

The Effectiveness of Non-Traditional Financial Education Models in Changing Students' Financial Behavior: The Mediating Role of Learning Engagement

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ABSTRACT: Financial education has become increasingly important in promoting responsible financial behavior among young adults. However, existing studies have primarily focused on improving financial knowledge and literacy, while the mechanisms through which innovative financial education approaches influence financial behavior remain insufficiently understood. This study investigates the effects of non-traditional financial education models on positive financial behavior by examining the mediating role of financial learning engagement. Drawing upon the Theory of Planned Behavior and Experiential Learning Theory, the proposed research model includes four instructional approaches gamification in financial education, experiential financial learning, financial simulation interactivity and lecture-based learning as antecedents of financial learning engagement, which subsequently influences positive financial behavior. Data were collected from 319 Vietnamese university students who had participated in at least one financial education method and were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results reveal that all four instructional approaches significantly enhance financial learning engagement, with financial simulation interactivity demonstrating the strongest effect, followed by lecture-based learning, experiential financial learning, and gamification in financial education. Financial learning engagement also exerts a significant positive influence on positive financial behavior and mediates the relationships between each instructional approach and behavioral outcomes. These findings suggest that the effectiveness of financial education depends not only on the instructional methods employed but also on their ability to actively engage learners throughout the educational process. The study contributes to the financial education literature by identifying financial learning engagement as a key mechanism linking innovative instructional approaches to behavioral change and provides practical implications for educators, curriculum developers, and policymakers seeking to design more engaging and effective financial education programs.

KEYWORDS: Experiential learning; financial education; financial learning engagement; positive financial behavior.

I. INTRODUCTION

In today's increasingly complex financial environment, fostering financial literacy and responsible financial behavior has become an important educational priority. Financial education is widely recognized as an essential means of equipping individuals with the knowledge, skills, and confidence needed to make informed financial decisions throughout their lives. It also contributes to the achievement of several United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 10 (Reduced Inequalities), and SDG 12 (Responsible Consumption and Production) (Souza et al, 2024). International organizations including the OECD have emphasized that financial education should begin early and continue throughout an individual's educational journey to promote financial well-being, resilience, and sustainable economic behavior. However, despite increasing policy attention and educational initiatives, international evidence continues to report relatively low levels of financial literacy and unsatisfactory financial behavior among students and young adults. While financial education programs have expanded considerably, significant gaps remain regarding how educational interventions can effectively translate financial knowledge into positive financial behavior (Hume et al, 2025). To address these limitations, educators have increasingly shifted from traditional lecture-based instruction toward non-traditional financial education models that emphasize active participation, experiential learning, and technology-enhanced learning environments. These models include gamified learning, simulation-based learning, mobile learning, online interactive platforms, social media learning, and other learner-centered approaches (Amirova, 2025). Compared with conventional instructional methods, non-traditional financial education models

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encourage greater interaction, collaboration, immediate feedback, and authentic problem-solving experiences, all of which may facilitate meaningful learning and behavioral change (Vaaler & Wilhelm, 2019). Nevertheless, existing studies have predominantly examined these approaches in terms of improving financial knowledge or financial literacy, while relatively limited attention has been devoted to understanding whether they effectively promote responsible financial behavior among students. Moreover, previous studies often evaluate individual instructional methods separately, providing limited evidence regarding the mechanisms through which innovative financial education influences students' behavioral outcomes.

Previous research suggests that one possible explanation lies in students' learning engagement. Learning engagement has consistently been identified as a critical determinant of successful educational outcomes and is closely associated with students' motivation, participation, and learning performance. Empirical studies have demonstrated that active and learner-centered instructional approaches significantly enhance students' behavioral, cognitive, and emotional engagement, leading to improved learning outcomes (Han, 2025). Furthermore, learning engagement is strongly influenced by students' learning motivation and instructional experiences. As an active psychological and behavioral state, learning engagement enables learners to devote greater effort, attention, and persistence to educational activities, thereby facilitating the transfer of acquired knowledge into practical application. Within financial education, highly engaged students are more likely to participate actively in financial learning activities, reflect on financial concepts, and apply them to real-life financial decisions. Therefore, learning engagement may represent an important mechanism through which non-traditional financial education models influence students' financial behavior. Despite these theoretical perspectives providing valuable insights into the relationships among instructional approaches, learning engagement, and educational outcomes, several limitations remain in the existing literature. First, previous studies have primarily focused on learning gains, financial knowledge, or financial literacy without sufficiently examining financial behavior as the ultimate educational outcome (Cordero et al., 2022). Second, although non-traditional financial education models have received increasing attention, empirical evidence regarding their effectiveness in changing students' financial behavior remains limited. Third, while numerous studies have confirmed the positive effects of innovative instructional approaches on learning engagement and the subsequent influence of learning engagement on educational outcomes (Lei et al., 2024), the mediating role of learning engagement in the relationship between non-traditional financial education models and students' financial behavior has rarely been examined. Consequently, the underlying mechanism through which innovative financial education contributes to behavioral change remains insufficiently understood.

Therefore, this study investigates the effectiveness of non-traditional financial education models in changing students' financial behavior by examining the mediating role of learning engagement. Specifically, the study explores whether participation in non-traditional financial education models enhances students' learning engagement and whether this increased engagement subsequently leads to more responsible financial behavior. By shifting the focus from financial knowledge acquisition to behavioral transformation, this study contributes to the financial education literature by providing a deeper understanding of the mechanisms through which innovative educational approaches promote sustainable financial behavior. The findings are expected to provide both theoretical contributions to financial education research and practical implications for educators and policymakers in designing more engaging and effective financial education programs. The study is divided into 5 parts including (1) Introduction; (2) Literature review and hypothesis development; (3) Methodology; (4) Results and discussion; and (5) Implications and conclusion.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Theoretical Foundations

The effectiveness of financial education extends beyond the acquisition of financial knowledge to the development of responsible financial behavior. Understanding how educational interventions influence behavioral change therefore requires a theoretical foundation that explains both the formation of behavior and the learning processes through which such behavior develops. Accordingly, this study is grounded in two complementary theoretical perspectives: the Theory of Planned Behavior (TPB) and Experiential Learning Theory (ELT).

