, which simultaneously increases the risk of poor economic decisions. Therefore, understanding the factors influencing economic behavior is increasingly crucial, especially for individuals in developing countries.

The issue of poor economic behavior is relevant for university students. As noted by Kadic-Maglajlic *et al.* [6], university students are in a critical developmental stage between adolescence and

adulthood. Similarly, Bai [7] and Chen *et al.* [8] explained that university students are learning to manage their finances and develop economic behavior independently. If university students do not have adequate financial knowledge and experience, economic behavior can be a major problem for them because of impulsive behavior and other economic decision-making issues [9], [10]. At the same time, previous studies [11], [12] revealed that the lack of economic literacy (EL) among young adults remains a persistent concern in many developing countries. If these challenges are not addressed by the university, students may develop poor economic behaviors that can affect their economic well-being and future stability.

Theoretically, there are two major perspectives to explain economic behavior. First, the neoclassical perspective (NP) assumes that individuals behave like rational agents aiming to maximize their utility given budget constraints, which is called the homo economicus theory [13]–[16]. However, the assumption of the neoclassical theory has been challenged by the theory of behavioral economics, which argues that economic decisions are often subject to influence by various cognitive biases, emotional responses, and social contexts [17]–[20]. These perspectives suggest that economic behavior cannot be understood solely through rational calculations but must also consider psychological and social influences.

According to the social cognitive theory (SCT) by Bandura [21], individual behavior is shaped by the interaction between personal factors and environmental influences. Within the educational context, these factors can be experienced through both formal and informal learning environments. Several previous studies [22]–[24] elucidate that formal education at universities, particularly through high-quality classroom instruction, can enhance students' economic understanding and analytical abilities. Meanwhile, informal education, especially parental economic socialization, plays a crucial role in shaping students' attitudes toward money, spending habits, and financial responsibility through everyday interactions within the family [25]–[27]. To complete the triadic reciprocal mechanism in the SCT, we include EL and self-efficacy (SE), which represent the personal factors within the SCT framework. According to McCowage and Dwyer [28] and Polat [29], individuals with a good level of EL are able to evaluate economic information, compare alternative decisions, and consider the consequences of each choice. Meanwhile, economic self-efficacy reflects an individual's confidence in managing finances, making economic decisions, and confronting risk and uncertainty [30], [31].

The relationships among financial literacy, education, and economic behavior have been extensively explored. However, previous studies often treat education as a single construct or focus on formal education or family-based learning independently. Few studies compare both variables within the same analytical framework. Furthermore, some research has examined the psychological processes through which these educational experiences affect behavior, particularly regarding university students' SE and EL. To close these gaps, this study examines how students' economic behavior is influenced by both formal and informal education, mediated by SE and EL. Understanding whether formal or informal education plays a stronger role in shaping students' economic behavior is essential for designing effective economic education programs in universities.

Furthermore, this study also presents a novel contribution by integrating two main perspectives in behavioral economics, namely NP which emphasizes rational decision making based on utility maximization and resource limitations, and also the behavioral economics perspective (BP) which emphasizes psychological bias (cognitive and emotional bias) in decision making. Previous research often analyzes these viewpoints in isolation, resulting in incomplete explanations of economic behavior. This study creates a more comprehensive framework by merging both frameworks, encompassing not only the rational assessment of costs and benefits but also the cognitive and emotional determinants affecting decision-making. This integrative model offers a more nuanced and realistic comprehension of students' economic decision-making.

This study contributes to the literature in three ways. First, instead of viewing education as a single factor influencing economic behavior, it makes a distinction between formal and informal educational influences. Second, it focuses on college students at a crucial stage of financial independence and offers empirical data in the context of higher education. Third, by combining EL and SE into a single analytical model, it clarifies the mechanisms connecting educational experiences to economic behavior. The results can offer recommendations to enhance curriculum design, teaching methods, and student support (SS) initiatives related to economic decision-making. In the end, this study supports more effective educational policies and student development programs by helping universities better understand how different forms of education (formal and informal education) affect students' economic behavior.

