

**Starting Younger:
Evidence Supporting the Effectiveness of
Personal Financial Education for Pre-High School Students**

**Lewis Mandell
University of Washington and the Aspen Institute**

January 22, 2009

**Starting Younger:
Evidence Supporting the Effectiveness of
Personal Financial Education for Pre-High School Students**

Abstract A total of 1,279 students in grades 5 through 9 were given personal finance education in the form of a live play and supporting classroom instruction revolving around the benefits of saving. Students' knowledge and attitudes were tested both before and after the educational intervention with identical questionnaires in order to examine the magnitude of change and to test for differences by the age (grade) of the students. The impact of the intervention on actual savings behavior was measured through an experiment which gave each student a dollar bill and promised an additional dollar if the original dollar was brought back after 2 weeks. The students were randomly divided into a test group, which received the original dollar after the educational intervention, and a control group which did not receive the education until after the experiment had been completed. The questionnaire results showed that learning and attitude change were inversely related to age, suggesting that earlier education might be more effective. The experiment showed that savings behavior (deferring consumption to earn a second dollar) was related to gender (females did better), directly to financial literacy and inversely to grade. However, the test group was not significantly more likely to return the dollar as the result of the educational intervention.

Introduction

The financial crisis that began in late 2007 has been attributed, in part, to financial “mistakes” made by consumers (Campbell, 2006). These “mistakes” refer most notably to the incurrence of mortgages that could not reasonably be expected to be honored in the absence of continually rising house prices. They also refer to unsustainably high levels of debt obligations of all types and the lack of savings for precautionary, short and long-term needs.

As a result of these “mistakes,” many, including the President’s Advisory Council on Financial Literacy, (2008) and the National Association of State Boards of Education (2006) have turned to America’s educational system to solve the problem by making America’s young people financially literate. Unfortunately, there is little evidence, to date, that such education has been effective. For example, five Jump\$tart surveys of high school seniors taken biennially from 2000 to 2008 show that those who have taken a full-semester course in personal finance are no more financially literate than those who have not taken such a course (Mandell 2001, 2002, 2004, 2006, 2008, 2009a, 2009b). Peng, Bartholomae, Fox and Cravener (2007) found no significant relationship between a personal finance course taken in high school and investment knowledge.

A recent national study of similar courses taken by college students (Mandell 2009c) show no better results on financial literacy, indicating that the problem is unlikely to be solved by pushing the program up to older students. And, while some studies show that highly targeted financial education programs delivered to adults at the workplace can enhance knowledge needed to make immediate decisions, such as enrolling in a 401k plan, (Madrian and Shea 2001, Bayer, Bernheim and Scholz 2006, Choi, Laibson and

Madrian 2006, Lusardi, Keller and Keller 2009) general financial education is less likely to be offered at the workplace by a disinterested presenter now than 10 years ago. This is largely the result of rising benefits costs to employers and a lack of interest by employees (Mandell 2008a).

If personal financial education is not being delivered effectively in high school, college or at the workplace, attention must turn, by default, to younger children, of pre-high school age. It is notable that the President's Council on Financial Fitness recommends education at all grades, K to 12, as does the National Association of State Boards of Education. The JumpStart Coalition's National Standards (Jumpstart Coalition for Personal Financial Literacy 2007) do include standards for children in grades 1 to 4 and 4 to 8 but measuring the financial literacy of pre-high school children against these standards has not yet been done on a national level.

There is reason to believe that personal financial education may be delivered more effectively to younger children than to their older counterparts. To understand this assertion, we must first ask what we want personal financial education to accomplish. Although much evaluative work has focused on knowledge, many of those who study the issue feel that the most important outcome is self-beneficial financial behavior (Lyons, Rachlis, Staten and Xiao 2006) which involves, in part, not making "mistakes." Such behavior may be enhanced by knowing and understanding key facts about financial services, consumer protection and the like, but these facts are subject to continual change and may be of little value to young students. However, if useful attitudes and habits in areas such as saving can be molded at an early age, financial behavior may be altered in a positive and permanent direction.

Many positive habits are instilled in young children in a non-cognitive manner. These include hygiene such as toilet training, teeth brushing and the washing of hands as well as safety such as looking for traffic before crossing a street, not biting other children and not talking to strangers.

