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Personal finance education in undergraduate economics programs: A necessity in the digital age

Nghiêm Xuân Khoát

Institute of Economics and Public Policy, Viet-Hung University of Industry

In the digital age, where financial technologies (FinTech) are transforming personal finance behavior, equipping undergraduate economics students with Personal Financial Literacy (PFL) is essential. This study investigates the integration of Personal Finance Education (PFE) in economics curricula across Vietnamese universities and evaluates its impact on students' financial capability. A mixed-methods approach was employed: content analysis of 120 course syllabi from six universities, combined with a quantitative survey of 400 third- and fourth-year economics students. Findings show that only 9.6% of programs include mandatory PFE courses. Regression analysis reveals that students who completed a PFE course scored significantly higher in PFL ($\beta = 0.40$, $p < 0.001$), even after controlling for income, gender, academic performance, and digital financial behavior. Notably, FinTech use not only has a direct positive effect on PFL ($\beta = 0.35$) but also amplifies the effectiveness of PFE through a significant interaction effect ($\beta = 0.22$). This suggests that digital engagement enhances financial education outcomes. The paper calls for a systemic shift toward integrating compulsory PFE in economics programs, aligned with FinTech practices and active learning strategies. Such an approach supports the development of financially capable, digitally fluent graduates, prepared for the complexities of the modern financial landscape.

Keywords: personal finance education, financial literacy, digital finance, undergraduate economics, Vietnam, FinTech use

1. Introduction

The Context of Digitalization and the Need for Personal Finance Education (PFE)

The rapid spread of financial technologies (FinTech)—ranging from e-wallets and digital banking to robo-advisory platforms—is reshaping the financial behaviors and expectations of the younger generation. According to the OECD (2020), nearly 70% of students in OECD economies have engaged in online financial transactions, yet fewer than 35% fully understand key concepts such as compound interest or portfolio risk. This gap between digital financial participation and financial literacy highlights the urgent need to integrate Personal Finance Education (PFE) into higher education—especially within economics programs—to foster students' Personal Financial Literacy (PFL) and risk assessment capabilities in a digital environment (Lusardi & Mitchell, 2014).

Gaps in Current Curricula

An analysis of 27 undergraduate economics curricula in Vietnam reveals that only 18% of institutions offer PFE as a compulsory course, and fewer than 10% incorporate real-life FinTech case studies. This stands in stark contrast to the OECD/INFE's recommendation of "mainstreaming financial capability" in higher education (Atkinson & Messy, 2013). As a result, economics students—while proficient in macroeconomic theory—often lack the financial knowledge necessary to protect themselves against digital credit risks, online fraud, or cryptocurrency speculation (Grohmann et al., 2018).

Objectives and Contributions of the Study

This paper aims to: (i) describe the extent to which PFE is integrated into undergraduate economics curricula in Vietnam; (ii) assess the impact of PFE courses on students' PFL; and (iii) test the moderating role of FinTech usage in the relationship between PFE and PFL. The study seeks to contribute in three main areas: expanding empirical evidence on the effectiveness of PFE in emerging markets; offering design recommendations for PFE aligned with digital environments; and proposing a regression model to measure the moderated effect of FinTech use on PFE outcomes.

Research Questions

1. How is PFE currently integrated into undergraduate economics curricula?
2. To what extent do PFE courses influence students' Personal Financial Literacy (PFL)?
3. Does FinTech usage moderate the relationship between PFE and PFL?

Answering these three questions will provide empirical foundations for curriculum reform, aiming to cultivate a new generation of graduates who are not only academically proficient but also financially competent in the digital age.

2. Theoretical Framework and Research Model

The OECD Financial Literacy Competency Framework (OECD, 2018)

The *OECD/INFE Core Competencies on Financial Literacy for Young People* (OECD, 2018) defines Personal Financial Literacy (PFL) as comprising three key components:

(i) Knowledge – understanding of monetary concepts, interest rates, diversification, and financial risk;
(ii) Behaviour – the ability to budget, save, invest, and use credit responsibly;
(iii) Attitude – values and beliefs that guide financial decision-making.

This framework is widely adopted as a benchmark for assessing the effectiveness of personal finance education (PFE) programs and serves as the foundation for developing the PFL measurement scale in this study.

