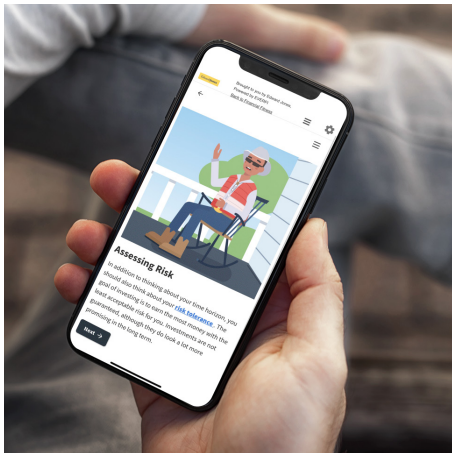
Edward Jones | EVERFI

An Efficacy Study of the Financial Fitness High School Program

Your **goals**



Your **future**

Your **impact**

Executive Summary

Building on the observational study of the Financial Fitness High School Program EVERFI conducted in the Spring of 2023, the research team of EVERFI continued to evaluate the program's efficacy in the Spring of 2024. Using a 3-group quasi-experimental design (home users, school users and comparison group) and rigorous repeated measure mixed model method, the study analyzed a sample of 370 adolescents from 37 US states and generated deep insights on the value of the program in helping students improve their financial investing knowledge, attitudes, and intended behaviors.

- On average, students who completed the course had a significant 11%-16% increase in financial investing knowledge based on test scores. The course was equally effective in improving the financial knowledge for students who used it at home and those who used it at school.
- The course effectively increased students' self-efficacy in their basic investing skills. Those who used it at home reported being 18% more confident in their ability to analyze the economy and company performance for investment decision-making, and the school users had a 9% increase in their confidence. The analysis suggests that the course was more effective in improving the confidence for those who took it at home.
- The program also helped demystify financial investing for students. After taking the course, the students perceived financial investing to be 24% of students found it less intimidating. This effect was only observed among the students who used the program at home.
- The finding that home users of the program had larger improvement in their investing-related attitudes suggests that there might be some unique advantages of taking financial investing education at home. Students in a more relaxed and informal setting could be more likely to enjoy the learning process instead of perceiving the course as a task assigned to them, which might contribute to a more favorable attitude towards the topics covered by the course. Further study is needed to evaluate the benefits of home-based financial education.

11-16%
increase in financial investing knowledge.

9%
increase in school users' confidence.

18%
more confident in their ability to analyze the economy and company performance.

24%
less intimidating for students.

9%
increase in investing intentions.

- The program had a positive impact on students' intentions to make financial investments. However, this effect was achieved completely through increasing students' confidence in basic investing skills and their financial knowledge, which in turn, made students more likely to invest. Overall, through making students more confident in their investing skills, the course increased investing intentions by 8% for the students who used the course at home, and a smaller, 4% increase was found for those who used the course at school. Through increasing learners' financial knowledge, the course increased the investing intention of students (both home users and school users) by 9%.

Introduction

Today, consumers face an overwhelming number of complex financial decisions. However, many young people are unprepared to make informed financial choices as they move into adulthood. Financial capability can be defined as the combination of attitudes, knowledge, skills, and behaviors needed to make sound financial decisions and manage money in a way that reflects an individual's circumstances and goals. Academic literature on the state of financial capability has been very clear regarding the dire state of affairs for future generations. While a lack of basic financial knowledge has been documented across the globe, adults in the U.S. are unable to answer 50% of fiscal literacy questions posed towards them and compared to Gen Z, members of Gen Y are three times more likely to have even one month of expenses stored in non-retirement savings (TIAA / GFLEC, 2022). Financial literacy scores have been found to be directly correlated with an individual's ability to "make ends meet", linking pure knowledge on the subject to observable behavior. While general educational attainment is positively correlated with financial literacy, it is not the most important predictor and even the well-educated can score very poorly on measures of fiscal understanding. These scores are very low for adolescents and young adults who tend to lack direct education and personal finance management experience (Lusardi, 2019). One specific financial behavior that is particularly underutilized among U.S. adults is investing.

Although the benefits of financial investing are well studied and documented, only 52% of American families have some forms of investment, and even fewer had any direct investment outside of their retirement accounts."

- Pew, 2020

Not only are few families directly investing in financial markets, but there are also clear gaps in investment participation based on socioeconomic status and demographic characteristics. According to a survey conducted by Gallup (2022), while 64% of White adults invested in the stock market, only 46% of adults of color had any stock investment. Investment participation rate is also found to be higher among individuals with a college or higher degree. A particularly alarming sign is that households with higher income were also more likely to invest. Gallup's data shows that 89% of families with an annual income of $100,000 or more invested in the stock market whereas only about 55% of the families with annual income below $100,000 invested. Given the compound wealth-generation effects of investment, the gap in financial market participation could lead to a further wealth divide over time between those who invest and those who don't.

On the positive side, the growing literature around the efficacy of financial education supports the role it can play in directly influencing financial knowledge, attitudes and behaviors."

