# SCHOOL OF STUDY AND FINANCIAL LITERACY

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## ABSTRACT

*This study examines the financial literacy of students in several schools of a metropolitan university. Comparisons are made in terms of the students overall knowledge of personal finance matters and their knowledge in selected areas of personal finance. The research finds that the level of financial literacy is low in all of the schools studied, but that there are statistically significant differences in the level of literacy between the students in the various schools.*

## INTRODUCTION

Personal financial literacy is important to understanding the basic financial issues that most individuals and families must deal with in our modern society. Even if an individual has a defined benefit plan that will hopefully meet most of the financial needs of one's retirement years, that person still will spend a lifetime dealing with issues related to mortgages, insurance (including automobile, home, life, and health), personal credit management, income taxes, and all of the other financial considerations that are part of modern life in our society.

Regrettably many research studies report that the level of personal financial knowledge in the American population is substantially below the level that would be desirable. There seems to be a serious lack of understanding about topics ranging from investing to home mortgages—as has been demonstrated with the recent subprime mortgage crisis. Because of the low level of financial literacy in our society, there are nationwide efforts today to enhance financial literacy, and many states have even mandated financial literacy education requirements in the public school systems.

With financial literacy being recognized as so important in our society, it is reasonable to inquire about the level of financial literacy among university students and ask if they are all equally well prepared for life after college. Is there a difference between students based on school of study within a university in terms of the level of financial literacy of the students progressing towards graduation from the institution? If there is a difference, where do improvements need to be made?

## THE LITERATURE ON FINANCIAL LITERACY

A significant number of studies attempt to demonstrate how certain factors have an effect on financial literacy. Some of these studies focus on general financial literacy, and other studies focus specifically on knowledge related to investing or some other facet of personal finance.

The literature seeks to explore a variety of factors that might impact literacy. Gender is the variable most often explored in an effort to explain differences in financial literacy. Research by Anthes and Most, 2000; Applied Research & Consulting, 2003; Merrill Lynch Investment Managers, 2005; Worthington, 2006; Loibl and Hira, 2006; Mandell and Klein, 2007; supports the proposition that gender is a significant factor in explaining the level of financial literacy. For example research studies by Chen and Volpe (1996), Goldsmith and Goldsmith (1997) and by Alexander, Jones and Nigro (1998) tend to find that women are less knowledgeable than men about investments. In their study Chen and Volpe (1998; 2002) report that women are less knowledgeable than men in all the areas of financial knowledge that they test.

Other variables that have been analyzed for their impact on financial literacy include employment status (Chen and Volpe, 1998; Worthington, 2006), family and personal income (Chen and Volpe, 1998; Worthington, 2006), age of the individual (Kreinin, 1959; Chen and Volpe, 1998; Worthington, 2006), and motivation (Mandell and Klein, 2007).

An additional variable that is found to be significant is the level of education attained (Zhong and Xiao, 1995; Bodie and Crane, 1997; Waggle and Englis, 2000; Yao, Gutter, and Hanna, 2005; Dolvin and Templeton, 2006). But in these studies where educational attainment is found to be significant, all undergraduate degrees are treated as being the same. Differences in the various fields of study are not explored, so no difference is made between bachelor degrees in the fields of business versus education versus liberal arts.

## SURVEY AND DATA

In randomly selected classes across the institution, undergraduate junior and senior undergraduate students at a metropolitan university were asked to complete a survey measuring financial literacy. Student participation was entirely voluntary and students were not allowed to identify themselves by anything other than the demographic information that was requested in the survey for analytical purposes.

The financial literacy survey instrument consists of multiple choice questions. The introductory inquiries pose questions about each respondent's demographic information, with participants providing self-identification of their gender, age, and income data. As previous literature indicates these are variables should have an impact on financial literacy, we collect these data so we can control for these factors in our analysis. The survey then poses 40 questions beyond the demographic data exploring each individual's knowledge of personal finance. The

survey asks ten questions on each of the topics of investments, personal income taxation, credit and debt management, and insurance.

The survey is constructed consistent with the Hill and Perdue (2008) approach where the last potential multiple choice answer for each of the 40 questions on financial topics allows the responding student the opportunity to admit not knowing the answer to the question. The failure to use this approach would put survey respondents in a position where they must guess at answers to complete the survey. Guessing at answers by respondents potentially tends to overstate the percentage of correct answers, since some lucky guesses are almost inevitable.

Chen and Volpe (1998) make an interesting observation in their study that as a group, domestic students tend to earn higher scores than foreign students. This observation caused us to recognize that international students often do not have the cultural or personal experiences to correctly answer many of the financial literacy questions because of a lack of familiarity with U.S. society, including the tax laws and other considerations. After finding the same result in an initial analysis of our data, we elect to drop international student survey responses from the final data set.

