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Does enrolling in finance-related majors improve financial habits? A case study of China's college students

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Abstract
There is a growing awareness of the importance of financial management skills. However, few studies have systematically examined this topic in China's current higher education (HE) system. In this study, we examine whether enrolling in a finance-related program, either as a degree program or as an elective, improves students' financial literacy and habits. We conducted a mixed-method study with a sample of 1334 students from seven universities in central China. Multivariate regression, matching methods, and the inverse–probability–weighting methods were used for quantitative analysis. The results indicate that college students are generally dissatisfied with their financial situation. Enrolling in finance-related majors has little effect on improving students' financial habits, despite a substantial improvement in their financial literacy. In the current HE system, there is a significant lack of personal finance management training. Therefore, curriculum design and field practices regarding students' personal finance management skills should be introduced to enhance their financial habits.

Keywords Financial literacy · Financial habits · College students · Higher education · China

Introduction

Effective personal finance management is crucial for building and maintaining a stable and satisfactory economic status (Johnson & Sherraden, 2007; Lusardi & Mitchell, 2006; Panos & Wilson, 2020). The increasing financial complexity of modern life calls for greater levels of financial literacy to make informed decisions regarding such issues as compound interest rates, mortgages, insurance, and self-funded pension plans, all of which affect our daily lives. Although the ability to navigate the complex world of personal finance is a pressing issue for all age groups, it is a growing concern, particularly among college students (Bamforth et al., 2018; Huston, 2012; Lusardi et al., 2010). On the one hand, as university students transition to adulthood, becoming financially independent and stable is a vital life habit goal (Wang & Xiao, 2009). On the other hand, today's financial management is increasingly complex due to the rapid development of online payments and internet finance, raising new challenges for contemporary college students. Therefore, preparing college students to deal with such complex financial management has become a critical dimension of HE.

Developing college students' financial knowledge and practices is a great challenge. First, which financial habits should be developed among college students is still subject to discussion. Muske and Winter (2004) argued that accounting, savings, regular review of personal credit, and risk management are the most crucial aspects of personal finance management. Accounting entails overseeing the state of one's personal finances, predicting future income and expenditures, and learning to make reasonable decisions (Walker & Llewellyn, 2000). Savings are crucial for wealth accumulation and mitigating financial instability (West & Mottola, 2016). Creditworthiness is also one of the most

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important aspects of personal finance, affecting people's lives and well-being (Caplinska & Tvaronavičienė, 2020). Finally, having an emergency fund is a vital risk management strategy for avoiding economic shocks and maintaining financial stability (West & Mottola, 2016).

Second, despite the importance of personal finance, there is still no concrete evidence on how to foster the development of such practices among college students. Many studies have examined the provision and effectiveness of financial education (FE) in improving students' financial outcomes, without reaching a consensus (Lyons et al., 2006; Mandell & Klein, 2009). For example, using a meta-analysis, Kaiser and Menkhoff (2017) found that providing students with financial management training positively affected their financial literacy. Johan et al. (2021) found that providing FE was a practical approach to developing the saving habits of college students. However, others found that FE has a limited effect on improving financial habits. Jobst (2014) found that providing personal finance management courses does not affect students' savings and spending behavior in the long term. Peach and Yuan (2017) found that financial literacy does not necessarily lead to improved financial practices. Even if interventions with abundant training time might yield some observed changes in students' financial practices, these positive effects decline over time (Fernandes et al., 2014).

Moreover, most empirical studies on college students' financial literacy and habits were conducted in developed economies (Lusardi et al., 2010). For instance, in an experimental study, Rosacker and Rosacker (2016) found that a parsed approach to teaching financial literacy was more effective at meeting college students' basic financial literacy needs than a single personal finance course. Furthermore, using a qualitative research method, Jill et al. (2018) showed that college students' financial practices improved as their studies progressed, and Brugiavini et al. (2018) found that training effectively improved Italian college students' subjective and objective financial knowledge. However, limited empirical evidence has been examined regarding developing countries. Given the increasing importance of personal finance management in many emerging economies and because a substantial share of college students worldwide are educated and trained in developing countries, assessing their financial literacy and fostering their financial habits are becoming increasingly important to the global labor market. At the same time, there is a significant lack of knowledge and documentation about FE in developing countries, including how FE is organized and integrated into their HE systems and the teaching staff, and curriculum design of these programs.

In this study, considering this background and the ongoing debate over the effectiveness of FE, we aim to contribute to the literature on FE in China's HE system and investigate how current FE programs affect college students' financial literacy and habits. We employed qualitative and quantitative methods to conduct our study to achieve this objective. First, we document the current FE in China's HE to derive the research hypothesis. Subsequently, we empirically examine how enrolling in finance-related training programs affects students' financial outcomes, including their accounting, savings, personal credit management, and emergency fund habits. Finally, we conclude with a series of qualitative findings.

Financial education in China's HE institutions and the research hypotheses

With the rapid growth of the Chinese economy and the increasing complexity of China's financial market, financial management has become prominent in people's daily lives. As a result, the Chinese government has implemented a series of measures to promote FE.[1] However, there is limited knowledge about college students' financial practices and the process of integrating college FE into formal HE. FE in China's HE system can be divided into two main types: (a) finance-related degree programs for college students and (b) finance-related course programs for nondegree students.

The operation of FE in Chinese universities

In the early stages of HE development in China, FE was mainly limited to certain universities established to train financial and economic talent, such as the Shanghai University of Finance and Economics and the Central University of Finance and Economics in Beijing. Most finance and economics HE institutions were colleges that focused on finance-related degree programs (Jiang, 2003). However, the development of comprehensive universities during the early 2000s has rapidly changed the HE landscape. An increasing number of comprehensive universities started offering both finance-related degree programs and finance-related training programs. The finance-related degree programs are for economics and finance majors who expect to receive a bachelor's and/or master's degree. These students receive formal FE, in which systematic training is provided in accounting, statistics, money, and banking (Jin & Chen, 2012). There are three types of courses: compulsory courses, elective courses, and lectures. Students can earn credits from both

[1] . For example, in 2016, the General Office of the State Council issued its first plan to promote the development of inclusive finance (2016–2020), which requires the Ministry of Education to integrate formal FE into the national education system. In 2018, the People's Bank of China started reporting the development of Chinese people's financial practices through the Consumer Financial Protection Bureau.

compulsory and elective courses (Li et al., 2022). In addition to participative courses or lectures, field training and internships are often integrated into these programs to further cultivate financial management skills in applied settings.