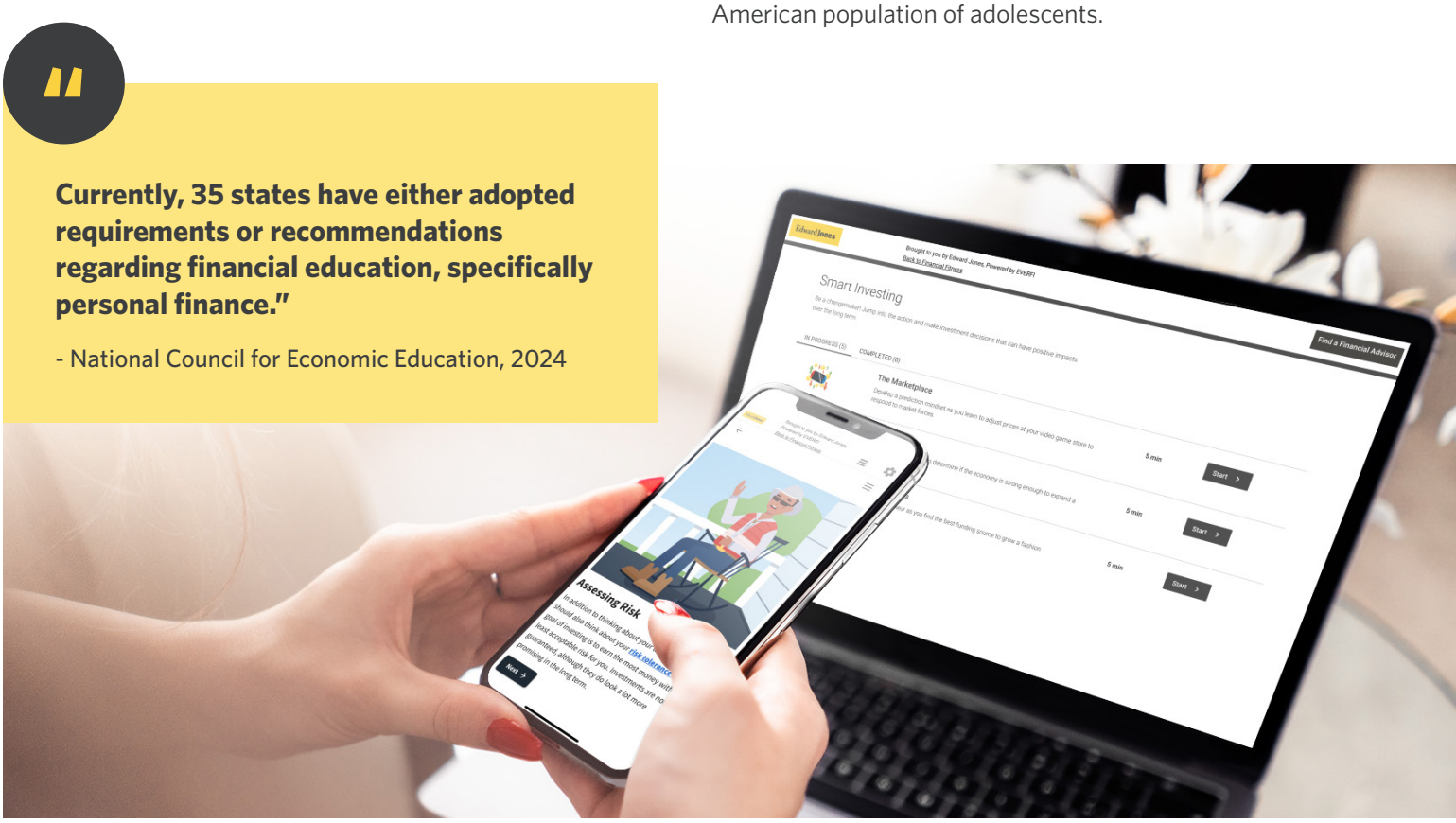
- Kaiser, Lusardi, Menkhoff, & Urban, 2022

Financial education can play an important role in removing the obstacles to investing, and numerous studies have shown that increasing people's financial literacy through education can significantly increase investment participation rate (van Rooij, Lusardi & Alessie, 2012; Kadoya, Khan & Rabbani, 2017). Financial education can increase the awareness of the value of investing and educate young learners on basic investing knowledge and skills. Even though financial education may not directly increase someone's income, it can address the most common obstacle to investing, i.e., not having enough money to invest, by correcting the misconception that only the rich can invest and establishing the concept that starting early even with a small amount can make a huge long-term difference.

Although financial education can play a very important role in encouraging investment participation, it is still not widely available, and not many people acquire investing knowledge through formal financial education. Marcus, a subsidiary of Goldman Sachs conducted a nation-wide survey (2021) on over 2000 American adults and found that the most common source of investing knowledge was online research. Despite the promising trend that an increasing number of states have required personal finance education be offered in high schools, most of the courses focus on basic and general financial literacy topics without enough specific content on investing. According to a survey by Intuit (2024), stocks/bonds were among the least understood terms of American high school students, and they longed to learn more about them. As adolescents transition from middle school to high school, they have developed the ability to understand complex economic and financial concepts (Jin & Chen, 2020) and will start making an increasing number of independent financial decisions. Therefore, timely education at this critical period will lay a solid foundation for teenagers to make responsible and healthy financial decisions (Whitebread & Bingham, 2013).

Despite how influential this type of education may be, it is not universally implemented in high schools across the country. Currently, 35 states have either adopted requirements or recommendations regarding financial education, specifically personal finance (National Council for Economic Education, 2024). In addition, many states include personal finance education in their curriculum standards but don't necessarily ensure that those standards are properly implemented. Further, this type of education is less available to students from schools where most of the population represents a racial or ethnic majority, or where most students receive free or reduced lunches.

Based on the review of existing studies, it is clear that education on financial investing can provide a equitable key solution to the low investment participation rate among Americans, and it is important to offer such education to adolescents at the critical transitional period from middle school to high school as they start to make more complex financial decisions and take more responsibility for their decisions. Our investigation into the impact of the program is a significant step towards determining how to provide this type of education at scale to a heterogeneous American population of adolescents.



Currently, 35 states have either adopted requirements or recommendations regarding financial education, specifically personal finance."

- National Council for Economic Education, 2024

Overview of the Financial Fitness High School Program

Through the *Financial Fitness* High School Program, students take the *Marketplaces* course, a cutting-edge digital learning experience to equip students with an understanding of how the market works and the confidence to participate in it. Through an engaging, gamified learning experience, students blend economic concepts with investing topics to learn how the government, corporations, and individuals come together to participate in the financial marketplace.

Edward Jones believes in the power of financial knowledge and confidence and a personal, needs-based approach to build long-lasting financial strength. The Edward Jones *Financial Fitness* program, in collaboration with EVERFI, provides high school students and learners of all ages with the tools to build their financial knowledge and confidence through the *Marketplaces* course.

