Financial Literacy Among our Students: Assessing and Improving Their Knowledge

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ABSTRACT

As professors of business students, we might think that exposure to a wide variety of business courses is a good substitute for personal financial literacy. Nonetheless, previous work such as Bianco and Bosco (2012), Power, Hobbs and Ober (2011), and Hanna, Hill and Perdue (2010) show the need to improve financial literacy skills among our colleges students, even our business students.

The objective of this work is to expose all students enrolled in introductory finance to personal financial literacy by making it part of the course's curriculum, taking advantage of topics already taught in the course. This provides an opportunity to expose a broader college audience to personal financial literacy. To my knowledge, this is the first attempt to make an introductory finance course dual in nature: a business finance and personal finance course. Pre and post test personal financial literacy scores show students learned personal finance in this course.

INTRODUCTION

One of the most important lessons from the financial crisis of 2008 is the lack of financial literacy of the U.S. population. Many Americans entered into mortgage loan agreements they did not understand and could not afford. Our population's lack of basic financial literacy skills like budgeting, saving for the future and understanding credit, became more evident after the 2008 events. Among our college student population we also see an increasing student loan indebtedness and lack of comprehension of it. The U.S. Financial Protection Bureau reports student loan debt has grown to $1 trillion, while other forms of debt have shrunk.[1] All in all we observe a lack of basic personal finance skills that need to be improved.

As professors of business students, we might think that exposure to a wide variety of business courses is a good substitute for personal financial literacy. Nonetheless, previous work in this field has proven this belief wrong. Bianco and Bosco (2012) survey 574 full-time undergraduate college students to evaluate financial literacy and find business students' average correct response rate is 47%. Better than other majors, but still quite deficient. Power, Hobbs and Ober (2011) find that only 42% of business majors feel adequately prepared to make retirement decisions, higher than the percentage of non-business majors that felt prepared to make this type of decision (15.8%) but still not a passing grade. Hanna, Hill and Perdue (2010) reaffirm previous findings. Business students scored only 47% in their financial literacy questionnaire, better than students in other majors, but "still a failing grade."

The above cited work evidences the need to improve financial literacy skills among our colleges students, something that I hope to achieve through this project. The objective of this work is to expose all students enrolled in introductory finance to personal financial literacy by making personal finance a part of the course's curriculum.[2] To my knowledge, this is the first attempt to make an introductory finance course dual in nature: a business finance and personal finance course.

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[1]Coy, Peter, "Student Loans: Debt for Life", Business Week, September 24, 2012.

[2] The department of Finance offers a Personal Finance elective course once per year. This course is "for non majors" since it does not have the pre-requisites that other finance courses do. This allows for any student to be able to take the course. From 2010 to 2014 average enrollment has been 19 students. The current project is an attempt to extend personal financial education to a broader audience at our University.

PREVIOUS WORK

At the university where I teach, introductory finance is a survey in finance course, compulsory to all business majors. For non-finance business majors this is the only finance course they will take. Therefore I strongly believe it is important for students enrolled in the course to learn finance not only business finance but also personal finance, and make them aware of the application and importance of these topics in their personal financial future. Given the current nature of the course there is little time for anything else than what is already covered in the course. Thus, inclusion of personal finance material has to be done thoughtfully.

Besides the challenge of incorporating this material in an already saturated course, teaching personal finance has its own challenges. Both Sallie Mae (2009) and Dempere, Griffin and Camp (2010) report that 64% of college students surveyed would like to receive financial literacy information in High School. Nonetheless, other authors like Mandell and Klein (2007) and Bruder (2009) question the effectiveness of delivering personal financial literacy education in high school. Mandell and Klein find that high school students continue to score low financial literacy scores even after taking a course in personal finance. They attribute these results to their lack of motivation to learn and retain these skills. Mandell and Klein stress the importance of motivation in helping financial literacy “stick”. Teachers need to emphasize why financial literacy is important to students and their future. Financial literacy courses in high school often have a limited impact because students do not perceive the information as relevant at that point in time. Bruder highlights financial education in high school is not efficient because even seniors, are unable to acknowledge the importance of the information being received because of the lack of immediate relevance it has for them at that point in time. To overcome the problem of lack of perceived relevance, Joo, Grable and Bagwell (2003) suggest initiating financial literacy courses in the early college years might be more relevant to students, since at this point they begin to have a higher degree of economic independence from their parents.