Those students who do not major in finance are offered the second type of finance-related training program as electives. These programs (or courses) aim to enable college students to develop an understanding of basic financial concepts, theories, and related knowledge. For instance, every year, a series of elective finance-related courses and lectures are open to all students who are not finance and economics majors. These courses may be lectures on accounting and savings or semester-long courses on finance-related topics. In addition, students who are not finance majors can select some elective financial courses based on their personal interests to improve their financial knowledge and habits.

The curriculum

The curricula of finance-related training programs differ significantly across Chinese universities; some offer more accounting-related courses, whereas others offer more risk management- and insurance-related courses. The design of the curriculum depends mainly on the capacity of the faculty. For instance, the curriculum design is much more comprehensive in universities with a specific financial-related degree program than in universities without. Most finance-related degree programs in Chinese universities include accounting, statistics, money and banking, financial markets, and financial product innovation, and additional courses may include international trade, international finance, and development economics (Xiang & Ping, 2010). In 2018, the China Financial Literacy Education Collaborative Innovation Center developed a university-level standard framework for FE, the goal of which is to primarily equip undergraduate students majoring in finance with the financial management knowledge and abilities necessary for future work in finance (Jiang, 2003). However, students who are not enrolled in finance-related majors can still receive some training per application; however, only a few students can enroll in these courses (Yue, 2018).

The course comprises two primary modules: simulation experiments and enterprise internships. The former allows students to learn financial management practices by simulating the relevant roles or businesses involved in financial management work. For example, accounting experimental teaching is divided into the roles of cashiers, accountants, and reviewers, covering commercial invoices and bills of lading in international trade, and internship encompasses standard work experience in business (Jin & Chen, 2012). When doing enterprise internships, college students gain work experience as the primary goal of internships, and they learn the financial management knowledge required by the job.

Although both the finance-related degree program and the nondegree-associated training programs are different from personal finance practices, the knowledge and training on financial management can be extended to personal finance management. Because college is a crucial period for students to foster healthy financial practices, when there are limited personal finance training programs, enrolling in a finance-related major or nondegree finance-related training program might promote the development of financial practices among college students.

Research hypotheses

By summarizing the existing works of literature, we found that enrolling in a finance-related training program might yield multi-effects on college students, ranging from personal finance literacy (Rosacker & Rosacker, 2016; Gerrans, 2021; Zhou et al., 2022) and habits (Kaiser et al., 2022; Liu & Hua, 2021) to financial satisfaction (Gignac et al., 2023). Therefore, given the structure of China's HE and its FE curriculum design, we have developed the following research hypotheses:

H 1 *Enrolling in a finance-related training program (either a degree program or an elective training program) can significantly improve college students' financial literacy.*

H 2 *Enrolling in a finance-related training program (either a degree program or an elective training program) can significantly improve college students' financial satisfaction.*

H 3 *Enrolling in a finance-related training program (either a degree program or an elective training program) can significantly improve college students' financial habits.*

Research design

Sampling and data collection

The data used for the empirical analysis were collected during two rounds of field surveys in Hunan province.[2] The first round was conducted in October 2016. To draw a representative sample, we randomly selected seven universities out of 41 eligible HE institutions to participate in the survey. According to the provincial statistical yearbook, there

[2] . Hunan is an important center of HE in China. With a total of 47 HE institutions, there are a great number of high school graduates enrolled in universities in Hunan province.

were 93,913 enrolled college students of the sampled seven universities, approximately 15.22% of all students from the 41 eligible HE institutions, 24,000 of whom were first-year students. In these seven universities, we randomly sampled 5% of first-year students from every major to participate in the survey. We surveyed a total of 1340 first-year students. The first round of the survey included three blocks of information: students' demographics, family background, and whether they had received financial training from their parents.[3] We also identified if they were enrolled in a finance-related major.

The follow-up survey was conducted in November 2018, which was the third year of the sample students' university studies. We surveyed college students' financial literacy and practices in detail. We chose to conduct the follow-up survey at this time because the finance-related courses were offered during the first and second academic years. In total, we tracked 1334 students. Conducting the follow-up survey during this time allowed us to examine the immediate effect of enrolling in finance-related programs on students' financial literacy and habits. Generally, students prepare for graduation and search for jobs during their last academic year; additionally, many begin working at internships.

Measuring students' financial habits

Following the early literature (Peach & Yuan, 2017), we developed questionnaires to measure students' financial literacy and practices. First, we asked students to self-evaluate their personal finance literacy using a five-point Likert scale. Following the self-evaluation, we conducted a standardized financial literacy test developed in the National Financial Capability Study (NFCS) by the FINRA Investor Education Foundation (NFCS, 2015). The test includes questions about compound interest, inflation, the bond rate, mortgages, and risk diversification; it has been widely applied to measure students' financial literacy (Hung et al., 2009).

Following the financial literacy test, we measured the students' financial habits. Specifically, taking Muske and Winter's (2001) recommendation, we focused on six daily financial practices: accounting, spending, investment, personal credit, savings, and risk diversification. These questions have been frequently used to examine students' financial habits (Lusardi, 2010; West & Mottola, 2016) and if they had put these personal finance behaviors into practice.

[3] . Cultural capital is measured by a list of assets related to a good learning environment, including whether the household has internet access, books, an independent study room, and other learning-related facilities. We use principal component analysis (PCA) to construct an index to reflect the relative rank of the households' intellectual wealth.

Analytical approach

To estimate whether enrolling in a finance-related training program improves students' financial literacy and habits, and considering that there are two types of finance-related training programs in Chinese universities (as discussed in Sect. 1.3), we addressed two specific challenges to yield unbiased estimation. First, these two types of finance-related training programs might attract different types of college students; thus, they might produce significantly different outcomes, given the different intensities and structures of the programs (Chung & Park, 2014). For instance, students who enrolled in finance-related majors (and are motivated to receive a corresponding degree) might be different from those who enrolled in a nondegree finance-related training program. To capture the potential heterogeneous effects of these two programs, we first identified students who enrolled in a finance-related major (as a degree program) and defined them as finance-major (FM) students. Subsequently, we identified students who were not finance majors but enrolled in a finance-related training program (as an elective program) and defined them as nonfinance-major (non-FM) students. In this way, we could treat these two types of students separately in the statistical analysis. Second, given that we only measured students' financial outcomes in the follow-up survey, and students' choices on which type of finance-related training program to participate in can be affected by various factors, we controlled for potential endogeneity due to omitted variables. Therefore, we implemented the empirical estimation with three different strategies to reduce the potential bias.