The course is designed to fit the learning needs of high school students. Nevertheless, students in lower grades can also use the course as an introduction to the fundamentals of company financing and investing. Teachers and students can use this course in a variety of ways to fit their teaching and studying arrangements. Typically, the course can be finished within 1.5 hours.

In the 2023-2024 school year, the course has 5 different modules covering the following essential topics on financial markets and investing:

01 **Marketplaces -** Overview of Financial Markets

02 **Startup to IPO -** Fundamentals of Company Financing

03 **Keys to Investing -** Fundamentals and Principles of Investing

04 **Investment Games -** Overview of Investing Products and Best Practices

05 **The Economy -** Fundamentals of Economic Analysis

Methodology

The Sample

A total of 405 high school students or adolescents in the equivalent age group from 37 US states participated in this study. About two thirds of the students (N=282) were recruited from families who indicated interest in participating in this study by submitting an intent-to-participate form through the study webpage. They were randomly assigned to either the control group (N=100) or the home user group (N= 182). The participants in the home user group were asked to complete all modules of the course at home in the month of March 2024. The control group participants did not take the course during the study period but were asked to take the same surveys and assessments as the home user group did. In the end, 35 children of the 282 participants did not complete the required activities by the deadline and were not included in the final sample. A third group of users (N = 123) were recruited from a high school in a Western US State who agreed to participate in this study, and they took the course in February 2024 as part of their school curriculum. The study was approved by the school district where the school is located. The final sample consisted of 370 participants from 32 states.

Table 1. Final Sample and Group Assignment

Groups	# of Students (% of the sample)
Control (no course; same surveys/assessments)	83 (23%)
Home users (course taken at home)	164 (44%)
School users (course taken at school)	123 (33%)

Due to the quasi-experimental design, the control group did not have an equal size as the treatment groups. A smaller control group in general tends to decrease the statistical power of the analysis (Bulus, 2021). In this particular case, the statistical power decreased from 0.8 to 0.7, i.e., the probability that the analysis can detect a small-size effect, if there is any, decreased from 80% to 70%.

In the final sample, 93% of the students were high school students (grades 9-12), and a small percentage of participants (7%) were homeschooled teenagers. An equal distribution of genders was achieved as 50% of the participants identified themselves as females and 50% of them as males. Slightly over half of the students were White, and 46% of them were students of color. The vast majority of the participants (75%) reported that they did not take any financial literacy courses in the past 6 months.

Measurement

The study's primary measurement tools were the built-in course surveys and assessments, which were integrated into the program as part of the course experience. Students had the option to skip questions they preferred not to answer. Participants in the control group took the same surveys and assessments sent to them via Survey Monkey.
The measurement tools had questions covering the following areas in the students' financial investing knowledge, attitudes, and behavior intentions (KAB).

Company Financing and Investing Knowledge

The assessments tested the students' knowledge of basic economic concepts, financial markets, personal investing and company financing. An increase in the score (0-100%) from the pre-course assessments to the post-course assessments indicated knowledge gains after students took the course.

Investing Self-Efficacy

The built-in course survey had multiple questions measuring the students' confidence in their investing-related skills. Based on factor analysis[1], two underlying types of self-efficacy were measured by the questions. First, the survey evaluated students' confidence in analyzing economic and company performance to make investing decisions. Second, students' confidence in their ability to set financial goals and make investing plans was measured. These constructs were measured using a 5-point Likert scale (1 = not confident at all, 5 = extremely confident), and an increase in the score indicated that the student had more confidence.

Attitude towards Financial Investing

One purpose of the course is to demystify financial investing so that it is perceived less intimidating by students. One question is designed to gauge students' perceived apprehension toward financial investing, measured by a 5-point Likert scale (1= not scary at all, 5 = extremely scary). A decrease in the score indicated a positive change that students perceive financial investing as less intimidating.

Behavioral Intention

Given that users of the program were high school students, their intention to engage in investing-related activities was asked in the survey rather than their actual investing-related behaviors. This study focused on three specific behavioral intentions: 1) students' intention to make financial investments when they are older, 2) students' intention to learn more about financial investing and 3) students' intention to have more conversations with their parents about investing topics. The intention was measured by a 5-point Likert scale (1 = not likely to do it at all, 5 = extremely likely to do it). An increase in the score indicated the student's intention becomes stronger.