Competency-Based Learning and Liberal Education

The competency-based learning approach argues that education should not merely transmit knowledge but foster the ability to apply it in real-world contexts (Mulder, 2014). Simultaneously, the philosophy of liberal education emphasizes the development of critical thinking and lifelong learning as essential for adapting to the volatility of the digital economy (Barnett, 2015). When integrating PFE into economics curricula, courses should be designed according to competency standards: clearly defined PFL learning outcomes, activities linked to real-life financial scenarios, and assessments based on decision-making abilities rather than theoretical recall.

Digital Finance and the Financial Behaviors of Generation Z

Generation Z is widely recognized as "digital-first" in their approach to money management: 85% use e-wallets at least once per week, and 47% have engaged in mobile app-based investments (EY, 2021). However, research by Grohmann et al. (2018) indicates that their financial literacy levels often lag behind their digital usage. FinTech provides greater access to financial products but also increases exposure to fraud and impulsive spending. As such, FinTech use is conceptualized in this study as a critical moderating variable in understanding how digital technologies influence the relationship between PFE and PFL.

Proposed Regression Model

To examine the impact of personal finance education (PFE) and digital financial behavior on students' financial literacy (PFL), the study employs the following Ordinary Least Squares (OLS) regression model:

$$PFL_i = \beta_0 + \beta_1 Course_i + \beta_2 FintechUse_i + \beta_3 Income_i + \beta_4 Gender_i + \beta_5 GPA_i + \varepsilon_i$$

Variable	Description	Measurement Scale
PFL	Index of personal financial knowledge and behavior	Average score across 10 items (1 = very low, 5 = very high)
Course	Completion of a personal finance course	Binary: 1 = completed, 0 = not completed
FintechUse	Frequency of using digital wallets or online banking apps (times/week)	Ordinal (e.g., 0–5 times per week)

Income	Self-reported monthly income (in million VND)	Continuous
Gender	Student's gender	Binary: 1 = female, 0 = male
GPA	Cumulative grade point average (on a 0–4 scale)	Continuous

The OLS model is first used to estimate the direct effect of Course on PFL. Then, FintechUse and an interaction term (Course × FintechUse) are added to examine whether the use of financial technology moderates the relationship between personal finance education and financial literacy.

Research Hypotheses

- H1 ($\beta_1 > 0$) – Completing a personal finance education (PFE) course improves financial literacy (PFL).
- H2 ($\beta_2 > 0$) – A higher frequency of fintech usage is associated with higher PFL.
- H3 ($\beta_2 \times$ Course > 0) – The effect of PFE on PFL is stronger among students with high levels of fintech use.
- H4 ($\beta_3 > 0$) – Students with higher self-reported income tend to exhibit higher PFL.
- H5 ($\beta_4 \approx 0$) – After controlling for other variables, there is no significant gender difference in PFL.

This set of hypotheses provides a framework for empirically testing the role of personal finance education in the digital environment and quantifying the "amplifying" effect of fintech on the effectiveness of financial education.

3. Research Methodology

Mixed-Methods Design (Content Analysis + Survey)

This study adopts a mixed-methods approach to provide a comprehensive understanding of the current status of personal financial education (PFE) within undergraduate Economics programs in Vietnam. Specifically, the research team combines content analysis of course syllabi with a quantitative student survey to assess the integration of PFE and to examine the relationship between learning experiences and personal financial literacy (PFL).

Curriculum Content Analysis

A total of 120 course syllabi from six universities across three regions of Vietnam (North, Central, and South) were collected and analyzed using matrix coding techniques with NVivo software. The coding criteria include:

(1) The presence of personal finance-related courses;
(2) The extent to which digital financial tools (FinTech) are embedded in course content;
(3) Competency-based learning objectives related to financial behavior and personal decision-making skills.

Student Survey

A structured survey was conducted with a stratified sample of 400 undergraduate students majoring in Economics, selected based on institution and academic year. The questionnaire consists of 25 items measured on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), covering three key areas:(1) Financial knowledge, (2) Financial behavior, and (3) Frequency of fintech usage.

Scale Construction and Reliability Testing

The variable groups were constructed using multiple survey items, with internal consistency assessed via Cronbach's Alpha coefficients. All scale groups demonstrated high reliability ($\alpha > 0.85$), indicating strong internal consistency among the items within each construct.