Multivariate regression analyzes

First, we ran a series of multivariate regression analyzes (MRAs) as the benchmark to examine whether receiving different finance-related programs affects students' financial outcomes. Specifically, we ran the following specification:

$$Y_{ij} = \alpha_0 + \alpha_1 T_{ij}^{FM} + \alpha_2 T_{ij}^{non-FM} + \alpha_2 X_{ij}^{'} + \theta_j + \varepsilon_{ij} \quad (1)$$

where Y_{ij} represents the students' financial outcomes that we are interested in (financial literacy and personal finance habits). T_{ij}^{FM} and T_{ij}^{non-FM} are two independent variables, where T_{ij}^{FM} is a dummy variable indicating whether a student enrolled in a finance-related degree program, and T_{ij}^{non-FM} is a dummy variable indicating whether a non-FM student enrolled in a finance-related training program. In this estimation, parameters α_1 and α_2 are the main coefficients of interest. To control for potential confounders, we add the term $X_{ij}^{'}$ to Eq. (1). $X_{ij}^{'}$ is a vector that includes not only students' characteristics but also their parents' and families'

characteristics. All control variables were collected during the first-round survey before the students received any FE during their college studies. To eliminate potential confounders at the university level (and/or department level), we further add the term θ_j as a group of university dummies to capture the unique characteristics of different departments and/or universities; ε_{ij} is the robust university-level clustered standard error.

Propensity score matching

An MRA can be an effective estimation if we assume that there is no correlation between the error term (ε_{ij}) and the independent variables (T_{ij}^{FM} and T_{ij}^{non-FM}). However, in reality, students' participation in different types of finance-related training programs may be associated with various observed and unobserved factors. If these two groups of students are significantly different from each other, our estimations may be misleading because of exploration out of the common support zone. To control for this potential omitted variable bias, we used the propensity score matching (PSM) method, which allows us to remove the sampled students who are significantly different from students from the comparison groups so that we do not yield a biased estimate due to extrapolation (King & Zeng, 2006). Moreover, assuming there is no unobserved omitted variable, under the conditional independence assumption (CIA), PSM removes any observed confounding factors that prevent an unbiased estimate of the correlation (Rosenbaum & Rubin, 1983).

The matching was conducted in two steps. First, we ran a series of *probit* models with students' choices of enrollment in different financial training programs as outcomes. These analyzes enabled us to identify the observed personal and family characteristics associated with students' choices in different training programs and calculate the propensity scores for each sampled student. Second, we conducted kernel matching (using the calculated propensity scores) to construct a balanced counterfactual group. We compared the observed characteristics between students who were enrolled in different finance-related training programs and students who did not enroll in any finance-related program. After the matching was implemented, two well-balanced counterfactual samples were constructed.[4] Subsequently, we ran the same MRA (as shown in Eq. 1) on top of the matched sample to accurately estimate the effect of enrolling in different finance-related training programs on students' financial outcomes.

Robustness check: Inverse probability-weighted regression adjustment

To serve as a robustness check, we used the inverse probability-weighted regression adjustment (IPW-RA) method to conduct our analysis, assuming that we have a multivalued finance-related training program (finance-related majors) and non-FM students enrolled in an elective training program). First, it is natural to assume that relative to T_{ij}^{non-FM} students enrolled in a financial training program, T_{ij}^{FM} students would receive considerable intensive and comprehensive training during their studies. Whether students are T_{ij}^{FM} or T_{ij}^{non-FM} could be treated as an experiment with multiple intensities of the treatment. Thus, the analysis can be defined as a multivalued treatment analysis (Cattaneo, 2010). Second, by using the IPW to compute the average of the potential outcomes for different treatment levels, the IPW-RA is a doubly robust estimator when either the model to estimate the probability weights is correctly specified, or the regression adjustment model is correctly specified (Cattaneo, 2010).

Results

College students' financial literacy and habits

Figure 1 illustrates the distribution of student enrollment in different types of finance-related training programs. We found that approximately 64% of sampled students did not enroll in any finance-related training program, 23% were enrolled in a finance-related major, and about 13% were enrolled in some elective programs.

Furthermore, Table 1 presents the mean differences in students' financial outcomes. On average, college students correctly answered three to four questions in the standard financial literacy test. However, the students' self-reported financial literacy is quite low (Table 1). Only 20% of the sampled students believe that their financial literacy was good. Even among T_{ij}^{FM} students, only 27% believe they have good financial literacy.[5] In addition, reported satisfaction with their personal financial situation was only slightly above the median value (mean value is 5, Table 1), indicating that approximately half of the students were not satisfied with their financial situation.

When considering the actual practice of financial literacy, we found that the rate was rather low (Table 1). Only 24% of

[4] . The full list of observed covariates simple t-test of mean differences and the balance check of all covariates after matching are presented in an online supplementary. Readers who are interested in this information could contact the corresponding author.

[5] . In fact, the score among students who did not enroll in any finance-related training program showed an even lower personal self-reported financial literacy (Table 1).