What are the preferred delivery methods for personal finance at the college level?

Sallie Mae (2009) reports undergraduates prefer in-person education over self-directed or passive methods. Their top choices for in-person delivery methods of financial literacy are: classroom setting and one-to-one basis (55%), followed by "from parents" (49%), and "informal group setting" (46%). The least popular delivery method was workbooks (chosen by 54% of students as their least preferred choice) followed by reminder e-mail tips and posted tips around campus (44% report as least preferred choice).

These results are in line with Dempere, Griffin and Camp (2010), who report that surveyed students chose parents as the first choice of financial literacy information (51%) followed by one to one counseling (48%), and classroom based-delivery (48%). It is important to note though that more than 50% of students surveyed reported never talking to their parents about financial advice and financial skill building, which questions the efficacy of parents as a first choice. In sum, classroom setting and one to one counseling seem to be the best ways to provide financial literacy education at the college level.

RESTRUCTURING THE INTRODUCTORY FINANCE COURSE

Knowing that relevance of the topics and teaching students personal finance in a classroom setting are factors that can improve their learning, I worked on finding and developing personal finance material that was concise and relevant for our students. Given the limited amount of time we have in a semester, an important strategy for the course was to take advantage of topics originally covered in the introductory finance course and discuss the personal finance side as well. For example, if we talked about stock characteristics and their valuation. We would discuss stock characteristics and their use and valuation from the corporate and individual investor perspective. Table 1 shows in more detail how each topic was discussed from these two points of view.

Since it is an introductory course students need to become familiar with a lot of terminology. This meant a few of the classes I had planned in the course where lectures. To be able to have more time devoted to applying the concepts learned and also to discuss personal finance, I used the flipped classroom model to substitute these lectures. I created videos of my class notes and had the students watch them for homework. When we met for class, we went over questions they had on the material discussed in the videos, answered a short quiz to reaffirm the terms and topics discussed in the videos and then engaged in small group activities related to the topics they learned about in the videos.

For instance, one of the videos they watched was an introduction to Money Market Securities. When we met in class we went over their questions on the topic, solved a quiz on Characteristics of basic money market securities and then did a pairs exercise of money market securities individual investors and companies would use depending on their needs and circumstances. For example:

- For business finance: If a company with a good credit rating needs short term financing what is/are examples of appropriate money market instruments they could issue? Why?
- For personal finance: John Smith is a very risk averse investor who is looking to invest his money for 1 year, which of the money market securities would be appropriate for John to invest his money in and why?

Table 1
Course Outline

Topic	Business Finance	Personal Finance
The Financial Environment	To maximize the value of the firm, managers must make investment decisions that add the most value to the firm; and financing decisions that minimize the firm's cost of funding.	As individuals we need to plan our financial future. Distinguish between needs and wants. Create a budget.
Banks and Other Financial Institutions	Recognize and understand the role of different types of financial institutions-focus on a business setting.	What are the services that financial institutions offer individuals? How do we benefit form these services? Importance of different types of insurance for individuals.
The Savings-Investment Process	Financial institutions in the role of intermediaries between savers and borrowers.	What types of financial instruments are available for individuals to invest in? benefits/drawbacks.
Financial Statements and Their Analysis	Learn to analyze a firm's basic financial statements: balance sheet, income statement and cash flow statement.	Learn to construct and analyze an individual's basic financial statements: balance sheet, income statement and cash flow statement.
Time Value of Money	Time value of money tools. Business Applications of Time value of money.	Personal applications of time value of money: loan amortization tables, saving and borrowing for big purchases, saving/borrowing for education. Financial planning and saving for retirement.
Interest Rates	How are interest rates determined? What is the role of monetary policy in setting interest rates? What is the role of inflation, liquidity and risk?	Analysis of interest rates in investing and borrowing. Credit card use; credit scores.
Bond Characteristics and Valuation	Understand bond characteristics and valuation from the business point of view.	Benefits and drawbacks of investing in a bond. Interpreting bond data.
Stock Characteristics and Valuation	Understand stock characteristics and valuation from the business point of view.	Benefits and drawbacks of investing in stock. Interpreting stock data.
Risk and Return	Measuring return and risk of financial securities. Portfolio construction. Mutual funds.	Building portfolios for personal investing. Interpreting and comparing mutual fund data.
Putting it all Together: Projects	Company financial analysis and valuation.	Your current financial situation and your financial future: prospects and challenges ahead.