The Theory of Planned Behavior proposed by Ajzen (1991) as an extension of the Theory of Reasoned Action is one of the most widely applied theories for explaining and predicting human behavior. According to this theory, an individual's behavior is primarily determined by behavioral intention, which is influenced by three key factors: attitude toward the behavior, subjective norms, and perceived behavioral control (Bosnjak et al., 2020; Nickerson, 2023). Compared with earlier attitude-behavior models, the Theory of Planned Behavior incorporates perceived behavioral control to explain situations in which individuals may face constraints in performing a particular behavior. The theory has been extensively applied in various research fields, including consumer behavior, technology adoption, financial services, and personal financial management, demonstrating its strong

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explanatory power in predicting behavioral outcomes (Lim, 2026). Within the context of financial education, the Theory of Planned Behavior provides an appropriate theoretical foundation for explaining how educational experiences influence students' financial behavior. Financial education can foster favorable attitudes toward responsible financial management, strengthen students' confidence in managing their personal finances, and reinforce social influences that encourage sound financial practices. As these determinants become more positive, students are expected to develop stronger intentions to engage in responsible financial behavior, thereby increasing the likelihood of adopting positive financial practices in their daily lives.

Besides, the Experiential Learning Theory developed by Kolb and further refined by Kolb et al. (2009) conceptualizes learning as a continuous process through which knowledge is created by transforming experience rather than passively receiving information. The theory emphasizes that effective learning occurs when learners actively engage in practical experiences, reflect on those experiences, develop conceptual understanding, and apply newly acquired knowledge in different situations. Learning is therefore regarded as a dynamic and holistic process that integrates cognitive, emotional, and behavioral dimensions while continuously shaping learners' knowledge and future actions (Radianti et al., 2020). The principles of the Experiential Learning Theory are particularly relevant to non-traditional financial education models. Instructional approaches such as gamification in financial education, experiential financial learning, financial simulation interactivity, and interactive classroom activities emphasize active participation, practical application, reflection, and continuous feedback rather than passive knowledge transmission (Bell & Bell, 2020). These learner-centered approaches encourage students to engage more deeply in financial learning activities, construct meaningful financial knowledge through experience, and develop greater confidence in applying financial concepts to real-life financial decisions. Consequently, the Experiential Learning Theory provides an educational perspective for explaining how non-traditional financial education models enhance financial learning engagement and ultimately promote positive financial behavior.

Non-Traditional Education in Finance Sector

The concept of non-traditional education has emerged alongside the diversification of higher education and the increasing recognition that conventional teacher-centered instruction cannot adequately address the needs of all learners. Traditionally, higher education has been designed around students who enter university directly from secondary school and who generally possess the social, cultural, and educational capital necessary to navigate academic environments successfully (Banks, 2015). However, the expansion of higher education has led to the participation of students from more diverse educational, socioeconomic, and cultural backgrounds, including mature learners, first-generation students, working-class students, and other underrepresented groups (Zamecnik et al., 2022). As a result, educational institutions have increasingly adopted non-traditional educational approaches that emphasize learner diversity, active participation, inclusive pedagogy, experiential learning, and flexible instructional environments rather than relying solely on conventional knowledge transmission. Unlike traditional education, which primarily focuses on instructor-centered teaching, non-traditional education recognizes that students possess diverse prior experiences, learning needs, and educational backgrounds. Consequently, effective learning environments should encourage students to actively construct knowledge through meaningful learning experiences while providing appropriate academic support and opportunities for participation. Such learner-centered environments not only facilitate knowledge acquisition but also enhance learners' confidence, sense of belonging, and engagement throughout the educational process (Abraham et al., 2019). By creating inclusive instructional practices that acknowledge students' lived experiences and cultural diversity, non-traditional education aims to improve both learning outcomes and educational equity.

Building upon this educational perspective, non-traditional financial education extends learner-centered instructional principles to the teaching of financial knowledge and financial decision-making (Silber, 2020). Rather than relying exclusively on conventional lectures, non-traditional financial education incorporates instructional approaches that actively involve learners in authentic financial contexts, encourage interaction, and facilitate the practical application of financial concepts. These approaches seek not only to improve financial literacy but also to enhance learners' engagement and promote the development of positive financial behaviors through meaningful educational experiences. Accordingly, this study conceptualizes non-traditional financial education as comprising several instructional approaches that differ in the degree of learner participation and interaction. Specifically, Gamification in Financial Education integrates game elements to increase learners' motivation, engagement, and academic performance in finance education (Montero-Benavides et al., 2025). Experiential Financial Learning emphasizes learning through practical experience and reflection, allowing learners to develop financial competencies by actively engaging with authentic financial situations (Faisal et al., 2026). Financial Simulation Interactivity enables students to practice financial decision-making within interactive simulated environments, thereby strengthening conceptual understanding and

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practical financial skills through experiential learning (Chulkov & Wang, 2020). Finally, Lecture-based Learning represents the conventional instructional approach, in which financial knowledge is primarily delivered through teacher-centered lectures and serves as a benchmark for comparing the effectiveness of more learner-centered instructional models (Zheng et al., 2023).

Financial Behavior

Financial behavior is widely recognized as one of the most important outcomes of financial education because it reflects how individuals apply financial knowledge, skills, and experience to manage their personal finances in everyday life. Rather than representing financial knowledge alone, financial behavior encompasses the actual financial decisions and actions individuals undertake, including budgeting, saving, spending, borrowing, investing, and managing financial risks (Mishra et al., 2024). As financial decision-making becomes increasingly complex, the development of responsible financial behavior has become a central objective of financial education programs, as it enables individuals to improve their financial well-being and make informed financial decisions throughout their lives. Positive financial behaviors refer to financial actions that promote effective money management and contribute to both individual and societal well-being (Yeo et al., 2024). These behaviors reflect individuals' ability to make responsible financial decisions and effectively manage available financial resources in ways that support both short-term financial needs and long-term financial goals. From a societal perspective, responsible financial behaviors contribute to financial stability, reduce financial vulnerability, and promote sustainable economic growth. At the individual level, they are associated with improved financial security, career development, mental and physical well-being, labor productivity, and financial satisfaction (Koskelainen et al., 2023). Individuals who regularly engage in positive financial behaviors are better prepared to cope with financial uncertainty, build financial resilience, avoid excessive debt, and accumulate financial resources for future needs. Consequently, the adoption of positive financial behaviors not only enhances individuals' long-term financial well-being but also supports broader economic sustainability by encouraging responsible consumption and sound financial decision-making. Examples of positive financial behaviors may include maintaining a personal budget, saving regularly, managing credit responsibly, adjusting spending according to changing financial circumstances, monitoring financial transactions, and comparing financial products before making purchasing decisions (Lind et al., 2020). Individuals who actively save create financial buffers that reduce vulnerability to unexpected financial shocks, while responsible credit management helps prevent excessive indebtedness. Likewise, monitoring personal finances and controlling expenditures enable individuals to spend within their financial means and improve overall financial well-being. Comparing alternative financial products and services also allows individuals to make more informed financial decisions and allocate their financial resources more efficiently.