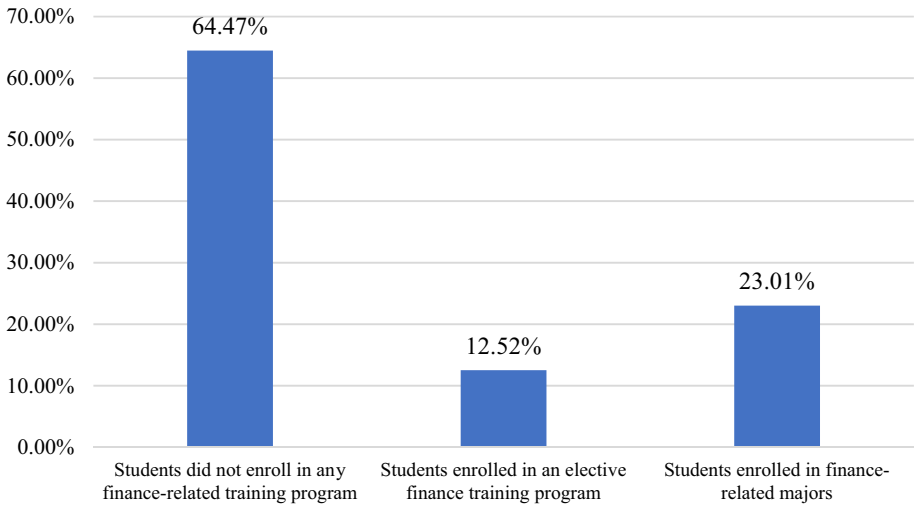

Fig. 1 The distribution of sampled students enrolled in different finance-related training programs. Data source: author's survey

Table 1 Description of all the variables

Outcome variables	Full sample	Students enrolled in finance-related training program		Students did not enroll in any finance-related training program
		Finance-majored students	*Non-finance-majored students*	
		$T^{FM} = 1$	$T^{non-FM} = 1$	$T = 0$
	(1)	(2)	(3)	(4)
Students' financial literacy and satisfaction				
1. Students' financial literacy	3.52	4.15***	3.64***	3.27
	[1.42]	(0.08)	(0.13)	(0.15)
2. Students' self-reported financial literacy,1 = good	0.20	0.27**	0.30***	0.16
	[0.40]	(0.02)	(0.03)	(0.01)
3. Students' satisfaction of their financial situation	6.45	6.51	6.81***	6.36
	[2.23]	(0.11)	(0.14)	(0.09)
Students reported personal financial habits				
4. Track monthly expenditure, 1 = yes	0.24	0.28**	0.28	0.22
	[0.43]	(0.02)	(0.06)	(0.01)
5. Follow the monthly budget, 1 = yes	0.58	0.53	0.70**	0.57
	[0.49]	(0.02)	(0.04)	(0.01)
6. Spend less than income, 1 = yes	0.53	0.54	0.55	0.52
	[0.50]	(0.04)	(0.04)	(0.02)
7. Frequently check the personal credit record, 1 = yes	0.47	0.53**	0.57**	0.43
	[0.50]	(0.03)	(0.05)	(0.01)
8. Have a personal savings account, 1 = yes	0.86	0.89	0.86	0.85
	[0.35]	(0.02)	(0.03)	(0.01)
9. Have an emergency fund, 1 = yes	0.56	0.58	0.62*	0.53
	[0.50]	(0.04)	(0.03)	(0.02)
# of observations	1334	307	167	860

(a) Standard deviations are reported in brackets; (b) Robust clustered (at university level) standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. (c) A simple t-test was administrated with both the Finance-majored students ($T^{FM} = 1$) and non-financed-majored students ($T^{non-FM} = 1$) versus students who did not enroll in any finance-related training program. Data source: author's survey

students accounted for their monthly expenditures; approximately half did not spend money based on their budget (or spent less than what they received), and more than half did not check their credit frequently. Although 86% of the sampled students had a personal savings account, only half reported that they also had an emergency fund. These results show that there is a strong presence of wishful thinking about personal finance behavior, whereas little is practiced in their day-to-day life.

Students' enrollment in finance-related programs and the matching results

Table 2 presents the relationship between the observed factors and college students' enrollment in different types of finance-related training programs. We can see that female students have a significantly higher probability than male students of enrolling in a finance-related major; however, there are no gender differences among non-FM students enrolled in an elective training program (Table 2). Whether their parents had taught them about financial management plays a statistically significant role in influencing students' choices (Table 2). Moreover, fathers' education, migration experiences, and if a student is an only child influence whether they enroll in a finance-related major program, but shows little influence on non-FM students' enrollment in an elective program. Intuitively, this makes sense since students' choice of a major is often strongly influenced by their parents' preferences (Fan, 2013), whereas the choice of enrolling in an elective program is less important.

Based on these observed predetermined covariates, we used the PSM method to create comparable counterfactual groups for both T_{ij}^{FM} or T_{ij}^{non-FM} students. To form a comparison group for T_{ij}^{FM} students, we excluded 105 sampled students after matching. The balance check shows that we observed no statistical difference between all the control variables after matching. To form a comparison group for T_{ij}^{non-FM} students, we dropped 202 sampled students after matching. Furthermore, the balance check showed no statistical difference between the control variables.

Effects of enrolling in a finance-related program on students' financial literacy

First, we present the estimated results of the standard financial literacy test. We found that enrolling in a finance-related training program significantly increased their financial literacy. With the MRAs, we found that enrolling in finance-related majors increased students' financial literacy score by 0.57, and non-FM students enrolling in an elective program increased their financial literacy scores by 0.24 e (Table 3). In the PSM and IPW regression analysis, we found that both methods yielded consistent and robust results. This result indicates that enrolling in finance-related major increases students' financial literacy scores almost double that of T_{ij}^{non-FM} students enrolled in an elective program. This positive effect can also be observed in students' self-reported financial literacy. The estimations with PSM and IPW regression analyzes yielded the same robust results.[6] These results confirmed the positive effect of enrolling in finance-related programs on students' financial literacy (Table 4).

Additionally, we examined whether enrolling in a finance-related program improved students' financial satisfaction (as shown in Outcome 3). The descriptive results show a relatively low level of student satisfaction with their financial situation. The estimation results show that enrolling in a finance-related training program increased students' satisfaction; however, the estimated increases are minimal. Interestingly, students enrolled in a finance-related major yielded less improvement than non-FM students enrolled in an elective program. Why is there a significant increase in financial literacy but limited improvement in students' satisfaction with their personal finances?

Effects of enrolling in finance-related programs on students' financial habits

To explore the potential explanations, we focus on the effects of enrolling in a finance-related program on students' financial practices. The results are very complicated. It is natural to assume that there was a strong motivation among students to develop their financial habits. However, when examining college students' financial practices, there was a significant discrepancy between their motivations and actual practices. We found that enrolling in a finance-related training program did not improve students' financial practices. This result can be observed from both students enrolled in finance-related majors (as a degree program) and non-FM students enrolled in an elective program (as shown in Table 4). For instance, we observed an increase in monthly accounting among students with finance majors, which was particularly large with the PSM estimator. However, the IPW regression analysis result is minimal and only statistically significant at the 10% level. For other financial practices, such as spending habits (B2 and B3), savings (B5), and emergency funds (B6), we found no positive or statistically significant increase from either FM or non-FM students. These results indicate that the observed increases in students' financial habits were

[6] . In both the multivariate regression and the PSM, we used the probit model given that the outcome variable is a binary variable, whereas, in the IPW regression analysis, we used the linear regression model, thus the coefficients are smaller than that in the probit model.