As children grow older they are conditioned emotionally to conform to family values. These values might include going to church, caring for relatives, giving to charity and saving money. Newly-developed behaviors are supported by attitudes toward things such as religion, concern for others and thrift. While these attitudes may change over time as children are increasingly exposed to and influenced by people and ideas from outside the core family, attitudes and habits formed in childhood are often hard to break.

In fact, evidence is emerging to support the notion that the emotional impact of some types of education may be as important as the cognitive impact. Studies of Head Start enrichment programs, which were given to children prior to first grade, showed little impact on educational outcomes. However, studies of Head Start participants who are now in their 20s show that they are doing better in life than their counterparts who did not participate in Head Start (Currie and Thomas 1995). Mandell and Klein (2007) have shown that those students who have positive attitudes toward thrift and limiting debt are more financially literate than those who lack these attitudes.

Two other studies document a delayed, but positive impact of financial education on the financial behavior of students years later even when this education may have had little or no impact on financial literacy. Bernheim, Garrett and Maki (2001) showed that students who took a high school course in personal finance tended to save more of their income in middle age than those who did not take such a course, in spite of the fact that

many respondents couldn't remember that they had ever had such a course. Mandell (2009c) examined college students and found that those who had taken a high school course in personal finance were no more financially literate than others in college, but *did* exhibit significantly better financial behavior. It appears that such education may have its greatest effect on behavior emotionally, in changing attitudes rather than knowledge.

Much of the current interest in child trust funds and investment accounts stems from a belief that an early start in asset accumulation and personal finance education is likely to shape future saving behavior in a positive manner (Mensah, Laraia and Perun 2008). As a result, the British Child Trust Fund program, which is in sixth year, plans to integrate personal finance education when the children reach first grade in a year. This program began with a government grant of £250 to each child born in Great Britain and was topped off with an additional grant in the same amount at age 6. The funds are generally invested for the child, first in equity accounts with high growth potential, and finally in more secure assets as the child approaches age 18. The aims of the program were to:

- help insure that each British child, regardless of family circumstance, would have at age 18 sufficient funds for basic higher education or training or the capital to start a business or get to work
- guarantee that every British child is “banked” with a relationship to a financial institution
- provide each child with assets of his or her own so the notion of saving, investing and earning returns is no longer theoretical for many
- Use the accounts as the basis for personal finance education

Work by developmental psychologists (Holden, Kalish, Scheinholz, Dietrich and Novak 2009) supports the benefits of providing financial education to young children, although there is, as yet, scant empirical evidence that it works. Jahoda (1981) suggests that a reasonable understanding of banking doesn't occur until a child is 10 or 11 which implies 3rd or 4th grade. Ng (1983) demonstrated that a child's understanding of banking is enhanced by having experience with it, supporting the advantages of associating a child with an asset account to help enhance financial literacy.

A pilot program evaluated by Mandell (2008b) involved an intervention in 10 public middle schools in the Chicago area in which students saw a live play, performed by professional improvisational actors from the National Theatre for Children, showing the advantages of saving to younger people. The play reflected both the cognitive and emotional benefits of saving, showing in one skit the disappointment of a student who spent his entire allowance on a CD and fast food when he learned that his favorite performer was coming to town to give a concert that he could not attend because he no longer had the money for a ticket.

Using anonymous questionnaires, both before and after the performance, students answered factual, attitudinal and behavioral questions related to saving. Those who had seen the performance showed a small improvement in knowledge, but the greatest improvement occurred among the youngest students in the 6th grade. Findings of some positive attitudinal change also occurred, although it was not possible to find behavioral differences because of the intervention.

North Dakota Study

In September, 2008, students in grades 5 through 9 in ten schools in North Dakota were given similar education relating to the management of money. Part of this educational intervention involved attendance at a live production of a play entitled “Mad About Money,” put on by the National Theatre for Children, which focused on the usefulness of savings. Students were also exposed to about a week of related classroom teaching.

This study was similar to the Chicago study in that both used interventions involving an improvisational play put on by the National Theatre for Children. They both also involved identical pre-tests and post-tests which measured their knowledge of and attitudes toward savings and also attempted to measure actual saving behavior. However, in contrast to the Chicago study, the North Dakota study extended to more grades (5 through 9 rather than 6 through 8), used a much larger group of students who took both the pre and post tests, and included an “experiment” to test actual saving behavior.

