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Assessing Finance Literacy Teaching at Indiana State University

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Abstract: This study investigates the effectiveness of a newly developed personal financial management course at Indiana State University. Analysis of pre- and post-test data suggests that students enrolled in the course score higher on knowledge exams and exhibit more desirable financial behaviors at the end of the course as compared with the beginning. Results also show that, first, enrollment in the personal financial management course was significant in predicting performance on the used personal finance post-tests, and, second, while some background factors, personal characteristics and financial experiences do affect pre-test scores, they had no effect on post-test scores.

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The views expressed are those of the individual authors and do not necessarily reflect official positions of Networks Financial Institute. Any errors or omissions are the responsibility of the author. Please address questions regarding content to Concetta DePaolo at Concetta.DePaolo@indstate.edu.

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INTRODUCTION

According to the National Foundation for Education Research, financial literacy is the ability of individuals to make informed judgments and, consequently, effective decisions on the use and management of money. In discussing the importance of financial literacy for Networks Financial Institute (NFI), Tatom (2006) said:

NFI views financial literacy as an important subset of literacy itself and a discrete skills set, important for helping people to become proficient and functional in our society.

Due to financial illiteracy, it has been argued that millions of American households live from paycheck to paycheck with no, or very little, financial savings. Individuals in these households cannot function properly in a society where the financial world is highly complex and requires some planning for a proper retirement and financial responsibility. As a result, significant media attention has been given to the importance of personal financial management (PFM). The *Wall Street Journal*, for instance, has featured several articles and created a special session online on personal finance with topics, among others, such as family finances, investing, retirement planning, taxes, and a how-to guide.

A rich literature has discussed the impact of financial education on financial literacy. For example, Caskey (2006), Lerman, and Bell (2006), Lusardi (2006), and Mandell (2006) argue on the effectiveness of courses and programs regarding financial education, and despite the identification of some deficiencies, they do not deny that financial illiteracy can be only eliminated with financial education. We believe that a strong case can be made to teach PFM to young and/or university students as much as to other populations. By teaching personal financial management skills to

university students, we can help their future households improve their credit histories and build savings.

At Indiana State University, a new Personal Financial Management course (FIN 108) was introduced in the Fall of 2010. This course is part of the University's Foundational Studies program, which requires all university students to complete coursework in several areas, including composition, sciences, history, communication, language, arts, and ethics. To meet the program's Mathematics or Quantitative Literacy requirement, students may opt to take either a mathematics course, an economics course or FIN 108. As a result of this structure, many students enroll in the economics course and FIN 108 as a way of avoiding college-level mathematics courses.

The purpose of this research is to assess, first, the effectiveness of the financial literacy course, FIN 108, by evaluating whether students have learned enough to change their financial practices, and, second, to investigate if students' background factors can affect success in financial literacy courses, such as FIN 108. Thus, we believe that this paper is not just of interest in its own right but its results add to the financial literacy literature at the college level.¹

Our results indicate that the course made a positive impact on students' knowledge and behavior. First, students scored significantly higher on knowledge in the post- than in the pre-tests. Second, a significant number of students were shifted away from what is considered to be very poor into good financial behavior.

¹ The course, entitled, FIN 108, Personal Financial Management, exposes students to the methods and uses of six-parts of personal financial planning: (1) foundations of financial planning; (2) managing basic assets; (3) managing credit; (4) managing insurance needs; (5) managing investments; and (6) retirement and estate planning.

The remainder of the paper is organized as follows. A data and methodology section is provided, followed by a section where the results are reported. The last section concludes.

DATA & METHODOLOGY

Data

This study involved classes taught in the fall semester of 2010 and the spring semester of 2011. A pre-/post-test design was used. Data were collected using a paper and pencil survey during class time. Students were told that the survey was voluntary and were asked to give informed consent before participating. Almost all students enrolled in the courses participated in the pre-tests, administered during the first week of classes.

We broke the study into two phases. For Phase I of the study, in which students' background factors were explored, the pre-test was administered in the first week of class. Its sample consisted of 50 (out of a total of 65) students enrolled in two sections of the Personal Financial Management course (FIN 108). Also included were 93 (out of a total of 106) students enrolled in Economics 101 (ECON 101), who served as the control group. This control group was chosen since ECON 101 is an alternative course to FIN 108 that can also be used to satisfy the university's Foundational Studies Quantitative Literacy requirement. On the post-test, administered in class during the final week of the fall semester, many students declined to participate in this voluntary exercise. In total, 25 students from FIN 108 and 42 students in the control group participated in the post-test.

For Phase II of the study in which effectiveness of the FIN 108 course was investigated, we used a sample of 89 students enrolled in two sections of that course.

Of these 89 students, 69 took both the pre- and the post-tests, while the remaining completed either only the pre-test or only the post-test. The pre-test was also administered in the first week of class, but for Phase II, unlike in Phase I, we administered the post-test instruments as extra credit as part of the final exam, which resulted in improved participation among students.