Besides using a survey in finance textbook for the course, we also used the personal finance book called Get a Financial Life! by Beth Koblinger. I chose this book because it was geared towards college-age readers, it was concise and interesting to read. Throughout the semester students were required to read assigned chapters of the book and prepare for a quiz and/or discussion of the topic they read about.

To reaffirm what they learned in personal finance, the course's final project was a personal financial plan. Each student made their personal financial plan for when they graduate college. Their personal financial plan consisted of a budget, their personal financial goals, and a basic investment portfolio. They had to research what their dream job salary would be, where they would work, their cost of living etc. to build a budget they could live on once they graduated. They determined their short, medium and long term financial goals and using their budget to determine the amount of savings a year, their goals, and a risk tolerance questionnaire they filled out in class, they would then determine their cash, fixed income and equity portfolio allocation at that point in time.

To further reinforce the importance of personal finance, we had a wealth manager visit our class and talk about her work and common mistakes she sees people do with their personal finances. She stressed the importance of starting to save early for retirement. This seems to have really stuck with the class. When they were asked to comment on their learning at the end of the course, many mentioned they learned it was important to start saving early for retirement. They also reiterated this in their personal finance plans.

What topics where students most interested in learning about?

To get a sense of students' interests in the various personal finance topics, at the beginning of the course, I asked students to write down their most pressing personal financial question they had. The majority of students in class (61.5%)[3i] wanted to know more about saving, investing and/or saving for retirement, 11.5% wanted to learn more about credit cards. 7.7%

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[3] 16 out of the 26 students that provided their most pressing financial literacy question.

wanted to learn more about dealing with student debt, and 7.7% wanted to learn more about credit scores. This is quite an interesting result because previous studies such as Chen and Volpe (1998), Mandell and Klein (2007) Bruder (2009), and La Borde et al (2013) have shown that the further away in the future students perceive a financial event to happen the less interested they are in it. The 2009 Sallie Mae Report and Dempere, Griffin and Camp (2010) also find that college students had little interest in learning about savings, retirement and financial planning whereas in the current study this seems to be a main interest.

RESULTS

All business majors are required to take the introductory finance course. This is the only finance course they take, with the exception of those who go on to do a minor or major in finance. Enrollment for the course was 28 students.

To gauge students' initial personal finance knowledge I applied a pre-test at the beginning of the course and a post test at the end of the course. I received 24 responses out of 28 students enrolled in class. However one student only provided answers for some of the questions on demographics, therefore some variables will only have 23 responses.

I used a modified version of the Jumpstart coalition 2008 financial literacy test, which includes 31 questions on personal finance knowledge, and 18 questions on financial behaviors and demographics. To shorten the amount of time it would take to answer the survey in class, I reduced the number of knowledge questions from 31 to 22, taking out those which I considered were already represented by other questions.

So, did students *really* learn personal finance? The average score on the pretest was 61.17%, with a median score of 59.09%. [4]At the end of the introductory finance course students retook the personal financial literacy test. Their average score was 71.21%, with a median score of 70.45%. Most importantly a t-test of average means indicates that scores did improve significantly (at the 1% significance level). Thus students learned personal finance in the introductory finance course.

In addition, I also analyzed the relationship between student demographics and their financial literacy scores. The information includes: gender, family income, parent's schooling, ethnicity, previous personal finance knowledge acquired in high school and college, class rank, and major. I used this information to analyze the impact of these variables on their pre and post financial literacy test scores. I classified answers into 2 groups to generate means tests. Below is a brief description of each variable and how responses were classified:

1.Gender

Out of 24 responses, 13 were male and 11 female. Previous work has shown men tend to be more financial literate than women.

2.High School Course in Personal Finance

6 people had an entire course in personal finance; 2 had a course where at least one week of the course focused on personal finance; 8 had an entire course in economics; 4 students took

[4] This compares to a college national average score of 62.2%, nonetheless it is important to remember I applied a modified or reduced test version.

a high school course where at least a week of the course focused on economics; 2 people took a course in which they played the stock market game. 5 students out of 24 left this question blank.

Students were asked to check all that apply, thus the above answers will not add up to number of students who answered survey. It is expected that prior knowledge in personal finance will positively impact their survey scores.