2. METHOD

2.1. Procedure and participants

This study was conducted from October to November 2025 with college students from the Faculty of Business in East Java Province, Indonesia. According to statistical data, East Java Province ranks second in terms of the number of universities in Indonesia. We used a convenience sampling method and distributed

an online questionnaire via WhatsApp and various social media platforms (Instagram and TikTok). Participants were invited in this study voluntarily and without coercion. They were provided with information regarding the purpose of the study, the confidentiality of their personal data, and confirmation that all information provided would be used for research purposes only. In the first phase of data collection (October), 184 students participated, with 18 excluded due to straight-lining patterns or incomplete response items. In the second phase (November), we successfully recruited 136 research participants, and 11 of them were also excluded for the same reasons. Therefore, the total number of research participants in this study was 291 students from the Faculty of Economics and Business in East Java Province, Indonesia.

2.2. Pilot study

Before distributing the research instrument, we conducted a pilot study to assess the clarity, validity, and reliability of the instruments with 50 students at Surabaya State University. At this stage, we also involved experts to review and provide feedback on content validity. Some refinements were made based on expert input on several instrument items. The results showed that the loading factor and Cronbach's alpha values for each item and construct exceeded 0.70, as recommended by Hair and Alamer [32].

2.3. Measurement

All instruments used in the current study were adapted from previous studies, which are available in English. All instruments were translated into Indonesian using the back-to-back translation method to ensure accuracy and to avoid significant meaning changes or ambiguities. The first construct, instructional quality, was measured using the scale developed by Schlesinger *et al.* [33] which comprises three dimensions (cognitive activation or CA, SS, and classroom management or CM) with nine items, exemplified by the item "My lecturer presents challenging tasks." For the second construct, parental economic socialization, we used the questionnaire from LeBaron-Black *et al.* [27] which covers three dimensions (parent economic modelling or PEM, parent-child economic discussion or PED, and experiential economic learning or EEL) and nine items, with a sample item "My parents are good examples of how to make economic decisions."

The third construct, EL, was assessed using the multiple-choice test developed by Walstad *et al.* [34] from the Council for Economic Education of the United States, comprising 20 indicators. The fourth construct, SE, was measured using the generalized self-efficacy (GSE) scale developed by Schwarzer and Jerusalem [35] which comprises 10 items, with a sample item "I am confident that I could deal efficiently with unexpected events." Last, for the economic behavior construct, we adopt the questionnaire from Muhson [36], which covers two dimensions, efficiency and non-consumptive behavior, to assess the NP. From a behavioral economics perspective, we adopt the questionnaire developed by Ritika and Kishor [37], which comprises cognitive and emotional bias dimensions. The instruments for the NP consist of four items, with a sample item "Using pocket money for saving," and six items for the behavioral economic perspective, with a sample item "I usually rely on past experience for my purchasing activity." All items in the questionnaire were measured using a 5-point Likert scale, with response options ranging from 1 (strongly disagree) to 5 (strongly agree).

2.4. Data analysis

The current research employs a structural equation modeling (SEM) with the partial least squares (PLS) approach to examine the research hypotheses. Since the current research is working with the higher-order construct (HOC) of multidimensional variables (instructional quality, parental economic socialization, and economic behavior), where the construct is formed by several lower-order constructs, except for EL and SE, we adopt the disjoint two-stage approach to assess the measurement and structural model [38], [39]. In the first stage, we focused on estimating the measurement model for all lower-order components (LOCs) of the HOC. At this stage, we tested convergent validity using factor loadings and the average variance extracted (AVE), discriminant validity using the heterotrait-monotrait (HTMT) ratio criterion, and internal consistency using Cronbach's alpha and composite reliability. In the second stage, we used the latent variable scores (construct scores) for each LOCs obtained from stage one as indicators to measure the HOCs. Next, a structural model was estimated to test the causal relationships between variables in the research model. In this stage, we tested the structural model using the collinearity bias test (variance inflation factor), the significance of path coefficients, explanatory power (R^2 and f^2), and predictive accuracy (PLS_{predict} procedure).

