

Starting Early: A Collaborative Approach to Financial Literacy in the Chicago Public Schools

Eric A. Hagedorn¹, Mark C. Schug², Mary Suiter³

ABSTRACT

This paper describes an economic and financial education program at the elementary grades involving the cooperation of an unlikely group of partners in Chicago. We provide a brief overview of the research literature for these grades. Then, we describe how a curriculum was implemented in Chicago Public Schools and evaluated. An attitude survey was administered to students as a pre-test and post-test. Over 2,500 individual tests from 48 schools and 110 librarians were matched. The measured changes, while often modest, were significant and large enough to indicate that the positive changes may be attributed to the curriculum.

Introduction

“Teaching at an inner-city school, with high crime, violence and poverty demands that we educators do everything within our means to educate students on the importance of managing limited finances. This will hopefully encourage parents to be mindful of it also. This is a topic that should be taught as early as possible in order to curtail the mindset of fast money earned on the streets, and gambling being the only way to improve one's financial circumstances in life. I sense that over the years the whole, “piggy bank...lemonade stand” concept in most children's lives has become something seen only on television and an unbelievable concept. Many entrepreneurs achieved their fortunes by starting out as youngsters doing just those kinds of things; saving and earning money responsibly. Those days are only gone for children if we allow them to be.”

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This paper describes a unique collaboration between the Chicago City Treasurer's Office, Chicago Public Schools, Money Savvy Generation Foundation, and a group of teacher librarians who joined forces to implement a financial literacy program for Chicago's elementary children. The paper provides a brief overview of the literature on teaching economics and personal finance at the elementary grades. Then, it describes how a financial education curriculum was implemented by Chicago Public School librarians and evaluated. Results and conclusions are offered including observations regarding modifications to the test instrument.

The goals of this paper are to:

- Establish a wider context within the research literature regarding how children learn the principles and concepts of economics and personal finance.

¹ Associate Professor, University of Texas: El Paso, 500 West University Avenue, TX 79968, email: ehagedorn@utep.edu.

² Professor Emeritus University of Wisconsin-Milwaukee, PO Box 413, Milwaukee WI 53201, email: mschug@uwm.edu.

³ Manager of Economic Education, Federal Reserve Bank of Chicago, 411 Locust Street, St. Louis, MO 63102, email: Mary.C.Suiter@stls.frb.org

- Advance our understanding of how financial education may be successful with younger age groups in large urban environments.

Review of Research

Although studies have been conducted about teaching basic economic and financial concepts to children, these studies are few in number. Why is there so little research in this area? There are several reasons. It may be due to the difficulties of measuring economic understanding at young ages. Multiple-choice test questions require a certain level of reading ability on the part of the child. Interviews of young children take time to administer and are difficult to standardize. As a result, there are no nationally-normed, readily available knowledge tests or attitude measures that can be used to assess a child's knowledge of personal finance and economics. The lack of research may also be the result of an assumption on the part of some educators that economics and personal finance are areas of study reserved for high school and college students.

However, there is empirical evidence going back as far as 1969 that young children can learn economics. Lawrence Senesh (1963) was a pioneer in the development of instructional materials for teaching economics at the elementary level. He created a series of materials titled *Our Working World*. Larkins and Shaver's (1969) study using the *Our Working World* series, demonstrated that first-grade students who studied economics consistently performed better on economics tests than those students who did not study economics. Kourilsky, in a study of the *Kinder Economy* program, found that children who participated in the program significantly outperformed students in control groups (1977). In 1989 Laney conducted research using the *Mini-Society* program and found that young students can learn economic concepts when exposed to carefully designed instruction. He also found that students better retained economic knowledge when they were exposed to real-life examples in the classroom rather than examples that depended heavily on vicarious experiences. In 1991, Morgan used a "Yes" or "No" response-test to measure the effectiveness of a video program titled *Econ and Me*. A sample of 300 students in the classrooms of teachers trained to use the program demonstrated a statistically significant gain in economic learning from pre-test to post-test.