Blank answers as well as having only a week of a course dedicated to personal finance or economics and playing the stock market game were considered as not having prior knowledge of personal finance. Taking a full course in personal finance or a full economics course was considered as having prior knowledge in personal finance, and classified as high school course (13 students), all other responses were classified under no high school course (11 students).

3. Class Rank

Out of 23 responses, 17 were sophomores; 4 juniors and 2 seniors.

Sophomores were classified as lower class rank and juniors along with seniors as higher class rank. It is expected that the closer they are to graduation or "real life" the more they will know about personal finance.

4. **Major**

All surveyed students are business students. Some students have more than one major, therefore results will not add up to the number of students who answered the survey.

Students' self reported majors were : 2 economics majors, 5 accounting majors, 10 finance majors, one information systems, 3 international business, 7 marketing majors, 3 management majors, and 2 reported "other" majors.

Economics, accounting and finance majors were classified as related majors (to personal finance). All other majors were classified as non-related majors (to personal finance). Based on previous work, it is expected that economics, accounting and finance majors (related majors) will score higher than other majors.

5. Parents' income

Out of 23 responses 6 answered they did not know, 3 answered below $79,999 and 14 answered above $80,000. Responses of income below $79,000 were classified as low income and responses for income above $80,000 were classified as high income. Don't know answers were excluded from the analysis.

Previous studies have shown that the higher level of family income the more *personal* finance knowledge students tend to have.

6.Highest level of parents' schooling

16 students answered their parents had college education or higher, classified as parent college; 8 students answered their parents had some college studies or less, classified as no parent college. Previous studies have shown that the higher level of parent schooling the more *personal* finance knowledge students tend to have.

7. Ethnicity

Out of 24 students, 23 classified themselves as white or Caucasian and one as other. Therefore this variable was excluded from the analysis.

8. Related Personal Finance Education in College

Students were asked whether they had taken economics, finance, accounting, and or a personal finance course. Since all students in this survey are business majors, they are required to take accounting and economics as prerequisites for the introductory finance course. Therefore all students surveyed have taken at least one accounting and 2 economics courses at the college level.

Only 2 students out of the 24 marked that they had either taken a semester long course in personal finance or had some coverage of personal finance in another course (which could include freshman orientation). Therefore this variable was excluded from the analysis.

What variables impact student's personal financial knowledge?

Table 2
Financial Literacy Average Pre and Post Tests Scores

	Pre-test	Post-test
Overall	61.17	71.21[a]
	(11.68)	*(10.09)*
female	55.79	69.83[a]
	(9.34)	*(6.19)*
male	65.73**	72.38[c]
	(11.83)	*(12.65)*
no hs course	59.09	62.94
	(9.96)	*(13.10)*
hs course	69.01	73.08
	(10.13)	*(10.07)*
sophomore	64.97	74.33[b]
	(11.67)	*(9.22)*
junior/senior	51.52***	65.15[a,**]
	(4.69)	*(7.96)*
non-related major	50.65	64.94[a]
	(4.86)	*(7.29)*
related major	67.21***	74.24[c,**]
	(10.72)	*(8.87)*
low income	59.09	69.70
	(13.64)	*(6.94)*
high income	63.96	74.03[b]
	(12.79)	*(10.61)*
parent no college	55.19	65.91[b]
	(7.62)	*(11.13)*
parent college	63.64*	73.86[a,*]
	(12.34)	*(8.70)*

*Standard errors in parenthesis. ***,**,* show significance at the 1,5,and 10% respectively* ***across*** *categories; i.e. significant difference in male and female pre-scores. a, b, and c indicate significance at the 1, 5 and 10 % respectively* ***within*** *categories; i.e. significant difference in pre and post test for males.*

Table 2 above shows average pre and post scores for each variable. Standard errors are presented in parenthesis. I conducted t- tests to compare pre and post scores *within* variable categories. For example average pre and post scores for male. I also conducted t-test for average scores *across* variable categories. For example means t-test comparison of male and female pre-test scores and means t- test for male and female post test scores.

Results indicate both males and females increased their scores significantly (10% and 1% significance, respectively). And, although pre-scores are significantly higher for males, post scores are not. Pre and post scores of students who took a financial literacy course in high school and those that did not take a course in high school are not statistically different. Thus it seems taking a financial literacy course in high school did not help students learn financial literacy in their college introductory finance course.

Both low (sophomores) and high ranks (juniors and seniors) improved their scores significantly from the pre to the post-test (5% and 1% respectively). Interestingly, lower class rank students scored significantly higher than high class rank students both in the pre and post tests (1% and 5% significance respectively).

