



Learning through play: Experimental evidence on financial education



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March 2026

Acknowledgments

This report was prepared as part of a PhD dissertation in Economics at Stockholm University. The intervention is registered in the AEA RCT Registry (Study ID AEARCTR-0015717). The study was approved by the Scientific Ethics Committee for Social Sciences, Arts and Humanities of the Pontificia Universidad Católica de Chile (Protocol ID 250510005). Financial support from the Jan Wallander and Tom Hedelius Foundation is gratefully acknowledged.

The development of this project was carried out in collaboration with Fundación Entrepreneur, within the framework of the program “FinanCity: Juega y Aprende a Manejar tus Finanzas”, implemented during 2025 in the regions of Maule, Biobío and Ñuble and funded by the ScotiaINSPIRA initiative of Banco Scotiabank. Particular thanks extended to Isidora Rojas, Jorge Morales and Kenneth Gent for their management, support, and valuable comments.

Finally, special recognition to the participating schools: to school principals for facilitating the participation of their teachers and students in the program, thereby strengthening financial education in their schools; to teachers for their dedication and motivation toward the continuous improvement of their students’ education; and to students, whose responses are fundamental for carrying out this study.

Many thanks to the entire community of the collaborating institutions: Escuela República de Argentina, Colegio Alessandri, Escuela Isla de Marchant, Escuela Holanda, Centro Educacional Bicentenario Altos de Tomé, Colegio Amanecer de Coronel, Colegio Polivalente Nuevos Horizontes, Colegio República de Italia, Colegio Santa Luisa, Escuela Lautaro, Liceo Politécnico Carampangue, Colegio San Agustín de Chillán, Escuela Arturo Merino Benítez, Escuela La Loma, Liceo Bicentenario de Excelencia Polivalente San Nicolás, and Liceo Bicentenario de Excelencia Técnico Puente Ñuble.



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1 Introduction and Motivation

Financial education can be defined as a set of skills that combine financial knowledge, behaviors, and attitudes that allow individuals to make informed financial decisions (OECD, 2023), and it is essential for achieving financial well-being. Despite its importance, evidence consistently documents low levels of financial education in the population: only 34% of adults reach the minimum target score measured by the OECD, and students obtain on average 505 out of 1000 points in the PISA 2018 financial literacy assessment (OECD, 2020).¹ In response, many countries have incorporated financial education into school curricula, and studies generally find positive effects on students' financial outcomes (Frisancho, 2020; Bruhn et al., 2016). However, this literature has mainly focused on traditional and passive teaching methods, primarily aimed at secondary school students. In contrast, growing evidence from the game-based learning literature suggests that interactive learning tools can substantially increase student engagement and improve learning outcomes (Noda et al., 2019; Alan and Mumcu, 2024). Nevertheless, the application of game-based approaches to financial education remains largely unexplored, as to date only a few studies have examined this issue (Ahmed, 2019; Kurniasari, 2021; Reisdorfer-da-Silva et al., 2025).

This study combines exogenous variation in exposure to financial education with the use of interactive activities as a learning tool. It uses experimental variation in access to a financial education board game to study the short-term effects of game-based learning on the financial education outcomes of both middle and high school students.

The research takes place in Chile, a country that shows a considerable lag in financial education. According to the report by ABIF (2022), Chile ranks among the lowest OECD countries in measures of adult financial literacy (three standardized questions). The situation is similar when comparing Chilean students with their peers from other countries: the report by CPP-UC (2024) reveals concerning figures for Chile in the financial education module of the PISA test, administered on two occasions to eighth-grade students nationwide. In 2015, Chile ranked 13th out of 15 countries, and in 2018 it ranked 14th out of 20, leaving ample room for improvement in this area.