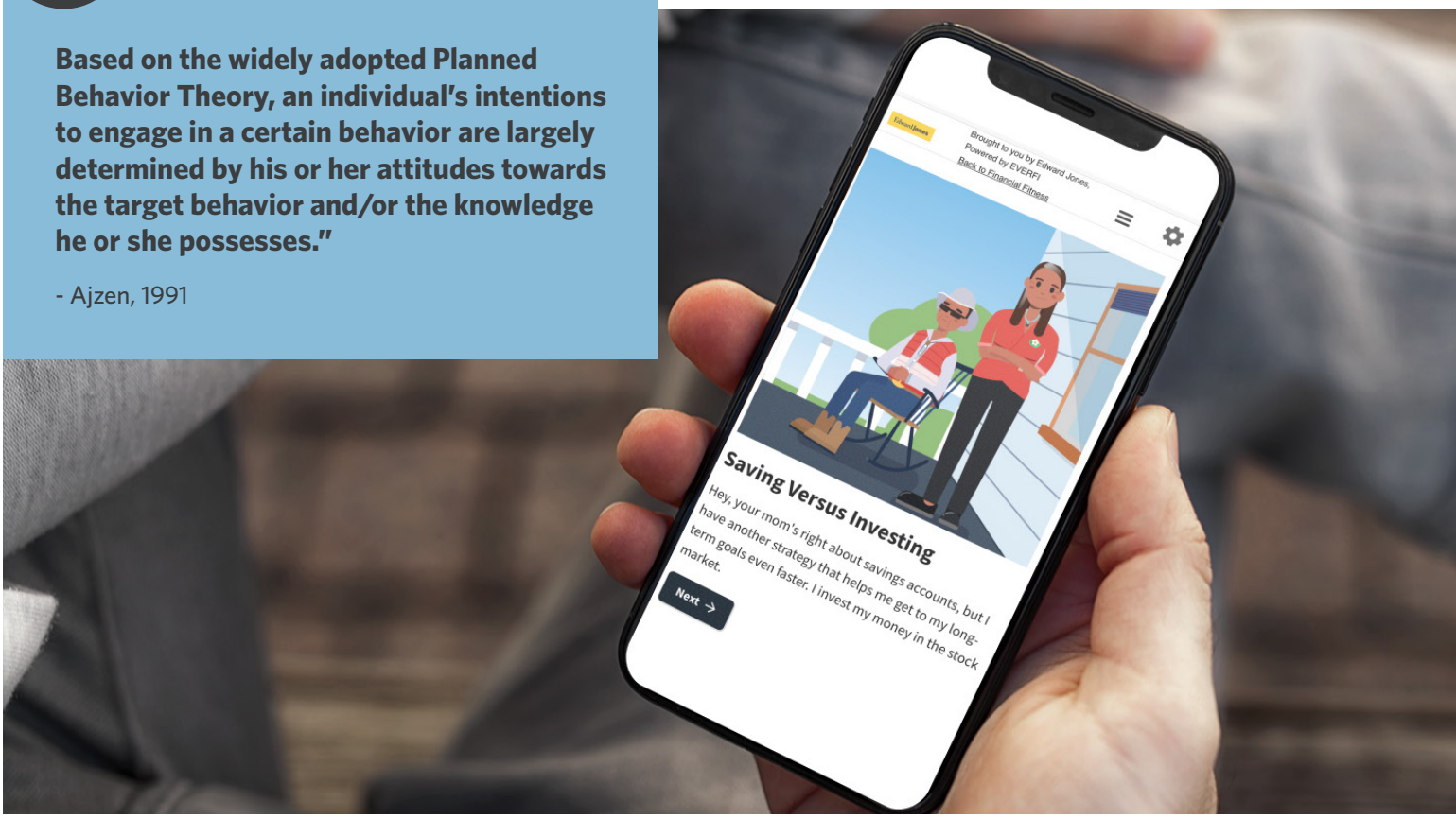
Students' genders, grades, race/ethnicities, and past financial education experience were included in the estimation as covariates. Given the interdependence among investing knowledge, attitudes, and behaviors, when analyzing the impact of the course on each of the constructs, the variables on the other two constructs were also included in the full estimation model.

[1] Factor analysis is a common statistical method used to identify the number of underlying constructs survey questions measure and how strongly each survey question is related to each underlying construct.

Statistical Method

This study used the repeated measure mixed model method (RMM) to evaluate the impact of the Financial Fitness Program on the participants' financial investing knowledge, attitudes and behavioral intentions. Compared to more conventional methods such as ANCOVA tests and repeated measure ANOVA, the RMM method has several advantages. First, it is better suited to settings where there are both factors which impact all units in the same way and factors which could have different impact on each individual unit. Second, in addition to the comparison of post-course outcomes, the RMM method makes it easy to show the trend differences among groups, which was more suitable for the current study. Third, as a regression-type of analysis, the RMM estimation has less restriction on the types of covariates that can be added to the model (Detry & Ma, 2016). When appropriate, the study used the 50% CI overlap rule developed by Cumming (2009) to compare the effects of the course among the home users and the school users to determine if there existed an optimal setting where the course should be used.

Based on the widely adopted Planned Behavior Theory, an individual's intentions to engage in a certain behavior are largely determined by his or her attitudes towards the target behavior and/or the knowledge he or she possesses (Ajzen, 1991). Therefore, it is possible that the program's effect on a learning outcome was achieved completed through improving other learning outcomes. For example, the effect of the program on students' behavioral intentions could be completely mediated by students' financial attitudes, i.e., the program could impact students' financial behavioral intentions completely through affecting their financial attitudes, which in turn, influence students' behavioral intentions. In this case, the analysis will show the course itself does not have a direct impact on students' behavioral intentions. Considering the possible existence of mediation effects, in the study, in addition to the testing for the direct impact of the program, we also conducted a mediation analysis for each learning outcome (except for the knowledge gain) to determine whether the program impacted the construct indirectly through other factors.



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- Ajzen, 1991

Baseline Outcomes

The students' investing-related knowledge, attitudes and behavioral intentions were examined before they took the course. In general, the participants had passable investing knowledge (68/100). Only 30% of them were confident in their basic investing skills, although more than half of them (53%) believed they had the skills to make sound financial plans based on their life stages. Most of them (61%) did not find financial investing intimidating, and over two thirds of them indicated they planned to make financial investments when they are older. Only a quarter of the participants said they wanted to learn more about financial investing, and less than half of them (45%) were likely to have conversations with their parents on financial

Knowledge on Investing Topics

On average, the students scored 68% in the pre-course knowledge assessment. No significant differences were found between participants of different races, genders and grades. Noticeably, those who reported they had taken financial education courses before did not have significantly higher scores compared to those who did not. This may indicate the lack of educational programs focusing on investing topics.

Self-Efficacy in Basic Investing Skills

Overall, the participants did not have high self-efficacy in their basic investing skills with only 30% of them indicating they had confidence in evaluating the economy and company performance for investing decisions. Students of color and males tended to have more confidence in their basic investing skills. Although the financial education some students received prior to the study was not associated with higher knowledge scores, it was positively correlated with the students' general confidence in their investing skills.

Self-Efficacy in Making Investment Plans and Setting Financial Goals

Although the participants were not very confident in their basic investing skills, over half of them (53%) thought they were ready to make financial and investing plans based on their current life stage. Again, students of color and males tended to have more confidence. Students who took other financial education courses before the study also showed higher self-efficacy in their ability to make sound financial and investing plans.

Perceived Apprehension toward Financial Investing

Students in general did not find financial investing intimidating, as only 40% of the participants thought financial investing was intimidating or extremely intimidating. The perceived apprehension toward financial investing did not vary significantly across genders, races, grades or prior experience with financial education.