In the experiment, students were given a dollar bill whose serial number had been recorded. They were told that if they brought that identical dollar bill back in two weeks, they would receive a second dollar bill. In order to see whether the educational intervention had an effect on the willingness of the students to forego current consumption to earn interest with an annual rate of several thousand percent (100 percent in 2 weeks), they were randomly divided into a test group, which received the intervention before receiving the dollar, and a control group which received the dollar

several weeks before the intervention. The hypothesis was that students in the test group should be more likely to save the dollar than those in the control group.

Study Design

A total of 10 schools with students in grades 5 through 9 participated in this pilot study. All of these schools were located in the Bismarck, North Dakota area and included both public and private schools. A total of 1,279 students participated in both the pre and post tests and were included in this study. Of that number, 956 were in the test group and 323 were in the random control group.

Impact of Educational Intervention on Knowledge

The questions were based upon the information communicated in the improvisational play and the related class materials. While they were relatively simple, they did tend to test important conceptual relationships such as the relationship between the risk of an investment and its expected return.

The results from this study show that the educational intervention significantly increased student knowledge in the area of savings. Of the eight knowledge questions shown in the appendix of this paper five showed significant improvement between the pre and post-tests.

A score was calculated for each student showing the proportion of the 8 questions that they answered correctly. This is shown in Table 1. Overall, they answered 72 percent of the questions correctly on the pre-test and 81.7 percent correctly on the post-test, a difference of 9.2 percentage points which is equal to an improvement of 13.5

percent from the base score of the pre-test. Using a paired samples test, this difference was highly significant at the .000 level. In fact, when the sample was divided by grade, gender and whether they had experienced the interventions, all pre and post test means were equally significant at this high level.

Looking at percent change in score from the pre-test to the post-test, females improved slightly more than males, those in lower grades appeared to have much larger increases in score than those in higher grades and those that saw the play and had a module in class also improved.

A one way analysis of variance showed that the percent change in score was significantly related to grade, at the .045 level which means that the lower the grade, the more they learned. It was very significantly related to whether students saw the play, at the .000 level, but was not significantly related to whether students had a class module on the topic, significant only at the .450 level. Clearly, having seen the play was the largest determinant of improvement in knowledge.

Table 1
Mean Scores

	<u>Pre-Test</u>	<u>Post-Test</u>	<u>Percent Change</u>
All Students	72.0%	81.8%	13.6%
Male Students	73.0%	82.1%	12.6%
Female Students	71.0%	81.6%	14.9%
Grade 5	70.3%	86.1%	22.5%
Grade 6	70.8%	82.7%	16.8%
Grade 7	68.2%	77.5%	13.6%
Grade 8	73.6%	82.8%	12.5%
Grade 9	76.3%	83.6%	9.6%
Saw Play	71.3%	84.0%	17.8%
Module in Class	70.5%	80.7%	14.5%

A linear regression was run in which percent change in score was regressed on those variables to see their separable effects. The results are given in Table 2. After controlling on other factors, the only significant variable is whether the student saw the play. Gender and grade and having had the class module were not significantly related to improvement in score.

Table 2
Regression on Percent Change in Score

Variable	Coefficient	T statistic	Significance
Constant	.143	1.815	.070
Saw Play	.152	6.418	.000
Had Class Module	.002	.075	.940
Male	-.022	-1.096	.273
Grade	-.008	-.852	.395
R squared	.037		

Impact of Educational Intervention on Attitudes Toward Saving

Student attitudes toward savings were measured by their answer to Question 10: *If you had a friend who saved most of his/her money and spent almost none, would you think he/she is ...?* The results are shown in Table 3.

Although there were many different types of responses, the first response, “smart,” was chosen by 75.8 percent of the students on the pre-test and 81 percent on the post-test, indicating that attitudes had shifted positively toward savers as a result of the intervention. This difference was highly significant. Other positive responses to that question included “careful,” “cool” and “fun,” all of which increased positively and significantly. Negative attributes attributed to saving fell between the pre and post tests, but not significantly.

Table 3
Change in Attitudes Toward Saving Between the Pre and Post Tests
If you had a friend who saved most of his/her money
and spent almost none, would you think he/she is ...?