Table 2 Factors associated with students' choices of enrollment in finance-related training program

Outcome variables	Enrolled in a finance-related major, $T^{FM} = 1$ (1)	Enrolled in a finance-related training program, $T^{non-FM} = 1$ (2)
College students' personal characteristics		
1. Students' age, in years	0.01	0.03
	(0.05)	(0.08)
2. Is he/she a female student, 1 = yes	0.52***	−0.19
	(0.13)	(0.12)
3. Is he/she an ethnic minority, 1 = yes	−0.09	−0.15
	(0.18)	(0.20)
4. Is he/she from a rural community, 1 = yes	0.16	0.23*
	(0.11)	(0.13)
5. Is he/she from another province, 1 = yes	−0.06	0.12
	(0.07)	(0.14)
6. College entrance exam scores, normalized	0.00**	−0.00
	(0.00)	(0.00)
7. Is he/she a student leader in college, 1 = yes	−0.15	−0.06
	(0.15)	(0.20)
8. Parents taught about financial management, 1 = yes	0.35***	0.41***
	(0.10)	(0.12)
9. Plan to continue to do master study, 1 = yes	−0.27***	−0.22
	(0.10)	(0.18)
10. Plan to work, 1 = yes	−0.13	−0.12
	(0.13)	(0.18)
11. Expected salary after graduation, in thousand yuan	−0.00	0.01
	(0.01)	(0.02)
12. Expected chance to find a major-matched job (%)	−0.00	0.01**
	(0.00)	(0.00)
Students' parents and family characteristics		
13. Father's education, in years	0.03*	0.02
	(0.02)	(0.02)
14. Mother's education, in years	−0.02	0.02
	(0.02)	(0.02)
15. Father is a migrant worker, 1 = yes	0.22**	0.06
	(0.10)	(0.15)
16. Mother is a migration worker, 1 = yes	0.00	0.06
	(0.11)	(0.14)
17. Family size, in persons	−0.09	−0.05
	(0.07)	(0.06)
18. Is the student a single-child, 1 = yes	−0.12**	−0.17
	(0.06)	(0.16)
19. Highest families with cultural capital (upper 33%)	0.08	0.04
	(0.14)	(0.14)
20. Lowest families with cultural capital (lower 33%)	−0.01	−0.31*
	(0.13)	(0.16)
21. From the lowest wealthy families (lower 33%)	−0.22*	0.09
	(0.13)	(0.13)
22. From the highest wealthy families (upper 33%)	0.03	−0.32**
	(0.20)	(0.15)
Department or university dummies controlled	Yes	Yes
Constant	−3.69**	−0.99
	(1.54)	(1.78)
Observations	1,166	1027
R-Square (R2)	0.26	0.15

Table 2 (continued)

Robust clustered standard errors reported in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

Table 3 Effect of financial training on students' financial literacy and their financial satisfaction

	Multivariate regression	Propensity score matching (PSM) with covariates adjusted		IPW reg. adjustments
	(1)	(2)	(3)	(4)
# of observations	1334	825	1062	1334
	Outcome 1: Measured students' financial literacy			
Treatment variable				
1. Enrolled in a finance-related major program, $T^{FM}=1$	0.57***	0.57***		0.51***
	(0.08)	(0.11)		(0.08)
2. Non-FM students enrolled in a training program, $T^{non-FM}=1$	0.24**		0.22***	0.23***
	(0.07)		(0.05)	(0.09)
3. Personal and family characteristics	Yes	Yes	Yes	Yes
4. Department or university dummies	Yes	Yes	Yes	Yes
	Outcome 2: Students' self-reported financial literacy, 1 = good			
Treatment variable				
5. Enrolled in a finance-related major program, $T^{FM}=1$	0.45***	0.40***		0.13***
	(0.09)	(0.10)		(0.04)
6. Non-FM students enrolled in a training program, $T^{non-FM}=1$	0.48***		0.36***	0.14***
	(0.06)		(0.13)	(0.04)
7. Personal and family characteristics	Yes	Yes	Yes	Yes
8. Department or university dummies	Yes	Yes	Yes	Yes
	Outcome 3: Students' satisfaction of their financial situation			
Treatment variable				
9. Enrolled in a finance-related major program, $T^{FM}=1$	0.13*	0.12*		0.17**
	(0.05)	(0.06)		(0.08)
10. Non-FM students enrolled in a training program, $T^{non-FM}=1$	0.24***		0.17*	0.19**
	(0.05)		(0.09)	(0.09)
11. Personal and family characteristics	Yes	Yes	Yes	Yes
12. Department or university dummies	Yes	Yes	Yes	Yes

Robust clustered standard errors reported in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

Data source: author's survey

minimal, from which we could barely make any confident statistical interference.

By summarizing these results, we find that enrolling in a finance-related training program increases college students' financial literacy. The increase was particularly robust among students enrolled in finance-related majors; however, there was limited evidence that enrolling in these programs improves their financial practices. This result is quite different from that of many previous studies. Several studies have found that financial literacy is often associated with more desirable financial behavior, contributing to better financial well-being (Hira, 2012; Huston, 2012). However, some studies have shown that enrolling in financial-related training programs may yield little improvement in actual financial practices (Hathaway & Khatiwada, 2008).