Behavioral Intention: Making Financial Investment

Before taking the course, 66% of the students indicated that they were likely or very likely to make financial investments when they are older. Male students had a stronger intention to make investments than female students did. No significant differences were found among students of different races, grades or experience with prior education.

Behavioral Intention: Having Conversations with Parents on Investing Topics

The data suggested that the participants in general were reluctant to have conversations with their parents about financial investing. Overall, 45% of the students reported that they were likely or very likely to have conversations with their parents on investing topics. Students in the 12th grade showed the lowest intention, as only 36% of them said they were likely to have conversations with their parents. Male students and those who took other financial literacy courses before were more likely to have conversations with their parents on investing topics.

Behavioral Intention: Learning about Company Financing and Investing

An even smaller percentage of the participants showed interest in learning about financial investing, as only 24% of them indicated they were likely to read news and books about the economy, company financing and personal finances. According to the self-reported intentions, students of color and male students were more likely to want to learn about this subject. Prior experience with financial education was also found to be positively correlated with the intention to learn about investing.

Baseline Equivalence

This study uses a quasi-experimental design where only the participants recruited from families were randomly assigned to the two condition groups. A prerequisite for a valid estimation of the program's impact is that the control group and the treatment group do not differ significantly in the baseline outcomes. Based on the results of ANOVA analysis[2], there was no significant difference among the three groups in the students' confidence in their basic investing skills, their confidence in making sound financial plans, their general attitude towards financial investing or their intention to learn about financial investing. For investing knowledge, baseline equivalence was achieved between the control group and the two treatment groups but not between the two treatment groups. The baseline equivalence in the students' intention to make financial investments was achieved only between the control group and the home user group. The baseline intention of the participants to communicate with their parents differed from one group to another. Considering the varying degrees of baseline equivalence in constructs, in the RMM analysis, we only focused on interpreting the differences among groups with equivalent baseline outcomes.

[2] ANOVA analysis is common statistical test that compares the means of several groups of observations to show if the groups are significantly different from each other.

KAB Improvement of the Participants

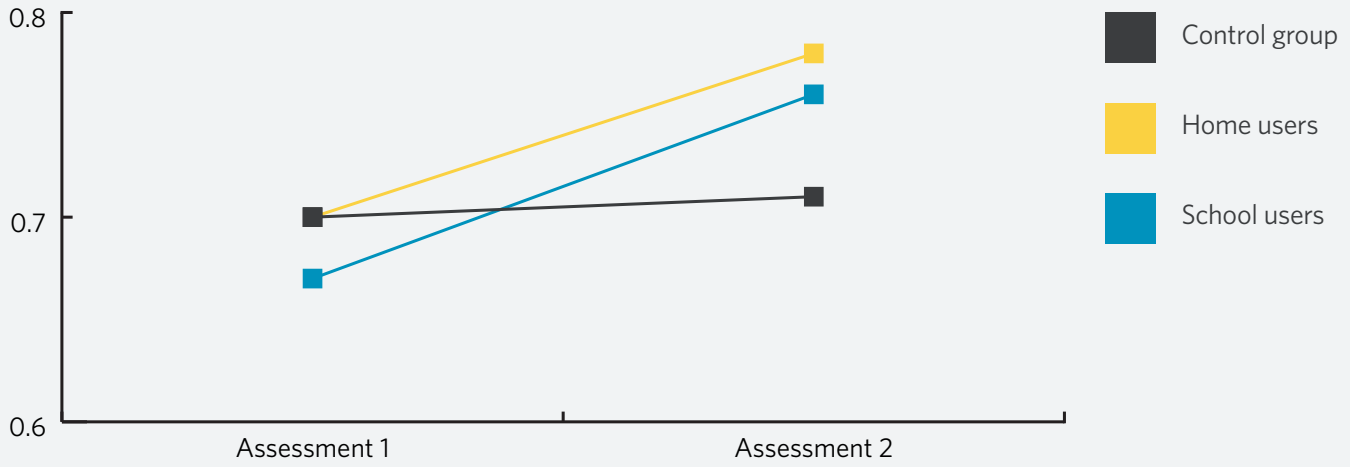
Using the repeated measures mixed model method, the impact of the course on students' financial knowledge, self-efficacy in investing-related skills, general attitude towards investing and investing-related behavioral intentions was analyzed. This section summarizes the results of the analysis and explains the effects of the course.

Knowledge Gain

A clear difference can be observed between the students who took the course and those who did not, as shown by Figure 1 below. Specifically, the expected[3] knowledge score of the home users increased from 70% to 78%, those who used the course at school also had a higher expected score as it increased from 65% to 76%, while the score of the control group basically remained unchanged. The difference in the change trajectory is confirmed by the more rigorous repeated measures mixed model analysis.

The differences are further confirmed by the post-hoc trend analysis which indicates a significant positive trend in the scores of the home users ($\beta = 0.04$, $p < 0.01$) and the school users ($\beta = 0.05$, $p < 0.001$) but no trend for the control group. The trend analysis also suggests that there was no significant difference in the course's impact between the home user and school user groups, although caution needs to be used when interpreting this finding as the baseline scores of the two groups were significantly different as shown by the baseline analysis.