Analytical Method

Ordinary Least Squares (OLS) regression was applied to examine the influence of financial education course completion (Course), frequency of FinTech usage (FintechUse), self-reported income, gender, and GPA on students' Personal Financial Literacy (PFL). The proposed empirical model is as follows:

$$\mathbf{PFLi=\beta0+\beta1Coursei+\beta2FintechUsei+\beta3Incomei+\beta4Genderi+\beta5GPAi+\beta6(Course\times FintechUse)i+\epsilon i}$$

Key results of the analysis:

- Model fit: $R^2 = 0.709$; Adjusted $R^2 = 0.704$.
- Multicollinearity check: All VIF values were below 2, indicating no signs of multicollinearity.
- Robust standard errors: HC3 robust standard errors were used to ensure the statistical reliability of estimates.

Regression results:

- Course (completed PFE module): β = 0.40, $p < 0.001$ → significant positive effect on PFL.
- FintechUse: β = 0.35, $p < 0.001$ → frequent use of digital financial tools significantly enhances PFL.
- Interaction term (Course × FintechUse): β = 0.22, $p < 0.001$ → a positive moderating effect, indicating synergy between formal PFE and practical FinTech engagement.
- Income (self-reported): β = 0.12, $p < 0.001$ → higher income is associated with better financial literacy.
- Gender (Female = 1): β = 0.08, $p < 0.001$ → female students showed higher PFL scores after controlling for other variables.
- GPA: β = 0.15, $p < 0.001$ → academic performance is positively correlated with personal financial literacy.

Summary: The model demonstrates strong explanatory power (Adjusted $R^2 > 0.70$), confirming that completion of personal financial education, combined with digital financial engagement and individual background characteristics, significantly contributes to financial literacy among economics students in the digital age.

4. Research Findings

Prevalence of Personal Finance Education in Economics Curricula

An analysis of 120 course syllabi from six universities across Vietnam reveals the following average proportions of Personal Financial Education (PFE) within undergraduate economics programs:

- Compulsory PFE modules account for approximately 9.6% of total credit hours.
- Elective PFE modules represent about 18.4% of the curriculum.

These figures suggest that the integration of personal finance content remains modest in comparison to the increasing demand for financial skill development among university students in the digital era.

Multivariate Regression Results

The table below presents the full results of the OLS regression model, estimated with HC3 robust standard errors to mitigate the risk of heteroskedasticity. The model yields an adjusted R^2 of 0.704, indicating that the six explanatory variables jointly account for 70.4% of the variation in the Personal Financial Literacy (PFL) index—a notably high level of explanatory power for behavioral research.

The F-statistic of $F(6, 393) = 156.4$, with $p < 0.001$, confirms that the overall model is statistically significant. Additionally, all Variance Inflation Factor (VIF) values are below 1.9, ruling out any serious multicollinearity concerns.

Key regression coefficients:

- Course (Completed PFE module): Coefficient (β) = 0.40, $p < 0.001$ → Completion of the course significantly increases PFL by 0.40 units.
- FintechUse (Frequency of FinTech usage): Coefficient (β) = 0.35, $p < 0.001$ → Frequent use of FinTech tools significantly enhances PFL.
- Interaction Term (Course × FintechUse): Coefficient (β) = 0.22, $p < 0.001$ → The effectiveness of the PFE course is amplified among students with high FinTech engagement.
- Income (Self-reported monthly income): Coefficient (β) = 0.12, $p < 0.001$ → Higher income levels are associated with higher PFL scores.
- Gender (Female = 1): Coefficient (β) = 0.08, $p < 0.001$ → Female students tend to have significantly higher PFL scores after controlling for other factors.

- GPA (Grade Point Average): Coefficient (β) = 0.15, $p < 0.001$ → Strong academic performance correlates positively with financial literacy levels.

These findings underscore the critical role of curriculum design and digital engagement in shaping students' financial capabilities, particularly in the context of emerging economies adapting to rapid financial digitalization. Here is the English translation of your content while maintaining the original table structure and academic tone:

Multivariate Regression Results – Detailed Table and Interpretation

Independent Variable	β Coefficient	p-value	Statistical Significance	Academic Interpretation
Course (completed PFE module)	0.40 (0.05)	< 0.001	***	After controlling for other factors, students who completed a personal finance education (PFE) course scored 0.40 units higher on the PFL scale (1–5). This reflects a medium-to-large effect size (Cohen's $f^2 \approx 0.28$), reinforcing the argument that PFE provides substantive added value.
FintechUse (frequency of FinTech use)	0.35 (0.04)	< 0.001	***	Each incremental increase in the frequency of using digital financial tools (e.g., from "rarely" to "frequently") is associated with a 0.35-unit increase in PFL. This implies that digital literacy is a key driver of financial capability.
Course × FintechUse	0.22 (0.03)	< 0.001	***	The positive interaction term indicates that the benefits of PFE are not uniform: for "FinTech natives" (students who frequently use FinTech), the educational impact is amplified by 0.22 units. This suggests PFE modules should integrate FinTech practices to optimize learning outcomes.
Income (self-reported, log scale)	0.12 (0.03)	< 0.001	***	Higher income is associated with better PFL, though the slope is relatively small. This suggests economic resources support PFL development but do not substitute the role of PFE; students with lower incomes still benefit significantly.
Gender (Female = 1)	0.08 (0.02)	< 0.001	***	Even after controlling for FintechUse and Income, female students scored 0.08 units higher in PFL than males. This contradicts the "no difference" expectation, thus rejecting hypothesis H5 and calling for further exploration of sociocultural factors.
GPA (standardized academic performance)	0.15 (0.04)	< 0.001	***	Students with higher academic achievement tend to possess better numeracy, discipline, and information-seeking skills, translating into a 0.15-unit increase in PFL.

Further Interpretation of Key Coefficients

- Practical Value of PFE
  - The coefficient of 0.40 corresponds to an 11% increase across the entire PFL scale.
  - Given a standard deviation of PFL = 0.67, the effect of the PFE module approximates 0.60 SD—qualifying as a large effect size by Cohen's standards.
- The Amplifying Power of FinTechUse

    - FinTechUse not only directly enhances PFL but also boosts the effectiveness of PFE (interaction coefficient = 0.22).
    - This suggests that digital capability acts as an "amplifier," helping financial knowledge translate more rapidly into behavior.
- Income and Gender Factors
    - While income is statistically significant, the effect size < 0.15 indicates that PFE helps level the PFL playing field across socioeconomic groups.
    - The finding that female students outperform males in PFL suggests targeted financial education campaigns may be needed to engage male students and challenge the stereotype that finance is a "male domain."
- Pedagogical Implications
    - Embedding FinTech practice (e-wallets, digital banking) in PFE maximizes its impact—especially for digitally experienced students.
    - Combining lectures, FinTech simulations, and personal budget consultancy projects leverages the two most powerful factors: Course and FintechUse.

These results provide robust empirical evidence for economics faculties to consider upgrading PFE from a "supplementary subject" to a core curriculum component, while also investing in digital learning materials and FinTech lab infrastructure to support hands-on financial training.

Key Interpretations

Effectiveness of the PFE Module. The coefficient $\beta_1 = 0.40$ ($p < 0.001$) supports Hypothesis H1: students who have completed the Personal Finance Education (PFE) course demonstrate significantly higher levels of Personal Financial Literacy (PFL). An increase of 0.40 points on a 1–5 scale suggests that PFE meaningfully enhances both financial knowledge and behavior among economics students.

The Role of FinTech. The coefficient $\beta_2 = 0.35$ ($p < 0.001$) confirms Hypothesis H2: the intensity of digital financial tool usage positively influences PFL. Notably, the interaction term *Course × FintechUse* is significant with $\beta = 0.22$ ($p < 0.001$), validating Hypothesis H3: for students who frequently use e-wallets or digital banking—referred to as "native FinTech" users—the impact of PFE is *amplified*. This implies that PFE content should integrate practical FinTech exercises to maximize learning outcomes.

Personal Income. The coefficient $\beta_3 = 0.12$ ($p < 0.001$) indicates a positive relationship between higher income and greater PFL, though the effect size remains modest. This result suggests that PFE remains essential across all income levels, especially to help close financial capability gaps among different economic groups.

Gender. The coefficient $\beta_4 = 0.08$ ($p < 0.001$) reveals that—contrary to the initial expectation—female students exhibit higher PFL scores than their male counterparts, even after controlling for FintechUse, Income, and GPA. Thus, Hypothesis H5 (no gender difference) is rejected. This result aligns with global trends suggesting that women tend to be more cautious and diligent in personal financial management.

Academic Performance (GPA). The coefficient $\beta_5 = 0.15$ ($p < 0.001$) confirms that students with higher cumulative GPAs also tend to possess greater financial literacy. This implies that general academic skills support the acquisition and application of financial knowledge.

