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EXPLORING THE FINANCIAL LITERACY OF SENIOR PRIMARY SCHOOL STUDENTS

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Abstract. *Financial literacy has become increasingly vital in society due to the growing complexity of financial products, coupled with the increasing number of financial fraud and deepening concerns regarding the funding at retirement. Based on a sample of 92 senior primary school students, this study first analysed the current financial literacy of students. The results showed that students had better knowledge in concepts, including "earning income", "managing credit", and "managing risk" among seven concepts tested. After executing a seven-hour financial education program supported by a University Social Responsibility Project, students showed significant improvements in financial knowledge. The average test score increased from 43.2 to 74.5. This study also observed that female students were generally more financially literate than male students prior to the implementation of financial education program and no difference by gender was found in the post-program test results. The implication from this study is that the financial education program is effective in improving financial literacy. Future educators may refer to the financial education program conducted in this study.*

Keywords: *financial literacy; university social responsibility project; financial education.*

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Introduction

The OECD Programme for International Student Assessment (PISA) examined 15-year-old students' understanding of money matters across countries over time (OECD, 2024). Their report in 2022 suggested that regardless of the level of economic and financial development, many students had potential to improve their financial literacy. Some countries like Brazil, Poland, Peru, Spain, and the United States showed improvements in financial literacy scores between 2015 and 2022, while the Flemish community of Belgium had a decline over the same time period. Research by Tennyson and Nguyen (2001) indicated that teenagers often lacked a fundamental understanding of personal finance concepts, including budgeting, saving, investing, and managing credit and debt. The Jumpstart Coalition for Personal Finance Literacy that administered US nationwide survey of high school students since 1997, discovered that the financial literacy of high school students had reached an all-time low, with an average score of just 48.3 percent in the 2008 surveys (Mandell, 2008).

Nowadays, children are exposed to money and begin using digital financial services at an early age (OECD, 2024). Children today are growing up in a rapidly changing financial environment that offers more opportunities but also places greater responsibility on individuals to

manage their own financial decisions compared to past generations. At the same time, many habits, including financial ones, are formed early in life, making it challenging to correct bad financial habits later on (Whitebread & Bingham, 2013). To help children face these challenges and take control of their financial future, it is important to educate them key financial concepts and principles while fostering smart financial attitudes and behaviours early on (EU/OECD, 2023).

The report by PISA in 2022 suggested a positive relationship between the level of financial literacy of 15-year-old students and their learning of finance-related terminology at school and exposure to money. Students who indicated that they had been taught various financial or economic terms and could still recall their meanings tended to achieve better financial literacy scores compared to those who had not, even when controlling for individual and school characteristics, as well as performance in mathematics and reading, across OECD and all participating countries and economies (OECD, 2024). The international survey of adult financial literacy by OECD/INFE (OECD, 2023a) reported that improving financial literacy was essential for helping individuals make informed financial decisions, particularly in difficult economic situations. Increased financial literacy was linked to improved financial well-being for individuals. Adults who achieved at least the minimum required level of financial literacy tended to experience significantly better financial well-being and greater financial resilience.

The Ministry of Education in Taiwan enforced a basic financial education system in K-12 education to build the financial literacy of children and youngsters in 2006. However, the research report by Financial Supervisory Commission (FSC) in 2023 revealed that while financial knowledge advocacy activities had reached 100% coverage in Taiwan, the younger generation still lacked sufficient financial literacy in general (Xie, 2024).

Therefore, the aim of this study is twofold. The first is to explore the current financial literacy of primary students (11 to 12 years old), and the second is to analyse the effectiveness of a seven-hour financial education program (supported by a University Social Responsibility Project) after implementation. The contribution of this study is that the findings of this study will be of interest to national policymakers and educators. For the former, the results will present the current status of financial literacy of senior primary students. By conducting a post-program test and assessing the effectiveness the financial education program proceeded by this study, if the results prove to be significant and students show improvements in basic financial knowledge, primary school teachers may refer to this financial education program in their future teaching.

Based on a sample of 92 senior primary students from two different schools, the findings indicated that students became more financially literate after taking the seven-hour financial education program. The mean test score increased from 43.2 to 74.5 and the t-test of the difference was significant at the 1% level. A further analysis on student gender showed that female students were generally more financially literate than male students although some results were not statistically significant. After the financial education program was executed, no significant difference was observed between male and female students.