Previous research suggests that positive financial behavior is influenced by several individual characteristics, particularly financial knowledge and financial confidence. Objective financial knowledge refers to an individual's understanding of financial concepts, markets, products, and services (Albarracín et al., 2024), whereas subjective financial knowledge, commonly referred to as financial confidence, reflects individuals' perceived ability to manage financial matters and evaluate financial opportunities and risks. Both objective financial knowledge and financial confidence have been found to contribute directly to financial well-being and indirectly through positive financial behaviors. Individuals with higher levels of financial knowledge are generally more likely to save regularly, avoid unnecessary borrowing, and make sound financial decisions. Similarly, financially confident individuals tend to set financial goals, manage credit responsibly, and engage in other beneficial financial practices, ultimately leading to greater financial satisfaction. Nevertheless, previous studies also indicate that discrepancies between actual financial knowledge and perceived financial confidence may result in overconfidence or underconfidence, leading to differences in financial decision-making and financial behavior (Dikmen et al., 2022). It can be seen that financial behavior represents the practical application of financial capability in everyday life. While financial knowledge provides individuals with the cognitive foundation for making financial decisions, positive financial behavior reflects their ability to translate that knowledge into responsible financial actions. Therefore, promoting positive financial behavior remains one of the primary objectives of contemporary financial education, as it directly contributes to individuals' long-term financial well-being and sustainable financial outcomes.

Financial Learning Engagement

Financial learning engagement is widely recognized as a key factor influencing the effectiveness of financial education and the development of positive financial behavior. Learning engagement generally refers to the extent to which learners actively invest their behavioral, cognitive, and emotional resources in educational activities (Fredricks et al., 2004). In financial education, engagement reflects students' willingness to actively participate in financial learning, maintain attention, exert effort to understand financial concepts, and apply acquired knowledge to practical financial situations. Higher levels of engagement

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enable students to develop stronger financial competencies and increase the likelihood of translating financial knowledge into responsible financial behaviors (de Castro et al., 2021).

Within the context of non-traditional financial education, learning engagement plays an even more critical role. Compared with conventional lecture-based instruction, innovative approaches such as gamification, experiential learning, and financial simulation activities encourage students to actively interact with learning materials, receive immediate feedback, solve authentic financial problems, and reflect on their learning experiences (Bell & Bell, 2020). These learner-centered approaches foster deeper cognitive processing, greater emotional involvement, and sustained behavioral participation throughout the learning process, thereby enhancing students' financial learning experiences. Given these characteristics, financial learning engagement is expected to serve as a crucial mediating mechanism between non-traditional financial education models and students' financial behavior. Students who become more engaged in financial learning are more likely to internalize financial knowledge, develop confidence in managing personal finances, and adopt positive financial behaviors such as budgeting, saving, responsible spending, and informed financial decision-making (de Castro et al., 2021). Therefore, this study conceptualizes financial learning engagement as the extent to which students actively participate, invest effort, maintain interest, and cognitively engage in financial learning activities, thereby facilitating the development of positive financial behavior.

Hypothesis Development

Non-traditional Financial Education Models and Financial Learning Engagement

Gamification in financial education incorporates game elements such as challenges, rewards, competition, points, badges, and immediate feedback into educational activities, transforming learners from passive recipients into active participants. By integrating these interactive features, gamified learning environments increase students' intrinsic motivation, encourage continuous participation, and create enjoyable learning experiences. Through continuous interaction with learning tasks and instant performance feedback, students become more motivated to sustain attention, invest greater effort, and actively engage in the learning process (Huerta-Zavala et al., 2023). Furthermore, gamification promotes active exploration and problem-solving, enabling learners to develop a deeper understanding of financial concepts while maintaining high levels of interest throughout the learning experience. From the perspective of ELT, gamification provides students with opportunities to acquire knowledge through active experimentation, reflection, and immediate feedback rather than passive information acquisition. These learning experiences facilitate greater behavioral, cognitive, and emotional engagement, which are essential components of effective learning. Consequently, gamified financial education is expected to strengthen students' engagement throughout financial learning activities and encourage them to participate more actively in the learning process. Empirical evidence supports this theoretical argument. Montero-Benavides et al. (2025) found that implementing a gamified assessment model in finance education significantly improved students' academic performance while simultaneously enhancing their learning engagement. The authors concluded that game-based instructional elements increased students' motivation, participation, and commitment to learning activities, thereby creating a more engaging and effective educational environment. Similar findings have also suggested that gamification enhances learner engagement by encouraging continuous interaction with educational content and fostering positive learning experiences (Huerta-Zavala et al., 2023). Therefore, the following hypothesis is proposed:

H1: Gamification in financial education positively influences financial learning engagement.

Experiential financial learning emphasizes that knowledge is developed through direct experience, practical application, and continuous reflection. Unlike traditional teaching approaches that primarily rely on theoretical instruction, experiential financial learning encourages students to actively participate in authentic financial situations, analyze real-world problems, and apply acquired knowledge to practical decision-making. Through these activities, learners become more actively involved in the learning process, enabling them to develop a deeper understanding of financial concepts and improve their ability to apply knowledge in different contexts. Such learning experiences are expected to enhance students' cognitive, emotional, and behavioral involvement, thereby strengthening financial learning engagement (Miftahunnajah et al., 2025). In addition, experiential learning promotes continuous interaction between learners and learning activities by encouraging exploration, discussion, collaboration, and reflection. These interactive experiences increase students' motivation to participate, maintain attention throughout the learning process, and develop greater confidence in handling financial issues. As students become more actively engaged in learning through practical experience, they are more likely to demonstrate higher levels of commitment and sustained engagement in financial education. Supporting this argument, Faisal et al. (2026) demonstrated that experiential financial learning promotes endogenous learning mechanisms by encouraging continuous participation, practical problem-solving, and active knowledge construction. Their findings suggest that experiential learning environments facilitate deeper learner involvement and sustained engagement throughout financial learning activities. Similarly, Miftahunnajah et al.

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(2025) argued that experience-based financial learning enhances students' participation and strengthens the effectiveness of financial education by promoting active learning and continuous reflection. Therefore, the following hypothesis is proposed:

H2: Experiential financial learning positively influences financial learning engagement.