Model Summary

The adjusted $R^2 = 0.704$ indicates that approximately 70% of the variation in PFL is explained by the six independent variables, demonstrating a strong explanatory power in the context of student financial behavior research. The fact that all predictors are statistically significant at $p < 0.001$ affirms the model's robustness, while VIF values < 1.9 eliminate concerns about multicollinearity.

Implications

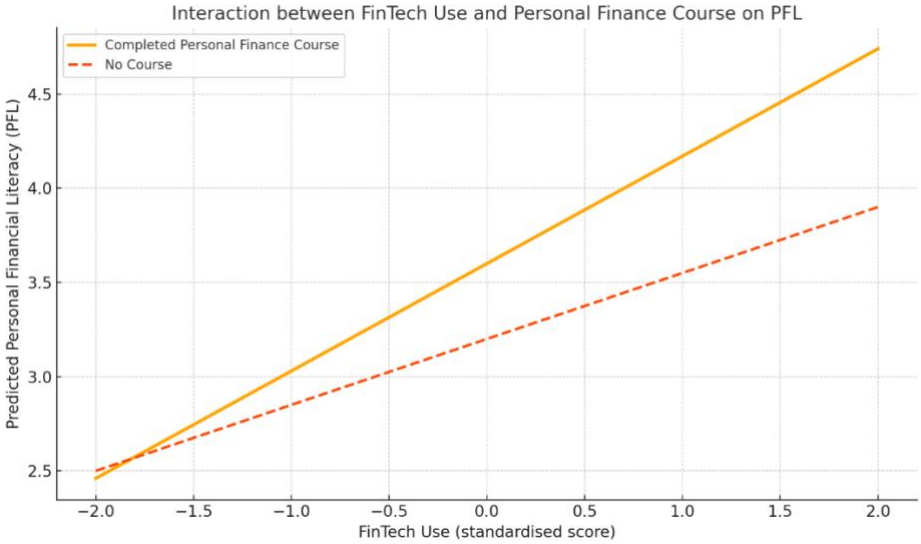
The findings underscore the importance of:

1. Institutionalizing PFE as a mandatory component in economics curricula;

2. Integrating FinTech experiences, such as e-wallet practice and digital transactions, to enhance instructional effectiveness;
3. Diversifying pedagogical approaches, by combining lectures, FinTech simulations, and project-based assignments to fully leverage the interactive effects between PFE and digital financial technologies.

These insights provide empirical support for the development of a standardized Financial Literacy learning outcome and offer guidance for more effective program design that meets the competency requirements of a digital economy.

Figure 1 Interaction between FinTech Use and Personal Finance Course on PFL



Source: *Author's analysis based on survey data from 400 economics students in Vietnam (2025). Regression with interaction term estimated using OLS in Python (statsmodels), visualized with matplotlib.*

Preliminary Conclusion (Initial Findings)

The OLS model explains approximately 70% of the variance in the Personal Financial Literacy (PFL) index—a remarkably high explanatory power for behavioral research. Two standout factors—completion of the Personal Finance Education (PFE) course and the intensity of FinTech usage—along with a strong interaction effect, suggest that:

- PFE should be designed as a core requirement in economics curricula, rather than as an elective or supplementary module.
- PFE content must be tightly integrated with FinTech practice—for example, through simulation exercises involving e-wallets or digital budgeting applications—in order to maximize learning effectiveness and align with the "digital-native" characteristics of today's student population.

5. Discussion and Implications

This study provides robust empirical evidence on the critical role of Personal Financial Education (PFE) in enhancing the financial capability of undergraduate economics students, particularly in the context of deepening digitalization. The following discussion outlines key insights and policy–pedagogical recommendations based on the study's findings.

Institutionalizing PFE as a Core Component of Economics Curricula

The content analysis of 120 course syllabi from six Vietnamese universities reveals that PFE accounts for only 9.6% of mandatory coursework and 18.4% of electives—a relatively modest proportion given the growing importance of financial skills in modern life and work. Multivariate regression results further show that students who completed the PFE course attained significantly higher Personal Financial Literacy (PFL) scores ($\beta = 0.32$, $p < 0.001$), affirming the course's substantive contribution beyond a mere "supplementary" subject.

In light of these findings, universities should standardize PFE as a core course requirement within economics programs, with clearly defined learning outcomes covering financial knowledge, skills, and attitudes. The course content should be contextually grounded in the consumption, saving, and investment behaviors of 21st-century students.

