

The Money Savvy Kids Curriculum: Changing Hearts and Minds

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I. The Money Savvy Kids Curriculum

Money Savvy Kids is a curriculum developed in 2001 by Susan and Michael Beacham, founders of Money Savvy Generation. The Beachams are former Chicago-area financial professionals. Susan Beacham became convinced that children needed to improve their economic and financial education and that the work had to begin early. As with any fundamental content and skills, Susan Beacham (and others) stresses that economic and financial education should be taught early and often, much like reading and math. It can't wait until high school. Establishing good financial habits takes time (Consumer Financial Protection Bureau, 2015).

Working with a team of elementary teachers and teachers with a masters in curriculum development, Money Savvy Generation gradually developed a curriculum called Money Savvy Kids. After lots of trial and error, use of good instincts, and careful listening to students and teachers, the curriculum was published in 2002. The complete Money Savvy Kids curriculum was developed for six levels, PK-6:

1. Level PK is suitable for PK.
2. Level A is suitable for K or 1st grade.
3. Level B is suitable for 1st or 2nd grade.
4. Level C is suitable for 2nd or 3rd grade.
5. Level D is suitable for 3rd or 4th grade.
6. Level E is suitable for 4th or 5th grade.

The research reported here focuses only on the lessons developed as part of the program for grades 2 to 5 (Levels B through E). Each of these levels includes eight lessons.

The lessons are fully-scripted making them highly consistent with the research on effective teacher-guided instruction. Decades of research clearly demonstrate that explicit instruction is more effective and more efficient than are the discovery or self-guided approaches (Clark, Kirschner, and Sweller, 2012).

The scripted nature of the curriculum also makes classroom implementation relatively easy. Each lesson begins with an introductory page in the teacher handbook outlining what will be needed for that lesson including extra props to bring to the classroom, what that lesson will achieve and the terms introduced in each lesson. The Money Savvy Kids curriculum has been aligned to Common Core State Standards for math and ELA as well as National JumpStart Coalition Standards and NCTM (National Council of Math Teachers) standards and expectations in areas of problem solving, reasoning and proof, communication, connection, and representation. The curriculum also provides an approach to teaching math and social studies economic concepts enhancing existing mathematics and social studies curriculum.

1. The History of Money – Lesson 1 traces the evolution of money in a lighthearted, easy-to-grasp way. From cattle to cowrie shells to modern-day coins and currency, students learn that money has taken the form of many things over time.

2. Where Does Money Come From - Lesson 2 explains the ways people earn money by doing different types of jobs and by selling their time, and that income is limited relative to wants. Wants are virtually unlimited, but limited income does not allow individuals to have everything they want.

3. Kids Can Earn Money, Too - Lesson 3 describes how businesses operate through two easy-to-grasp examples: a dog-walking service and a lemonade stand. They learn what an entrepreneur is, and that businesses offer products or services in exchange for money.
4. Saving Money - Lesson 4 introduces students to the 4-chamber Money Savvy Pig bank which each student receives as part of this curriculum level. The students learn about saving, interest, short-term goals and long-term goals.
5. Spending Money - Lesson 5 explores how students can be smart spenders. This lesson presents four strategies designed to help students spend wisely and helps them to develop critical thinking about purchasing decisions. The four strategies include making a spending list, prioritizing the spending list, giving the “gimmies” a time out, and comparing prices.
6. Donating Money - Lesson 6 lays out several easy donating strategies for students such as researching charities, choosing a charity, and making a giving board. They learn that donating can mean giving time or talent as well as money.
7. Investing Money - Lesson 7 introduces students to the concept of investing in a lighthearted, age-appropriate way. Students become familiar with basic investment terms and concepts including bear market, bull market, shareholder, stocks, and risk.
8. Family Money Press Conference: In this final lesson, students hold their own “press conferences” with members of their families or other adults in their lives asking questions to discover how the grown-ups earned income when they were young.

An important part of the Money Savvy Kids curriculum is the Money Savvy Pig. What makes the Money Savvy Pig distinctive? Rather than having one slot for all types of saving, it has four slots--one each for saving, spending, donating and investing. Each child participating in the program is taught about the concepts embodied by the Money Savvy Pig and he or she receives one to keep. The Money Savvy Pig, along with the Money Savvy Kids curriculum, provides teachers and parents with a fun and engaging way to introduce children to the basic ideas in economics and personal finance.