Financial simulation interactivity refers to the extent to which learners actively engage with simulated financial environments that replicate real-world financial situations, enabling them to apply theoretical knowledge, make financial decisions, observe outcomes, and receive immediate feedback (Godsk et al., 2025). Compared with conventional instructional approaches, simulation-based learning provides greater opportunities for active participation and repeated practice, facilitating the application of financial concepts in realistic decision-making contexts. Through continuous interaction with simulation activities, learners are expected to demonstrate higher levels of cognitive processing, behavioral participation, and sustained involvement in financial learning. Furthermore, financial simulation interactivity promotes experiential learning by allowing students to evaluate alternative financial decisions and reflect on their outcomes in a risk-free environment. Such interactive learning experiences encourage continuous participation and strengthen students' attention and commitment throughout the learning process. As learners become more actively involved in simulation-based activities, their level of financial learning engagement is expected to increase. Empirical evidence supports this relationship. Chulkov & Wang (2020) found that simulation-based learning significantly enhanced student participation and engagement in finance courses by enabling learners to actively interact with financial decision-making scenarios rather than relying solely on traditional lecture-based instruction. Similarly, Godsk et al. (2025) suggested that interactive simulation environments improve learning effectiveness by promoting active participation, practical application, and continuous feedback. Accordingly, financial simulation interactivity is expected to positively influence students' financial learning engagement. Therefore, the following hypothesis is proposed:

H3: Financial simulation interactivity positively influences financial learning engagement.

Lecture-based learning remains one of the most widely adopted instructional approaches in higher education due to its effectiveness in delivering structured knowledge and fundamental theoretical concepts (Zhang et al., 2024). Although this approach is generally characterized by teacher-centered instruction, it provides learners with systematic explanations, organized content, and clear conceptual frameworks that facilitate knowledge acquisition. In the context of financial education, lecture-based learning enables students to establish a solid understanding of financial principles, terminology, and decision-making concepts before applying them in more interactive learning environments. Such structured instruction may encourage students to participate in classroom discussions, enhance their understanding of financial topics, and maintain sustained engagement throughout the learning process. Furthermore, lecture-based learning can contribute to financial learning engagement when instructional content is delivered effectively and supported by appropriate teaching strategies. Well-organized lectures provide opportunities for students to ask questions, clarify complex financial concepts, and connect theoretical knowledge with practical financial issues. As students gain greater understanding and confidence in financial topics, they are more likely to remain attentive, participate actively in learning activities, and demonstrate higher levels of cognitive and behavioral engagement. Zheng et al. (2023) found that lecture-based learning remains effective in supporting student learning outcomes, although learner-centered approaches may achieve superior educational performance in certain contexts. Their systematic review suggested that well-designed lecture-based instruction continues to contribute positively to students' learning processes and classroom engagement, particularly when integrated with effective instructional strategies. Similarly, Zhang et al. (2024) emphasized that structured lectures continue to play an important role in facilitating knowledge acquisition and promoting students' engagement in higher education. Therefore, the following hypothesis is proposed:

H4: Lecture-based learning positively influences financial learning engagement.

Financial Learning Engagement and Positive Financial Behavior

Financial learning engagement refers to learners' active involvement, commitment, and persistence throughout the financial learning process. It encompasses students' cognitive investment, emotional participation, and behavioral effort in learning activities, enabling them to process financial knowledge more effectively and apply what they have learned to practical financial situations (Xu et al., 2023). Students who are highly engaged are more likely to participate actively in classroom activities, complete learning tasks, reflect on financial concepts, and continuously improve their financial decision-making abilities. As a result, greater engagement is expected to facilitate the translation of financial learning into responsible financial practices. Empirical evidence supports this relationship. de Castro et al. (2021) found that learner engagement significantly enhances students' learning outcomes by encouraging sustained participation, greater learning effort, and continuous involvement throughout the educational process. Their longitudinal study demonstrated that engaged learners are more likely to achieve better academic performance because they devote greater attention and commitment to learning activities, thereby strengthening their ability to internalize and apply acquired knowledge. Positive financial behavior refers to responsible financial

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actions that enable individuals to manage financial resources effectively, including budgeting, saving, responsible spending, and making informed financial decisions. These behaviors contribute to long-term financial well-being by helping individuals maintain financial stability, cope with unexpected financial challenges, and avoid excessive debt. Dare et al. (2023) demonstrated that positive financial behaviors constitute an important pathway through which individuals improve their subjective financial well-being. Their findings indicate that individuals who consistently engage in responsible financial management practices are more likely to experience favorable financial outcomes and greater financial well-being. Based on these arguments, students who actively engage in financial learning are more likely to acquire, internalize, and apply financial knowledge in their daily financial decisions. Higher levels of financial learning engagement therefore increase the likelihood that learners will develop and maintain positive financial behaviors beyond the educational environment.

H5: Financial learning engagement positively influences positive financial behavior.

The Mediating Role of Financial Learning Engagement

Financial learning engagement is increasingly recognized as a critical mechanism through which educational approaches influence learning outcomes and behavioral development. It reflects learners' active participation, cognitive investment, emotional commitment, and behavioral involvement throughout the learning process. Students who demonstrate higher levels of engagement are more likely to devote sustained attention to learning activities, actively interact with instructional materials, participate in discussions, and persist in completing learning tasks (Tran et al., 2025). Such engagement not only facilitates the acquisition of financial knowledge but also encourages learners to critically evaluate financial information, reflect on their learning experiences, and develop confidence in applying financial concepts to real-life situations. Through these continuous learning experiences, learners are better able to internalize financial knowledge, develop practical financial competencies, and transfer acquired knowledge to everyday financial decision-making. Consequently, financial learning engagement is expected to play an important intermediary role in converting instructional experiences into desirable behavioral outcomes.

The effectiveness of non-traditional financial education models largely depends on their ability to actively involve learners rather than merely deliver financial knowledge. Instructional approaches such as gamification, experiential learning, financial simulations, and well-designed lecture-based learning encourage different forms of learner participation and interaction throughout the learning process (Hu et al., 2025). Compared with passive knowledge transmission, these learner-centered approaches promote continuous interaction, collaborative learning, immediate feedback, and practical application, thereby enhancing students' motivation and commitment to learning. As students become more engaged in these educational activities, they are more likely to develop a deeper understanding of financial concepts, maintain stronger motivation to learn, and continuously apply newly acquired knowledge when making financial decisions. Therefore, the influence of these instructional approaches on positive financial behavior is expected to occur, at least in part, through learners' engagement with the financial learning process.