Figure 1. Group Comparison of Knowledge Score on Financial Investing



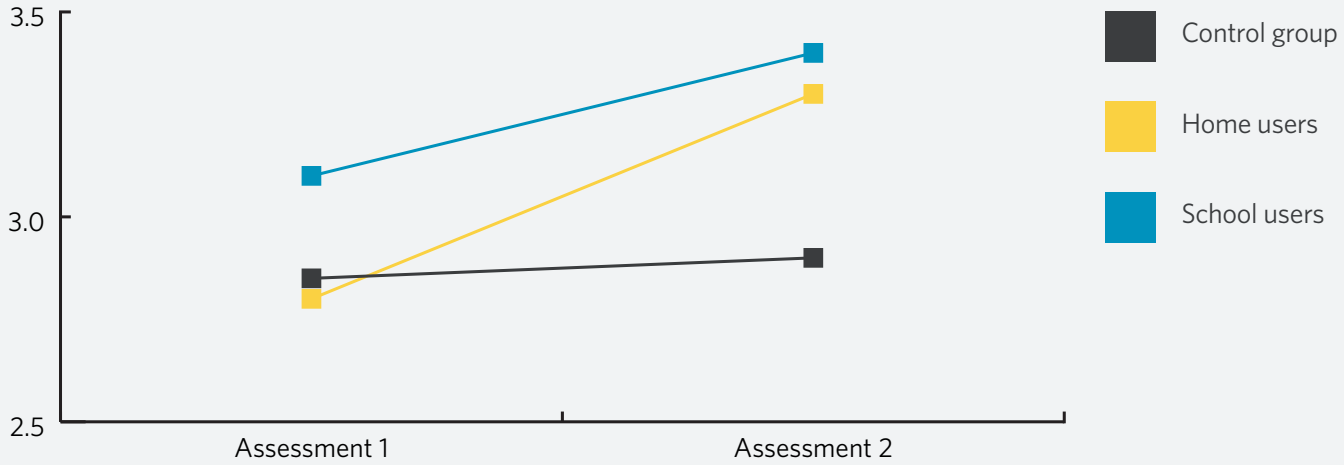
[3] The expected value shows what the score would be after controlling for the effects of other influencing factors such as gender, grade and other courses taken before the study, etc. Compared to the raw value of the score, the expected value is a better indicator to show the direct effect of the course on students.

Financial Investing Self-Efficacy

Confidence in Basic Investing Skills

The RMM analysis shows a clear difference in the change trajectory of the confidence in investing skills among the three groups. As Figure 2 shows, other things being equal, students who took the course had a sharp increase in their confidence while no change took place for those who did not take the course.

Figure 2. Group Comparison of Confidence Score in Investing Skills



Consistent with the RMM analysis results, the trend analysis indicated a significantly positive trend among both the home user group ($\beta = 0.25$, $p < 0.001$) and the school user group ($\beta = 0.15$, $p < 0.001$). Based on the rule of 50% CI overlap, the effect of the course on the home users was significantly larger than that of those who took the course at school.

A mediation analysis was conducted to test if the program also had an indirect impact on the students' confidence in their investing skills through improved financial knowledge. As shown in the Knowledge Gain section, the program did significantly increase students' financial knowledge.

Nevertheless, the analysis did not find that increased financial knowledge led to increased confidence in investing skills. This finding suggested that the students became more confident in their investing skills not through increasing their financial knowledge. Notably, the knowledge test score used in the analysis was the aggreate score of all five modules' assessments. If only the scores for the two modules closely related to investing skills and practices (Keys to Investing and Investing Games) were used, the mediation analysis clearly indicated that increased investing-specific knowledge led to improved self-efficacy in investing skills.

Investing and Financial Planning

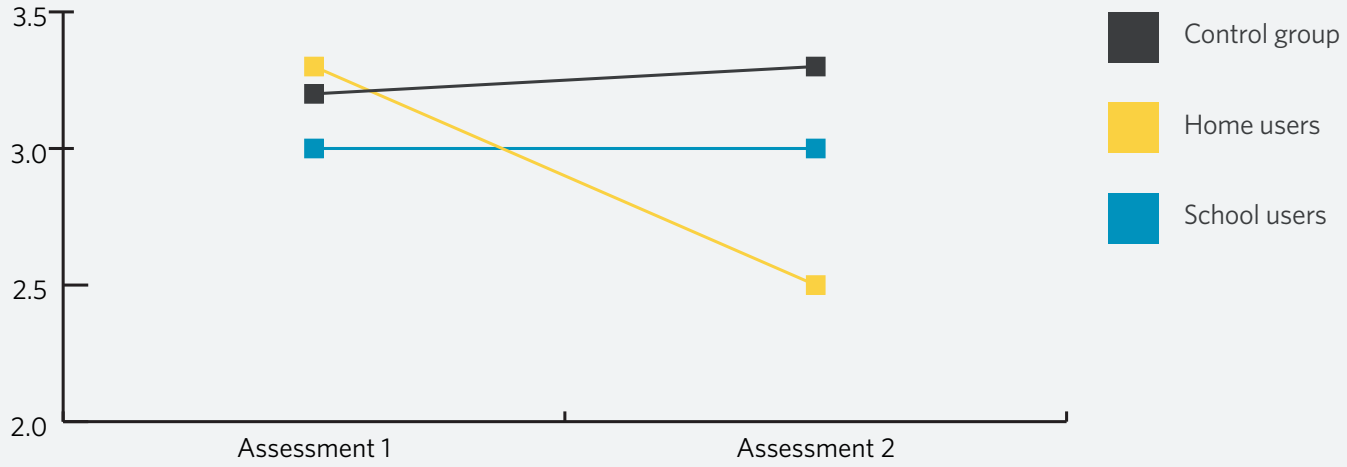
Although the course was shown to have a positive impact on students' self-efficacy in their investing skills, the analysis did not show any significant effect of the course on the students' confidence in making financial plans. The mediation analysis did not find evidence for any indirect impact of the program through increased financial knowledge.

Admittedly, this finding could suggest that the program did not have a noticeable impact on the students' self-efficacy in making financial plans. Nevertheless, the lack of improvement could also be caused by other factors as well. First, before the study started, all participants already had high confidence in their financial planning skills. With a fairly high average confidence score of 3.2 out of 5 and 53% of the participants already quite confident, there was little room for improvement. Second, due to the small percentage of control group participants in the sample, the power of the analysis was decreased. If there existed a small effect of the course, our estimation would have a reduced likelihood of detecting it.