Methodology

We were interested, first, in both the backgrounds of students who enroll in the personal financial management course and how those backgrounds affect performance in the course, and second, how effective the course was in terms of student progress toward the learning objectives. With this two-fold purpose in mind, we broke the study into two phases, and devised the following research questions.

Phase I: On Students' Background:

Research Question 1 (RQ1) - Are there differences in backgrounds and characteristics between students who select the personal financial literacy course (FIN 108) as opposed to other similar courses?

Research Question 2 (RQ2) - Do students who select FIN 108 have different incoming levels of financial knowledge than students who select other courses?

Research Question 3 (RQ3) - Do financial background factors affect performance on financial literacy pre-tests?

Research Question 4 (RQ4) - Do financial background factors affect performance on financial literacy post-tests?

Phase II: On Course Effectiveness:

Research Question 5 (RQ5) - Do students taking FIN 108 score higher on financial literacy post-tests than pre-tests?

Research Question 6 (RQ6) - Do students taking FIN 108 exhibit more positive financial behaviors after taking the course than before?

Research Question 7 (RQ7) – What are the topics or learning objectives that FIN 108 students make the most progress?

For Phase I of the study in Fall 2010, two separate instruments were used to measure financial knowledge and backgrounds of students in FIN 108 and in the control group (ECON 101).

- JumpStart Coalition for Personal Financial Literacy (2008) Survey for College Students, which includes 31 multiple-choice knowledge questions and several financial background and demographic questions. This instrument was administered as both a pre- and post-test (background questions were only included on the pre-test) to students in both FIN 108 and in the control group.
- For FIN 108 students only, a 20-question multiple choice test mapped to specific course learning objectives, taken from the course textbook (Madura, 2010), and given as both a pre- and a post-test.

For Phase II of the study in Spring 2011, the focus was on course effectiveness, so only FIN 108 students were included in the sample. From our experiences in Phase I, we felt that many students opted out of the survey because of its length, so we made an effort to reduce the number of knowledge questions and to ask only a limited number of background questions. Specifically, we used as both a pre- and post-test:

- The same 20-question instrument mapped to course objectives that was used in Phase I;

- A reduced set of 8 Jump\$Start knowledge questions. These questions were chosen as ones that probed knowledge (a) deemed important for students to know by course instructors, (b) not duplicated by the 20 course objective questions and (c) of more general ideas and concepts as opposed to detailed facts.

On the pre-test, a set of 15 demographic questions and questions about students' financial backgrounds (e.g. credit card, checkbook and bill paying history and experiences) were excerpted from the Jump\$Start background questions.

In addition, we obtained two other instruments from the U.S. Department of Treasury² that provided additional measures of financial knowledge and behaviors that we used as both pre- and post-tests:

- A 25-question true-false instrument, "What is your Financial Literacy Score?", designed to assess financial knowledge; and
- A 25-question behavior instrument, "Your Financial Checkup," designed to assess financial skills by measuring the number of positive behaviors that students exhibit. Based on the number of behaviors exhibited, respondents are given a "Financial Fitness Score" and classified as Very Good to Very Poor.

For the Phase I, pertaining to backgrounds, the following statistical tests and techniques were used:

² These questionnaires were developed by the U.S. Department of Treasury and have not yet been made available to the general public. Their use here is permitted by the Treasury in order to test their usefulness.

1. Regarding *RQ1*, chi-square tests of independence were used to compare the demographics and backgrounds of students (as reported in multiple-choice/categorical questions) in FIN 108 compared to students in the control group (students in ECON 101).
2. Regarding *RQ2*, an independent samples t-test was used to compare the pre-test scores of students in FIN 108 and in the control group on the Jump\$start questions to see if there is evidence of differing levels of incoming financial knowledge.
3. Regarding *RQ3*, multiple regression analyses employing variable selection methods were used to determine if any of the demographic and background variables, as well as a control variable indicating enrollment in FIN 108, had significant effects on pre-test scores on (a) the Jump\$start questions and (b) the 20-question pre-test linked to course objectives.
4. Regarding *RQ4* on the effects of background factors on post-test scores, the same variables that were used to predict pre-test scores were also used in multiple regression models to predict post-test scores on both (a) the Jump\$start questions and (b) the 20-question pre-test linked to course objectives. One additional independent variable representing each student's pre-test score on the instrument was also used in each regression model.