3. RESULTS

3.1. First stage: measurement model of lower-order components

At stage one, we estimate the validity and reliability of the measurement model for all lower-order constructs. Table 1 indicates that the convergent validity of all lower-order constructs was established, as the factor loadings and AVE exceeded the thresholds of 0.70 and 0.50, respectively. Regarding discriminant

validity, Table 2 also demonstrates that all the HTMT values are under the threshold of 0.85. Meanwhile, the internal consistency reliability of all lower-order constructs, as measured by Cronbach's alpha and composite reliability (ρ_a and ρ_c), also meets the threshold, with values in the range 0.70-0.95. Lastly, we save the construct scores (latent variable scores) of the lower-order construct for later use in measuring the HOC in stage two.

Table 1. Convergent validity and internal consistency reliability in the stage one

Lower-order constructs	Items	Convergent validity		Internal consistency reliability		
		Loadings >0.70	AVE >0.50	Cronbach's alpha 0.70-0.95	Reliability ρ_a 0.70-0.95	Reliability ρ_c 0.70-0.95
CA	CA1	0.919	0.825	0.894	0.895	0.934
	CA2	0.913				
	CA3	0.893				
SS	SS1	0.899	0.799	0.874	0.876	0.923
	SS2	0.903				
	SS3	0.879				
CM	CM1	0.894	0.810	0.883	0.883	0.927
	CM2	0.905				
	CM3	0.901				
PEM	PEM1	0.872	0.774	0.854	0.857	0.911
	PEM2	0.884				
	PEM3	0.883				
PED	PED1	0.837	0.752	0.837	0.860	0.901
	PED2	0.874				
	PED3	0.890				
EEL	EEL1	0.890	0.778	0.858	0.859	0.913
	EEL2	0.887				
	EEL3	0.869				
EL	EL	1.000	0.743	0.962	0.962	0.967
SE	SE1	0.844				
	SE2	0.863				
	SE3	0.855				
	SE4	0.852				
	SE5	0.854				
	SE6	0.876				
	SE7	0.875				
	SE8	0.876				
	SE9	0.870				
	SE10	0.857				
NP	NP1	0.884	0.781	0.907	0.907	0.935
	NP2	0.887				
	NP3	0.891				
	NP4	0.874				
BP	BP1	0.872	0.757	0.936	0.936	0.949
	BP2	0.885				
	BP3	0.858				
	BP4	0.862				
	BP5	0.868				
	BP6	0.876				

Table 2. Discriminant validity (HTMT ratio) in the LOC

Items	CA	SS	CM	PEM	PED	EEL	EL	SE	NP	BP
CA	-									
SS	0.794	-								
CM	0.776	0.814	-							
PEM	0.268	0.240	0.332	-						
PED	0.307	0.787	0.307	0.787	-					
EEL	0.306	0.303	0.352	0.789	0.802	-				
EL	0.515	0.509	0.545	0.378	0.408	0.404	-			
SE	0.446	0.437	0.437	0.270	0.258	0.260	0.440	-		
NP	0.729	0.724	0.752	0.522	0.533	0.525	0.661	0.660	-	
BP	0.758	0.747	0.785	0.497	0.513	0.507	0.658	0.641	0.804	-

3.2. Second stage: measurement model of higher-order construct

As explained in the literature review, the variables of instructional quality, parental economic socialization, and economic behavior are HOCs or multidimensional variables that are formed by lower-order constructs (dimensions), except for EL and SE, which are unidimensional variables. Therefore, at stage two,

we assess the measurement model of the HOCs using construct scores (latent score) obtained from stage one. The results in Table 3 indicate that all indicators meet convergent validity, as the loadings and AVE exceed 0.70 and 0.50, respectively. Furthermore, the discriminant validity was assessed through the HTMT in Table 4, which also met the critical value (<0.85). Meanwhile, internal consistency reliability was established, as Cronbach's alpha and composite reliability (ρ_a and ρ_c) met the threshold, in the range of 0.70 to 0.95.