Literature Review

Financial literacy defined by PISA, an OECD Program for International Student Assessment, is “knowledge and understanding of financial concepts and risks, as well as the skills and attitudes to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life” (OECD, 2023b). According to PISA’s report (OECD, 2023b), nowadays young people and children have increasing access to financial products and services. Due to a rapid innovation and development in digital technology and related applications, digital financial services are able to reach out to more people including youngsters. Moreover, the emergence of digital financial products and services has created new risks for consumers such as new types of fraud and data security issues. The report in 2022 also suggested that there was room for improving financial literacy. The overall average score across all participating countries and

economies was just 60 out of 100, underscoring the need for enhanced financial education initiatives.

Research by Whitebread and Bingham (2013) and CFPB (2016) showed that people developed their financial behaviour and habits from early age, influenced significantly by parents and the surrounding environment. This underscores the importance of early interventions to nurture positive financial attitudes and practices. Today's youth are not only faced with more sophisticated financial products and services but also greater financial risks than previous generations due to the widespread emergence of digital financial services.

A number of studies (Amagir et al., 2018; Atkinsoni et al., 2015; Bruhn et al., 2016) in both developed and emerging countries showed a significant correlation between effective financial education and improved financial behaviours among both young individuals and adults. Those who received quality financial education tended to be more inclined to plan, save, and adopt responsible financial practices. Amagir et al. (2018) conducted a systematic literature review on financial education for children and young adults and demonstrated that school-based programs could enhance financial knowledge and attitudes. The evidence highlights the need for integrating effective financial education into educational systems to encourage responsible financial habits among young people.

The significance of financial literacy is that if consumers lack the ability to make important financial decisions for their own best interests, it can have negative consequences on the national economy such as inflation, deteriorating business cycles, increased inequality in income and wealth distribution, inadequate retirement savings, low savings rates, and a weaker dollar (Mandell & Klein, 2009). Prior studies on financial literacy (Braunstein & Welch, 2002; Mandell & Klein, 2009; Perry, 2008) have documented that consumers were not sufficiently financially literate to make critical financial decisions for their best interests. The importance of financial education on individual's saving behaviour was reported by Bernheim, Garrett and Maki (2001) who showed that those who took personal financial management course in high school saved a greater proportion of their income than those who did not take the course.

Hilgert, Hogarth, and Beverly (2003) examined the relationship between financial knowledge and financial behaviour, estimated by a Financial Practices Index on four dimensions including cash-flow management, credit management, savings and investment practices. Based on a nationwide Survey of Consumer Finances, Hilgert et al. (2003) found that respondents who scored higher on the financial literacy quiz had higher Financial Practices Index scores. Mandell (2006) examined a sample of high school seniors and found that the likelihood of high school seniors to bounce checks was lower for those with higher financial literacy scores. They were also more likely to balance their checkbooks. Moreover, van Rooij, Lusardi, and Alessie (2007) investigated how financial literacy was related to investment behaviour based on a sample of Dutch adults and reported that those who lacked financial literacy were more likely than others to rely on friends' advice for financial decisions and tended to invest less in stocks.

Furthermore, Danes (2004) studied the short-term impact of financial education course of high school students on their financial behaviour. Based on a three-month follow-up survey after completing the financial education course, Danes (2004) documented that more than half of the participants had changed their saving and spending behaviours, and concluded that the changes in financial management practices would have an impact on their future. Specifically, comparative shopping, saving money for the future, and making on-time debt repayments were all more common among students. The students were also more aware of the costs associated with using credit.

The financial literacy education policy in Taiwan was officially promoted starting in 2006. The Ministry of Education released the "National Education Financial Literacy Policy Guidelines" in 2006. Subsequently, the government promoted financial literacy courses in schools at all levels, aiming to enhance students' financial knowledge and management skills. In the 2010s, with the changing financial landscape and an increasing societal demand for financial literacy, related policies and curricula continued to deepen, gradually being integrated into high school and university education systems. In 2019, the Ministry of Education further emphasized incorporating

financial literacy in high school students' "diverse learning courses" to enhance students' overall competencies. In 2023, the Financial Supervisory Commission (FSC) of Taiwan published a report on the achievements of financial education. The report indicated that the financial knowledge advocacy activities had reached 100% coverage in all 368 townships in Taiwan, and yet the younger generation generally lacked sufficient financial literacy (Xie, 2024).