	Pre-Test	Post-Test	Significance
Smart	75.8	81.0	.000
Careful	51.4	61.4	.000
Cool	12.7	20.4	.000
Boring	6.2	7.0	.252
Fun	10.6	14.5	.000
Nerdy	5.6	5.2	.500
Silly	5.2	4.7	.453
Careless	2.1	1.3	.086

Impact of Educational Intervention on Saving Behavior

Question 9 attempted to measure actual saving behavior as reported by the respondents. The question was: “*When some kids get money, they spend it right away. Other kids like to save their money to spend in the future. What about you?*” Answers on this Likert-type scale ranged from “I usually save all my money right away” to “I usually spend all my money right away.”

While reported saving behavior appeared to improve, the improvement was very slight. This is not surprising since ingrained behaviors are unlikely to change dramatically in response to an intervention that lasted for little more than a week.

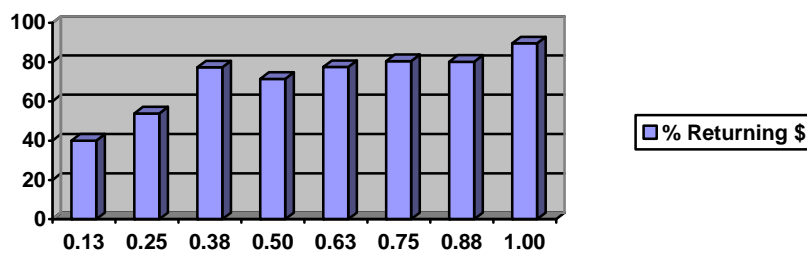
Results of the Experiment

For students in the test group, who received the intervention prior to receiving their dollar, 83.2 percent returned the dollar bill to get another. For those in the control group, who received the intervention only after the dollar was given to them and expected back, 81.8 percent returned the dollar. The difference was 1.4 percentage points or 1.7 percent on the base. This difference was positive, but not significant. However, if we

look at the proportion of students who returned their dollar by their score on the post-test (an indicator of knowledge), we see in Figure 1 that those who had higher test scores (the horizontal axis) tended to have been more likely to have returned the dollar.ⁱ

Figure 1

Percent Returning Dollar by Post-test Score



In Table 4, return of the dollar by the student was regressed on gender, grade, post-test knowledge score, and whether they were in the test group that had the educational intervention prior to the experiment with the dollar. The results show clearly that males were significantly less likely than females to return the dollar. In addition, return of the dollar varied inversely with the student's grade, with younger students significantly more likely to return the dollar than older students. Also, return of the dollar is directly and significantly related to financial knowledge or literacy as measured by scores on the post test.

The return of the dollar was not significantly related to whether the student was assigned to the test group, which received the educational intervention before the experiment with the dollar, or to the control group which received the education after the experiment.ⁱⁱ

Table 4
Binary Logistic Regression of Who Returned the Dollar

	Coefficient	Significance
Male	-.918	.000
Grade	-.184	.026
Post-test Score	2.125	.000
Had Intervention before Experiment	-.262	.193
Constant	1.924	.007
Nagalkerke R Square	.083	

General Summary and Conclusions

The purpose of this study was to measure the impact of financial education in the form of a live play, *Mad about Money*, and a week’s worth of classroom instruction on the savings knowledge, attitudes and behavior of students in grades 5 through 9. The results showed that the intervention increased knowledge by more than 13 percent, which was highly significant. In a manner similar to the earlier study of *Googolplex* in Chicago, gains in knowledge were inversely related to the grade of the student, demonstrating again that financial education appears to work better with younger children. However, the degree of improvement of knowledge was most closely related to whether the students had seen the play. The related classroom instruction did not result in significant improvement in knowledge.

The educational intervention also had a favorable and significant impact on attitudes toward savings. Students were more likely to have favorable views of those who save.

The effect of the educational intervention on self-reported saving behavior was in the right direction, but not statistically significant. Students reported that they were

slightly more likely to save money that they received, but even this self-reported variable did not change significantly from the pre to the post test.

Nor did the educational intervention increase the return of the dollar bill significantly in the experiment. The lack of statistical significance of the test may be the result of the very short savings time required to double one's money or the relatively immaterial size of the sum involved. It would be worthwhile to replicate this test using a larger sum of money, (perhaps \$5) with a mail-in feature that would increase the amount of "interest" for every week that the student foregoes consumption. For example, if received after 2 weeks, \$6 would be returned. After 3 weeks, \$7, etc.