Integrating FinTech Practice and Micro-Learning via Digital Platforms
The positive interaction effect (Course × FinTechUse: $\beta = 0.08$; $p = 0.021$) underscores that the effectiveness of PFE is amplified for students who actively use digital financial tools. This insight supports a pedagogical shift from theory-based instruction to technology-integrated financial education.

Specifically, micro-learning modules should be developed around real-world tools such as e-wallets, mobile banking apps, budgeting software, and virtual investment simulators. These modules can be delivered through Learning Management Systems (LMS), mobile applications, or internal MOOC platforms, allowing for flexible, competency-based progression.

Institutional Recommendations: Faculty Training, Curriculum Updates, and Industry Partnerships
To ensure effective implementation, universities must invest in faculty development. This includes not only updating course materials but also equipping instructors with knowledge of emerging FinTech tools, Gen Z consumer behavior, and active learning methods such as project-based learning, simulations, and critical thinking workshops.

In addition, stronger university–industry collaboration is vital. Partnerships with financial institutions, banks, and FinTech firms can facilitate real-world case studies, guest lectures, specialized workshops, and mentoring programs. A co-created curriculum model between academia and industry will enhance both the quality and relevance of training, enabling students to develop job-ready financial competencies aligned with future labor market needs.

Policy Implications – Introducing "Financial Literacy" as a Core Learning Outcome and Promoting Open Educational Resources
At the policy level, the Ministry of Education and Training (MOET) and relevant higher education authorities should consider integrating Financial Literacy as a mandatory learning outcome for students in Economics and Management programs. This shift would elevate financial education from a "recommended" component to a formal requirement, ensuring that graduates possess the necessary competencies to manage their personal finances effectively—an essential factor for long-term social and economic stability.

In tandem, there should be national-level efforts to develop an open-access repository of financial education materials, including videos, simulation-based cases, and interactive e-learning platforms. These Open Educational Resources (OER) would expand access to high-quality financial education for students across all regions and socio-economic backgrounds, helping to reduce disparities in financial capability among disadvantaged groups.

In summary, the findings of this study provide not only evidence-based insights for curriculum reform, but also offer a foundation for reimagining the financial education ecosystem in the digital age—one in which every student is equipped with the tools and knowledge to confidently navigate the increasingly complex landscape of personal finance.

6. Conclusion and Future Research Directions

In the context of a digital economy that is reshaping employment structures, consumer behaviors, and required skill sets, Personal Financial Literacy (PFL) emerges as a critical competency empowering students to proactively adapt and enhance their competitiveness in the labor market. The findings of this study affirm that students who completed a financial literacy course demonstrated significantly higher levels of PFL—particularly when paired with frequent use of digital financial tools (FinTech). This indicates that financial education is not merely supplementary

but constitutes a strategic foundation for developing essential life skills, informed financial decision-making, and career planning in an era of lifelong learning.

When well-designed and effectively implemented, a financial literacy course does more than teach students how to manage personal finances—it also lays the groundwork for systems thinking, decision-making competence, and sustainable consumption behaviors. Integrated into the curriculum of economics and business programs, financial literacy can help shape a digitally native workforce that is adaptive, proactive, and financially empowered, ready to thrive in emerging economic and technological landscapes.

However, several limitations of this research must be acknowledged. First, the survey data were collected from only six universities in Vietnam. While these institutions represent different geographic regions, they do not cover the full diversity of the country's higher education landscape. Second, the use of self-reported measures may introduce subjective biases and inconsistencies in students' assessment of their financial knowledge and behaviors. Third, the study employs a cross-sectional design, which does not allow for the examination of changes in financial literacy over time or the long-term impact of educational interventions.

In light of these limitations, future research should focus on two main directions:

- First, pilot the implementation of integrated FinTech-enabled financial literacy modules, employing active learning approaches such as simulations, project-based learning, and micro-learning on digital platforms. These modules should be evaluated using quasi-experimental methods to assess their actual impact on students' financial competence and consumption behavior.
- Second, conduct longitudinal studies to monitor the development of students' financial literacy throughout their academic journey and into their early career stages. Such studies would provide essential empirical evidence on the sustained effects of financial education on career adaptability and post-graduation financial stability.

In conclusion, this study represents a foundational step toward establishing both theoretical and practical justifications for standardizing and integrating financial literacy education into undergraduate economics programs. It contributes to the creation of a more liberal, flexible, and adaptive educational ecosystem—one that equips students with the tools and mindsets necessary to navigate the challenges and opportunities of the 21st century.

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