Average pre and post-scores for non-related and related majors are significantly different. Related majors' scores in the pre and post test are significantly higher (1% significance in the pre-test and 5% in the post-test). Both related and non-related majors show a statistically significant improvement in their scores from the pre to the post test (10% and 1% significance, respectively).

Improvement in financial literacy scores are linked to family income. Pre score averages for students in high vs. low income categories are not significantly different; post scores for both groups are also not significantly different. Nonetheless, students from high income families improve their scores slightly more than those in low income families.

Students whose parents have a college education and those whose parents don't show a significant score increase (1% and 5% respectively). However, both pre and post scores are significantly higher for students whose parents have a college education.

Overall, it seems both males and females, and both students who have parents with and without a college education significantly improve their financial literacy knowledge. However students that have parents with college start of with a significantly higher pre-score. Students from high income families improve their scores slightly more than those from low income families. In addition, all majors and ranks increase their scores but related majors and lower ranks have higher pre and higher post scores. High school financial literacy courses, do not significantly impact their learning of financial literacy in introductory finance.

Chen and Volpe (1998) show that gender, class rank, ethnicity, age, years of work experience, major, and income make a difference in students' personal finance knowledge. LaBorde, Mottner and Whalley (2013) also conclude that gender, age, race, and major have a significant impact on personal financial literacy. Contrary to Chen and Volpe (1998) and LaBorde et al. (2013), I find gender does not have a significant impact on financial literacy: post scores for males and females are not significantly different. In addition, contrary to the above studies, I find lower rank students score higher in the pre and post test than higher rank students. In line with the above studies, students with related majors have higher scores than those with unrelated majors.

Perceived student learning

To gauge students perceived personal finance learning at the end of the course they were asked to fill out a seven question survey.

The survey questions are listed in table 3 below.

Table 3
Perceived Student Learning

Please rate the following statements about personal finance:

Check off the response that best corresponds to your level of agreement with each statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
1. This course **increased my knowledge** of personal finance.		❑	❑	❑	❑
2. This course **made me aware** of the importance of personal finance.	❑	❑	❑	❑	❑
3. After taking this course I have a **better understanding** of how to manage my personal finances.	❑	❑	❑	❑	❑
4. This course **taught me how to manage** my personal finances.	❑	❑	❑	❑	❑
5. This course helped me **improve how I manage** my personal finances.	❑	❑	❑	❑	❑
6. This course helped me become **more confident in** my personal financial management skills.	❑	❑	❑	❑	❑
7. I would recommend this FI-101 course because it **includes personal finance**.	❑	❑	❑	❑	❑

I received 24 responses to the above questionnaire. 23 of 24 respondents agreed or strongly agreed the course had increased their knowledge f personal finance. This is in line with the significant increase in the average financial literacy post-test score. All 24 respondents agreed/strongly agreed the course had made them aware of the importance of personal finance. 21 of the respondents agreed/strongly agreed they had a better understanding of how to manage their personal finances after the course. 22 agreed/strongly agreed the course had taught them how to manage their personal finances.

16 of 24 agreed/strongly agreed the course had helped them improve how they manage their personal finances. The lower score for this questions may be due to the fact that the focus of the personal finance discussion was on how to manage your personal finances when you graduate, close to the time in their lives but maybe not applicable yet. For example, if they do not have a full time job that offers a 401k they can't start saving for retirement in a 401k.

19 of the 24 respondents agreed or strongly agreed the course had helped them become more confident in their personal finance management skills. Last, 22 of the 24 agreed or strongly agreed they would recommend an introductory to finance course that included personal finance. Overall, students do perceive they learned personal finance throughout the course, and would recommend taking an introductory finance course that incorporates personal finance.

CONCLUSION

College students, including business majors lack personal financial literacy skills. By taking advantage of topics already taught in an introductory finance course, which is a required course for all business majors, I incorporate personal financial literacy in the course. This provides an opportunity to expose a broader college audience to personal financial literacy. Pre and post test personal financial literacy scores show students learned personal finance in this course. In addition, the majority of the students enrolled reported the course had made them aware of the importance of personal financial literacy and after taking the course had a better understanding of how to manage their personal finances. Next steps involve incorporating personal financial literacy in the curriculum of other majors beyond the school of business.

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