Sosin, Dick, and Reiser (1997) conducted a study involving control and experimental groups in grades three, four, five, and six. Teachers in the experimental groups participated in training in economics and used curriculum materials developed primarily by the Council on Economic Education. Teachers in the control group did not have the training and materials. Students in the control and experimental teachers' classrooms were pre-tested and post-tested using a standardized test of economics. In analyzing the results, the research team concluded that students in the experimental groups learned significantly more economics than students in the control groups. The variable that was most significant in explaining the difference in learning between the groups was the extent to which economic concepts were taught.

Further contributions to our understanding of young students' ability to learn personal finance content were conducted using the *Money Savvy Kids*TM curriculum. This study involved 300 second- and third-grade students who were taught financial content by teachers who were trained to use the *Money Savvy Kids* curriculum. Analysis of the pre-test and post-test results for these students showed a statistically significant gain in content knowledge and change in attitudes for those students who were in classrooms in which the *Money Savvy Kids* curriculum was used (Schug and Hagedorn, 2005).

Suiter (2006) found that middle school students who were taught personal finance and economics content in mathematics classes scored better on an economics test than their counterparts who weren't taught economics and personal finance. Additionally the results of the study showed that the students who were taught economics and personal finance in their mathematics classes performed as well as their counterparts on a mathematics test.

Harter and Harter (2007) conducted a study to measure the effectiveness of the *Financial Fitness for Life* (FFFL) curricula published by the Council on Economic Education. The study focused on the use of FFFL in low-to-moderate income elementary, middle, and high schools in a region of Kentucky. Teachers

in the experimental group were trained and used FFFL in their classrooms. Teachers in the control group were not trained and did not use the materials. Students in these classrooms were pre-tested and post-tested using a carefully developed test designed to match the content of the program. Based on pre- test and post-test results for over 300 elementary students in the experimental group and over 600 elementary students in the control group, the study concluded that students in the experimental group showed a statistically significant increase in financial knowledge.

Finally, two important reviews of research provide a good summary of what we know regarding the economic and financial education of children. In 2005, Watts conducted a review of research on outcomes and effective program delivery in pre-college economic education. In the review he notes that research in economics and personal finance show that students can and do learn economics when their teachers understand the content and when they incorporate the use of high-quality educational materials in the classroom. In 2008, Miller and VanFossen conducted a review of research in economic education and concluded the “children’s economic knowledge can be improved via direct, purposeful instruction” (p. 293). In other words, if we teach children basic economic and financial concepts, they do learn.

Methodology

The CPS elementary curriculum, like most around the nation, has a strong emphasis on the teaching of reading and mathematics. There is time for little else. This provides a challenge to those who are interested in beginning financial and economic literacy in the elementary grades. What to do? After much discussion between the CPS, the Office of the City Treasurer of Chicago, and Money Savvy Generation Foundation, a new curricular path was identified. It was decided to recruit CPS teacher librarians and to use library instructional time as a way to integrate financial education into the CPS elementary school curriculum.

During Chicago’s 2011 Money Smart Week, CPS teacher librarians at 145 schools volunteered to teach financial literacy lessons from Level C of a curriculum called *Money Savvy Kids™ Beginning Personal Finance* curriculum to their students. Teachers were recruited via e-mail and registered for the program through a link provided by the CPS Department of Libraries and Information Services Office.

The six-hour curriculum was taught to CPS third graders during time in the school library. *Money Savvy Kids™* is a curriculum developed by Money Savvy Generation of Lake Bluff, Illinois. The curriculum includes eight lessons:

- The History of Money
- Where Does Money Come From?
- Kids Can Earn Money Too!
- Saving Money and Bank Field Trip
- Spending Money
- Donating Money
- Investing Money
- Family Money Press Conference

An important part of *Money Savvy Kids™* curriculum is the Money Savvy Pig™. This is a four slot piggy bank. It provides teachers and parents with a new way to introduce children to saving, spending, investing, and donating. Each child participating in the program received a Money Savvy Pig™.

During the 2010-2011 school year, training was provided via the participants’ use of self-study materials. The CPS teacher librarians were offered a pre-recorded training session available online through CPS’s internal training department. The teacher librarians were asked to implement the program in their classrooms and to administer a pre-and post-test to their students. The Money Savvy Kids™ materials and curriculum were taught by the teacher librarians in over 110 elementary school classrooms.