General Attitude toward Financial Investing

Besides the self-efficacy in basic investing skills and planning, the study also measured the students' general attitude toward financial investing to see if the program was effective in demystifying financial investing. The RMM revealed that a significant difference existed among the change trajectory of the three condition groups. Specifically, as Figure 3 shows, the perceived apprehension toward financial investing basically remained unchanged among the school users and the control group, while for the home users it decreased dramatically after they finished the course. The difference was also confirmed by the post-hoc trend analysis: a significantly negative trend was detected only for the home user group ($\beta = -0.38$, $p < 0.001$). The difference in the course's effect on home and school users could reveal the unique advantage of financial education at home or in more informal settings. The mediation analysis showed that the decreased apprehension toward investing was not achieved through increased knowledge. However, a significant, two-way correlation was found between the perceived apprehension toward investing and the students' confidence in their investing skills.

Figure 3. Group Comparison of Attitude toward Financial Investing



Investing-Related Behavioral Intentions

Intention to Make Financial Investments

According to the result of the RMM analysis, the changes in the students' intention to make financial investments when they are older did not differ significantly from one group to another. Given that attitudinal changes and knowledge gains could predict changes in behavioral intentions, as suggested by the planned behavior theory (Ajzen, 1991), a mediation analysis was conducted to test if the effect of the program on students' investing intention was mediated by their improved financial attitudes and/or increased financial knowledge.

Based on the mediation analysis, the course had a significant impact on students' confidence in their investing skills, and students' confidence in their basic investing skills was found to affect their intention to make financial investments. These findings suggested the existence of a strong mediation effect of students' confidence in basic investing skills: the impact on students' intention to make investments was mediated through improving their self-efficacy in their investing skills. Overall, through making students more confident in their investing skills, the course effectively increased the intention to invest by 8% for the students who used it at home and 4% for those who used it at school. The effect of the course was significantly larger for the home user group.

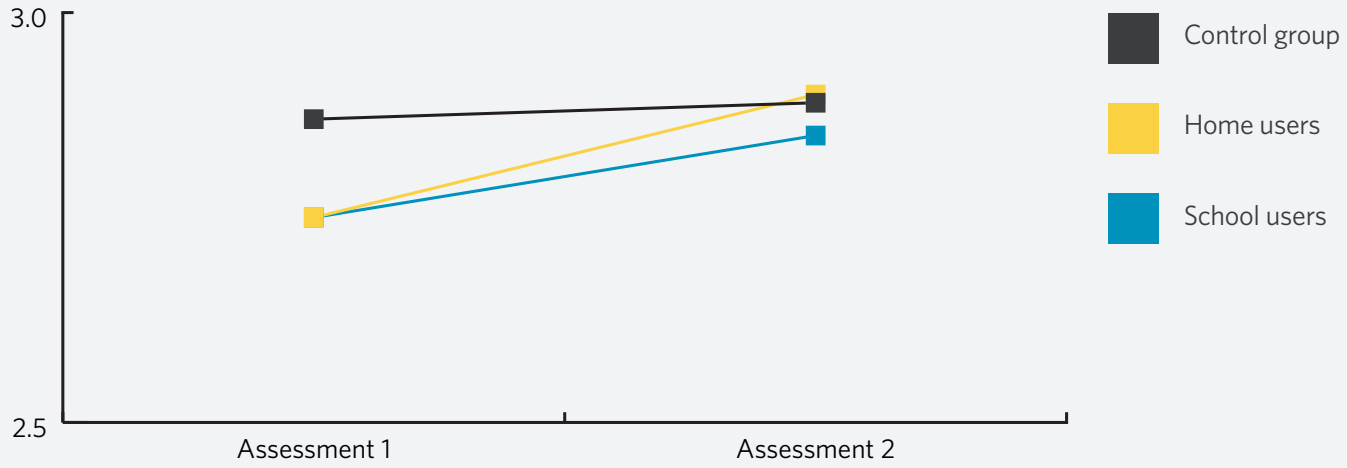
Similarly, a mediation analysis was conducted to test if there existed a mediation effect of knowledge gain on the students' investing intentions. As shown in the Knowledge Gain section, the course effectively improved students' knowledge on financial investing. Further analysis also showed that increased investing knowledge led to higher intention to make financial investments. Based on these findings, it can be concluded that the course also had an indirect impact on students' investing intention through making students more knowledgeable about financial investing. Overall, through improving the financial knowledge, the course increased the students' investing intention by 9%. The magnitude of the effects was not significantly different between the home users and school users.

For students who used the program at home, there might exist a third mechanism through which the course indirectly increased their investing intention: the course lowered the perceived apprehension toward investing, the lowered perceived apprehension increased the students' confidence in their investing skills, and eventually the increased confidence led to a higher level of investing intention. However, given the two-way correlation between the two constructs, the causal relationship that lowered apprehension led to increased confidence could not be established conclusively. Therefore, the analysis did not give compelling evidence that the course made home users of the program more likely to invest through lowering the perceived apprehension toward investing.

Intention to Learn More about Financial Investing

Although the program was shown to improve students' financial investing knowledge and make financial investing less intimidating, it was not very effective in stimulating interest among the students in learning more about financial investing. As Figure 4 shows, the learning intention of the students in the two treatment groups both increased slightly, while that of the control group changed very little. However, the positive changes were not statistically significant, and they were not significantly different from that of the control group. The mediation analysis did not show the existence of any significant mediating effect of any attitudinal improvement either.