Questions regarding the current status of financial literacy of our children and youngsters in Taiwan are therefore of great interest and our research aims to test the effectiveness of a seven-hour financial education program conducted by this study on improving students' financial literacy.

Methods

This study examines the financial literacy of grade 5 and grade 6 students (who are eleven and twelve years old) from two primary schools in Taiwan in 2024. Senior primary students were chosen as the sample subjects for several reasons. First, in 2019, the Ministry of Education in Taiwan executed the "Curriculum Guidelines of 12-Year Basic Education" in which the basic financial education learning structure was formally integrated in the curriculum. Therefore, it is of interest to find out the current financial literacy status of young children, which is the first objective of this study. Additionally, grade five and six students start to have number sense and pocket money from parents. It is important to know how well these children manage their money and if they possess the basic financial knowledge.

Table 1. Overview and goals of the financial education program

Financial concepts	Time (hr)	Session overview and goals
Earning income	1	• Leading students to think about what they are good at, what their passions are, and what they want to be in the future.
Investing	1	• Leading students to think about different ways of "investing in oneself". • Introducing the basic knowledge about stocks.
Saving	2	• Leading students to think about different reasons of saving. • Comparing different ways of saving and helping students to understand better ways of saving. • Introducing the concepts of "deposit insurance", "simple interest" and "compound interest". • Asking students to make a savings plan for the graduation trip.
Spending	1	• Leading students to think about differences between "needs" and "wants" and factors to consider when purchasing. • Conveying the idea of "think for 3 days before purchasing and avoid impulse buying".
Managing risk	1	• Leading students to think about the potential risks that may happen at different places or situations such as at school, at playground, at sports field, and crossing roads. • Leading students to think about different ways of managing risks. • Discussing the two types of insurance that all students have, student group insurance and health care.
Managing credit	0.5	• Introducing the concepts of "credit" and discussing the consequences of losing credibility. • Introducing the concept of "black money" and "money-laundering".
Contributing	0.5	• Conveying the idea of being grateful to everyone around you and one should try their best to help others.

The second objective of this study is to investigate if the financial knowledge of sample students improves after executing of a financial education program. Therefore, a seven-hour financial education program supported by a University Social Responsibility Project was taught in selected primary schools. The program consisted of seven important concepts, including earning income, saving, spending, managing credit, managing risk, investing, and contributing (Table 1).

The concepts covered in the program followed the framework in "National Standards for

Personal Financial Education" by the Council for Economic Education (CEE) and the Jump$tart Coalition for Personal Financial Literacy (Jump$tart) for K-12 education (CEE, 2021) with an addition of the seventh element, "contributing".

Pre- and post-program tests that consisted of questions based on these seven concepts were conducted. The same set of questions were used in the pre- and post-program tests which consisted of five multiple-choice questions and seven fill-in-the-blanks. The pre-program test was carried to find out the current financial literacy of senior primary students. The post-program test was carried out after the seven-hour program was completed and was used to find out the effectiveness of the financial education program.

This study used a paired sample design to test the effectiveness of a seven-hour financial education program implemented among grade 5 and grade 6 primary students. The original sample consisted of 83 grade five students and 22 grade six students. After eliminating incomplete data (i.e., students who were either absent in the pre- or post-program test), the final sample consisted of 92 students, where 72 students were grade five and 20 were grade six as shown in Table 2.

Table 2. Sample characteristics

	Male	Female	No. of respondents	% of respondents
5th Grade	36	36	72	78.3%
6th Grade	14	6	20	21.7%
Total	50	42	92	100%
%	54.3	45.7		

Results

Based on research aims, the results are be categorized into two parts. The first part examines the current financial literacy or knowledge of 11 to 12-year-old primary students. The second part addresses the effectiveness of the financial education program.

Current Financial Literacy of Senior Primary Students

Before starting the financial education program, a pre-program test on students' basic financial literacy was executed. The pre-program test also helped identify the knowledge that students lacked of and thereby that the financial education program could put more focus on. Table 3 shows the summary statistics on pre-program test scores. The score on each concept is converted into percentage as each concept has different weighting in the test. The results show that on average students score the best on these three concepts, managing credit, earning income, and managing risk (ranking from high to low). The overall mean score is only 43.2. It is somewhat surprising to find out that students have better knowledge on the concepts of managing credit and managing risk than saving and spending, which we would hope 11 to 12-year-old children to have built good habits in these financial behaviours.