Since Chen and Volpe (1998) use an individual's personal income and Worthington (2006) uses total household income in their respective studies, we ask for both personal income and estimated family income information in our survey. However, we only report results for personal income because that variable produces statistically significant results and estimated family income fails to have any statistically significant value in our findings.

Table 1 provides relevant demographic data from the 278 usable surveys. Students completing the survey are from the schools of business, education, and liberal arts, comprising 33 percent (91 students), 32 percent (90 students), and 35 percent (97 students) of the sample, respectively. The self-reported ethnic mix is rather diverse, with nine percent of the students describing themselves as African-American, 23 percent Hispanic, 59 percent non-Hispanic white, and nine percent of the students coming from other ethnic groups. The sample is 72 percent female.

The age and personal income characteristics of the surveyed population are interesting. The age distribution is not heavily skewed towards the younger students. Only 54 percent of the respondents are age 25 or younger. This is due to the nature of the particular university (and so this undergraduate population may be marginally different from any other given student group), with many students working while attending college or perhaps returning to school after a work or a family related absence. This characteristic of our data set gives us a better range of ages among our survey participants than might be present in many other student-based surveys.

The personal income distribution pattern is about what we would have expected for an undergraduate population. We observe in Table 1 that 63 percent of the students classify themselves as having a personal annual income of less than $20,000, with only six percent indicating that they have a personal annual income of $60,000 or higher.

**Table 1**
**Demographic Description of Survey Participants**

| | Business | Education | Liberal Arts | Total |
|---|---|---|---|---|
| Gender | | | | |
| Female | 48 | 83 | 68 | 199 |
| Male | 43 | 7 | 29 | 79 |
| Ethnicity | | | | |
| African-American | 10 | 5 | 9 | 24 |
| Hispanic | 23 | 22 | 20 | 65 |
| White, non-Hispanic | 47 | 55 | 63 | 165 |
| Other | 11 | 8 | 5 | 24 |
| Age | | | | |
| 20 or younger | 3 | 7 | 5 | 15 |
| 21 to 25 | 50 | 44 | 42 | 136 |
| 26 to 30 | 21 | 11 | 16 | 48 |
| 31 to 40 | 10 | 21 | 16 | 47 |
| Over 40 | 7 | 7 | 18 | 32 |
| Personal Income | | | | |
| $0 to $19,999 | 53 | 68 | 54 | 175 |
| $20,000 to $39,999 | 19 | 17 | 23 | 59 |
| $40,000 to $59,999 | 13 | 1 | 13 | 27 |
| $60,000 to $79,999 | 4 | 0 | 4 | 8 |
| $80,000 or more | 2 | 4 | 3 | 9 |
| | | | | |
| Total | 91 | 90 | 97 | 278 |

## RESULTS OF THE STUDY

As we report in Table 2 respondents to our survey have an average overall correct response rate of approximately 16.08 out of 40 questions, which is 40 percent. These results are reasonably consistent with the results of other studies in the literature that survey the financial literacy of university students. In their respective studies of university students, Volpe, Chen and Pavlicko (1996) indicate an average correct survey response rate of 44 percent and Chen and Volpe (1998) report an average correct response rate of 53 percent for their participants. Also, the simple fact that questions on our survey are not the very same questions used by others inevitably means there should be somewhat different scores. But we did expect having marginally lower scores because of our decision to offer the "I don't know" answer option for each question, as that would minimize the number of correct answers based on guessing.

Table 2 goes beyond the simple overall correct response rate to examine the average number of correct answers in each of the areas of investments, taxes, credit and debt, and insurance. We find that the questions about taxes prove to be the most difficult for the students, while questions about credit and debt prove to be the easiest.

Results of each personal finance topic area are analyzed by school of study. Clearly business students do better on the overall survey than do students from the other two schools, correctly answering on average 18.82 of 40 questions (47 percent). Business students have a relatively higher correct mean response rate for issues relating to investments, personal income taxes, and credit and debt management issues. Only in the area of insurance matters do the liberal arts students have a marginally higher mean score than business students. Education students consistently have a mean score lower than either the liberal arts or business students in every category.

After finding the financial literacy scores are not the same for the three schools, we use Tukey's pairwise comparison test to see which schools have statistically significant different correct response rates from the other schools. Students in the business school performed significantly better than the education majors and the liberal arts majors on the overall financial literacy score as well as on the mean scores by school for investment, taxes, and credit and debt. However, a significant difference between schools on the insurance scores cannot be found at the 0.05 level. The liberal arts majors score significantly better than education majors on the overall financial literacy score and also on the mean investment score, but there is no significant difference between these two schools in the other areas of financial literacy.

