

Money Savvy Kids Basic Personal Finance Curriculum
Washington State 2021-2022

Evaluative Report

Executive Summary

From the 2021-2022 academic year, 922 matched pre and post-content measures (the MSGKT) collected from 29 schools and 57 teachers indicated a statistically significant increase in score with large effect size. From the perspective of normalized gain (Hake Index) students learned, on average, 40% of what this curriculum had to offer to achieve a perfect final score. Nevertheless, these students had a larger average gain in the number of correct items (5) on the post-test than last year, because they started with a lesser mean pre-test score.

These results demonstrate that students, on average, had significantly higher scores on the post-test than on the pre-test, which suggests the efficacy of the Money Savvy Generation curriculum for teaching various aspects of financial literacy. The largest learning gains, as determined by effect size, were on four lessons (as opposed to only two last year): 1) the History of Money, 2) Spending Money, 3) Saving Money, and 4) Investing Money. The learning gains on the: 1) Source of Money and 2) Donating Money, improved with medium effect size. The single lesson indicating the least learning (with small effect size), Kids Can Earn Money Too!, included 3 items that that 66%, 84% and 87%, of the students knew before instruction.

What do these results, using the carefully refined content knowledge instrument tell us? The Money Savvy Kids® program continues to positively affect student learning (and we assume attitudes) towards personal finance, and reinforce correct understanding already held.

Knowledge Test

Background

In the fall of 2022, participation of Washington State elementary and middle schools in the Money Savvy Generation began by offering their students the pre-test. During the 2021-2022 academic year, teachers taught the curriculum, and then administered posttests.

To measure the learning impact of this program, we analyzed the results of the 921 matched tests from 29 Washington state schools. The 27 multiple choice item test, referred to as the “Money Savvy Generation Knowledge Test” (MSGKT), was employed in a pre-post design on 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)

Nine hundred and twenty one (921) matched pre and post-tests from the 2021-2022 school year were analyzed. The tests analyzed came from 29 distinct schools with 57 teachers delivering the curriculum

and proctoring the testing. Before looking at the test as a whole, let us consider this test lesson by lesson.

Test Results by Lesson

To summarize the student learning measured with this instrument, the sums of raw scores for each lesson were converted to a scale of 100. The means and standard deviations for these lesson scores are presented in table 1. Note that the number of matched scores is less than either the number of pre scores or post scores as any missing item in a lesson removed that entire test from the change calculation and subsequent inferential statistics. 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 effect size suggested by Rosenthal, $r = \frac{z}{\sqrt{N}}$ (1994) was used to interpret statistically just how “big” these changes were. These results are presented in Table 2.

Table 1. Descriptive statistics for normalized lesson scores (N = 922)

Lesson	# items	Pre-score	SD _{pre}	Post-score	SD _{post}	Mean change
History of money	5	44.6	20.6	71.3	25.8	26.8
Source of money	3	66.7	28.0	81.6	25.1	14.9
Kids can earn	3	78.9	27.4	86.1	26.6	7.3
Saving money	4	54.6	25.1	78.9	25.1	24.3
pending money	5	42.0	23.6	61.0	28.1	19.0
Donating money	3	63.6	32.4	76.7	30.8	13.1
Investing money	4	43.0	26.5	61.7	31.5	18.8

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

Lesson	Z	p value	Effect size	Interpretation of effect size
History of money	-21.0	0.000	0.69	Large
Source of money	-13.4	0.000	0.44	Medium
Kids can earn	-7.4	0.000	0.24	Small
Saving money	-20.1	0.000	0.66	Large
Spending money	-16.7	0.000	0.55	Large
Donating money	-11.3	0.000	0.37	Medium
Investing money	-15.1	0.000	0.50	Large

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 four of the lessons: 1) History of money, 2) Saving

money, 3) Spending money, and 4) Investing had large effect sizes. The changes in mean lesson scores for the: 1) Source of money, and 2) Donating money lessons had medium effect sizes. Lastly, the changes in mean lesson score for the: 1) kids can earn lessons had a small effect size.

Test as a Whole

The change in total raw score across our sample of 921 matched pre and post-tests, changed from 14.5 (SD = 4.3) on the pre-test to 19.6 (SD = 5.2) on the post-test. This increase was 5.1 compared to our 4.4 more items correct in 2020-2021 (N = 1155).