Money Savvy Kids and the Money Savvy Pig are highly popular. Nearly 380,000 students in the lower 48 states have participated in the curriculum. Thousands of Money Savvy Pigs have been sold or distributed to schools across the nation at no cost due to the generosity of local and state donors. Moreover, the odds are good that you have seen the Money Savvy Pig at a school, bank, insurance company or other financial institution that wishes to promote economic and financial literacy. But, you might not have realized that it was a key part of a well-developed and seriously researched curriculum for children.

II. Earlier Research on the Money Savvy Kids Curriculum

For roughly a decade the evaluation of the *Money Savvy Kids* curriculum relied on an attitude test 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, called the Money Savvy Kids Assessment, is a 10

item, Likert-scale instrument. A three-point response format was used: “agree” (value 3), “unsure” (value 2), and “disagree” (value 1).

Typically, our evaluation efforts indicated students’ attitudes improving slightly after instruction, with reasonably positive (desired) attitudes before instruction on many items (Schug & Hagedorn, 2005). After similar results over the next decade, we realized we needed to investigate more deeply. We realized that while attitudes are important, so is solid evidence of content learning. With funding from an Elizabeth Morse Genius Charitable Trust, we developed and piloted a multiple-choice content test during the 2015-2016 school year at multiple sites. We also piloted a freshly designed attitudinal instrument. From the results of this pilot we improved both instruments by eliminating items with poor psychometric properties.

Once poorer performing items were removed, we used these improved instruments for the 2016-2017 academic year in a large study across Washington State (N = 1299). The raw scores on the content test improved with statistical significance and large effect size. While many of the attitude changes were small, as in previous years, one noteworthy finding arose: the changes in student attitudes towards saving money and investing money changed with medium effect sizes. Why is this noteworthy? Because this larger change in attitude occurs on topics that evidence from our content test confirms was new learning because of the program.

III. Review of Related Research

A search of the educational literature finds very few studies of elementary students learning financial literacy. This dearth of studies about teaching basic economic and financial concepts to children is possibly 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 to assess a child’s knowledge of personal finance and economics.

However, research going back as far as 1969 suggests that young children can learn economics. In 1963, Lawrence Senesh, a pioneer in economic education, developed the instructional materials *Our Working World: Families at Work* for teaching economics at the elementary level (Senesh, 1963). Larkins and Shaver’s (1969) study used the *Our Working World* series to demonstrate that first-grade students who studied economics consistently performed better on economics tests than those students who did not study economics.

Kourilsky (1977), in a study of the *Kinder Economy* program, found that children who participated in the program significantly outperformed students in control groups. Laney’s (1989) research used 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 heavily dependent on vicarious experiences. Morgan (1991) used a “Yes” or “No” response test to measure the effectiveness of the video program *Econ and Me*. A sample of 300 students taught in the classroom by 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 received economics

training in economics and used curriculum materials developed primarily by the Council on Economic Education. Teachers in the control group did not receive the training or curriculum materials. Students in both groups were pre- and post-tested using a standardized test of economic knowledge. In analyzing the results, the research team concluded that students in the experimental group learned significantly more economics than students in the control group. The variable that most significantly explained the difference in learning between the groups was the extent to which economic concepts were taught.

Schug and Hagedorn (2005) conducted research using the *Money Savvy Kids* curriculum to further understand young students' ability to learn personal finance curriculum. This study involved 300 second- and third-grade students who were taught financial content by teachers trained to use the *Money Savvy Kids* curriculum. Analysis of the pre- and post-test results for these students showed they had a statistically significant gain in content knowledge and change in attitudes. Hagedorn, Schug, and Suiter (2016) more recently published a study with similar results but with a much larger sample size and teacher librarians using the curriculum.