Empirical evidence further supports the importance of learner engagement as an underlying educational mechanism. de Castro et al. (2021) found that learner engagement significantly enhances learning performance by promoting sustained participation, greater learning effort, and continuous involvement throughout the educational process. Their longitudinal study demonstrated that students who maintain higher levels of engagement are more likely to achieve superior learning outcomes because they invest greater cognitive and behavioral effort in learning activities. Similarly, Fredricks et al. (2004) argued that engaged learners exhibit stronger behavioral, emotional, and cognitive involvement, enabling them to achieve more effective learning outcomes and demonstrate greater persistence in educational activities. These findings suggest that learner engagement functions as an important pathway through which educational interventions generate meaningful learning outcomes. Building on these theoretical and empirical arguments, financial learning engagement is expected to mediate the relationship between non-traditional financial education models and positive financial behavior. Specifically, innovative financial education approaches are expected to enhance students' engagement during the learning process, which subsequently facilitates the acquisition and application of financial knowledge and increases the likelihood of adopting responsible financial behaviors in daily life. Accordingly, the mediating role of financial learning engagement provides a theoretical explanation for how different instructional approaches contribute to positive financial behavioral outcomes. Therefore, the following hypotheses are proposed:

H6a: Financial learning engagement mediates the relationship between gamification in financial education and positive financial behavior.

H6b: Financial learning engagement mediates the relationship between experiential financial learning and positive financial behavior.

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H6c: Financial learning engagement mediates the relationship between financial simulation interactivity and positive financial behavior.

H6d: Financial learning engagement mediates the relationship between lecture-based learning and positive financial behavior.

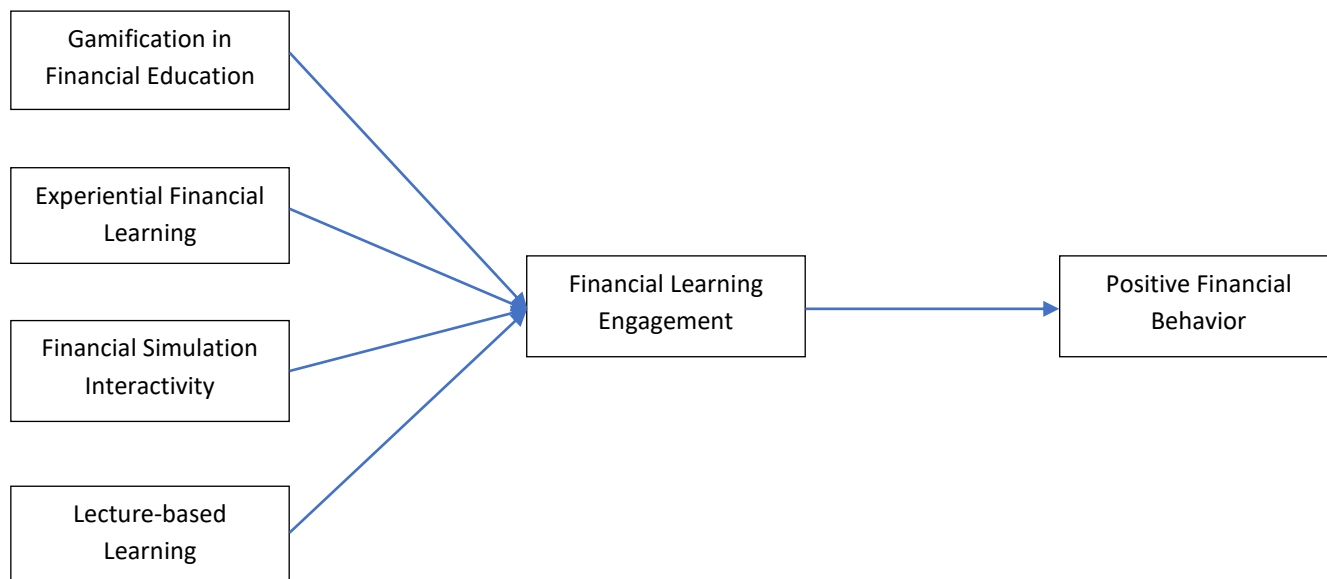


Figure 1. Research Model

III. METHODOLOGY

Measurement and Questionnaire Development

The measurement scales employed in this study were adapted from previously validated studies in the fields of financial education and learning behavior. Specifically, Gamification in Financial Education (GFE) was measured using three items adapted from Montero-Benavides et al. (2025), Experiential Financial Learning (EFL) using four items from Faisal et al. (2026), Financial Simulation Interactivity (FSI) using four items from Chulkov and Wang (2020), Lecture-based Learning (LI) using four items from Zheng et al. (2023). Financial Learning Engagement (FLE) adopted four items from de Castro et al. (2021), and Positive Financial Behavior (PFB) used five items from Dare et al. (2023). The questionnaire consisted of 24 observed variables representing the six constructs in the proposed research model. All constructs were measured using a five-point Likert scale, ranging from 1 - Strongly disagree to 5 - Strongly agree. Prior to the main survey, the questionnaire was pilot-tested to ensure the clarity and appropriateness of the measurement items. After minor revisions, the finalized questionnaire was distributed to Generation Z respondents in Vietnam. The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3 to evaluate the measurement model and test the proposed hypotheses.

Sample, data collection and analysis

Data for this study were collected from students in Vietnam who had participated in at least one financial education method. The unit of analysis was the individual respondent. Therefore, the target respondents were whom had experienced financial education through lecture-based learning, gamification, experiential financial learning, or financial simulation activities, as they were considered capable of evaluating their learning experiences and financial behaviors. A structured questionnaire was employed to collect the data, and the survey was administered through online distribution via university networks, communities, and social media platforms. A total of 350 questionnaires were distributed. After excluding incomplete and invalid responses, 319 valid questionnaires were retained for the final analysis, representing a response rate of 91.1%. The demographic profile of the respondents included gender (male and female), age (18–22, 23–28, and 29–35 years), education level (high school, college/university, and postgraduate), monthly income (< 300 USD, 300–500 USD, 500–1,000 USD, and > 1,000 USD), and financial education methods experienced by respondents (lecture-based learning, gamification in financial education, experiential financial learning, and financial simulation activities).

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IV. RESULTS AND DISCUSSION

Demographics of Respondents

The demographic characteristics of the respondents are presented in Table 1. A total of 319 valid responses were included in the final analysis. In terms of gender, 56.4% of the respondents were female (n = 180), while 43.6% were male (n = 139), indicating a relatively balanced gender distribution with a slightly higher proportion of female participants. Regarding age, the majority of respondents (64.3%, n = 205) were between 18 and 22 years old, followed by 30.7% (n = 98) aged 23–28, while only 5.0% (n = 16) were between 29 and 35 years old. This distribution suggests that the sample was primarily composed of younger respondents, which is consistent with the target population of the study.