**Table 2**
**Correct Responses by Topic**

| | Investments | Taxes | Credit and Debt | Insurance | Overall |
|---|---|---|---|---|---|
| School | | | | | |
| Business | 5.297 | 3.077 | 5.868 | 4.802 | 18.82 |
| Education | 2.722 | 1.333 | 4.711 | 4.156 | 12.92 |
| Liberal arts | 4.052 | 1.711 | 5.289 | 4.856 | 15.91 |
| All students | 4.029 | 2.036 | 5.297 | 4.613 | 16.08 |

The primary purpose of this study is to explore the impact of school of study on financial literacy. But as discussed above there are other factors that influence financial literacy, and it is necessary to control for these additional factors. Therefore, we also consider age, gender, and personal income, as these variables have been raised in the literature as being potentially important. It is particularly important to control for gender, given the great range of gender mixes we report for the three schools in Table 1.

We perform analysis of variance tests considering each of these variables with the overall financial literacy score as well with the scores in each of the four specific areas of financial literacy. The results (p-values) for tests of hypotheses are shown in Table 3. When age and personal income are tested both of these variables are found to be statistically significant at the 0.01 level in the test for each of the four specific areas of knowledge as well as for overall literacy, as shown in Table 3. These results come as no surprise as age and income have been associated with higher levels of financial literacy (see Kreinin, 1959; Chen and Volpe, 1998; Worthington, 2006). Even in their work on motivation as a key variable in explaining financial literacy, Mandell and Klein (2007) cite literature using as examples older persons who are motivated to learn about matters that affect them.

However, when we test to see if financial literacy is impacted by gender, we find mixed results. We do find gender to be highly statistically significant with males exhibiting greater knowledge of investments, income taxation, and overall financial literacy. However, we do not find gender to be significant when measuring financial literacy in either the area of credit and debt or the area of insurance. There are no really good explanations for this phenomenon, which has been found by other researchers. However, it has been suggested by Goldsmith and Goldsmith (1997), that since males as a group are more quantitative (for whatever reason), males may be more attuned to knowledge areas that are perceived as being more quantitative. However, the debate on the impact on gender of nature versus environment is on-going in the literature and is not resolved here.

**Table 3**
**P-values of ANOVA Tests for Demographics**

| | Investments | Taxes | Credit and Debt | Insurance | Overall |
|---|---|---|---|---|---|
| School | 0.000 | 0.000 | 0.000 | 0.006 | 0.000 |
| Age | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| Gender | 0.000 | 0.000 | 0.787 | 0.353 | 0.001 |
| Personal Income | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

We use a general linear model approach so we can include age, gender, and personal income in our analysis with school of study. Table 4 presents the p-values for the tests of significance for these four variables. We find that school of study is a highly significant ($p < 0.001$) variable when looking at the percentage of correct answers on the overall financial literacy score. The reported results also indicate that there is a very significant difference among the students in the three schools on the investment questions, on the tax questions, and on the credit and debt questions. When testing for a significant difference between the schools in the

student scores on the insurance questions, the significance level of school of study is lower but is still significant at about the 0.10 level.

**Table 4**
**P-values from General Linear Model Test**

| | Investments | Taxes | Credit and Debt | Insurance | Overall |
|---|---|---|---|---|---|
| School | 0.000 | 0.000 | 0.000 | 0.065 | 0.000 |
| Age | 0.022 | 0.000 | 0.001 | 0.000 | 0.000 |
| Gender | 0.033 | 0.004 | 0.068 | 0.934 | 0.274 |
| Personal Income | 0.046 | 0.105 | 0.035 | 0.536 | 0.015 |

## SUMMARY AND CONCLUSIONS

Our primary finding is that school of study is statistically significant in explaining the level of financial literacy. In our comparison of undergraduate students from the business, education and liberal arts schools at a metropolitan university, business students as a group were found to be the most financially literate and education students were relatively the weakest.

Why do the business students perform so much better than students in the other two schools? There are some obvious explanations for this phenomenon, as discussed by Chen and Volpe (1996; 1998). The business majors have already had courses in economics and accounting, and some students may have already had a course in finance. This background would likely provide some exposure to a mindset that would help in thinking through and answering some personal finance questions. Also, students may have chosen business as a major due to their overall interest in financial issues and personal wealth attainment, and this same interest may have provided motivation to them to investigate on their own some of these areas of personal finance.

Yet while those answers might explain why business students as a group perform better than the education and liberal arts students, those answers do not explain why the liberal arts students performed better than the education students on the overall literacy score and in particular on the investment score. While our results clearly establish a difference in the financial literacy of students based on school of study, further research will be required to explain why these differences exist.

Meanwhile, a broad policy recommendation seems appropriate. Relatively speaking business students exhibit the greatest level of financial literacy on our survey. But their relatively higher score of 47 percent correct is really still a failing grade. It is just a higher "F" than the "F" for the students in the other two schools studied. It is a disservice to students to train them well to be good accountants or school teachers that can earn a living to support

themselves on their families, but leave the students ignorant as to the basics of investing, insurance, and home mortgages. It is our opinion that a personal finance class should be mandatory for all university students if academia is going to produce well-educated citizens prepared to live in our modern society.

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