Table 3. Convergent validity and internal consistency reliability in the stage two

Variables	Indicators	Convergent validity		Internal consistency reliability		
		Loadings >0.70	AVE >0.50	Cronbach's alpha 0.70-0.95	Reliability ρ_a 0.70-0.95	Reliability ρ_c 0.70-0.95
Instructional quality	LV scores-CA	0.954	0.919	0.946	0.876	0.921
	LV scores-SS	0.962				
	LV scores-CM	0.960				
Parental economic socialization	LV scores-PEM	0.941	0.897	0.943	0.893	0.925
	LV scores-PED	0.948				
	LV scores-EEL	0.953				
EL	EL	1.000	-	-	-	-
SE	SE1	0.845	0.743	0.942	0.882	0.917
	SE2	0.863				
	SE3	0.855				
	SE4	0.852				
	SE5	0.854				
	SE6	0.876				
	SE7	0.875				
	SE8	0.876				
	SE9	0.870				
	SE10	0.857				
Economic behavior	LV scores-NP	0.981	0.963	0.931	0.891	0.901
	LV scores-BP	0.981				

Table 4. Discriminant validity (HTMT ratio) in the HOC

Variables	Instructional quality	Parental economic socialization	EL	SE	Economic behavior
Instructional quality	-				
Parental economic socialization	0.314	-			
EL	0.525	0.399	-		
SE	0.441	0.268	0.44	-	
Economic behavior	0.751	0.521	0.658	0.65	-

3.3. Structural model

In the structural model evaluation, we begin by assessing collinearity to ensure that the model is free of correlation among constructs and to avoid bias in the regression results [40]. The result in Table 5 exhibits that the variance inflation factor (VIF) values are below the critical threshold (<3), indicating that the current research model is free from the collinearity issue. This condition ensures the stability and reliability of the estimated path coefficients, thereby allowing for more accurate hypothesis testing.

Table 5. Collinearity statistics (VIF)-structural model

Path	VIF
Instructional quality $\rightarrow$ economic behavior	1.472
Instructional quality $\rightarrow$ EL	1.098
Instructional quality $\rightarrow$ SE	1.380
Parental economic socialization $\rightarrow$ economic behavior	1.203
Parental economic socialization $\rightarrow$ EL	1.098
Parental economic socialization $\rightarrow$ SE	1.196
EL $\rightarrow$ economic behavior	1.574
EL $\rightarrow$ SE	1.479
SE $\rightarrow$ economic behavior	1.327

After ensuring that the research model is free of collinearity, we estimate the research hypotheses using a bootstrap resampling procedure. Table 6 exhibits that all path coefficients for all research hypotheses are positive and significant at $p < 0.05$. These findings indicate that the current study successfully rejected the proposed null hypothesis, confirming that instructional quality, parental economic socialization, EL, and SE are significant antecedent variables that influence economic behavior, both directly and indirectly.

Moreover, the path coefficient (β) of the direct effect of instructional quality and parental economic socialization towards students' economic behavior is 0.418 and 0.209, respectively, indicating a modest and moderate effect size [32]. Meanwhile, the path coefficients for the indirect effects are quite small, 0.035 and 0.021, indicating a weak effect size [32]. Therefore, the direct effect of the antecedent variables (instructional quality and parental economic socialization) toward students' economic behavior was higher than the indirect effect (via EL and SE).

The current study also examines the models' in-sample explanatory power through the coefficient of determination (R^2) and effect size (f^2). The results in Table 7 show that the R^2 values for economic behavior, SE, and EL in the current research model were 0.730, 0.238, and 0.319, indicating that the current model has modest to strong explanatory power [32]. Meanwhile, the effect sizes (f^2) for each path in the current research model range from 0.065 to 0.446, indicating small to large effect sizes [40].