The change this year implies that on average, students on the pre-test got 15 of 27 items correct (56%), while on the post-test roughly 19 (70%). The Wilcoxon signed ranks test for this change was statistically significant at less than one chance in a thousand. The calculated effect size is 0.79, which is considered large. The normalized learning gain for this sample was 0.40, which implies participants had a 40% gain in learning as measured with the MSGKT.

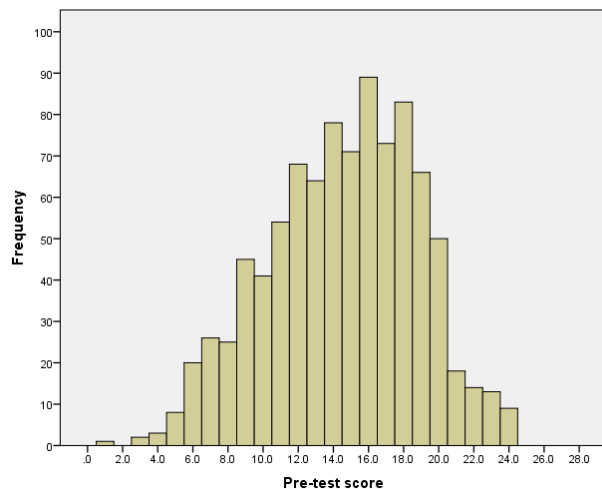


Figure 1. Distribution of raw pre-test scores
Mean = 14.54, SD = 4.27, N = 921

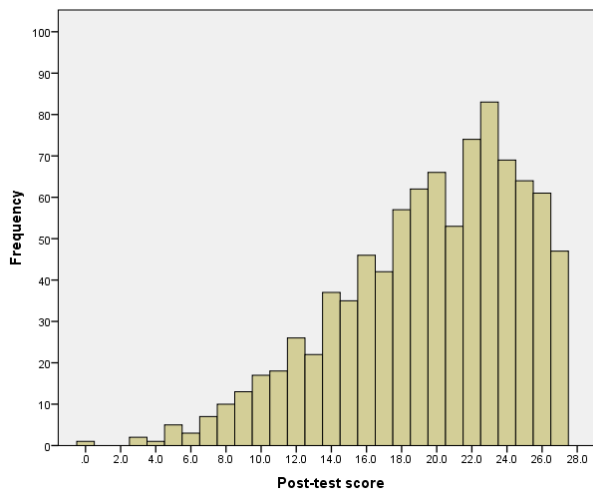


Figure 2. Distribution of raw post-test scores
Mean = 19.59, SD = 5.19, N = 921

A Look at Individual Items

Table 3 provides the percentage of students who correctly chose the correct response on the pre-test and post-test, along with the change from pre to post. Non-significant or negative percentage changes are highlighted.

Table 3. Percentages of students with correct responses to individual items

Item	Lesson	Pre-test % correct	Post-test % correct	Change in % correct
	<i>History of money</i>			
L1_1	Identify currency	34	54	20
L1_2	Identify a good	11	63	52

L1_3	Identify a service	67	92	25
L1_4	Identify barter	32	66	34
L1_5	Identify exchange	78	82	4
Item	Lesson	Pre-test % correct	Post-test % correct	Change in % correct
	<i>Source of money</i>			
L2_1	Where do adults get money?	83	88	5
L2_2	Adults trade time at work for?	68	85	17
L2_3	Identify deposit	49	73	24
	<i>Kids can earn money, too!</i>			
L3_1	Identify entrepreneur	66	84	18
L3_2	Identify price	84	86	2
L3_3	Identify businesses	87	89	2
	<i>Saving Money</i>			
L4_1	Identify profit	21	51	30
L4_2	Identify best place to save money	81	91	10
L4_3	Identify long-term saving goal	77	91	14
L4_4	Identify short-term saving goal	40	83	43
	<i>Spending money</i>			
L5_1	Identify consumer	49	67	18
L5_2	Identify loan	33	50	17
L5_3	Identify debt	41	62	21
L5_4	Identify best spending decision	77	87	10
L5_5	Relate credit card with borrowing	11	39	28
	<i>Donating money</i>			
L6_1	Identify donating money	79	86	7
L6_2	Identify donating time	56	76	20
L6_3	Identify a charity	57	69	12
	<i>Investing money</i>			
L7_1	Identify reason to invest	31	57	26
L7_2	Identify stocks	43	64	21
L7_3	Relate risk and investing	68	82	14
L7_4	Identify investor	31	44	13

Table 4 provides the results for each item analyzed using a McNemar chi-squared test, which indicates that the statistical likelihood that the changes in percentages of correct responses from pre- to post- had occurred purely by chance and “how big” a change this was in terms of the odds ratio effect size. For instance, the changes in frequency of correct responses to Lesson 1, Item 1, from pre-test to post-test, increased by 20%. An odds ratio effect size indicates that the likelihood of a student who got the answer wrong on the pre-test is 3.3 times more likely to get it right on the post-test.