Table 1. Demographics of Respondents (n = 319)

Demographics		Frequency	Percentage (%)
Gender	Male	139	43.6
	Female	180	56.4
Age	18–22	205	64.3
	23–28	98	30.7
	29–35	16	5.0
Education Level	High school	32	10.0
	College/University	256	80.3
	Postgraduate	31	9.7
Monthly Income	< 300 USD	148	46.4
	300–500 USD	101	31.7
	500–1000 USD	54	16.9
	> 1000 USD	16	5.0
Financial education methods experienced by respondents	Lecture-based learning	231	72.4
	Gamification in financial education	156	48.9
	Experiential financial learning	171	53.6
	Financial simulation activities	128	40.1
Total		319	100

For educational attainment, 80.3% (n = 256) of the respondents were at the college/university level, representing the largest proportion of the sample. In comparison, 10.0% (n = 32) had completed high school, and 9.7% (n = 31) were pursuing or had completed postgraduate education. Regarding monthly income, nearly half of the respondents (46.4%, n = 148) reported earning less than USD 300 per month. This was followed by 31.7% (n = 101) with a monthly income of USD 300–500, 16.9% (n = 54) earning USD 500–1,000, and 5.0% (n = 16) reporting an income of more than USD 1,000. Respondents were also asked to indicate the financial education methods they had experienced. As multiple responses were permitted, the total frequency exceeded the sample size. Among the four educational approaches, lecture-based learning was the most frequently reported, with 72.4% (n = 231) of respondents indicating prior experience. This was followed by experiential financial learning (53.6%, n = 171), gamification in financial education (48.9%, n = 156), and financial simulation activities (40.1%, n = 128). The findings indicate that while traditional lecture-based instruction remains the most common form of financial education, a considerable proportion of respondents have also been exposed to non-traditional financial education methods, reflecting the increasing adoption of interactive and technology-enhanced learning approaches.

Among the 317 respondents, males accounted for 162 participants (51.1%), while females represented 155 participants (48.9%). This relatively balanced distribution reflects the participation of both male and female decision-makers in production and business activities within traditional craft villages. Regarding age, the majority of respondents were concentrated in the 26–

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35 age group (102 respondents, 32.2%) and the 36–45 age group (96 respondents, 30.3%), followed by those aged over 45 (71 respondents, 22.4%) and under 25 (48 respondents, 15.1%). This distribution indicates that most respondents are in their prime working age, which is important for decision-making related to production practices and business performance. In terms of education level, most respondents had completed high school (98 respondents, 30.9%), followed by secondary school (67 respondents, 21.1%) and college education (62 respondents, 19.6%). A smaller proportion of respondents had primary education (38 respondents, 12.0%) or university-level education and above (52 respondents, 16.4%). This structure reflects the typical educational background in traditional craft villages, where practical experience often complements formal education. With respect to monthly income, the largest proportion of respondents reported earning between 500 and 1000 USD (118 respondents, 37.2%), followed by those earning between 1000 and 2000 USD (82 respondents, 25.9%) and those earning less than 500 USD (74 respondents, 23.3%). Only a smaller group reported income above 2000 USD (43 respondents, 13.6%), indicating a moderate income level among respondents.

Regarding firm size, most businesses were small-scale enterprises, with 121 firms (38.2%) employing 1–5 workers and 89 firms (28.1%) employing 6–10 workers. Firms with 11–20 employees accounted for 63 respondents (19.8%), while only 44 firms (13.9%) had more than 20 employees. This distribution highlights the dominance of small and micro enterprises in traditional craft villages. In terms of firm age, a considerable number of firms had been operating for a long period, with 98 firms (30.9%) aged between 11 and 20 years and 88 firms (27.8%) operating for more than 20 years. Meanwhile, 79 firms (24.9%) had been in operation for 5–10 years, and 52 firms (16.4%) had been established for less than 5 years. This indicates the long-standing and stable nature of traditional craft village enterprises. Overall, the diversity of respondents in terms of demographic profiles and firm characteristics provides a solid foundation for examining how circular economy practices influence environmental cost and economic performance in traditional craft villages in Vietnam.

Scale Reliability and Validity Assessment

The reliability and convergent validity of the measurement model were assessed using Cronbach's Alpha (CA), rho_A, Composite Reliability (CR), and Average Variance Extracted (AVE). As shown in Table 2, all constructs demonstrated satisfactory internal consistency reliability. Specifically, Cronbach's Alpha values ranged from 0.912 to 0.955, exceeding the recommended threshold of 0.70 (Hair et al., 2022). Similarly, the rho_A values ranged from 0.913 to 0.968, while the Composite Reliability (CR) values ranged from 0.938 to 0.971, indicating strong construct reliability.

Table 2. Construct Reliability and Convergent Validity

Variables	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
EFL	0.912	0.913	0.938	0.792
FLE	0.951	0.954	0.965	0.872
FSI	0.945	0.955	0.961	0.859
GFE	0.955	0.968	0.971	0.917
LI	0.948	0.949	0.962	0.865
PFB	0.952	0.954	0.963	0.839

Source: Data analysis by SmartPLS 3

Regarding convergent validity, the AVE values ranged from 0.792 to 0.917, all of which were well above the recommended threshold of 0.50. These results indicate that each construct explains more than 50% of the variance of its corresponding indicators, thereby confirming satisfactory convergent validity. Overall, the measurement model demonstrates adequate reliability and convergent validity, supporting its suitability for subsequent structural model analysis.

Discriminant validity was first assessed using the Fornell-Larcker criterion, which compares the square root of the Average Variance Extracted (AVE) of each construct with its correlations with other constructs. As presented in Table 3, the square root of AVE for each construct, shown on the diagonal of the Fornell-Larcker matrix, ranged from 0.890 to 0.958. All diagonal values

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were greater than the corresponding inter-construct correlations, indicating that each construct shared more variance with its own indicators than with other constructs. These results satisfy the Fornell-Larcker criterion and confirm adequate discriminant validity among the latent constructs.

Table 3. Fornell-Larcker Criterion

	EFL	FLE	FSI	GFE	LI	PFB
EFL	0.890					
FLE	0.614	0.934				
FSI	0.613	0.681	0.927			
GFE	0.394	0.525	0.558	0.958		
LI	0.629	0.653	0.658	0.536	0.930	
PFB	0.529	0.551	0.579	0.422	0.543	0.916

Source: Data analysis by SmartPLS 3

In addition, discriminant validity was further evaluated using the Heterotrait-Monotrait Ratio (HTMT), which is considered a more stringent criterion for assessing construct distinctiveness. As shown in Table 4, all HTMT values ranged from 0.418 to 0.712, which were well below the recommended threshold of 0.85 (Henseler et al., 2015). This finding indicates that the constructs are empirically distinct and do not exhibit problematic overlap. Therefore, the HTMT results provide further evidence supporting the discriminant validity of the measurement model.