For Phase II pertaining to course effectiveness, our methodology included the following tests and analyses:

5. Regarding *RQ5* whether students in the Personal Financial Management course scored higher on post-tests than pre-tests measuring financial literacy, paired samples t-tests were used to compare student pre- and post-test scores on three instruments: (a) the course pre-test consisting of 20 questions linked to course objectives plus 8 selected Jump\$tart questions; (b) the number correct on the 25-question True/False financial knowledge instrument; and (c) the number of positive behaviors exhibited based on the 25-question financial skills instrument.
6. Regarding *RQ6* whether there are differences in financial behaviors exhibited by students before and after the course, the percentage of students falling into each category of “financial fitness” (Very Good to Very Poor) both at the beginning and end of the course were compared. Then, a chi-square test for Goodness-of-Fit was used to test whether the distribution of students among the categories was the same at the end of the course as at the beginning.
7. Regarding *RQ7* on which FIN 108 topics or learning objectives students made the most progress, we compared the percentage of students answering each question correctly on the post-test to the percentage answering correctly on the pre-test, and used McNemar’s tests for paired proportions to identify any significant differences.

RESULTS

Phase I and Regarding *RQ1*

Table 1 shows values for an overall comparison. Among the FIN 108 and ECON 101 students, a majority were female and underclassmen (freshmen or sophomores). A vast majority was of traditional college age, and just under one-third of the students in

the sample were minority students. Less than one half had parents who were college graduates. About two-thirds of students had no credit cards at all and more than one-third anticipate owing more than \$20,000 in student loans when they graduate. About 40 percent of these students worry about their debts at least sometimes. A significant difference between students enrolled in the two courses, according to chi-square tests for independence, was that FIN 108 students were more likely to be upperclassmen (8 percent of ECON 101 -- the control group -- vs. 19 percent of FIN 108 students, $p < 0.05$).

Phase I and Regarding RQ2

An independent samples t-test was also used to compare the pre-test scores of students in FIN 108 and in control group on the Jump\$start questions. The purpose was to see if there was evidence of differing levels of incoming financial knowledge. Results show that students in FIN 108 scored significantly lower, on average, than students in the control group on this pre-test (mean 11.37 out of 31, compared to 14.13 for students in control group, $T = -2.89$, $df = 83$, $p\text{-value} < 0.01$).

Phase I and Regarding RQ3

There were a total of 24 background and demographic questions on the survey. Eight binary background questions included whether the student: (1) was male, (2) was a racial minority, (3) had a checking account, (4) had mortgage, auto or other personal loans, (5) filed income tax returns him/herself, (6) used online banking, (7) had taken a college course in finance or economics, and (8) had an entire high school course in economics.

Ordinal background questions included the student's age group, class (freshman, sophomore, junior, senior), parental income and education, anticipated

education and salary, credit card history and experience, student loans, attitudes toward debts and current savings levels, number of investments, how often checkbook is balanced, and previous financial education. Table 2 shows the significant bivariate correlations between the independent and dependent variables and among the dependent variables.

Bivariate correlations suggest that some background factors, including a student's age, parental education, number of credit cards, credit card balances, and practice of doing his or her own taxes had positive effects on pre-test scores. On the other hand, being minority, enrolling in FIN 108, and balancing checkbooks less often appear to be negatively correlated with pre-test scores. A complete table of bivariate correlations between all independent and dependent variables is shown in the Appendix.

The possibility of using a principal components analysis to reduce this fairly large set of background items to a smaller set of factors that could be used as predictor variables for a multiple regression analysis was explored; however, results were deemed unreliable due to a fairly small sample size (156, considered only fair to poor by Comrey and Lee, 1992). We also found that several items did not load strongly on any factors, and some components were difficult to interpret.

Instead, to examine any relationship of both (1) the JumpStart pre-test questions and (2) the 20-question pre-test, linked to course objectives, to students' background variables, we used these latter variables as independent variables in a multiple regression model to predict the dependent variables representing scores on those two groups of pre-test questions. As shown in Table 3, the model results to predict JumpStart pre-test scores suggest that students who are (1) minorities and (2) enrolled in FIN 108 score lower than others, and (3) students who reported filing their

own tax returns scored higher. We also found a large number of insignificant variables. No strong indicators of multicollinearity were detected among independent variables (see the Appendix for all bivariate correlations). As listed in Table 3, a stepwise regression was also employed. In this model, the three variables indicated in the full model also appeared significant with roughly the same size coefficients, along with the Age and RateSavings variables, suggesting that older students and those who rate their investments more positively score slightly higher on the Jump\$Start pre-test.

In Table 3 we also report the results for the stepwise regression used to predict pre-test scores on the 20-question course objectives. As shown, students who reported higher parental education levels and doing their own tax returns scored significantly higher than others.³ Thus, regardless of the dependent variable or the model chosen, some background factors do appear to affect pre-test scores.

Phase I and Regarding RQ4

Although pre-test scores appeared to be correlated with several background variables, results in Table 2 suggest that post-test scores were not. To investigate how background variables may affect post-test scores, the same background and demographic variables that were used in the pre-test models were also used as independent variables in regression models in which the dependent variables were the post-test scores on both instruments. Pre-test score on the corresponding test was also used as an independent variable in the regressions.