Suiter (2006) found that middle-school students taught personal finance and economics content in their mathematics classes performed better on economics tests than their counterparts not taught economics and personal finance in their mathematics classes. Additionally, the results of the study showed that the students 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 elementary, middle, and high schools in low- to moderate-income areas in a region of Kentucky. Teachers in the experimental group were trained to use the *FFFL* in their classrooms. Teachers in the control group were not trained and did not use the materials. Students in both groups were given pre- and post-tests carefully designed to match the content of the program. Based on pre- and post-test results for the 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. Watts (2005) conducted a review of research on outcomes and effective program delivery in pre-college economic education. He noted 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. Miller and Van Fossen (2008) 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.

This conclusion is supported by a more recent study by Batty, Collins & Odders-White (2015). The results of this quasi-experimental design study indicated that fourth and fifth grade students who participated in a relatively brief financial literacy program retained knowledge gains after a year.

IV. Methodology

The content test employed in our repeated measures design (pre-instruction, post-instruction), consists of 27 multiple choice items investigating student learning related to the 7 lessons provided in the curriculum:

1. History of money (5 items)
2. Where does money come from? (3 items)
3. Kids can earn money too! (3 items)
4. Saving money (4 items)
5. Spending money (5 items)
6. Donating money (3 items)
7. Investing money (4 items)

Each item on the content test was dichotomously scored, a “0” if either incorrect or left blank, or a “1” if correct.

The attitude test, also given pre and post-instruction, consists of 17 multiple choice items investigating student learning related to 5 of the 7 curriculum areas:

1. Earning (4 items)
2. Spending (2 items)
3. Saving (4 items)
4. Investing (3 items)
5. Donating (3 items)
6. General attitude towards learning about money (1 item)

The response choices for these items were: a smiley face (representing “I agree,”), a neutral face (representing “I’m unsure,”) and a frowning face (representing “I disagree”). Smiling face responses were scored as a “3,” neutral face responses as a “2,” and frowning responses as a “1.” Items that were negatively worded, those where the appropriate response would be to disagree with them, were recoded for analysis, meaning if students agreed with them, the 3 value was replaced with a 1 (the lowest score) and vice versa.

The results from the content test are analyzed as a whole (raw test scores) and by lesson (section raw scores). The attitude test results are presented as subscale scores only. Our subscale scores were obtained by adding the responses to each attitudinal item on the subscale (with negatively worded items recoded) and divides the sum by the number of items on that particular subscale. As a result, all mean subscale scores are on the 1 to 3 scale. Descriptive statistics describing scores are provided along with inferential statistics that evaluate the likelihood that the changes observed were caused by simple chance or as we hypothesize, by participation in the *Money Savvy Kids* curriculum. For the raw test scores and lesson section scores, the non-parametric Wilcoxon Signed ranks test was used. Why? When comparing means (pre-test to post-test) from a matched sample, the appropriate parametric statistic is the paired samples t-test (Aron & Aron, 2003). However, an oft overlooked assumption for using parametric statistics is that the data analyzed be normally distributed. As our data are not normally distributed, as indicated by both Kolmogorov-Smirnov and Shapiro-Wilk tests, we chose the more appropriate non-

parametric test. This non-normality of data is common, particularly on post-tests where scores tend to be skewed to the left.

Any results indicating a statistically significant change from pre- to post- were also analyzed using a Cohen effect-size statistic. A statistically significant difference in means from pre-test to post-test indicates a high likelihood that the changes were not a result of chance and, may be attributed to the Money Savvy Kids curriculum. The Cohen effect-size statistic addresses the importance—or size—of the change (Cohen, 1992; Kirk, 1995). Obtained effect sizes will be categorized using the Cohen’s suggested rules of thumb: $d = 0.2$ is the threshold for a “small effect size”, $d = 0.5$ is the threshold for a “medium effect size”, and $d = 0.8$ the threshold for a “large effect size.” (Cohen, 1988). We agree with more recent effect size research that concludes that the traditional Cohen effect-size calculation must be modified to take into account the dependence among means in a paired pre-test post-test sample such as we have. With this in mind, we use Morris and Deshon’s equation to calculate our effect sizes (2002).

Lastly, a normalized gain score, or Hake Index, was calculated for the content test. This index is a measure of how much of an improvement has been made from pre to post in terms of the amount the students would have to improve from the mean pre-score to everyone getting 100% correct on the post-test (2001). For instance, a Hake Index of 50% implies that the students improved half as much as they could have.