To investigate the effectiveness of this program, students were pre-and post tested using an attitude survey. The instrument selected was the Money Savvy Kids™ Assessment. This is a 10 item, Likert scale instrument. A three point response format was used: “agree” (with a value of 3), “unsure” (with a value of 2) and “disagree” (with a value of 1). The instrument was originally developed by the Center for Economics Education at the University of Wisconsin – Milwaukee as a device to measure student beliefs about savings habits, handling money, the role of business, and so forth. The instrument has subsequently been modified.

The survey was given to students before receiving their Money Savvy Pigs and after they had completed the curriculum. Over 6,000 pre-tests and post-tests were administered. More pre-tests were received than post-tests. Receiving more pre-tests than post-tests is not uncommon in year-long external curriculum projects and may be explained by student absence, students using inconsistent codes making matching impossible, or teachers forgetting to administer or turn in the post-tests. Nevertheless, 2,553 individual pre- and post-tests from 48 distinct schools and 110 individual teachers were matched. Unmatched data were not included in this analysis because paired samples data are more informative than unmatched data from the same sources and the current data sample was sufficiently large. In previous studies with other school districts, where both paired and independent samples data were available, the results were very similar.

Overall Results

Item response means and standard deviations were calculated for the combined group of participating students for whom we had matched both pre- and post-tests (N=2,553). These are provided in Table 1. When the sample size is less than 2,553 for a particular item, it indicates some students left this item blank. The data for every single item differed from normal with a statistical significance less than 1 in 1000 as determined by both the Kolmogorov-Smirnov and Shapiro-Wilks tests. Because of this, the Wilcoxon Signed Ranks test was used to determine if there were any statistically significant changes occurred from pre-test to post-test.

**Table 1:
Descriptive Statistics for Paired Samples Data from Chicago Students**

	N	Pre	SD	Post	SD	Desired change/achieved
Item 1	2553	2.715	0.5350	2.789	0.4778	Increase, yes
Item 2	2544	1.368	0.6753	1.266	0.5932	Decrease, yes
Item 3	2526	1.503	0.7644	1.454	0.7489	Decrease, yes
Item 4	2527	2.737	0.8480	2.806	0.5027	Increase, yes
Item 5	2532	1.360	0.6911	1.265	0.5960	Decrease, yes
Item 6	2515	2.428	0.8031	2.013	0.8921	Decrease, yes
Item 7	2522	2.118	0.7085	1.952	0.8137	Decrease, yes
Item 8	2526	2.664	0.5960	2.796	0.4926	Increase, yes
Item 9	2538	2.735	0.5871	2.796	0.5189	Increase, yes
Item 10	2534	1.878	0.8419	1.694	0.8267	Decrease, yes

The non-parametric Wilcoxon Signed Ranks test was performed on the data to determine if student responses changed from pre- test to post-test in a statistically significant manner. The Wilcoxon Signed Ranks test is the non-parametric equivalent to the paired or dependent samples t-test. It is used because the paired samples t-test assumes a normal distribution in the data, which these data are not (based upon Kolmogorov-Smirnov and Shapiro-Wilk tests of normality). This is not unusual in data coming from a 3-point Likert scale.

The data were also analyzed using a Cohen Effect Size statistic. A statistically significant difference in means from pre-test to post-test indicates that it is highly likely that the changes were not a result of chance and, indeed, can be attributed to the curriculum used by the teachers and students. The Cohen Effect Size statistic addresses the importance or size of the change (Cohen, 1992; Kirk, 1995).

Table 2 shows the results of the Wilcoxon analysis and the Cohen Effect Size analysis and indicates there were statistically significant improvements in student understanding on all ten of the items. The individual item changes are described below in terms of averages based on the rating scale: 3 indicating agreement, 2 unsure, and 1 disagreement. The Cohen Effect Size result suggests, however, that the improvements were modest.