The project was carried out together with Fundación Entrepreneur (F-entrepreneur), which seeks to develop in individuals the skills that allow them to thrive in the 21st century. One of its pillars is Personal Finance, focused on promoting financial education as a way to create

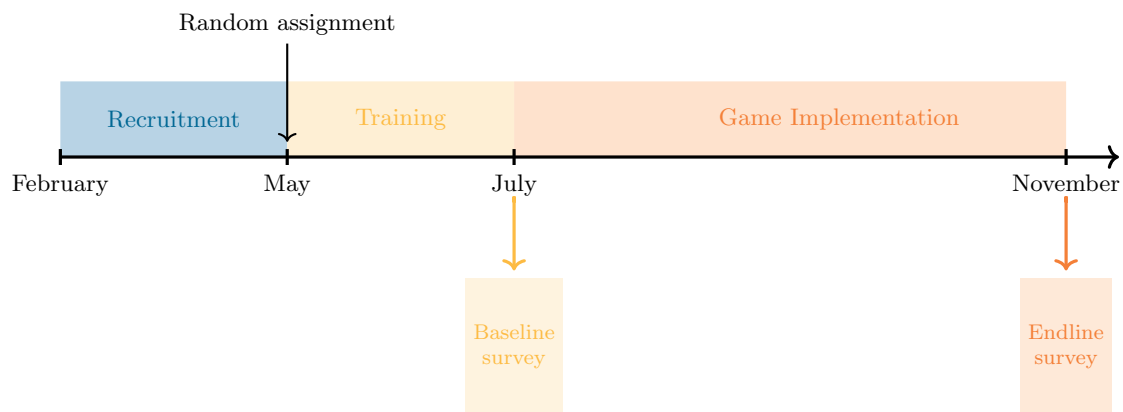
¹The minimum target score is defined as 70 out of 100 points and is composed of financial knowledge, financial behaviors, and financial attitudes.

opportunities and equity.² Among the methodologies, strategies, and tools they have used is the game *FinanCity*: “A personal finance game in which the winner is the one who best balances well-being and money.” For more than 10 years, F-entrepreneur has trained teachers to learn how to play the game and then teach it to their students. To encourage teachers to transmit this knowledge, the foundation has organized inter-school championships at the regional, national, and international levels, which has also allowed them to observe students’ learning. However, to date, no intervention has been conducted to measure the impact of the game on students.

2 Study Description

To conduct the research, the planning described in the following timeline was followed:

Figure 1: Study timeline



Recruitment: Between February and May, the foundation invited teachers from the regions of Maule, Ñuble and Biobío who wished to participate in the program “FinanCity: Juega y Aprende a Manejar tus Finanzas”. Teachers were asked about the classes they taught and the number of students in each class.

Random Assignment: Using the information provided, each class was randomly assigned for all participating teachers. All teachers were assigned one class with which they had to play the game, the *treated* class. In addition, teachers who had more than one class were assigned another class with which they were not supposed to play, the *control* class.

Training: Between May and July the foundation trained the teachers. An in-person meeting was held in each region, where participants learned how to play the *FinanCity* game. Afterwards, teachers had to complete the courses “Mentalidad Lúdica y Aprender Jugando” and “Facilitadores

²See the foundation’s website: <https://www.fentrepreneur.org/>

ABJ *FinanCity*".

Baseline Survey: Between July and August, after completing the training stage and before starting to play with their assigned classes, teachers administered a first survey to both classes (control and treated) to measure students' initial levels of the variables of interest.

Game Implementation: Between August and October the game was implemented, with teachers playing *FinanCity* only with the assigned class (the control class continued with its usual routine). Students reported having played on average 4 times.

Endline Survey: To conclude the intervention, between October and November teachers administered a second survey to both classes (control and treated) to measure again the variables of interest.

Initially the study included 60 teachers from 30 schools, which corresponded to potentially 2,500 participating students. Because some teachers were unable to continue participating—or did not complete the training courses—the sample was reduced to 33 teachers from 16 schools who administered the baseline survey to 942 students. Subsequently, 4 teachers did not continue until the end of the study, but the remaining 29 collected endline survey data for 768 students. However, some students did not coincide with those in the baseline survey, so after matching students who answered both the baseline and endline surveys, the **final sample consists of 510 students from 29 teachers in 16 schools**. The distribution of the participating schools can be observed in Figure 2.