It was interesting to note, however, that females were significantly more likely than males to return their dollar and that return of the dollar was strongly related to financial knowledge as measured by post-test results. This type of favorable behavior also appeared to be inversely related to the student's grade level indicating that younger students are more saving-oriented.

This second pilot test of the effectiveness of providing financial education to younger students continues to suggest its efficacy in imparting financial knowledge, improving attitudes and perhaps even modifying behavior.

References

- Bayer, P. J., Bernheim, B. D., and Scholz, J. K. (2006). The effects of financial education in the workplace: evidence from a survey of employers. Cambridge, MA: NBER Working Paper Issue 5655,
- Bernheim, B. D, Garrett, D. M., and Maki, D. M. (2001). Education and saving: the long-term effects of high school financial curriculum mandates. *Journal of Public Economics*, 80(3), 435-465.
- Campbell, J. Y. (2006). Household finance. *The Journal of Finance* LXI(4) p1553-1604.
- Choi, J., Laibson, D. and Madrian, B. (2006), Reducing the complexity costs of 401(k) participation through quick enrollment. Cambridge MA: NBER Working Paper n. 11979
- Currie, J., and Thomas, D. 1995. Does head start make a difference? *American Economic Review* 85 (3) 341-364.
- Holden, K., Kalish, C. Scheinholz, L., Dietrich, D. and Novak, B. (2009). Financial literacy programs targeted on pre-school children: development and evaluation. Madison, Wisconsin: University of Wisconsin working paper
- Jahoda, G. (1981). The development of thinking about economic institutions: The bank. *Cahiers de Psychologie Cognitive/Current Psychology of Cognition*, 1(1), 55-73
- Jumpstart Coalition for Personal Financial Literacy (2007) *National standards in k-12 personal finance education. 3rd edition* Washington, D.C.: JumpStart Coalition
- Lusardi, Annamaria, Punam Keller and Adam Keller (2009), New ways to make people save: a social marketing approach, in Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press
- Lyons, A., M. Rachlis, M. Staten and J. Xiao “Translating financial education into knowledge and behavior change.” *Consumer Interests Annual* 52, 397-403
- Madrian, Brigitte and Dennis Shea. 2001. Preaching to the converted and converting those taught: financial education in the workplace. University of Chicago Working Paper
- Mandell, Lewis. 2001. *Improving financial literacy: what schools and parents can and cannot do*. Washington, D.C.: Jumpstart Coalition
- Mandell, Lewis. 2002. *Financial literacy: a growing problem-- results of the 2002 national JumpStart survey*. Washington, D.C.: Jumpstart Coalition

- Mandell, Lewis. 2004. *Financial literacy: are we improving -- results of the 2004 national Jump\$tart survey*. Washington, D.C.: Jumpstart Coalition
- Mandell, Lewis. 2006. *Financial literacy: improving education results of the 2006 national Jump\$tart survey*. Washington, D.C.: Jumpstart Coalition
- Mandell, Lewis and Linda S. Klein. 2007. Motivation and financial literacy, *Financial Services Review* 16, 106-116
- Mandell, Lewis. 2008a *Financial education in the workplace--a cost-benefit analysis*. Washington, D.C.: New America Foundation
- Mandell, Lewis .2008b. Teaching young dogs old tricks: the effectiveness of financial literacy intervention in pre-high school grades. in Thomas A. Lucey and Kathleen S. Cooter *Financial Literacy for Children and Youth* Digitaltextbooks.biz,
- Mandell, Lewis 2009a. Financial education in high school, in Annamaria Lusardi (ed.), *Overcoming the saving slump: how to increase the effectiveness of financial education and saving programs*. Chicago: University of Chicago Press
- Mandell, Lewis 2009b. *The financial literacy of young American adults: results of the 2008 national Jump\$tart coalition survey of high school seniors and college students*. Washington, D.C.: Jumpstart Coalition (forthcoming)
- Mandell, Lewis 2009c The impact of financial education in high school and college on financial literacy and subsequent financial decision making. Seattle: University of Washington Working Paper.
- Mensah,Lisa, Mary Laraia, and Pamela Perun (2008) Child development accounts: the case for a U. S. retail model. New York: Aspen Institute Initiative for Financial Security, 2008
- National Association of State Boards of Education. 2006. *Who Owns Our Children?* Alexandria VA, 2006
- Ng, S. (1983, November). Children's ideas about the bank and shop profit: developmental stages and the influence of cognitive contrasts and conflict. *Journal of Economic Psychology*, 4(3), 209-221.
- Peng, T. S. Bartholomae, J., Fox J. and G. Cravener (2007) The impact of personal finance education delivered in high school and college courses. *Journal of Family and Economic Issues* 28 (2), 265-284
- President's Advisory Council on Financial Literacy. 2008. *2008 Annual Report to the President*, Washington, DC, US Department of the Treasury, p7