Results are listed in Table 4. With regard to post-test scores on the Jump\$Start questions, the full regression model suggests that none of the background variables

³ The regression model to predict pre-test scores on the 20-question course objective instrument based on the full set of background variables was not significant ($F(24,25) = 1.67, p > 0.10$), most likely due to the smaller sample size ($n = 50$ students enrolled in FIN 108) for that instrument.

are significant; only pre-test score and enrollment in FIN 108 appeared to have a positive and significant relationship with JumpStart post scores. If a stepwise regression is employed, the same two variables are significant.

For post-test scores on the course objective questions, the full regression model was not statistically significant ($F(25,24) = 0.552, p > 0.10$). When the stepwise model was run, only pre-test scores on the course objective instrument were found to be statistically significant (see Table 4), with those scoring higher on the pre-test also scoring higher on the post-test. Again, none of the background variables were found to affect post-test scores.

The evidence in Phase I can be summarized as follows: (1) students who enrolled in both FIN 108 and in the control group course (ECON 101) appear to be fairly similar with respect to their background characteristics; (2) students enrolled in FIN 108 scored lower on pre-tests and, hence, may have self-selected to take the course because they are aware they may need more knowledge on the subject; (3) background factors, including a student's age, parental income, adequacy of savings, and practice of filing their own tax returns, appear to positively affect pre-test scores on the financial literacy instruments we used. On the other hand, minority status seems to negatively affect pre-test scores; (4) background factors do not appear to have any effect on post-test scores; and (5) FIN 108 students entering with higher pre-test scores scored higher on post-tests.⁴

Phase II and Regarding RQ5 & RQ6

⁴ Further research may find that it is also worthwhile controlling for mathematics background, overall college GPA, or course grade when investigating effects of background on performance.

In Phase II of the study, the focus was on course effectiveness; thus, only FIN 108 students were included in the sample. Only a few demographic questions were asked of the students participating in Phase II of the study. Of the 89 students enrolled in FIN 108 in Spring 2011, 55 percent were male and 85 percent were of traditional college age. About 21 percent were minorities, 76 percent were underclassmen (freshmen or sophomores), and about 40 percent had parents who were college graduates. About two-thirds of those with credit cards pay off the entire balance each month, and just under half say they worry about their debts sometimes, often or nearly all of the time. While the Spring sample appears to have more males (55 percent compared with 34 percent in the Fall sample) and fewer minority students (21 percent compared with 31 percent in the Fall), the other financial background factors appear to be fairly similar.

On all three instruments administered as both pre- and post-tests (28 course objective plus 8 Jump\$tart questions, 25 knowledge questions, and 25 behaviors), Phase II participants scored significantly higher on the post-tests (see Table 5, Part 1).

Regarding students' classification into one of five behavior categories (Very Good, Good, Fair, Poor or Very Poor), we used a Financial Fitness Score based on the number of desirable behaviors they exhibited. Table 5, Part 2, lists the percentage of students in each category both before and after the course. Results indicate a significant shift away from Very Poor and toward Good or Very Good behaviors over the course of the semester ($X^2 = 52.95$, $df = 3$, $p\text{-value} < 0.001$).

Phase II and Regarding RQ7

To see which questions/topics on which students made most progress, we compared the percentage of students answering each question correctly on the post-

test to the percentage answering correctly on the pre-test. These percentages were checked for significant differences using a McNemar's tests for paired proportions.

As listed in Table 6, overall results show that on 25 out of 28 course objective and Jump\$Start questions, a larger percentage students answered correctly on the post-test than the pre-test. These increases were observed to be statistically significant for questions related to (1) interest rate effect on present value, (2) insurance deductibles, (3) cash flow statements, (4) auto insurance, and (5) credit card finance charges.

As listed in Table 7, for the 25-question true-false questions ("What is your Financial Literacy Score?" instrument), a larger percentage of students answered 21 of the questions correctly on the post-test than the pre-test. Moreover, as Table 7 results show, statistically significant increases were observed for seven questions related to topics (1) compound interest, (2) risk vs. return, (3) saving for retirement, (4) amount of income used to pay debt, (5) interest and payments on mortgages, (6) cost of borrowing from payday lenders, and (7) ability to get free credit reports.

Table 8 lists 25 desired financial behaviors ("Your Financial Checkup" instrument) and the percentage of students who reported engaging in each behavior at the beginning and end of the course. As the table shows, a larger percentage of students reported having adopted and/or participated more in 23 of the 25 behaviors at the end of the course than at the beginning. Four of these increases were statistically significant at the 5 percent level and involved (1) budgeting, (2) maintaining positive balances in checking accounts, (3) knowing their net worth, and (4) reviewing their bills for accuracy.

The evidence in Phase II can be summarized as follows: (1) based on their mean scores, students enrolled in FIN 108 scored higher on knowledge post-tests than on pre-tests, (2) students exhibited more healthy financial behaviors after taking FIN 108 than before taking the course. Significantly more students were given Very Good or Good “Financial Fitness” scores, and fewer students were included in the “Very Poor” group at the end of the course; and (3) a larger percentage of students answered correctly the vast majority of knowledge questions on the post-test than on the pre-test. Several of these increases were statistically significant.