Table 1: Data Collection

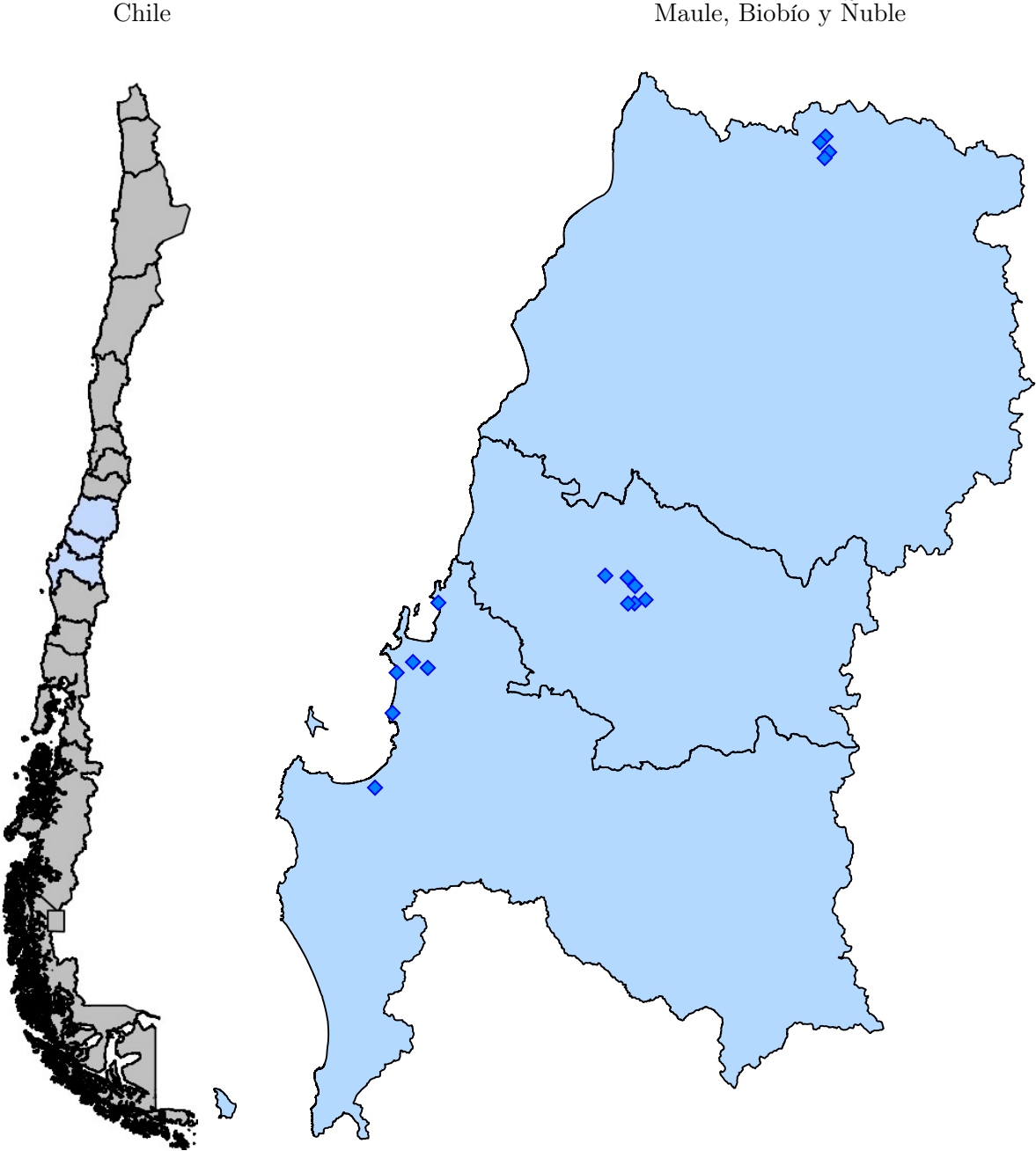
	Plan	Baseline	Endline	Both
Schools	30	16	16	16
Teachers	60	33	29	29
Students	2,500	942	768	510

3 Main Results

The learning objectives of the *FinanCity* game include balancing money and well-being, responsible use of money, budgeting, risks of over-indebtedness, responsible purchasing, relationships with financial institutions, and the importance of saving. To measure these outcomes, a series of indices and variables of interest were developed:

The role of money in happiness: Students were asked to think of a close person who is very happy. They were then asked: How important do you think money is to their happiness? (Very;

Figure 2: Study Map



Notes: The intervened regions are highlighted in blue. Blue diamonds represent the geolocation of participating schools.