Table 2.
Wilcoxon Z (indicator of significant change) and Cohen Effect Size of Changes

	Item	Z value	2-tailed significance	Cohen Effect size	Described Effect Size
1.	I know a lot about how to handle my money.	-5.871	0.000	0.15	Small
2.	Saving money is greedy.	-6.055	0.000	-0.16	Small
3.	It is important to have the things I want when I want them.	-2.477	0.013	-0.06	Small
4.	It is important to save for the things that I want to buy in the future.	-5.422	0.000	0.10	Small
5.	I want to spend the money I earn right away.	-6.445	0.000	-0.15	Small
6.	It is best to put the money you save in your room at home.	-17.748	0.000	-0.49	Medium
7.	When I invest in stocks, I will always make money and never lose money.	-8.323	0.000	-0.22	Small
8.	Business people help others by providing them with goods and services.	-8.820	0.000	0.24	Small
9.	It is important for families to keep money in real banks.	-4.369	0.015	0.11	Small
10.	When I donate money it helps others but doesn't help me.	-9.191	0.000	-0.22	Small

Item by Item Analysis

The following is an item by item description of the results.

Item 1: I know a lot about how to handle my money.

The average response of the students changed from 2.715, leaning towards agreement to 2.789, more strongly agreeing. This indicates an improvement in student self-confidence regarding the proper handling of money. The two-tailed significance implies that this improvement in average score could only have occurred by chance less than 1 in 1000 times. The .15 effect size indicates that this improvement is 15% of an average standard deviation in size. Cohen considers this a “small effect.”

Item 2: Saving money is greedy.

The average response of the students changed from 1.368, leaning toward disagreeing, to 1.266, which leans further toward disagreeing. This indicates an improvement in student understanding, because it is

appropriate for students to disagree with the notion that saving money is selfish. The two-tailed significance implies that this improvement in average score could only have occurred by chance less than 1 in 1000 times. The -.16 effect size indicates that this improvement is roughly 16% an average standard deviation in size. Cohen considers this a “small effect.” The minus sign indicates that the average score decreased from pre to post (which is appropriate for this item).

Item 3: It is important to have the things I want when I want them.

The average response of the students changed from 1.503, leaning towards unsure, to 1.454, which is more strongly disagreeing. The two-tailed significance implies that this improvement in average score could only have occurred by chance less than 13 in 1000 times. The -.06 effect size indicates that this improvement is 6% of an average standard deviation in size. Cohen considers this a “very small effect.” The minus sign indicates that the average score decreased from pre to post (which is appropriate for this item).

Item 4: It is important to save for the things that I want to buy in the future.

The average response of the students changed from 2.737, leaning towards agreement to 2.806, more strongly agreeing. This indicates an improvement in students’ perceptions that you should save for the future. The two-tailed significance implies that this improvement in average score could only have occurred by chance less than 1 in 1000 times. The .10 effect size indicates that this improvement is one tenth of an average standard deviation in size. Cohen considers this a “small effect.”

Item 5: I want to spend the money I earn right away.

The average response of the students changed from 1.360, leaning towards disagreeing, to 1.265, which is more strongly disagreeing. This indicates an improvement in student understanding because the decline in the averaged responses indicates more students disagreeing with the item saving money in your room is the best method of saving, which is appropriate. The two-tailed significance implies that this improvement in average score could only have occurred by chance less than 1 in 1000 times. The -.15 effect size indicates that this improvement is about one seventh of an average standard deviation in size. This is a small effect size. The minus sign indicates that the average score decreased from pre to post (which is appropriate for this item).

Item 6: It is best to put the money you save in your room at home.

The average response of the students changed from 2.428, on the agreeing side of unsure, to 2.013, which, on average, indicates uncertainty. This suggests an improvement in student understanding, because the average dropping indicates more students disagreeing with this item which is appropriate for this item (saving money in your room is the best method of saving). The exact two-tailed significance implies that this change in average score could only have occurred by chance less than 1 out of 1000 times. The -.49 effect size indicates that this decrease in score is almost half of an average standard deviation in size. Cohen considers this a “medium effect.”

Item 7: When I invest in stocks, I will always make money and never lose money.

The average response of the students changed from 2.118, on the agreeing side of uncertain, to 1.952, which is now on the disagreeing side of uncertain. This indicates an improvement in student learning because it is more appropriate for students to disagree with the idea that investing in the stock market always pays off. The two-tailed significance implies that this change in average score could only have occurred by chance less than 1 out of 1000 times. The -.22 effect size indicates that this improvement is almost one quarter of an average standard deviation in size. Cohen considers this a “small effect.”

Item 8: Business people help others by providing them with goods and services.