CONCLUSIONS

Based on Phase I of this study, we have found that students who enroll in the Financial Literacy course at our institution tend to score lower on the pre-test than those enrolling in an alternate course that satisfies the same university requirement and are more likely to be upperclassmen (juniors and seniors), i.e., students who will be leaving college sooner. While motivation for enrolling in a particular course to satisfy the university requirement was not probed in this study, some possible explanations for this difference may include that students are selecting this course because they recognize the need for more competence in personal financial management, or because perceive it to be an easier way to fulfill the graduation requirement than a mathematics or economics course.

Based on the financial literacy pre-tests results, some background variables do appear to be related to performance. For example, students who are older, have higher parental income, more adequate savings and file their own tax returns tend to score higher on pre-tests, while minority students tend to score lower.

On our financial literacy post-tests, we found that none of the background variables appear to affect post-test scores. Not surprisingly, those with higher pre-test scores also performed better on post-tests.

We also found that those who took FIN 108 scored significantly higher on the post-test than those in the control group, even after the effects of pre-test score are controlled for. Since FIN 108 students scored significantly lower on the pre-tests and significantly higher on the post-tests, this shows that the course is adding value by producing larger gains in scores.

The finding that background factors appear to have some effect on pre-test but not on post-test scores is of importance because it suggests that while some students are not as knowledgeable about personal financial management principles at the beginning of the course, these background and demographic factors become immaterial at the end of the course. This result suggests that a college course covering these principles may serve to “level the playing field” for students with less experience in financial matters.

Based on Phase II of the study in which we examined course effectiveness, we found that students enrolled in the Personal Financial Management course scored moderately but significantly higher on knowledge post-tests than pre-tests. It is possible that these modest gains could be due in part to correct answers from guessing on the pre-test, whereas correct answers on the post-test are more likely attributable to actual knowledge. However, we cannot verify this claim with data from this study.

A larger percentage of students answered correctly on the post-test than on the pre-test on almost all of the knowledge questions. Regarding twelve out of fifty-three questions, these observed increases were statistically significant. After the course, we

found that students exhibit more positive financial behaviors. Though many of the percent increases on individual questions are not statistically significant, we did find a significant change in the classification of students into different behavior categories, with a larger percentage of students in the Good/Very Good category and a smaller percentage in the Very Poor category at the end of the course.

These post-test scores also suggest that instructors teaching FIN 108 should place more emphasis on questions related to topics such as, among others (1) stock market and prices, (2) personal balance sheet preparation, (3) tax benefits of retirement plans, (4) Federal Reserve role and interest rates level, (5) family net worth, (6) insurance premiums, (7) interest rate effect on present value, (8) costs associated with home purchases, (9) auto insurance, and (10) certificates of deposit. These topics were found to be associated with the lowest ten post-test scores on students' knowledge in FIN 108 classes taught in the Fall 2010 and Spring 2011.

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APPENDIX: Table of Bivariate Correlations between all Phase I variables