Table 3. Summary statistics on pre-program test

Concepts	Mean	Median	SD	Min	Max
Earning income	58.42	50.00	26.80	0.00	100.00
Saving	31.52	40.00	17.09	0.00	80.00
Spending	31.52	28.13	21.68	0.00	87.50
Managing credit	62.50	50.00	31.12	0.00	100.00
Managing risk	56.52	66.67	27.40	0.00	100.00
Investing	46.74	50.00	38.38	0.00	100.00
Contributing	46.74	0.00	50.17	0.00	100.00
Overall	43.22	44.50	17.28	12.00	76.00
n	92.00				

Note: The score of each concept is converted into percentage to enable comparison across different concepts.

Effectiveness of the Financial Education Program

After conducting the financial education program, a post-program test on students' basic financial literacy based on the same set of pre-program test questions was carried out to examine if students exhibited improvements in basic financial knowledge. Table 4 shows that on average, students score the best on these four concepts, investing, contributing, earning income and managing credit (ranking from high to low, with the last two having the same mean). The post-program test results indicate that students have shown improvements in basic financial knowledge with a higher overall mean score of 74.5.

Table 4. Summary statistics on post-program test

Concepts	Mean	Median	SD	Min	Max
Earning income	80.98	100.00	24.12	0.00	100.00
Saving	53.26	60.00	28.02	0.00	80.00
Spending	67.19	75.00	30.71	0.00	100.00
Managing credit	80.98	100.00	27.58	0.00	100.00
Managing risk	51.45	66.67	20.02	0.00	66.67
Investing	91.30	100.00	24.14	0.00	100.00
Contributing	82.61	100.00	38.11	0.00	100.00
Overall	74.46	80.00	20.17	12.00	100.00
n	92.00				

Note: The score of each concept is converted to percentage to enable comparison across different concepts (as their original scores were not the same).

Table 5 presents the paired sample t-test on pre- and post-program test results. The results show that students exhibit the biggest improvements in the concept of "investing", followed by "contributing" and "spending", with a slight deterioration in "managing risk". The results show that student's basic financial knowledge in each concept improves significantly after the financial education program. The evidence suggests that the financial education program conducted was effective.

Table 5. Paired sample t-test between pre- and post-test results

Concepts	Difference in mean	SD	SEM	t	df	p-value
Earning income	22.55	28.00	2.92	-7.73	91.00	0.000
Saving	21.74	27.60	2.88	-7.55	91.00	0.000
Spending	35.67	28.99	3.02	-11.80	91.00	0.000
Managing credit	18.48	32.07	3.34	-5.53	91.00	0.000
Managing risk	-5.07	29.21	3.05	1.67	91.00	0.099
Investing	44.57	40.23	4.19	-10.63	91.00	0.000
Contributing	35.87	60.37	6.29	-5.70	91.00	0.000
Overall	31.24	19.64	2.05	-15.25	91.00	0.000

Note: SD is standard deviation. SEM is standard error of the mean. Two-tail p value is used.

Further Analysis of Financial Literacy by Gender

To examine if male and female students are different in financial literacy prior to and post financial education program, we provide summary statistics and t-test results in this section. Panel A of Table 6 shows that on average male students are more knowledgeable on these three concepts, managing credit, earning income, and managing risk, while female students are better in these concepts, contributing, managing credit and earning income. Panel B presents the post-program results. Male and female students have similar results. Both groups of students perform better in these concepts, investing, contributing, managing risk, and earning income.

Table 6. Summary statistics on pre- and post-program test by gender

Panel A: Pre-program test						
Concepts	**Male**			**Female**		
	Mean	**Median**	**SD**	**Mean**	**Median**	**SD**
Earning income	58	50	26.94	58.93	62.5	26.95
Saving	30	40	17.73	33.33	40	16.33
Spending	28	25	20.66	35.71	28.13	22.36
Managing credit	64	50	28.64	60.71	50	34.1
Managing risk	56	66.67	26.46	57.14	66.67	28.78
Investing	40	50	37.8	54.76	50	37.95
Contributing	34	0	47.85	61.9	100	49.15
Overall	40.72	44.5	17.24	46.19	44.5	17.06
n	50			42		