The average response of the students changed from 2.664, leaning towards agreement to 2.796, more strongly agreeing. This indicates an improvement in students’ perceptions that business people help others and how they do so. The two-tailed significance implies that this improvement in average score could only have occurred by chance less than 1 in 1000 times. The .24 effect size indicates that this improvement is just less than one quarter of an average standard deviation in size. Cohen considers this a “small effect.”

Item 9: It is important for families to keep money in real banks.

The average response of the students changed from 2.735, leaning towards agreeing, to 2.796, leaning even more towards agreeing. This indicates an improvement in student understanding because more students agree that it is important for families to keep money in real banks. The two-tailed significance implies that this change in average score could only have occurred by chance 15 in 1000 times. The .11 effect size indicates that this improvement is roughly 11% of an average standard deviation in size.

Item 10: When I donate money it helps others but doesn't help me.

The average response of the students changed from 1.878, leaning towards uncertain, to 1.694, which also leans towards uncertain, but not as much relative to the pre-test average. This indicates an improvement in student understanding because more students should disagree that donating money only helps the recipient. The two-tailed significance implies that this change in average score could only have occurred by chance 1 out of 1000 times. The -.22 effect size indicates that this improvement is 22% of an average standard deviation in size. Cohen considers this a “small effect.”

A follow-up online survey was also used to gather feedback from participating teacher librarians on the success of the program in the classroom. From the results, we found that the teacher librarians were extremely supportive of the program and wish to continue to present these lessons to their students. A few noteworthy survey results are as follows:

- 100% of the teacher-librarians believe that it is important to teach personal financial literacy at the elementary and middle school levels.
- 98.1% feel the lessons effectively address key financial concepts and skills.
- 86% believe the program has changed their students' attitudes about money in a positive way.
- 96.3% of the teacher-librarians would recommend this program to others.

Limitations

This study has several limitations. The study would be stronger if we had been able to use a nationally normed and validated instrument to measure knowledge and attitudes at the elementary grade levels.

Other possible improvements include:

- Adding control groups to the design would strengthen confidence in the results.
- Improving the training of the teacher librarian participants. We suspect that a more robust teacher training program might increase the size of the knowledge gains thus increasing the effect sizes.
- Expanding the program to include more grade levels. A well-developed economics and financial program includes opportunities for students to continue to learn and develop their understanding as they move through the grades. The work is not over at grade three. It has just begun.

Separately, we are conducting additional research on the instrument to refine existing items and to add new ones. Our hope is that such an improved survey might be a step toward developing a general measure of financial understanding for elementary students. These and other revisions will be done in order to improve the psychometric quality of the instrument. We are currently piloting these changes. We hope we will be able to offer researchers a general survey that can be used with other programs.

Conclusions

We have focused on the actions of an unexpected coalition – the Chicago City Treasurer's Office, Chicago Public Schools, Money Savvy Generation Foundation, and a group of teacher librarians who

joined forces to implement a financial literacy program for Chicago's elementary children. Such an effort is not the result of magic. Instead, it reflects hours and hours of collaboration involving mission driven persuasion, patience, and planning.

The effort paid off with concrete results. A large-scale financial literacy program was implemented involving over 6,000 students in over 110 elementary school classrooms. A six-hour curriculum was taught to CPS third graders who were pre- and post-tested as a way to measure the impact of the program.

The results are encouraging for two reasons. First, the aggregate data indicate that the Money Savvy Kids™ program was effective in positively affecting students' attitudes and knowledge about spending, saving, and investing money. The matched samples data for these students indicate statistically significant improvements on all 10 items of the survey instrument.

Second, the organizers of the program agreed to include evaluation as part of the process. Most financial education programs across the nation fail to include formal evaluation as part of the process or it is left to much later in the process when their funding is about to run out. Unlike most other efforts, here we have results which help us understand the strengths and weaknesses of the program.

Finally, and most importantly, this effort reveals that children can make progress toward becoming financially literate. This is not a small matter. We would never expect adults to be competent at reading or mathematics if those subjects were not introduced early and repeated regularly in the school curriculum. In the same way, like a good savings program, economic and financial education ought to start early and be repeated often. In fact, we have evidence (Butt, Haessler, and Schug, 2008) that children across grades K-8 can make gains in their economic and financial understanding. All we need to do is teach them.

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