	PreScore 108 questions	PreScore JumpStart Only	PostScore 108 questions	Post JumpStart Only	Male	Age	Highest Ed	Parents Income	Parents Educ
PreScore 108 questions	1								
PreScore JumpStart Only	.602 (49) **	1							
PostScore 108 questions	.503 (24) *	.662 (24) **	1						
Post Jumpstart Only	.836 (17) **	.796 (47) **	.828 (18) **	1					
Male	.201 (48)	.120 (142)	-.154 (25)	-.014 (48)	1				
Age	.240 (43)	.176 (147) *	.164 (22)	.208 (42)	.149 (127)	1			
Highest Ed	-.156 (42)	-.047 (125)	-.325 (22)	-.105 (43)	.016 (125)	-.110 (123)	1		
Parents Income	.030 (35)	.004 (115)	-.097 (15)	-.039 (36)	.118 (115)	.049 (112)	.025 (109)	1	
Parents Educ	.327 (43) *	.091 (130)	-.047 (22)	-.009 (43)	.215 (130) *	-.069 (127)	.112 (125)	.338 (114) **	1
Minority	-.283 (42)	-.320 (128) **	-.165 (22)	-.258 (42)	-.170 (128)	.071 (125)	.095 (122)	-.119 (113)	-.168 (127)
Antic Salary	.026 (42)	-.049 (128)	.035 (21)	-.010 (41)	.013 (128)	-.053 (124)	.355 (122) **	.161 (113)	.095 (127)
Have CheckAcct	.078 (42)	.086 (129)	.165 (21)	.142 (42)	-.129 (129)	-.114 (125)	.003 (123)	.163 (114)	.087 (128)
How often Balance Checkbook	-.189 (41)	-.176 (126) *	-.178 (20)	-.027 (41)	.085 (126)	-.148 (121)	.035 (119)	.104 (111)	-.121 (124)
Numb Credit Cards	.158 (41)	.210 (125) *	.131 (20)	.293 (40)	.117 (125)	.350 (120) **	-.057 (118)	.056 (109)	.011 (123)
CC Payments	.115 (23)	-.014 (76)	.116 (13)	-.130 (28)	.043 (76)	.381 (72) **	-.177 (73)	.004 (66)	-.031 (74)
CC Balances	.502 (22) *	.064 (71)	.428 (13)	.300 (27)	.220 (71)	.683 (68) **	-.041 (67)	.104 (61)	-.126 (69)
When First CC	.319 (22)	.067 (62)	-.203 (13)	.159 (25)	.119 (62)	.140 (61)	.163 (59)	.063 (52)	-.078 (61)
Student Loans	-.103 (38)	.061 (118)	-.082 (19)	.042 (37)	-.059 (118)	.079 (114)	-.042 (111)	.071 (104)	-.226 (116) *
Have Auto, Mortgage, Other Loans	.284 (40)	.053 (119)	-.080 (22)	.081 (40)	.104 (119)	.224 (114) *	.045 (112)	-.216 (105) *	.010 (117)
Worry Debt	.007 (41)	-.031 (118)	.080 (23)	.151 (42)	.008 (118)	.109 (112)	-.054 (110)	-.063 (103)	-.132 (115)
Rate Savings	.155 (38)	-.141 (105)	-.022 (21)	.119 (38)	.170 (105)	.153 (98)	-.089 (97)	-.069 (90)	-.090 (101)
Do Taxes Self	.447 (41) **	.209 (105) *	.331 (22)	.248 (37)	.182 (105)	.227 (98) *	-.076 (98)	-.204 (89)	-.127 (101)
Online Banking	.253 (43)	.138 (111)	.084 (23)	.124 (40)	-.020 (111)	-.037 (104)	.054 (103)	.060 (96)	.112 (107)
Had Pers Fin Course in HS	.059 (43)	.089 (108)	.069 (23)	.066 (39)	.186 (108)	-.067 (101)	-.149 (100)	-.097 (92)	-.013 (104)
Had Econ Course in HS	-.037 (44)	.180 (110)	.207 (23)	.255 (39)	-.024 (110)	.099 (104)	-.001 (103)	-.089 (94)	.125 (107)
Had PersFin, Fin, or ACCT in Coll	-.160 (39)	-.017 (98)	-.176 (22)	-.107 (37)	.157 (98)	.408 (92) **	.128 (92)	-.105 (84)	-.015 (95)
Class	-.003 (43)	.162 (104)	.163 (23)	.156 (39)	.120 (104)	.359 (98) **	-.091 (97)	.050 (91)	-.028 (101)
Number of Investments	.141 (43)	-.011 (120)	.104 (23)	-.007 (42)	.021 (120)	-.078 (113)	-.006 (111)	.056 (104)	.072 (116)
FIN 108	n/a	-.250 (143) **	n/a	.172 (60)	-.036 (143)	.097 (127)	-.082 (125)	.117 (115)	-.035 (130)
<i>Sample sizes indicated in parentheses</i>									
<i>* Significant at 5%</i>									
<i>** Significant at 1%</i>									

TABLE 1: Background Characteristics of FIN 108 and Control Group (ECON 101) Students

	FIN 108 (n=43) %	Control Group (n=88) %	
Male (Yes/No)	34	42	
Minority status (Yes/No)	31	29	
Aged 18-22	88	93	
Upperclassmen (juniors or seniors)	19	8	*
Want degree beyond Bachelor's	41	47	
Parents' income less than \$40K	37	45	
Have college grad parents	42	44	
Anticipate starting salary more than \$50K	29	38	
Have checking account	86	93	
Never balance checkbook	42	40	
Use online banking	51	65	
Have no credit cards	68	67	
Always/almost always pay off CC balances	65	83	
CC balance of more than \$2500	14	10	
First CC before starting college	32	55	
Will owe more than \$20K in student loans	39	36	
Have auto loans, mortgage or other debt	23	22	
Worry about debt Sometimes/Often/All the time	44	39	
Have investments other than savings account	55	45	
Rate savings as much less than should have	26	24	
Do own taxes	22	25	
College course in Finance, Economics, Accounting	23	39	
Exposed to personal finance in high school	23	23	
Had an economics course in high school	77	80	