V. Overall Results

Content Test and Content By Sections

Of the 992 students for whom we had matched pre and post-tests, 358 (36%) were in the 2nd grade and 634 (64%) were in the 3rd grade. These tests came from 39 distinct schools with 57 teachers delivering the *Money Savvy Kids*[®] curriculum and proctoring the testing.

The change in the mean raw score across all lessons changed from 14.6 (SD = 4.1) on the pre-test to 19.4 (SD = 5.0) on the post-test. This implies that on average, students on the pre-test got 15 items correct, and on the post-test, 19. This change in raw score is statistically significant at less than one chance in a thousand, and has a large effect size of 1.1. The Hake index indicates how much improvement the students made on average, compared to how much improvement they would have made if they had all answered every question correctly on the post-test. For this sample, the Hake index was 0.39, which implies the participants improved 39% of what they could have. Histograms for the pre-test and post-test are provided in Figure 1.

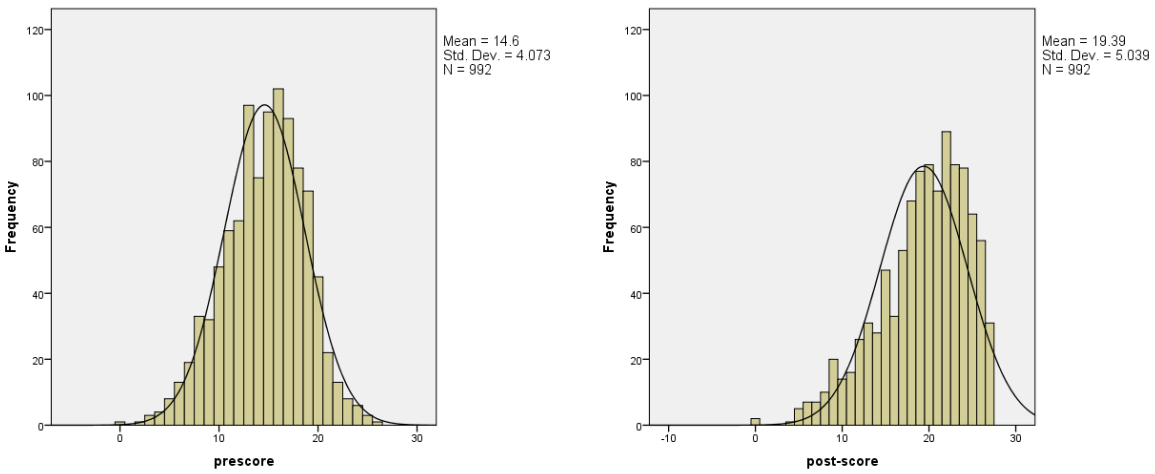


Figure 1. Distributions of scores on pre- and post-tests

To summarize the student learning for each lesson, the raw scores for each item in each lesson were summed and then converted to a scale of 100. The means and standard deviations for these lesson scores are presented in table 1. The non-parametric Wilcoxon Signed Ranks Test was used to determine the likelihood that the changes from pre to post occurred purely by chance or as we would hope, because of their participation in the program. The appropriate Cohen effect size for the change from pre to post with a matched sample was also calculated. These results are presented in Table 2.

Table 1. Descriptive statistics for normalized lesson scores

Lesson	N	Pre-score	SD _{pre}	Post-score	SD _{post}	Correlation	Mean change
History of money	991	44.9	20.8	67.7	26.5	0.262	22.8
Source of money	992	65.3	27.5	81.4	24.3	0.313	16.1
Kids can earn	992	78.8	28.3	85.5	24.5	0.337	6.7
Saving money	992	54.6	22.5	79.0	22.7	0.302	24.4
Spending money	992	43.9	23.7	58.4	26.2	0.377	14.5
Donating money	992	70.7	32.9	80.6	28.7	0.440	9.9
Investing money	992	38.2	25.6	62.4	29.3	0.252	24.2

Table 2. Wilcoxon Signed Ranks results with effect sizes for lesson score improvement