Quite; Somewhat; Little; Not at all).

The relationship between money and well-being: Students were asked to imagine choosing only one of five options ranging from having a lot of money but feeling completely unhappy, to having no money but feeling very happy.

Willingness to accept compensation to forgo an activity: Students were asked to imagine they are enjoying their favorite activity. If someone asked them to stop this activity to do something they don't like, how much money would they need to be paid? Options ranged from 0, 10,000, 50,000, 100,000, to refusing to leave the activity for any amount of money.

Savings index: Composed of six questions indicating whether the student chooses saving as the main use of their own or their parents' income, whether they have saving goals, whether they have any savings, whether they feel safe when saving, and whether they believe saving is easy.

Behavior index: Comprises six binary outcomes: planning expenses before spending money, keeping a record of income and expenses, feeling prepared for unexpected events, comparing prices, negotiating prices, and repaying borrowed money on time.

Knowledge index: Collects individual responses to questions on debt, insurance, and investment. Each question has four options, and students must select the one that correctly describes the concept.

Attitude index: Financial attitude as an index aggregating three binary outcomes: agreeing with maintaining a budget, paying debts on time, and learning about finance from an early age.

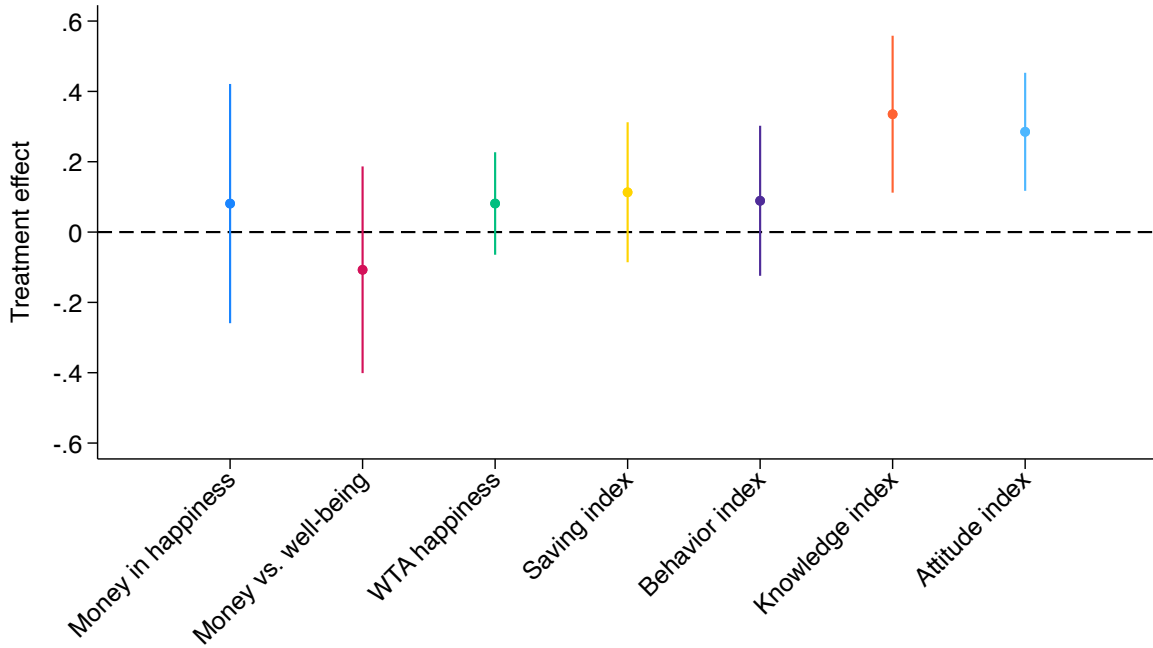
All variables were standardized with respect to their baseline survey values.³ This is done because each index has different scales, allowing them to be compared and interpret the results more easily.

The results show the differences in variables before and after playing the game, comparing students who played with those who did not. The analysis indicates that the treatment has small and statistically insignificant effects for measures relating money to happiness, as well as for the savings and behavior indices.