Table 4. Heterotrait-Monotrait Ratio (HTMT)

	EFL	FLE	FSI	GFE	LI	PFB
EFL						
FLE	0.658					
FSI	0.655	0.712				
GFE	0.418	0.543	0.579			
LI	0.675	0.686	0.688	0.561		
PFB	0.568	0.577	0.607	0.439	0.572	

Source: Data analysis by SmartPLS 3

Research Model Assessment and Discussion

The structural model results indicate that all hypothesized relationships are statistically significant at the 5% significance level, providing empirical support for the proposed research framework. Regarding the explanatory power of the model, the adjusted coefficient of determination shows that the four financial education approaches jointly explain 56.9% of the variance in Financial Learning Engagement (Adjusted $R^2 = 0.569$), indicating moderate explanatory power. In addition, Financial Learning Engagement explains 30.1% of the variance in Positive Financial Behavior (Adjusted $R^2 = 0.301$), suggesting that students' engagement in financial learning represents an important predictor of responsible financial behavior. Although other individual and contextual factors may also influence financial behavior, these results demonstrate that the proposed model provides satisfactory explanatory capability for understanding how different financial education approaches contribute to behavioral change through learning engagement.

Gamification in Financial Education (GFE) positively influences Financial Learning Engagement (FLE) ($\beta = 0.136$, $t = 2.389$, $p = 0.017$), supporting H1. This finding indicates that incorporating game elements into financial education encourages students to become more actively involved in financial learning activities by increasing motivation, curiosity, and willingness to participate. Features such as challenges, rewards, progress tracking, and immediate feedback appear to create a more attractive learning environment, encouraging students to devote greater attention and effort to financial learning. Although the standardized coefficient is the smallest among the four instructional approaches, the relationship remains statistically significant, confirming that gamification contributes positively to students' financial learning engagement. This finding is consistent with Montero-

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Benavides et al. (2025), who reported that gamified finance education significantly improves learner engagement by increasing participation and commitment throughout the learning process.

Experiential Financial Learning (EFL) also has a significant positive effect on Financial Learning Engagement ($\beta = 0.219$, $t = 2.519$, $p = 0.012$), supporting H2. The result suggests that providing students with opportunities to apply financial concepts through practical activities and real-life experiences encourages more active participation in financial learning. Rather than passively receiving theoretical knowledge, students become directly involved in solving financial problems, reflecting on their experiences, and connecting financial concepts with everyday financial situations. Such learning experiences appear to strengthen students' cognitive and behavioral involvement throughout the learning process, thereby increasing overall engagement. This finding supports the conclusions of Faisal et al. (2026), who emphasized that experiential financial learning promotes active knowledge construction and continuous learner participation, ultimately creating more meaningful and effective financial learning experiences.

Table 5. Structural Equation Modelling Results Estimates

Paths	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
EFL -> FLE	0.219	0.219	0.087	2.519	0.012
FLE -> PFB	0.551	0.552	0.050	11.020	0.000
FSI -> FLE	0.318	0.317	0.094	3.391	0.001
GFE -> FLE	0.136	0.140	0.057	2.389	0.017
LI -> FLE	0.233	0.232	0.107	2.180	0.030
EFL -> FLE -> PFB	0.121	0.122	0.053	2.300	0.022
FSI -> FLE -> PFB	0.175	0.177	0.058	3.018	0.003
GFE -> FLE -> PFB	0.075	0.077	0.031	2.448	0.015
LI -> FLE -> PFB	0.128	0.127	0.058	2.198	0.028
<i>Adjusted R²: FLE = 0.569; PFB = 0.301</i>					

Source: Data analysis by SmartPLS 3

Among the four instructional approaches, Financial Simulation Interactivity (FSI) demonstrates the strongest positive effect on Financial Learning Engagement ($\beta = 0.318$, $t = 3.391$, $p = 0.001$), supporting H3. This finding suggests that interactive financial simulations are particularly effective in engaging students because they provide realistic financial decision-making environments in which learners can experiment with different financial choices, immediately observe outcomes, and continuously refine their understanding. Such authentic learning experiences encourage students to remain actively involved throughout the financial learning process and facilitate a deeper understanding of financial concepts through repeated practice and interaction. The finding is consistent with Chulkov and Wang (2020), who demonstrated that simulation-based learning enhances student engagement by promoting active participation and interaction with realistic financial scenarios rather than relying solely on conventional instructional methods.

Lecture-based Learning (LI) also exerts a significant positive influence on Financial Learning Engagement ($\beta = 0.233$, $t = 2.180$, $p = 0.030$), supporting H4. Although lecture-based instruction is generally regarded as a traditional teaching approach, the findings indicate that it continues to play an important role in financial education when learning materials are systematically organized and delivered effectively. Well-structured lectures provide students with a clear conceptual framework that facilitates understanding of financial principles before applying them in more interactive learning activities. This structured foundation may encourage greater confidence and participation during financial learning, thereby enhancing engagement. The result is

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consistent with Zheng et al. (2023), who concluded that lecture-based learning remains an effective instructional approach when supported by appropriate teaching strategies and clearly organized learning content.

Furthermore, Financial Learning Engagement (FLE) has a strong positive effect on Positive Financial Behavior (PFB) ($\beta = 0.551$, $t = 11.020$, $p < 0.001$), supporting H5. This relationship represents the strongest direct effect in the structural model, highlighting the important role of learner engagement in translating financial education into behavioral outcomes. Students who actively participate in financial learning activities, devote greater cognitive effort, and remain consistently engaged are more likely to apply acquired financial knowledge when making financial decisions in their daily lives. As a result, they are more likely to demonstrate responsible financial behaviors, including budgeting, saving, responsible spending, and financial planning. This finding is consistent with de Castro et al. (2021), who emphasized that learner engagement is a key determinant of successful educational outcomes through sustained participation and continuous learning effort. It also supports the findings of Dare et al. (2023), who argued that positive financial behaviors develop through the effective acquisition and practical application of financial knowledge.