* $X^2 = 8.43$, $df = 3$, $p < 5\%$

Table 2: Significant Bivariate Correlations between Dependent & Independent Variables in Phase I				
	PreScore 108 questions	PreScore JumpStart Only	PostScore 108 questions	Post JumpStart Only
PreScore 108 questions	1			
PreScore JumpStart Only	.602 **	1		
PostScore 108 questions	.503 *	.662 **	1	
Post Jumpstart Only	.836 **	.796 **	.828 **	1
Male				
Age		.176 *		
Highest Ed				
Parents Income				
Parents Educ	.327 *			
Minority		-0.320 **		
Antic Salary				
Have CheckAcct				
How often Balance Checkbook		-.176 *		
Numb Credit Cards		.210 *		
CC Payments				
CC Balances	.502 *			
When First CC				
Student Loans				
Have Auto, Mortgage, Other Loans				
Worry Debt				
Rate Savings				
Do Taxes Self	.447 **	.209 *		
Online Banking				
Had Pers Fin Course in HS				
Had Econ Course in HS				
Had PersFin, Fin, or ACCT in Coll				
Class				
Number of Investments				
FIN 108		-.250 **		
<i>Correlations that are not statistically significant at 5% levels are omitted.</i>				
<i>* Significant at 5%</i>				
<i>** Significant at 1%</i>				

TABLE 3: Regressions of Pre-test Scores on Background Variables

Independent Variables	Full Model			Stepwise			Stepwise		
	Coefficient	T	Sig.	Coefficient	T	Sig.	Coefficient	T	Sig.
Constant	9.910	2.39		14.198	11.42		3.302	2.20	
Male	0.291	0.33							
Age	1.678	1.54		1.878	2.54	*			
Highest Ed	-0.131	-0.22							
Parents Income	-0.052	-0.10							
Parents Education	0.436	0.83					1.218	2.60	*
Minority	-2.606	-2.47	*	-3.773	-4.34	**			
Antic Salary	-0.017	-0.04							
Have CheckAcct	1.286	0.75							
How often Balance Checkbook	-0.337	-1.17							
Numb Credit Cards	0.757	1.32							
CC Payments	-0.277	-0.59							
CC Balances	-0.803	-0.94							
When First CC	0.617	1.17							
Student Loans	0.250	1.01							
Have Auto, Mortgage, Other Loans	-0.075	-0.06							
Worry Debt	-0.086	-0.22							
Rate Savings	-1.204	-1.87		-1.104	-2.01	*			
Do Taxes Self	3.690	2.94	**	2.999	2.77	**	3.883	3.43	**
Online Banking	0.435	0.44							
Had Pers Fin Course in HS	0.522	0.83							
Had Econ Course in HS	0.504	0.43							
Had PersFin, Fin, or ACCT in Coll	-0.760	-0.67							
Class	0.716	1.07							
Number of Investments	-0.398	-0.81							
FIN108	-2.302	-2.68	**	-2.487	-3.21	**			
n	156			156			50		
R-squared	30%			24%			28%		

* Significant at 5%
 ** Significant at 1%

TABLE 4: Regressions of Post-test Scores on Background Variables

Independent Variables	Full Model			Stepwise			Stepwise		
	Coefficient	T	Sig.	Coefficient	T	Sig.	Coefficient	T	Sig.
Constant	5.250	1.78		8.124	10.72		8.947	12.54	
Male	-0.483	-0.79							
Age	-0.288	-0.38							
Highest Ed	-0.276	-0.66							
Parents Income	-0.168	-0.46							
Parents Education	0.110	0.30							
Minority	0.493	0.66							
Antic Salary	0.131	0.41							
Have CheckAcct	1.800	1.50							
How often Balance Checkbook	0.187	0.93							
Numb Credit Cards	0.085	0.21							
CC Payments	-0.441	-1.36							
CC Balances	0.507	0.85							
When First CC	0.302	0.82							
Student Loans	-0.177	-1.02							
Have Auto, Mortgage, Other Loans	-0.653	-0.77							
Worry Debt	0.152	0.57							
Rate Savings	0.387	0.85							
Do Taxes Self	0.571	0.63							
Online Banking	0.145	0.21							
Had Pers Fin Course in HS	-0.226	-0.51							
Had Econ Course in HS	0.355	0.43							
Had PersFin, Fin, or ACCT in Coll	-0.587	-0.74							
Class	0.075	0.16							
Number of Investments	-0.088	-0.26							
Pre-test score on instrument	0.352	5.77	**	0.337	6.77	**	0.206	2.47	*
FIN108	1.641	2.67	**	1.654	3.09	**			
n		156			156			50	
R-squared		28%			24%			11%	

* Significant at 5%

** Significant at 1%

TABLE 5: Pre and Post-Test Knowledge & Behavior Comparisons for FIN 108 Students

Part 1 - Pre- vs. Post-Test Scores			
	Related To Course Objectives	Related to Knowledge	Related to Overall Behavior
	No. of Correct	No. of Correct	No. of Behaviors
# Questions/Behaviors	28	25	25
Mean Pre-Test	13.86	17.49	15.07
Mean Post-Test	17.22	19.82	16.96
Mean difference (Post – Pre)	3.36	2.22	1.88
Degrees of Freedom	68	66	68
T-statistic	5.91***	4.21***	4.28***
Part 2 - Percentage of Students in Each Behavior Category			
	Pre-Test	Post-Test	Differences***
Very Good (23-25)	1%	5%	+4%
Good (20-22)	7%	26%	+19%
Fair (17-19)	27%	26%	-1%
Poor (14-16)	33%	27%	-6%
Very Poor (0-13)	33%	17%	-16%