Figure 4. Group Comparison of Expected Learning Intention



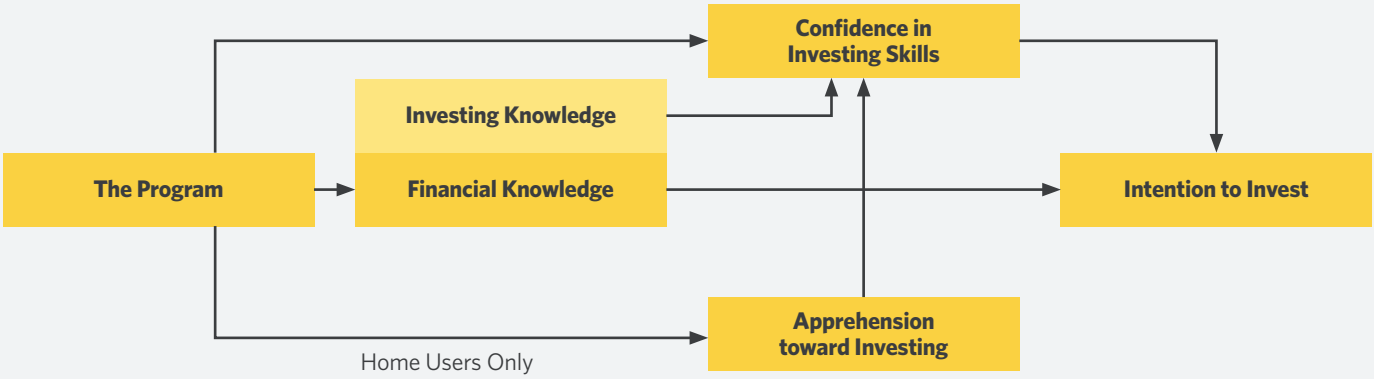
Note: The expected values not the actual values are presented. The expected values show what the scores would be after controlling for the influence of other factors and therefore are a better indicator to show the direct impact of the course.

Intention to Talk with Parents on Financial Investing

Given that there was no baseline equivalence between any two groups, only a pre-post comparison was made by using ANOVA testing. The result shows a significant increase in the intention among the home user group from 3.3/5 to 3.9/5, and no significant changes among the school user and control groups. However, the significant difference in the baseline outcomes indicates that the participants who took the course were not comparable to the control group. Therefore, it cannot be determined if the positive change among the home user group was in fact caused by the course or due to natural growth over time.

The effects of the program as shown by the analysis were summarized in the chart below. Note that the overall knowledge assessment score covered topics in all the five modules of the course, and the mediation shows it did not affect the students' financial self-efficacy. Nevertheless, an increase in the assessment scores for the two modules specifically about financial investing skills (Keys to Investing and Investing Games) did lead to increased confidence in students' confidence in their investing skills.

Figure 5. Effects of the Program



Conclusion and Discussion

The efficacy study of the Financial Fitness High School Program was built on the observational study and generated deeper insights on its effects on students. Using the rigorous repeated measures mixed model analysis, the study compared the change in financial investing knowledge, attitudes and behavioral intentions among those who used the course to those who did not take the course. The findings provide strong evidence that the course was effective in increasing students' knowledge about financial investing and improving students' attitudes towards financial investing. Moreover, based on the mediation analysis, the program also improved students' intention to make financial investments through increasing their confidence in using basic investing skills.

Before the study began, the participants had a passable knowledge score of 68/100. Noticeably, the participants who took other financial literacy courses before the study did not have a higher score than those who did not. This finding may suggest the lack of specific content on financial investing in the courses they took. The High School Financial Fitness Program effectively improved the knowledge for those who finished the program, resulting in a growth of 16% in the students' knowledge score for those who took it at school and a growth of 11% for those who took it at home. The analysis also showed no significant difference in the improvement between the home user group and school user group.

Besides improving students' financial investing knowledge, the course is also designed to help students gain more confidence in their basic investing skills, which the students obviously lacked as only 30% of the participants said they were confident in their ability to analyze the economy and company performance for basic investing decision-making. The RMM analysis showed that those who took the course at home had an 18% growth in their confidence, and those who took the course at school had a 9% growth in their confidence. Although the participants in both groups became significantly more confident, further analysis showed that the course's effect was significantly larger for the home users.

The study also found strong evidence that the program could effectively decrease the perceived apprehension toward financial investing if the course was taken at home. According to the RMM estimation, after taking the course at home, the 24% of students perceived investing to be less intimidating while it remained unchanged for the school users and the control group.

The study's three-group design enabled us to explore how different usage settings could impact the course's effects. According to the analysis, there was no difference in the knowledge gained between school and home users, but the course was more effective in improving users' attitudes towards financial investing if the course was taken at home. This finding revealed some unique advantages of taking financial education courses at home. One possible explanation for the differentiated impact could be that students who took the course at home felt more comfortable and relaxed. They were less likely to perceive the course as an assignment to them and were more likely to enjoy the learning process instead of simply completing a task. The less-stressful setting might translate into a more favorable attitude towards the topics being taught to them. The findings of the study suggest a promising area for future research on the effect of home-based financial education, which receives less attention and has not been thoroughly studied thus far.

16% growth in the students' knowledge score for those who took it at school.

11% growth in the students' knowledge score for those who took it at home.

18% growth in the confidence of those who took it at school,

19% growth in the confidence of those who took it at home.

Our study also showed the value of improving students' investing-related attitudes. Specifically, the program did have a positive impact on students' intention to make financial investment. However, such an effect was completely achieved through increasing students' confidence in their basic investing skills and their financial knowledge. This finding provided a useful insight into financial education program design and goal setting. Consistent with the Planned Behavior Theory, although changes in behaviors or behavioral intentions may be the primary objectives of financial education, educators and course designers should pay attention to the fostering of healthy financial attitudes and the gaining of relevant financial knowledge among the students, as they could be important prerequisites for changes in behaviors or behavioral intentions.

Another finding worthy of further discussion is that even though the course was effective in increasing students' knowledge on financial investing and making financial investing less intimidating for students, it did not significantly increase users' intention to learn more about financial investing. This finding is not particularly surprising as Gruber & Fandakova (2021) noted how difficult it is to inspire adolescent curiosity and differentiated learning strategies may need to be employed to impact this outcome. Therefore, more work is needed to be done to increase teenagers' interest in financial investing, as simply equipping them with more knowledge, demystifying financial investing and making them more confident in their financial skills are not enough to encourage continued learning. One promising solution is to give students more hands-on experience in financial investing, such as a demo investing account and/or stock transaction simulation. These activities may stimulate interest among the students to a level that is difficult to achieve by a course alone.

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