Lastly, we estimate the out-of-sample prediction metrics of the current research model using the PLS_{predict} procedure to evaluate external validity within analogous research design frameworks. This procedure compares the root mean squared error (RMSE) between the actual observation (PLS-SEM) and the naive linear regression model (LM). Table 8 exhibits that all the indicators of the consequent variables in the PLS-SEM produce lower error than the naïve LM benchmark, indicating that the current research model has a strong predictive power, as explained by Hair and Alamer [32].

Table 6. Hypotheses testing

Path		Path coefficient	p-value	Confidence interval	
				2.5%	97.5%
Direct effect	Instructional quality→economic behavior	0.418	0.000	0.343	0.491
	Parental economic socialization→economic behavior	0.209	0.000	0.137	0.281
Indirect effect	Instructional quality→ EL → SE →economic behavior	0.035	0.001	0.017	0.058
	Parental economic socialization→ EL → SE →economic behavior	0.021	0.004	0.009	0.037

Table 7. Model's explanatory power

Constructs	R^2 adjusted	f^2
Economic behavior	0.730**	
SE	0.238**	
EL	0.319**	
Instructional quality→economic behavior		0.446**
Instructional quality→ EL		0.256**
Parental economic socialization→economic behavior		0.137*
Parental economic socialization→ EL		0.089*
EL → SE		0.065*
SE →economic behavior		0.256*

Note: * significance under p -value 0.05; ** significance under p -value 0.000

Table 8. Model's predictive power (PLS_{predict})

Constructs	Indicators	Q ² predict	PLS-SEM-RMSE	LM-RMSE
Economic behavior	LV scores-NP	0.555	0.669	0.683
	LV scores-BP	0.594	0.640	0.653
EL	EL	0.312	6.538	6.663
	SE1	0.129	1.138	1.157
SE	SE2	0.126	1.048	1.060
	SE3	0.137	1.099	1.113
	SE4	0.126	1.114	1.127
	SE5	0.106	1.075	1.091
	SE6	0.151	1.050	1.068
	SE7	0.142	1.080	1.098
	SE8	0.133	1.115	1.130
	SE9	0.152	1.091	1.109
	SE10	0.137	1.056	1.075

4. DISCUSSION

4.1. Direct effect of instructional quality and parental economic socialization on students' economic behavior

This study was motivated by concerns about poor economic behavior among university students in developing countries, including Indonesia. Previous works often examine education as a single construct or analyze formal and informal education separately, leading to the mechanisms linking these educational experiences to economic behavior being insufficiently understood. By examining instructional quality and

parental economic socialization simultaneously, this study addresses this research gap and clarifies how formal and informal education contribute to students' economic decision-making.

The findings in Figure 1 show that the instructional quality is closely related to students' economic behavior. This finding strengthens the previous studies [41], [42], which say students who receive better learning experiences have better knowledge, which in turn leads to better decision-making. The current findings demonstrate that instructional quality plays a crucial role in shaping students' economic behavior, whereby higher instructional quality enhances students' economic understanding and ultimately enables them to make more rational economic decisions. Furthermore, this finding aligns with SCT proposed by Bandura [21], which emphasizes that individual behavior is influenced by environmental factors, as represented in the current study by instructional quality.

Parental economic socialization also evidences a significant effect on students' economic behavior. This result reinforces prior findings [43], [44] highlighting the crucial role of family in shaping students' economic behavior. Children observe and internalize economic decision-making within the family environment through parental modeling, financial discussions, and experiential learning. Parents serve as role models for their children, whose behaviors, including those related to economic decision-making, are frequently observed and emulated. Furthermore, parents transmit economic values and knowledge through open communication within the family, which can foster more responsible economic attitudes and behaviors, as Kim and Torquati [45] found that family communication is closely related to students' financial attitudes. Meanwhile, EEL provided by the parents, such as opportunities to manage their pocket money independently, will cultivate children's abilities in resource allocation, self-control, and rational decision-making. These arguments are consistent with SCT by Bandura [21], which posits that individual behavior is shaped through observational learning. The current findings also align with the experiential learning theory proposed by [46], [47] which posits that direct practice and hands-on experience are more effective in reinforcing knowledge than abstract instruction.