*** $p < 0.001$

TABLE 6: Pre & Post-test Performance on Course Objective/ Jump\$tart questions

No.	Question Topic	% of Students Answering Correctly			Sig.
		Pre-Test	Post-Test	% Increase	
1	Opportunity costs	86	95	9	
2	Mutual funds	49	63	14	
3	Interest rate effect on present value	33	50	17	**
4	Exemptions	54	61	7	
5	Federal Reserve role - Interest rates	38	39	1	
6	Certificates of deposit	40	54	14	
7	Annual percentage rate	73	88	15	
8	Disadvantages of leasing	44	66	22	
9	Costs associated with home purchase	36	51	15	
10	Insurance deductibles	50	70	20	**
11	Insurance premiums	37	49	12	
12	Common investment mistakes	80	94	14	
13	Stock prices/market	17	18	1	
14	Tax benefits of retirement plans	41	33	-8	
15	Career planning mistakes	53	54	1	
16	Economic influences on job market	59	71	12	
17	Personal Balance sheet	11	22	11	
18	Family net worth	35	41	6	
19	Cash flow statement	53	79	26	**
20	Budget deficit/surplus	86	88	2	
21	Inflation effects on those with fixed incomes	51	66	15	
22	Low risk, liquid investments	80	90	10	
23	Reasons for borrowing	74	72	-2	
24	Pay deductions	53	65	12	
25	Emergency funds	51	63	12	
26	Effects of compounding interest	64	62	-2	
27	Auto insurance	34	51	17	*
28	Credit card finance charges	44	68	24	**

* Differences in paired proportions of correct answers significant at 5%.

** Differences in paired proportions of correct answers significant at 1%.

TABLE 7: Percentage of students answering each Knowledge question correctly

No.	Question Topic	% of Students Answering Correctly			Sig.
		Pre-Test	Post-Test	% Increase	
1	Education/training effect on income	95	97	2	
2	Amount of employee benefits	82	81	-1	
3	Pay deductions for benefits	67	71	4	
4	Employer deductions for taxes	83	84	1	
5	Usefulness of spending plan	95	100	5	
6	What fixed expenses are	76	84	8	
7	Advantages of comparison shopping	91	92	1	
8	Effect of inflation on buying power	79	71	-8	
9	Compound interest	68	88	20	**
10	Recommended size of emergency savings	89	90	1	
11	Risk vs. return	59	79	20	**
12	Investing in single stock vs. mutual fund	59	74	15	
13	Rates of return, stocks vs. bonds	69	76	7	
14	Planning and saving for retirement	79	93	14	*
15	Cost of loan (APR)	72	83	11	
16	Monthly payments vs. length of loan	65	75	10	
17	Amount of income used to pay debt	44	65	21	*
18	Total interest and monthly payments on mortgages	59	79	20	*
19	Cost of borrowing from payday lenders	62	76	14	*
20	Contents of credit report	77	75	-2	
21	Effect of paying bills on credit score	67	69	2	
22	Ability to get free credit reports	53	82	29	**
23	Reporting identity theft	84	92	8	
24	Effect of deductibles on insurance premiums	26	25	-1	
25	Reviewing insurance policies	93	96	3	

* Differences in paired proportions of correct answers significant at 5%.

** Differences in paired proportions of correct answers significant at 1%.

TABLE 8: Percentage of students reporting they exhibited each Behavior

No.	Behavior	% of Students Exhibiting			Sig.
		Pre-Test	Post-Test	% Increase	
1	Setting short- and long-term financial goals	67	81	14	
2	Investing in education/career training	88	89	1	
3	Budgeting	44	67	23	**
4	Spending less than earn	76	84	8	
5	Paying bills on time	92	90	-2	
6	Reviewing income, expenses before purchases	86	85	-1	
7	Comparing prices	89	97	8	
8	Having savings or checking account	93	99	6	
9	Maintain positive balances in checking account	86	97	11	*
10	Saving regularly	53	67	14	
11	Emergency fund	16	22	6	
12	Contributing to retirement account	10	12	2	
13	Diversifying investments	25	29	4	
14	Knowing net worth	21	42	21	**
15	Shopping around for interest rates	51	63	12	
16	Keeping debt payments to percentage of income	38	48	10	
17	Avoiding interest charges on credit cards	58	59	1	
18	Keeping credit card balances low	65	68	3	
19	Avoiding payday lenders	94	95	1	
20	Keeping financial records organized	70	74	4	
21	Keeping financial records secure	84	85	1	
22	Reviewing bills for accuracy	61	82	21	**
23	Checking credit report annually	30	40	10	
24	Maintaining health insurance	80	81	1	
25	Reviewing insurance needs annually	45	60	15	

* Differences in paired proportions of students exhibiting behaviors significant at 5%.

** Differences in paired proportions of students exhibiting behaviors significant at 1%.