Table 4 Effect of enrolling in finance-related training program on students' financial habits

	OLS with full sample	PSM with covariate adjusted		IPW reg. adjustments	OLS with full sample	PSM with covariate adjusted		IPW reg. adjustments
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
# of observations	1334	852	1062	1334	1334	852	1062	1334
	B1: Track monthly expenditure, 1 = yes				*B2: Follow the monthly budget, 1 = yes*			
Treatment variables								
1. Enrolled in a finance-related major program, $T^{FM} = 1$	0.06	0.15***		0.07*	0.11**	-0.05		0.11***
	(0.06)	(0.06)		(0.04)	(0.04)	(0.06)		(0.04)
2. Non-FM students enrolled in a training program, $T^{non-FM} = 1$	0.05**		0.09	0.06*	-0.03		0.28*	-0.05
	(0.02)		(0.26)	(0.04)	(0.03)		(0.15)	(0.04)
3. Personal and family characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4. Department or university dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	B3: Spend less than what you received, 1 = yes				*B4: Frequently check personal credit record, 1 = yes*			
Treatment variables								
5. Enrolled in a finance-related major program, $T^{FM} = 1$	0.05	0.05		0.08*	0.10	0.24*		0.12***
	(0.03)	(0.15)		(0.04)	(0.06)	(0.14)		(0.04)
6. Non-FM students enrolled in a training program, $T^{non-FM} = 1$	0.05		0.07	0.03	0.06		0.32	0.09**
	(0.06)		(0.07)	(0.04)	(0.05)		(0.30)	(0.04)
7. Personal and family characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8. Department or university dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	B5: Have a personal savings account, 1 = yes				*B6: Have an emergency fund, 1 = yes*			
Treatment variables								
9. Enrolled in a finance-related major program, $T^{FM} = 1$	− 0.00	0.14		− 0.05	0.08**	0.08		0.07
	(0.04)	(0.21)		(0.03)	(0.03)	(0.15)		(0.05)
10. Non-FM students enrolled in a training program, $T^{non-FM} = 1$	0.01		− 0.04	− 0.01	0.04		0.22***	0.00
	(0.04)		(0.24)	(0.03)	(0.05)		(0.08)	(0.04)
11. Personal and family characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12. Department or university dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

(a) In all analyses, we have controlled students' personal and family characteristics; (b) We have also added the university or department dummies to control for specific university or department characteristics, this has provided us great statistical power. (c) Results obtained from the matching might show a larger standard error due to the reduced the sample size and subsequently reduced statistical power. (d) We reported the robust clustered standard errors in parentheses

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Data source: author's survey

Qualitative findings and discussion

To explain these discrepancies, we conducted a qualitative study with 30 in-depth interviews. We interviewed five students who did not enroll in any finance-related program, 10 non-FM students enrolled in a finance-related training program, 10 students enrolled in a finance-related major (as a degree program), and five university staff who taught financial management at the sampled universities. By summarizing the qualitative interviews, we found three main barriers to the development of students' financial habits in the current financial training programs.

Imbalanced curriculum design

Many students enrolled in finance-related training programs reported that the current curriculum overemphasized the concepts, definitions, and their relationship with public finance and/or corporate finance (Jin & Chen, 2012). As a result, there is limited knowledge and practice

regarding personal finance management. For instance, an FM student told us the following [HN-110102–02]:

> *Basically, we have learned all this knowledge in class and can calculate compound interest when considering inflation and deflation. However, we never learned how this knowledge is associated with our personal financial management. I do not know what it means for my personal financial situation.*

Students may have a positive attitude toward personal finance management, yet the imbalanced curriculum design and lack of personal finance training prevents students' from learning and does not encourage students to apply acquired knowledge to their day-to-day experience. For instance, a non-FM student enrolled in an elective program told us [HN-110104-05]:

> *I think that learning financial knowledge and applying this knowledge in my daily life is very important. The courses I joined last year were helpful, and I learned a lot. However, I find it difficult to integrate this knowledge into my personal, day-to-day financial practice. For instance, I learned the importance of accounting and how to do it for a company. However, my personal finance is different from corporate finance, and I found it is very unclear what I should do with my personal finance and how this information being examined should be used to guide my personal financial management. I think I will still need to do some self-exploration in the future.*

Without redesigning the curriculum and improving the quality of the content, it would be difficult to improve the students' financial habits. A large number of personal finance management programs have been rolled out over the past decades, such as the FDIC's Money Smart for Young Adults curriculum in the United States (Lyons & Scherpf, 2003) and the National Committee for Financial Education in Brazil (Atkinson & Messy, 2013). These programs are a great reference for redesigning the current FE in Chinese HE.

Lack of qualified staff

Despite a redesigned curriculum, training qualified staff is another challenge (Compen et al., 2019; Yue, 2018). We observed that most university staff who taught financial management did not receive any specific training on personal finance management skills (Su et al., 2019). Teachers are equipped with a strong background in corporate and/or public finance. For instance, a university staff told us [HN-110102-09]:

> *I teach a bachelor's program in financial management. These courses are primarily about corporate finance. I sometimes extend the content of corporate finance to personal financial management purely from my personal experience. I was not trained in personal financial literacy and personal financial management. I think it is important to teach the younger generation how to manage their own money. Indeed, it is a pity that, at the moment, no specific programs have been set up in Chinese college education.*

A piggy bank-style family financial support

Additionally, college students are at a decisive time in their lives as they move from financial dependance to financial independence; when they are financially dependent, college students often engage in relatively risky financial behavior (Lyons, 2004). In China, most college students are financially supported by their parents. Parents tend to do their best to keep their children financially secure (Yao & Meng, 2018). Previous studies indicate that when parents provide extensive financial support during this transition period, it often inhibits young adults' transition to becoming financially independent (Liu, 2014; Wang et al., 2010). Almost all the surveyed students told us that their parents financially supported them. For instance, an interviewee told us the following [HN-110103-02]:

> *I think financial management is important, but I don't think I need to worry about it. My parents always back me up; they transfer money to me regularly. Although I sometimes spend too much, they do not really blame me. I guess they just care about me too much. Studying at a university far away from home makes them feel I am not being taken good care of.*

When college students have excessive financial support from their parents, they rarely worry about financial matters (Yao & Meng, 2018), which might diminish their motivation to learn financial management skills. In our study, we controlled for whether students had received FE from their parents. However, it is difficult to know if the parents are equipped with proper financial management knowledge and whether they teach their children properly. All these inappropriate family financial management behavior may result in limited improvement in their actual financial practices.