Lesson	Z	p	Effect size	Interpretation of effect size
History of money	19.2	0.000	0.79	medium
Source of money	14.6	0.000	0.53	medium
Kids can earn	6.9	0.000	0.22	small
Saving money	21.0	0.000	0.91	large
Spending money	14.6	0.000	0.52	medium
Donating money	9.2	0.000	0.30	small
Investing money	18.3	0.000	0.72	medium

As table 2 shows, the change in lesson scores from pre to post changed with statistical significance for all 7 lessons. The probability that such changes occurred purely by chance are less than one in one thousand. The change in mean lesson scores for the saving money lessons had a large effect size. The changes in mean lesson scores for the: 1) history of money, 2) source of money, 3) spending money and 4) investing money lessons had medium effect sizes. Lastly, the changes in mean lesson scores for the: 1) kids can earn, and 2) donating lessons had small effect sizes.

Attitudinal Measure by Subscale

Of the 1299 students for whom we had matched pre and post- attitudinal measures, 21 (1.6%) were in the 1st grade, 529 (40.7%) were in the 2nd grade and 749 (57.7%) were in the 3rd grade. The 21 first grade students were filtered from analysis in this study as attitudinal changes are compared to learning gains and only 2nd and 3rd grade students took the content test. Table 3 provides descriptive statistics on the attitudinal subscale scores on both the pre and post-test, dealing with missing values analysis by analysis. This implies that missing data only eliminated that student pair of data for the item from which it was missing. If one removes cases that had any missing data, the sample size reduces to 994 and the results are shared in Tables 5 and 6. Despite slight changes in the descriptive statistics, the statistical inferences were nearly identical between the larger more inclusive set of data and the smaller more conservative set.

Table 3. Descriptive statistics for attitudinal subscale scores (missing values analysis by analysis)

Attitudes towards	N	Pre-score	SD _{pre}	Post-score	SD _{post}	Correlation	Mean change
Earning money	1216	2.40	0.389	2.61	0.349	0.257	0.22
Spending money	1241	2.20	0.533	2.31	0.530	0.276	0.10
Saving money	1202	2.41	0.440	2.65	0.395	0.329	0.24
Investing money	1194	2.14	0.489	2.52	0.476	0.168	0.38
Donating money	1237	2.40	0.650	2.52	0.595	0.337	0.11
Learning about money	1230	2.69	0.609	2.82	0.473	0.276	0.13

Table 4. Wilcoxon Signed Ranks results with effect sizes for lesson score improvement

Lesson	Z	p	Effect size	Interpretation of effect size
Earning money	15.4	0.000	0.44	small
Spending money	5.4	0.000	0.17	very small/small
Saving money	15.5	0.000	0.47	small/medium
Investing money	18.2	0.000	0.60	medium
Donating money	5.4	0.000	0.14	very small

Learning about money	6.8	0.000	0.20	small
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Table 5. Descriptive statistics for attitudinal subscale scores (missing values listwise)

Attitudes towards	N	Pre-score	SD _{pre}	Post-score	SD _{post}	Correlation	Mean change
Earning money	994	2.41	0.390	2.62	0.346	0.226	0.21
Spending money	994	2.21	0.529	2.31	0.522	0.255	0.09
Saving money	994	2.41	0.443	2.65	0.397	0.346	0.24
Investing money	994	2.14	0.484	2.52	0.476	0.159	0.37
Donating money	994	2.40	0.650	2.52	0.595	0.340	0.12
Learning about money	994	2.69	0.609	2.82	0.473	0.255	0.15

Table 6. Wilcoxon Signed Ranks results with effect sizes for lesson score improvement

Lesson	Z	p	Effect size	Interpretation of effect size
Earning money	13.6	0.000	0.43	small
Spending money	4.3	0.000	0.16	very small/small
Saving money	14.0	0.000	0.47	small/medium
Investing money	16.5	0.000	0.61	medium
Donating money	5.0	0.000	0.16	very small/small
Learning about money	6.8	0.000	0.18	very small/small

VI. Limitations

This study has several limitations. It would be stronger if we could match each student's content test responses with their measured attitude responses. This would allow a statistical analysis of the relationship between measured learning (knowledge change) and attitude change. The relationships between learning and attitude changes noted in this study were discovered by serendipity, not intention.