This study also reveals that instructional quality (formal education) shows a stronger effect on economic behavior than parental economic socialization (informal education). This finding reflects the transitional stage that university students experience as they gradually become more independent in managing their finances. During this period, the university learning environment may become a more dominant source of economic knowledge and guidance for decision-making [6]. Therefore, improving instructional quality in higher education is likely to be a critical strategy for strengthening students' economic behavior.

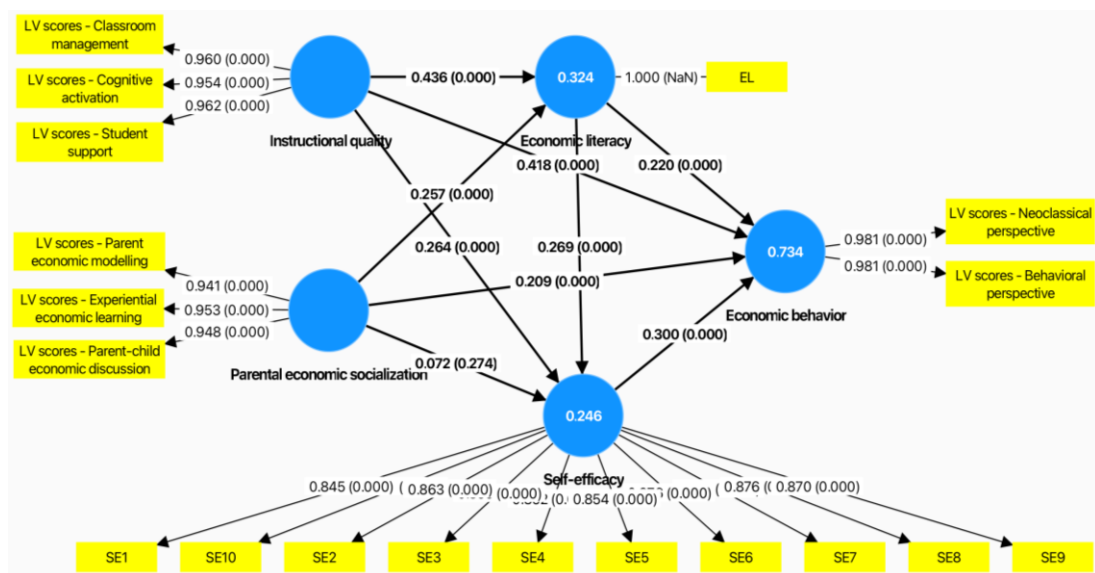


Figure 1. Result of structural model analysis with standardized path coefficient

4.2. Mediating role of economic literacy and self-efficacy

This study also examined the mechanisms linking educational experiences to economic behavior by considering EL and SE as mediating variables. The result shows that both variables play a critical role in explaining how instructional quality and parental economic socialization influence students' economic behavior. In this study, EL functions as a cognitive mediator, whereby high instructional quality fosters

a deeper and more applicable understanding of specific concepts, such as economic concepts [48]. Meanwhile, parental economic socialization, through role modeling, communication, and direct experiences, reinforces students' economic understanding [43], [49]–[51]. Ultimately, EL becomes a valuable resource that enables students to evaluate economic information, compare alternatives, and consider the consequences of their decisions, which in turn shape the rational economic behavior of students [28], [29].

Furthermore, SE serves as a psychological mediator that translates EL into actual economic behavior. As revealed by several researchers [52], [53], a strong understanding of economic concepts enhances students' confidence in making economic decisions. With a high level of SE, students not only understand what should be done economically but also possess the confidence to consistently apply this knowledge in real-life situations. These arguments are consistent with previous research by Srinivasan and Karthikeyan [31] demonstrating that SE plays a significant role in economic decision-making, including the selection of investment instruments. Similarly, the current study is also consistent with Caliendo *et al.* [30], who found that SE plays a crucial role in the identification and exploitation of opportunities as well as the execution of business strategies. Accordingly, instructional quality and parental economic socialization influence students' economic behavior indirectly through the enhancement of EL as a cognitive foundation and SE as a psychological driver in economic decision-making.