Conclusion

Effective personal finance management is crucial for building a stable and satisfactory economic life. However, there is a significant lack of personal FE in Chinese HE students. In our study, we examined the status of Chinese college

students' financial literacy and whether enrolling in a finance-related program increases college students' financial literacy and habits. The empirical analyzes show that enrolling in a finance-related program, a finance-related degree program, or a non-finance-majored elective program yields a relatively high level of financial literacy; however, limited differences regarding their actual financial practices are prevalent. This result is quite consistent with many previous studies. Fox et al. (2005) and Peng et al. (2007) found that personal finance training improved students' investment knowledge. However, none of them reported a positive correlation with students' actual practices. Qualitative interviews demonstrate that an imbalanced curriculum design and a lack of qualified teaching staff can be significant barriers to facilitating behavioral changes, and that parental financial support might play a negative role in fostering financial practices.

Meanwhile, several limitations should be pointed out despite carefully designing the empirical estimation strategy. First, we only measured students' financial literacy and habits per year. The cross-sectional nature of the data limited our ability to draw a rigorous causal relationship. Structured panel data should be considered in future studies. Second, our findings were short-term observations. Long-term effects may be more or less substantial. Future research on the long-term effects should be emphasized. Third, we focused on college students because we believe that the college period is the best time for students to develop their financial practices (Peng et al., 2007). However, other age groups of students, such as high school students, should also be considered in future studies. These limitations should be carefully addressed in future research, and more rigorous empirical methods should be employed to examine the effectiveness and impact to yield a better understanding of FE in Chinese HE.

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Data availability The datasets used in this paper were collected by the authors and are not publicly available due the fact that they constitute an excerpt of research in progress but are available from the corresponding author on reasonable request.

Declarations

Conflict of interest No potential conflict of interest was reported by the authors.

References

Bamforth, J., Jebarajakirthy, C., & Geursen, G. (2018). Understanding undergraduates' money management behaviour: A study beyond financial literacy. *International Journal of Bank Marketing, 36*(7), 1285–1310. https://doi.org/10.1108/IJBM-05-2017-0104

Brugiavini, A., Cavapozzi, D., Padula, M., & Pettinicchi, Y. (2018). On the effect of financial education on financial literacy: Evidence from a sample of college students. *Journal of Pension Economics and Finance, 19*(1), 344–352. https://doi.org/10.1017/S1474747218000276

Caplinska, A., & Tvaronavičienė, M. (2020). Creditworthiness place in Credit Theory and methods of its evaluation. *Entrepreneurship and Sustainability Issues, 7*(3), 2542–2555. https://doi.org/10.9770/jesi.2020.7.3(72)

Cattaneo, M. D. (2010). Efficient semiparametric estimation of multivalued treatment effects under ignobility. *Journal of Econometrics, 155*, 138–154. https://doi.org/10.1016/j.jeconom.2009.09.023

Chung, Y., & Park, Y. (2014). The effects of financial education and networks on business students' financial literacy. *American Journal of Business Education, 7*(3), 229–236. https://doi.org/10.19030/ajbe.v7i3.8632

Compen, B., De Witte, K., & Schelfhout, W. (2019). The role of teacher professional development in financial literacy education, A systematic literature review. *Educational Research Review, 26*, 16–31. https://doi.org/10.1016/j.edurev.2018.12.001

Fan, M. (2013). Analysis of influence factors of Chinese college students' major selection. *Modern Education Management, 1*, 113–117. (in Chinese).

Fernandes, D., Lynch, J. G., Jr., & Netemeyer, R. G. (2014). Financial literacy, financial education, and downstream financial behaviors. *Management Science, 60*(8), 1861–1883. https://doi.org/10.1287/mnsc.2013.1849

Fox, J., Bartholomae, S., & Lee, J. (2005). Building the case for financial education. *Journal of Consumer Affairs, 39*(1), 195–214. https://doi.org/10.1111/j.1745-6606.2005.00009.x

Gerrans, P. (2021). Undergraduate student financial education interventions: medium term evidence of retention, decay, and confidence in financial literacy. *Pacific-Basin Finance Journal, 67*(7), 101552. https://doi.org/10.1016/j.pacfin.2021.101552

Gignac, G. E., Gerrans, P., & Andersen, C. B. (2023). Financial literacy mediates the effect between verbal intelligence and financial