In contrast, the results indicate that **the group exposed to the game shows a statistically significant increase in both their financial knowledge index and financial attitudes index**, compared to the control group. In other words, the group that played *FinanCity* increased their financial knowledge by 14.7% and their financial attitudes by 9.7%. These results suggest that the board game has a considerable impact on short-term

³Standardization involves taking the final value of each variable, subtracting the initial mean, and dividing by the standard deviation.

Figure 3: Main Results



outcomes such as financial knowledge and attitudes, but does not generate significant changes in longer-term measures, such as behaviors, saving, and the perceived relationship between money and happiness.

In order to continue exploring the effects of playing *FinanCity*, the results were separated by different groups of interest. First, columns (2) and (3) of Table 2 show the effects for students in middle and high school education, respectively. On the one hand, **middle school students show an increase in their willingness to accept compensation for leaving an activity they enjoy, as well as higher knowledge and financial attitudes indices.** In contrast, high school students do not show changes compared to their respective control group, except for a lower importance of money in happiness and a lower preference for well-being (and greater importance of money).

Next, columns (4) and (5) correspond to the division of the sample between female and male students. Treated female students do not show differences compared to females in the control group. However, **for male students, those who played show an increase in their willingness to accept compensation for leaving an activity they enjoy, as well as higher knowledge and financial attitudes indices.**

Finally, the sample was separated between students who reported playing at most twice and those who played at least three times. In this case, the results indicate that **students who played more show statistically significant increases in their savings, financial**

Table 2: Results by student characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Main	Grade		Gender		N° played	
	Result	Middle	High	Female	Male	0-2	3+
Money in happiness	0.081 (0.165)	0.152 (0.223)	-0.139* (0.075)	0.207 (0.225)	0.042 (0.214)	0.084 (0.193)	0.137 (0.173)
Money vs well-being	-0.107 (0.143)	-0.012 (0.170)	-0.360* (0.188)	-0.053 (0.224)	-0.144 (0.152)	0.056 (0.200)	-0.202 (0.205)
WTA happiness	0.081 (0.071)	0.168** (0.073)	-0.146 (0.108)	0.012 (0.115)	0.339** (0.150)	-0.032 (0.069)	0.158 (0.104)
Saving index	0.113 (0.097)	0.113 (0.127)	-0.027 (0.091)	0.052 (0.129)	0.117 (0.126)	-0.112 (0.171)	0.226** (0.098)
Knowledge index	0.089 (0.104)	0.072 (0.139)	0.177 (0.162)	0.246 (0.156)	-0.133 (0.104)	-0.245* (0.136)	0.300*** (0.098)
Knowledge index	0.335*** (0.109)	0.456*** (0.142)	0.096 (0.120)	0.247 (0.209)	0.517*** (0.126)	0.259** (0.122)	0.384** (0.155)
Attitude index	0.285*** (0.082)	0.296*** (0.085)	0.250 (0.249)	0.218 (0.169)	0.392*** (0.098)	0.206 (0.123)	0.314** (0.130)
N° Observations	508	352	156	237	253	316	375

behavior, and financial attitudes indices, indicating that the greater the repetition of the game, the larger the effect.

In summary, the main effect of the game is focused on financial knowledge and attitudes. Moreover, the impact is more pronounced among male students, younger (middle school), and it is also greater as the game is played more frequently.

4 Conclusions

This study, conducted during 2025, allowed for identifying the causal impact of the *FinanCity* game on students' financial literacy. It was established that there is a significant effect on the

knowledge and financial attitudes of students who played the game, compared to those who did not. Furthermore, the results indicate that the game has a greater impact on male children, on middle school students, and also that the effect is larger for those who play more frequently.

While the study delivers significant results, there remain aspects to improve in future research. For example, adjusting certain survey questions for which no variation is observed due to the provided responses. In the same line, it is important to incorporate new questions that better measure the outcomes of interest. Moreover, to analyze additional aspects of the game, a larger number of participating schools could be included, thus allowing observation of potential spillover effects among peers within the same school. Finally, it would be valuable to evaluate the possibility of conducting a long-term follow-up with students to determine the extent to which the effects of the game persist over time.

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