While we have carefully developed our instruments, this 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. A different tack would be to apply Rasch analysis to our existing data and see what conclusions we could draw from the results of this more stringent measurement analysis.

An improvement to the curriculum that would very likely impact knowledge gains would be to improve the training of the participating teachers. In previous years, the changes in student

attitudes could be statistically linked to the individual teachers, and it is all the more likely that this be evident in learning differences examined by teacher.

Future studies that would further support our claims include conducting a retention study and carrying out a quasi-experimental study with treatment and control groups. While a retention study is a future intention, we are currently carrying out the quasi-experimental study in Washington State with a control group as demographically similar to our treatment group as possible. Note: in an experimental study individual students are randomly assigned to treatment and control groups. In a quasi-experimental study, groups of students (classes or schools) are randomly assigned to treatment or control. In an educational setting, experimental studies are logistically very difficult.

VII. Conclusions

The results of this study demonstrate that participating students, on average, had significantly higher scores on the post-test than on the pre-test, which suggests the efficacy of the *Money Savvy Kids*[®] curriculum for teaching various aspects of financial literacy. The gains students made, when broken down by lesson topics were largest for details about saving money and ways of saving it. The learning gains made by students regarding the history of money, while statistically considered “medium,” were 0.01 units from the criterion for being a large effect size, 0.8. Medium effect size gains were made in the lessons regarding the sources of money, details about saving, and details about investing

As we found in previous studies, where student attitude changes were small or very small, enough students held the “desired” attitudes towards “kids earning money” or donating to others before instruction that the mean attitude scores were greater than 2.0. While this may be a “technical rule of thumb” interpretation, mean scores greater than 2.0 indicate more students agree with the statement (mean 3.0) than are unsure (mean 2.0) or disagree (mean 1.0). Graphs of frequencies of responses to individual items before and after instruction make this easier to discern, but were omitted from this paper due to space considerations.

While small changes in attitudes or appropriate attitudes being held before instruction may beg the question, what is the benefit of the curriculum in terms of changing attitudes? In previous years we have argued that whether students held the desired attitudes before instruction or not, learning about the related topic and showing even small changes in attitude may very well indicate that the desired attitudes are held more robustly – something a retention study or a student focus group study might shed light on.

What this study suggests, that we could not consider prior to having a reliable content measure, was that the largest attitude changes (in this case ones with medium effect sizes) are more likely to accompany new learning. The only two attitudinal changes with medium effect size were related to saving money and investing. Our content analysis indicates that students learned the most, on average, about saving money, as indicated by the large effect size for the change in knowledge on this lesson. Similarly, the medium effect size for gains in knowledge regarding investing, correspond to the medium effect size gain in desired attitude. Simply put: how can students have the desired attitude about something they know very little about?

Finally, and most importantly, our most careful study to date, reveals that children can make progress toward becoming financially literate and towards more positive attitudes about what they have learned. This finding is important. 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. We can also see the negative attitudes that can occur and be reinforced in mathematics education. In the same way, like a good savings program, economic and financial education ought to start early and be repeated often, particularly if our means for doing so inculcates and supports desired attitudes.

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Appendix A. Money Savvy Kids Attitudinal Measure

Students were asked to choose which of the three faces

		
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best reflected their response to each item.

1. Getting money is easy. Just put a card in the cash machine and out it comes!
2. I can earn money at my age.
3. Earning money makes me happier than getting money as a gift.
4. Owning a business is not a good way to earn money.
5. Spending money leaves less money for me to save.
6. TV commercials make me want to spend more money than I should.
7. Banks are safe places to save my money.
8. A smart place to keep money is in a secret hiding place in my room.
9. I don't understand what banks do.
10. I am not interested in having a savings account at a bank.
11. I am not interested in investing my money.
12. I want to invest my money in businesses that earn profits.
13. I want to invest my money to earn more money.
14. Giving my money to people who really need it makes me happy.
15. Earning money is hard so I am not giving my money away.
16. It pleases me to give my money to groups I care about.
17. I like learning about what to do with my money.