Although EL and SE are statistically significant mediators in the research model, their indirect effects are smaller than the direct effects. These findings indicate that students' economic behavior is shaped more strongly by the direct learning experiences and behavioral modelling within educational and family environments than by cognitive and psychological mechanisms. In the higher education context, the quality of instruction seems to affect students' economic behavior by providing structured learning experiences, problem-solving activities, and decision-making situations that let student to practice economic reasoning directly. Similarly, parental economic socialization helps students to develop their economic behavior through everyday financial interaction, such as observing how parents manage resources and discussing financial matters.

4.3. Theoretical contribution

This research contributes by integrating two major perspectives in economic behavior: the NP, which emphasizes rational decision-making based on utility maximization under resource constraints, and the behavioral economics perspective, which highlights the role of cognitive and emotional biases in shaping decisions. These two perspectives are often contrasted and compete in explaining how individuals' economic behavior is formed. The findings of this research show that these two perspectives can be complementary and interdependent, in which individuals do not operate solely as purely rational agents in economic decision-making. Rather, individual decisions emerge from a hybrid process in which decision-making is an outcome of rational evaluation (e.g., cost-benefit analysis and resource considerations) and of psychological mechanisms such as heuristics, overconfidence, affect, and impulsivity. This evidence challenges the strict assumptions of full rationality while also avoiding the extreme position that decisions are entirely irrational.

In this regard, this study advances the literature by proposing a more comprehensive economic behavior framework in which every economic decision-making is the result of rational considerations as well as cognitive and emotional biases. These findings also provide empirical support for the view that rationality deviations in economic decision-making are not random anomalies but rather systematic and predictable patterns. These findings also strengthen the key concept of bounded rationality and Prospect Theory. Therefore, this study bridges the gap between the utility-maximization-based NP and the psychologically based behavioral economic perspective, offering a more realistic representation of economic behavior. Consequently, this study refines existing theoretical models by demonstrating that economic decision-making should be conceptualized as a dynamic interaction between rational calculations and psychological biases.

4.4. Implications

The present study provides several practical implications for universities, lecturers, and parents. First, universities and lecturers can use the current study to develop more efficient financial and economic education programs by improving instructional methods, redesigning the curriculum by incorporating practical activities in economic decision-making, and developing student support programs to enhance students' EL. By implementing these strategies, students are expected to enhance their EL, confidence in managing financial decisions, and positive economic behaviors, which can lead to positive financial and economic outcomes in their future lives.

Second, parents should recognize their crucial role in shaping students' economic behavior. Accordingly, parents are encouraged to serve as positive role models in everyday economic decision-making, foster open communication about financial issues, and provide opportunities for children to engage directly in simple economic management tasks, such as managing their allowance. These practices will strengthen children's learning experiences in economic matters, thereby increasing the likelihood of responsible

economic behavior among students. Therefore, collaboration between universities and parents is needed to create consistent learning environments that support the development of responsible economic behavior among students in the long term.

4.5. Limitations

This study needs to acknowledge several limitations. First, we exclusively use research participants from the faculty of economics and business, who theoretically have more advanced economic knowledge, which may constrain the extent to which current findings on economic behavior can be generalized to samples from other disciplines. Future research should consider enhancing the external validity of the current findings by expanding the sample to a broader range of majors. Second, data from the current study were collected via an online self-administered questionnaire, which may introduce personal bias. In this regard, we recommend future studies to complement the surveys with a guided instruction questionnaire or interview results to mitigate the bias. Finally, the present study uses a cross-sectional research design, which limits the ability to capture the dynamic changes over time. Then, we highly recommend considering the longitudinal research design to validate and extend the current findings.

5. CONCLUSION

The main goal of the present study was to examine the direct effects of instructional quality and parental economic socialization on students' economic behavior, while also examining the mediating role of EL and SE. The findings indicate that instructional quality, as a form of formal education, and parental economic socialization, as a form of informal education, play a crucial role in shaping students' economic behavior. Among these factors, instructional quality has a stronger effect on students' economic behavior than parental economic socialization, suggesting that formal education is increasingly crucial for higher-education students in shaping their economic behavior, rather than informal education.