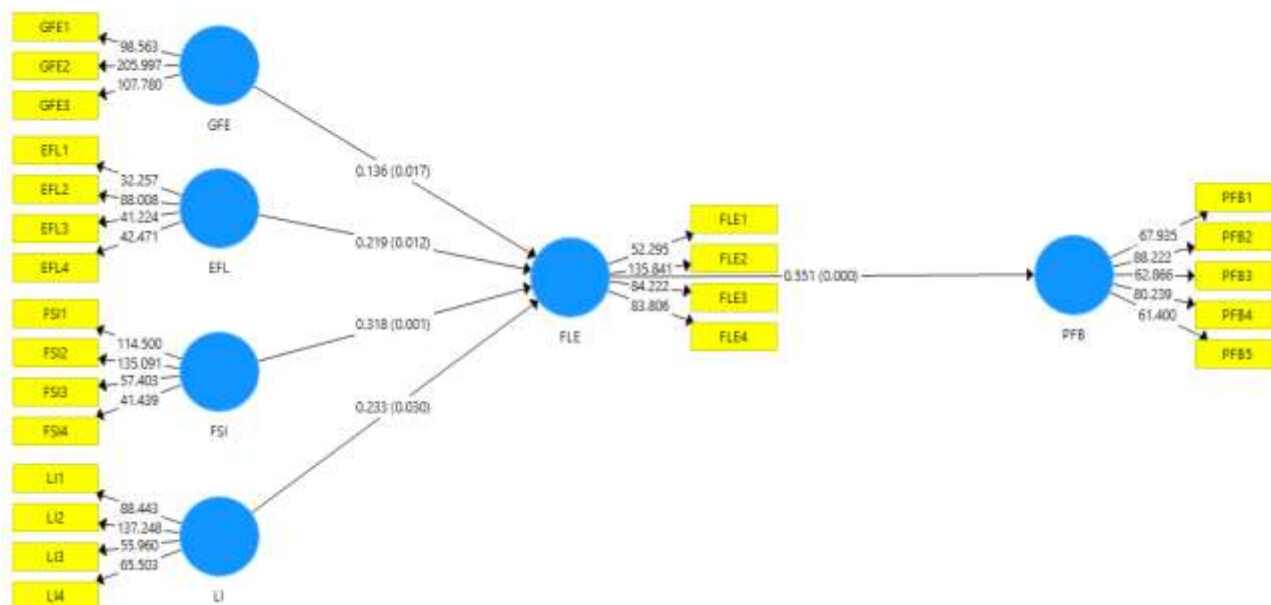


Figure 2. PLS Bootstrapping Model
Source: Data analysis by SmartPLS 3

The mediation analysis further reveals that Financial Learning Engagement significantly mediates the relationships between all four financial education approaches and Positive Financial Behavior. Specifically, the indirect effects of Gamification in Financial Education ($\beta = 0.075$, $p = 0.015$), Experiential Financial Learning ($\beta = 0.121$, $p = 0.022$), Financial Simulation Interactivity ($\beta = 0.175$, $p = 0.003$), and Lecture-based Learning ($\beta = 0.128$, $p = 0.028$) are all statistically significant. Among these relationships, financial simulation interactivity produces the largest indirect effect, indicating that interactive simulation activities are particularly effective in improving students' financial behavior by first strengthening their engagement during financial learning. Overall, these findings highlight that the effectiveness of non-traditional financial education models depends not only on the instructional methods themselves but also on their ability to foster active engagement throughout the financial learning process. Therefore, Financial Learning Engagement functions as a crucial mediating mechanism that transforms financial learning experiences into positive financial behavioral outcomes among students, which is consistent with the central objective of the present study.

V. IMPLICATIONS AND CONCLUSION

Theoretical Contributions

This study contributes to the financial education literature by providing empirical evidence on how different financial education approaches influence students' financial behavior through the mediating role of Financial Learning Engagement. While previous studies have primarily emphasized the direct effects of financial education on financial literacy or financial behavior, the present study demonstrates that the effectiveness of both traditional and non-traditional financial education models depends largely on their ability to actively engage students throughout the learning process. By integrating the Theory of

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Planned Behavior and Experiential Learning Theory, this study offers a more comprehensive explanation of how educational approaches promote behavioral change. The findings also highlight that Financial Simulation Interactivity is the most effective instructional approach in enhancing learning engagement, followed by lecture-based learning, experiential financial learning, and gamification in financial education. These findings enrich the literature by identifying learning engagement as a key educational mechanism linking financial education to students' positive financial behavior.

Practical Implications

The findings of this study provide several practical implications for universities, educators, curriculum developers, and policymakers seeking to enhance the effectiveness of financial education programs. First, the results indicate that educational institutions should move beyond relying exclusively on conventional lecture-based instruction and adopt a more diversified instructional approach. Interactive learning methods, including financial simulations, case-based learning, role-playing activities, project-based learning, and gamified learning environments, should be integrated into financial education courses to create more engaging and authentic learning experiences. These approaches allow students to actively apply financial concepts in realistic contexts, improve critical thinking and decision-making skills, and foster greater motivation and participation throughout the learning process. As student engagement has been identified as a significant mediator between learning methods and financial behavior, increasing opportunities for active involvement is likely to strengthen the long-term effectiveness of financial education.

Secondly, although Interactive Learning demonstrated a stronger influence on Student Engagement, the significant positive effect of Lecture-based Learning suggests that traditional teaching methods continue to play an important role in financial education. Well-structured lectures provide students with a solid conceptual foundation, ensure systematic coverage of essential financial knowledge, and help learners develop a clear understanding of complex financial principles before applying them in practice. Therefore, rather than viewing lecture-based and interactive learning as competing approaches, educators should consider adopting a blended instructional strategy that combines the strengths of both methods. For example, lectures can be used to introduce theoretical concepts, while interactive activities can reinforce these concepts through practical application, collaborative problem-solving, and reflective learning. Such an integrated approach may maximize both knowledge acquisition and student engagement.

Thirdly, the findings suggest that universities should reconsider how the effectiveness of financial education programs is evaluated. Assessment should not focus solely on students' cognitive learning outcomes, such as examination scores or financial knowledge tests, but should also include indicators of student engagement, including participation, motivation, emotional involvement, and behavioral engagement during learning activities. Since student engagement was found to be a significant mechanism through which teaching methods influence financial behavior, monitoring engagement can provide educators with valuable feedback for improving instructional design and identifying students who may require additional learning support.

Finally, curriculum developers should design financial education programs that promote continuous interaction between students and instructors, encourage collaborative learning, and provide regular opportunities for reflection and feedback. The incorporation of digital learning technologies, financial simulation software, online quizzes, gamified assessment platforms, and real-world financial decision-making scenarios can further enhance students' learning experiences and sustain their engagement over time. Collectively, these strategies are expected to strengthen students' financial competencies, encourage the development of responsible financial habits, and ultimately contribute to improved financial well-being both during university and throughout adulthood.

Limitation and Future Research Directions

Despite its contributions, this study has several limitations. The cross-sectional design limits the ability to establish causal relationships. Besides, the study focused only on university students, which may limit the generalizability of the findings to other populations. Although the model explains a substantial proportion of the variance in financial learning engagement and positive financial behavior, other relevant factors, such as financial self-efficacy, financial attitude, parental financial socialization, and digital financial literacy, were not included. Future research should employ longitudinal designs, examine more diverse populations, and incorporate additional mediating or moderating variables to provide a more comprehensive understanding of the factors influencing positive financial behavior.

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