Appendix

Questionnaire with Responses and Level of Significance

The proportion of students giving each response is shown for both the pre and post tests. The correct response is given in bold.

If the proportion of students giving the correct answer changed significantly from the pre to the post test, the correct post-test percentage will be followed by asterisks. A single asterisk indicates that the improvement is significant at the 5% level. Two asterisks indicate that the improvement is significant at the 1% level. Three asterisks indicate that the improvement is significant at the .1% level.

<u>Pre</u>	<u>Post</u>	
		1. If your friend gets a job at McDonalds that pays \$10 an hour and works 10 hours one week, what will be the amount of your friend's paycheck?
79.6	42.8	a. \$100
10.3	8.1	b. More than \$100
10.2	48.9	c. Less than \$100***
		2. Are you more likely to lose money on
16.4	17.6	a. An investment that isn't very risky?
83.3	82.3	b. An investment that is very risky?
		3. If a famous actor does an advertisement for a soft drink, it generally means that
2.7	1.8	a. This is the actor's favorite soft drink
4.9	3.6	b. The actor really likes this particular soft drink
92.5	94.4	c. The actor is paid a lot of money to make the advertisement**

<u>Pre</u>	<u>Post</u>	
61.0	73.2	4. Riskier investments tend to pay out
14.3	9.6	a. More money than less risky investments***
24.7	17.2	b. The same money as less risky investments
		c. Less money than less risky investments
		5. "Take-home pay" is the amount that people who work receive
26.9	12.8	a. Before deductions are taken out
72.8	87.0	b. After deductions are taken out***
		6. If an advertisement tells us that a product will make you look better, the company paying for that advertisement
2.9	2.4	a. Is genuinely interested in how you look
4.4	3.7	b. Wants everyone to look better
92.7	93.8	c. Wants everyone to buy its product
		7. What might happen if you spend all your money as soon as you get it?
1.6	2.9	a. You will save a lot of money
24.1	12.1	b. You will have to pay a lot in interest
73.0	83.5	c. You may find something you want more than what you already bought***
1.3	1.4	d. Your friends will give you more money
		8. Which of the following deductions is likely to be taken from a paycheck?
5.4	3.1	a. The cost of your education
3.9	5.1	b. The cost of a bridge that you use to get to work
90.5	91.6	c. Taxes
		9. When some kids get money, they spend it right away. Other kids like to save their money to spend in the future. What about you?
5.2	4.8	a. I usually spend all my money right away
10.8	11.8	b. I usually spend most of my money right away
23.9	25.4	c. I usually spend half my money right away
44.1	42.0	d. I usually save most of my money right away
15.9	16.0	e. I usually save all of my money right away

Pre **Post**

<u>Pre</u>	<u>Post</u>	
		10. If you had a friend who saved most of his/her money and spent almost none, would you think he/she is ... (circle as many as apply) ?
75.8	81.0	a. Smart***
51.4	61.4	b. Careful***
12.7	20.4	c. Cool***
6.2	7.0	d. Boring
10.6	14.5	e. Fun***
5.6	5.2	f. Nerdy
5.2	4.7	g. Silly
2.1	1.3	h. Careless
6.6	3.1	i. None of these

ⁱ No students in the 5th or 6th grade were included in the control group and were, therefore, excluded from this analysis

ⁱⁱ This regression contained all the students who participated in both the pre and post tests, including 5th and 6th graders for whom there was no control group. When the 5th and 6th graders were excluded from the sample, the significance of grade fell to just below the five percent level of significance, both gender and test score remained significant and being in the test or control group remained insignificant.