Moreover, this research confirms that EL and SE mediate the effects of instructional quality and parental economic socialization on students' economic behavior. This finding explained that EL provides the cognitive foundation for evaluating economic choices, and SE strengthens students' confidence in applying this knowledge in real-life decisions. Nonetheless, the indirect effects of EL and SE are smaller than the direct effect of instructional quality and parental economic socialization. This indicates that students' economic behavior is more influenced by direct learning experiences and behavioral modelling than by cognitive and psychological mechanisms. Finally, this study highlights the importance of improving the instructional quality in formal education and family-based economic socialization to foster responsible economic behavior among university students.

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AUTHOR CONTRIBUTIONS STATEMENT

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Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Mohamad Arief Rafsanjani	✓	✓	✓		✓		✓	✓	✓	✓	✓		✓	
Waspodo Tjipto Subroto	✓	✓				✓		✓		✓		✓	✓	✓
Luqman Hakim	✓	✓				✓		✓		✓		✓	✓	
Handri Dian Wahyudi		✓	✓	✓			✓	✓		✓				
Prattana Srisuk	✓			✓		✓	✓	✓		✓		✓		

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare there is no conflict of interest.

ETHICAL APPROVAL

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. All procedures involving human participants complied with internationally recognized standards for research ethics, including respect for participants' autonomy, voluntary participation, informed consent, confidentiality, and protection from harm. Prior to data collection, participants were informed of the study's purpose, their right to withdraw at any time without consequences, and the confidentiality of their responses.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [MAR], upon reasonable request. The data, which contain information that could compromise the privacy of research participants, are not publicly available due to certain restrictions.

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BIOGRAPHIES OF AUTHORS



Mohamad Arief Rafsanjani    is an associate professor at Universitas Negeri Surabaya. He obtained his bachelor's and master's degrees from Universitas Negeri Malang and is currently pursuing a doctoral degree at Universitas Negeri Surabaya. His research interests include economics education, educational psychology, and economic behavior. Until April 2026, he has published 21 research documents indexed in Scopus. He can be contacted at email: mohamadrafsanjani@unesa.ac.id.



Waspodo Tjipto Subroto    is a professor and lecturer in the Economic Education Study Program at the Faculty of Economics and Business, Universitas Negeri Surabaya. He has extensive research experience and has published Scopus-indexed articles across Q1, Q2, Q3, and Q4 journals. In addition, he has authored several books in the fields of macroeconomics, development economics, and regional economics. His primary research interests focus on macroeconomics and development economics. He can be contacted at email: waspodosubroto@unesa.ac.id.



Luqman Hakim    is an associate professor at Universitas Negeri Surabaya. He got his doctoral degree from Universitas Negeri Malang. His research primarily investigates instructional design and assessment in accounting education, digital and gamified learning innovation, psychometric evaluation of educational instruments, student self-regulated learning and engagement, and the role of education in fostering social entrepreneurship and sustainable development goals (SDGs). He can be contacted at email: luqmanhakim@unesa.ac.id.



Handri Dian Wahyudi    is an assistant professor at Universitas Negeri Malang. He obtained his bachelor's degrees from Universitas Negeri Malang and masters' degree from Universitas Gadjah Mada. Currently pursuing a doctoral degree at Universitas Negeri Malang. His recent research interests center on digital marketing and consumer behavior, MSME digital transformation and e-commerce strategy, entrepreneurship and entrepreneurial intention, organizational behavior and work engagement, and educational psychology in higher education contexts. He can be contacted at email: handri.dian.fe@um.ac.id.



Prattana Srisuk    is a lecturer in Business Foreign Languages and serves as the Director of Thai Global Business Administration Technological College (TGBC), Thailand. Her area of expertise lies in foreign language instruction for business contexts. Her research focuses on sustainable development and business development. She can be contacted at email: prattana@tgbc.ac.th.