Panel B: Post-program test						
Concepts	**Male**			**Female**		
	Mean	**Median**	**SD**	**Mean**	**Median**	**SD**
Earning income	79	75	25.43	83.33	100	22.54
Saving	53.6	60	27.83	52.86	60	28.57
Spending	66.25	75	31.16	68.3	75	30.51
Managing credit	79	100	28.73	83.33	100	26.29
Managing risk	51.33	66.67	18.08	51.59	66.67	22.33
Investing	89	100	27.27	94.05	100	19.76
Contributing	82	100	38.81	83.33	100	37.72
Overall	73.2	78	21.15	75.95	80	19.08
n	50			42		

Table 7. Independent sample t-test on differences in pre-and post-program test results between male and female students

Panel A: Pre-program test					
Concepts	**Difference in mean**	**Std error of difference**	**t**	**df**	**p-value**
Earning income	0.93	5.64	-0.16	90	0.87
Saving	3.33	3.58	-0.93	90	0.35
Spending	7.71	4.49	-1.72	90	0.09
Managing credit	-3.29	6.54	0.5	90	0.62
Managing risk	1.14	5.77	-0.2	90	0.84
Investing	14.76	7.93	-1.86	90	0.07
Contributing	27.9	10.14	-2.75	90	0.01
Overall	5.47	3.59	-1.52	90	0.13
Panel B: Post-program test					
Concepts	**Difference in mean**	**Std error of difference**	**t**	**df**	**p-value**
Earning income	-4.33	5.06	-0.86	90	0.39
Saving	0.74	5.9	0.13	90	0.9
Spending	-2.05	6.46	-0.32	90	0.75
Managing credit	-4.33	5.79	-0.75	90	0.46
Managing risk	-0.25	4.21	-0.06	90	0.95
Investing	-5.05	4.92	-1.03	88.21	0.31
Contributing	-1.33	8.02	-0.17	90	0.87
Overall	-2.75	4.24	-0.65	90	0.52

Note: Two-tail p value is used

Table 7 presents the independent sample t-test results on differences between male and female students. Panel A shows that prior to the program, female students have significantly better score in “contributing” than male students at the 1% level. Female students are also generally more financially literate than male students prior to the implementation of the program though the differences in mean are only statistically significant in these three concepts, spending (significant at 5%), investing (significant at 5%), and contributing (significant at 1%). Panel B shows that after the program there is no difference in financial literacy between male and female students.

Discussion

This research focused on primary school students who are eleven to twelve years old. As students at this young age are not yet involved in making important financial decisions, the program conducted focused mainly on conceptual ideas and students may not retain much of what they learnt in the program. At a young age, some students may not have pocket money and thus may not see the practical application of saving or budgeting, making it difficult for them to engage with the material. Also, young children may not have the cognitive skills to fully understand abstract concepts like interest, investment, or budgeting. Their ability to grasp complex financial ideas often develops as they grow older.

Another limitation of this research is that we do not track the long-term financial behaviour of the sample students. The present research only analysed the “knowledge gained” rather than “behavioural change”. Therefore, future research with more research resource support may further examine the impact of financial education program by analysing the financial behaviour after the program. Another suggestion is to examine a different sample group such as high school students who have more control of money than primary students. It would be interesting to see if different results are observed.

Conclusion

Financial literacy has become a focus by policy makers and educators because of the increasing complexity of financial products and the growing concerns for financial fraud. If individuals fail to take responsibility for their own financial well-being, they may end up relying on welfare and unable to sustain themselves in retirement. Furthermore, financial illiteracy may lead to irrational behaviour that negatively affect the functioning of financial markets.

Past research has shown that youngsters often lack the basic knowledge required to make sound financial decisions. Therefore, there are two aims in this study. The first is to examine the current financial literacy of senior primary school students by conducting a pre-program test. Secondly, a seven-hour financial education program supported by the University Social Responsibility Project was conducted. A post-program test was then executed to examine the effectiveness of the program and see if students have gained more financial knowledge.

From the pre-program test, this study finds that students have better knowledge in the concepts of “earning income”, “managing credit”, and “managing risk” and that female students are generally more financially literate than male students. After the financial education program, all students show improvements in financial knowledge. Their test scores increased from 43.2 to 74.5, significant at the 1% level. No difference between male and female students was found in the post-program test results. The implication from this study is that this financial education program was effective in improving financial literacy. Future educators may refer to this financial education program conducted in this study. However, due limited research funding, this study did not track the financial behaviour of sample students over time. One suggestion of future research is to study the long-term financial behaviour of individuals after the financial education program. This will provide stronger evidence on the impact of financial education and the link between financial literacy and financial decision making.

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