For all but four of the items, the statistical significance for the change from pre- to post- was less than one in one thousand. Two of the items (Lesson 1 item 5, and Lesson 2, item 1) had p values of 0.019 and one 0.002 (respectively), which are both below the cut off at 0.05. Two of the items showed no statistically significant gain, and both were from the Lesson3 (Kids can earn money too!) Item 2 (identify price), and Item 3 (identify a business). It is crucial to note that for both of these items at least 84% of the students correctly responded to this item on the pre-test, in fact, 87% did so for identifying a business.

Table 4. Percentages of students with correct responses to individual items

Item		Change	McNemar χ^2	p value	Odds Ratio	Interp
	<i>History of Money</i>					
L1_1	Identify currency	20	75.3	.000	3.30	Medium
L1_2	Identify a good	52	441.4	.000	13.61	Large
L1_3	Identify a service	25	180.8	.000	5.51	Large
L1_4	Identify barter	34	238.8	.000	4.08	Medium
L1_5	Identify exchange	4	5.5	.019	1.28	Very small
	<i>Source of Money</i>					
L2_1	Where do adults get money?	5	9.48	.002	1.45	Very small
L2_2	Adults trade time at work for?	17	87.9	.000	2.55	Medium
L2_3	Identify deposit	24	137.3	.000	2.76	Medium
	<i>Kids Can Earn Money Too!</i>					
L3_1	Identify entrepreneur	18	97.8	.000	2.62	Medium
L3_2	Identify price	2	3.13	NS		NS
L3_3	Identify businesses	2	1.68	NS		NS
	<i>Saving Money</i>					
L4_1	Identify profit	30	188.5	.000	4.05	Large
L4_2	Identify best place to save money	10	48.9	.000	2.40	Medium
L4_3	Identify long-term saving goal	14	83.6	.000	2.89	Medium
L4_4	Identify short-term saving goal	43	331.7	.000	7.20	Large

Item		Change	McNemar χ^2	p value	Odds Ratio	Interp
	<i>Spending Money</i>					
L5_1	Identify consumer	18	75.3	.000	2.12	Small
L5_2	Identify loan	17	80.8	.000	2.07	Small
L5_3	Identify debt	21	100.6	.000	2.30	Small
L5_4	Identify best spending decision	10	45.5	.000	2.06	Small
L5_5	Relate credit card with borrowing	28	196.3	.000	5.26	Large
	<i>Donating Money</i>					
L6_1	Identify donating money	7	27.2	.000	1.68	Small
L6_2	Identify donating time	20	112.8	.000	2.56	Medium
L6_3	Identify a charity	12	35.2	.000	1.63	Small
	<i>Investing Money</i>					
L7_1	Identify reason to invest	26	139.4	.000	2.91	Medium
L7_2	Identify stocks	21	93.3	.000	2.41	Small
L7_3	Relate risk and investing	14	62.6	.000	2.22	Small
L7_4	Identify investor	13	40.7	.000	1.77	Small

Conclusions

These results demonstrate that students, on average, had significantly higher scores on the post-test than on the pre-test, which suggests the efficacy of the Money Savvy Generation curriculum for teaching various aspects of financial literacy. The largest learning gains were on the lessons: 1) the History of Money, 2) Saving money, 3) Spending money and 4) Investing money. It should be noted that the lesson indicating the least learning (statistically significant, but with the only small effect size) Kids Can Earn included items that 66%, 84% and 87%, of the students knew before instruction.

The most encouraging result of comparing this year's test scores and last year's were: 1) statistically significant lesson score improvements on every lesson, and 2) no decrease in scores from pre- to post-, statistically significant or not.

These results continue to support the assertion that the Money Savvy Generation™ curriculum continues to positively impact students' understanding of personal finance across Washington state.

References

Rosenthal, R. (1994). Parametric measures of effect size. In H. Cooper & L. V. Hedges (Eds.), *The handbook of research synthesis*. (pp. 231-244). New York: Russell Sage Foundation.