anxiety. *Personality and Individual Differences, 23*, 112025. https://doi.org/10.1016/j.paid.2022.112025
Hira, T. K. (2012). Promoting sustainable financial behavior, Implications for education and research. *International Journal of Consumer Studies, 36*, 502–507. https://doi.org/10.1111/j.1470-6431.2012.01115.x
Huston, S. J. (2012). Financial literacy and the cost of borrowing. *International Journal of Consumer Studies, 36*, 566–572. https://doi.org/10.1111/j.1470-6431.2012.01122.x
Jiang, Y. (2003). Reform and development of China's higher financial education. *Jiangsu Higher Education, 06*, 44–45. (in Chinese).
Jill, B., Charles, J., & Gus, G. (2018). Understanding undergraduates' money management behaviour: A study beyond financial literacy. *International Journal of Bank Marketing, 36*(7), 1285–1310. https://doi.org/10.1108/IJBM-05-2017-0104
Jin, T., & Chen, Y. (2012). The characteristics and development trend of practical teaching of economics and management majors. *China Higher Education, 3*, 71–72. (in Chinese).
Jobst, V. J. (2014). Does a university financial literacy course change financial behavior? *Journal of Higher Education Theory & Practice, 14*(5), 63–77.
Johan, I., Rowlingson, K., & Appleyard, L. (2021). The effect of personal finance education on the financial knowledge, attitudes and behaviour of university students in Indonesia. *Journal of Family and Economic Issues, 42*(2), 351–367. https://doi.org/10.1007/s10834-020-09721-9
Johnson, E., & Sherraden, M. S. (2007). From financial literacy to financial capability among youth. *Journal of Sociology Social Welfare, 34*(3), 119–145.
Kaiser, T., & Menkhoff, L. (2017). Does financial education impact financial literacy and financial behavior, and if so, when? *The World Bank Economic Review, 31*(3), 611–630. https://doi.org/10.1093/wber/lhx018
Kaiser, T., Lusardi, A., Menkhoff, L., & Urban, C. (2022). Financial education affects financial knowledge and downstream behaviors. *Journal of Financial Economics, 145*, 255–272. https://doi.org/10.1016/j.jfineco.2021.09.022
King, G., & Zeng, L. (2006). The dangers of extreme counterfactuals. *Political Analysis, 14*(2), 131–159. https://doi.org/10.1093/pan/mpj004
Li, G., Xi, Y., & Zhu, Z. (2022). The way to sustainability: Education for sustainable development in China. *Asia Pacific Educ, 23*, 611–624. https://doi.org/10.1007/s12564-022-09782-5
Liu, H. C. (2014). An analysis of consumer behaviour of college students born in the 1990s in China. *Canadian Social Science, 10*(6), 186–189. https://doi.org/10.3968/5439
Liu, L. A., & Hua, Z. B. (2021). Financial literacy, self-efficacy and risky credit behavior among college students: evidence from online consumer credit. *Journal of Behavioral and Experimental Finance, 32*, 100569. https://doi.org/10.1016/j.jbef.2021.100569
Lusardi, A., & Mitchell, O. S. (2006). Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth. *Journal of Monetary Economics, 54*(1), 205–224. https://doi.org/10.1016/j.jmoneco.2006.12.001
Lusardi, A., Mitchell, O. S., & Curto, V. (2010). Financial literacy among the young. *Journal of Consumer Affairs, 44*(2), 358–380. https://doi.org/10.1111/j.1745-6606.2010.01173.x
Lyons, A. C. (2004). A profile of financially at-risk college students. *Journal of Consumer Affairs, 38*(1), 56–80. https://doi.org/10.1111/j.1745-6606.2004.tb00465.x
Lyons, A. C., Palmer, L., Jayaratne, K. S., & Scherpf, E. (2006). Are we making the grade? A national overview of financial education and program evaluation. *Journal of Consumer Affairs, 40*(2), 208–235. https://doi.org/10.1111/j.1745-6606.2006.00056.x
Mandell, L., & Klein, L. S. (2009). The impact of financial literacy education on subsequent financial behavior. *Journal of Financial Counseling and Planning, 20*(1), 15–24.
Muske, G., & Winter, M. (2001). An in-depth look at family cash-flow management practices. *Journal of Family and Economic Issues, 22*(4), 353–372. https://doi.org/10.1023/A:1012764712063
Muske, G., & Winter, M. (2004). Personal financial management education: An alternative paradigm. *Journal of Financial Counseling and Planning, 15*(2), 79–88.
Panos, G. A., & Wilson, J. O. (2020). Financial literacy and responsible finance in the FinTech era: Capabilities and challenges. *The European Journal of Finance, 26*(4–5), 297–301. https://doi.org/10.1080/1351847X.2020.1717569
Peach, N. D., & Yuan, H. (2017). Assessing the financial knowledge, behaviors, and attitudes of undergraduates. *Journal of Business Education and Scholarship of Teaching, 11*(2), 27–38.
Peng, T. C. M., Bartholomae, S., Fox, J. J., & Cravener, G. (2007). The impact of personal finance education delivered in high school and college courses. *Journal of Family and Economic Issues, 28*(2), 265–284. https://doi.org/10.1007/s10834-007-9058-7
Rosacker, K. M., & Rosacker, R. E. (2016). An exploratory study of financial literacy training for accounting and business majors. *The International Journal of Management Education, 14*(1), 1–7. https://doi.org/10.1016/j.ijme.2015.11.002
Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41–55. https://doi.org/10.1093/biomet/70.1.41
Su, S., Huang, S., & Zhang, H. (2019). Research on financial literacy education from the perspective of core competency. *Journal of Beijing Normal University (Social Science Edition), 272*(02), 74–79. (in Chinese).
Walker, S. P., & Llewellyn, S. (2000). Accounting at home: Some interdisciplinary perspectives. *Accounting, Auditing & Accountability Journal, 13*(4), 425–449. https://doi.org/10.1108/09513579910270129a
Wang, J., & Xiao, J. J. (2009). Buying behavior, social support and credit card indebtedness of college students. *International Journal of Consumer Studies, 33*(1), 2–10. https://doi.org/10.1111/j.1470-6431.2008.00719.x
Wang, H., Kong, M., Shan, W., & Vong, S. K. (2010). The effects of doing part-time jobs on college student academic performance and social life in a Chinese society. *Journal of Education and Work, 23*(1), 79–94. https://doi.org/10.1080/13639080903418402
West, S., & Mottola, G. (2016). A population on the brink: American renters, emergency savings, and financial fragility. *Poverty and Public Policy, 8*(1), 56–71. https://doi.org/10.1002/pop4.130
Xiang, S., & Ping, W. (2010). Curriculum design for the undergraduates majoring in statistics in financial colleges retrospect and prospect. *Statistical Research, 27*(001), 74–78. (in Chinese).
Yao, R., & Meng, X. (2018). Credit card usage among college students in China. *Journal of Financial Counseling and Planning, 29*(2), 304–315. https://doi.org/10.1891/1052-3073.29.2.304
Yue, C. (2018). Why financial literacy education becomes more important? *Global Education, 47*(1), 56–67. (in Chinese).
Zhou, Y., Yang, M., & Gan, X. (2022). Education and financial literacy: Evidence from compulsory schooling law in China. *The Quarterly Review of Economics and Finance*. https://doi.org/10.1016/j.qref.2022.09.006
Atkinson, A., & Messy, F. A. (2013). Promoting financial inclusion through financial education: OECD/INFE evidence, policies and practice. *OECD Working Papers on Finance, Insurance and Private Pensions*, 34, OECD Publishing: Paris. https://doi.org/10.1787/5k3xz6m88smp-en

Hathaway, I., & Khatiwada, S. (2008). Do financial education programs work? *FRB of Cleveland Working Paper No. 08–03*. https://doi.org/10.2139/ssrn.1118485

Hung, A., Parker, A. M., & Yoong, J. (2009). Defining and measuring financial literacy. *RAND Working Paper Series WR-708*. https://doi.org/10.2139/ssrn.1498674

Lusardi, A. (2010). Financial Capability in the United States: Consumer Decision-Making and the Role of Social Security (September 2010). *Michigan Retirement Research Center Research Paper No. 2010–226*. https://doi.org/10.2139/ssrn.1707529

Lyons, A. C., & Scherpf, E. (2003). An evaluation of the FDIC's financial literacy program Money Smart. *Official Report to the Women's Bureau at the US Department of Labor*, 41. https://www.researchgate.net/publication/237343766

National Financial Capability Study (NFCS). (2015). *Data and Download*. https://www.usfinancialcapability.org/downloads.php