

StockTrak / PersonalFinanceLab Pre- and Post- Tests

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Project Overview

Financial literacy education is more important than ever, but tools to demonstrate the efficacy of financial literacy programs, whether software, classes, or other initiatives is currently lacking. Several pre- and post- test templates exist for specific programs, including tests created by the SIFMA Foundation and the Global Financial Literacy Excellence Center (GFLEC), but these tests typically have critical flaws that hamper their usage across general financial literacy.

1. **Scope.** The focus of existing tests is too narrow to use as a measure of general financial literacy.
 - a. The SIFMA pre- and post- tests are designed to be paired with the SIFMA Stock Market Game – as such, the questions exclusively focus on the realm of investing, and so this test could not be generalized to overall financial literacy.
 - b. Similarly, the GFLEC “Big 3” and “Big 5” questions are kept short for ease-of-use, but this fails to capture the bulk of what would be covered by a typical “financial literacy” program. The questions exclusively focus on interest rates, inflation, and investing – important topics, but only a small fraction of the concept mastery and skill requirements of being “financially literate”.
2. **Standardization.** The definition of “financial literacy education” itself is a moving target. At the high school level alone, 3 major organizations have published competing sets of standards on what “should be” taught in a Personal Finance class. Each state that has mandated Personal Finance or Financial Literacy to be taught in schools has published their own variations. The lack of standardization on “what should a financial literacy class focus on?” is another hurdle towards the creation and adoption of a broad pre- and post- testing framework.
3. **Adoption.** When speaking with non-profit organizations who have attempted to implement either of the SIFMA or GFLEC tests, a major barrier has been actually getting participation in the programs. Both tests are voluntary and designed for teachers to choose how to administer the questionnaires to their classrooms – with the vast majority of classes choosing to simply skip the hassle, as it does not add value to the class (again, because the existing scope is too narrow for the class that is being taught, so the end results of the pre/post tests are not useful to the teachers).
4. **1:1 Measurement.** The SIFMA survey was designed as a paper-and-pencil test distributed by teachers and reported back to SIFMA for recording at the beginning and end of the portion of the class that utilized their Stock Market Program, while the GFLEC test has no individual recordkeeping at all (designed more as a benchmark than a real pre- post- test). Keeping individual student records is always a sensitive issue, especially concerning students under 18 years of age, which significantly hampers the ability to know the cohort who took the pretest is the same cohort who took the corresponding post test.

We seek to remedy these shortfalls with the creation of a compact, comprehensive, and accurate framework for pre- and post- tests measuring the efficacy of financial literacy education programs. The goal of developing these tests is for a portable measurement – which can be applied not just to StockTrak (and our partner)’s programs, but for any comprehensive financial literacy program to measure program efficacy in an unbiased and accurate manner.

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StockTrak's Position

Stock-Trak, Inc. has been a leading provider of stock market and investing simulations for colleges and universities for over 30 years. Since the 2008 financial crisis, we have also expanded rapidly into high school classrooms – first through our partnerships with state-level Councils on Economic Education as a vendor, then through our independent efforts to work with classrooms directly.

Beyond our investing simulation, StockTrak has also developed a large library of videos, articles, lesson plans, quizzes, and other resources suited for high school and college economics and personal finance courses. In 2019, we expanded our platform to also include an immersive and customizable Budgeting Game. As we have expanded our offerings to teachers and non-profit organizations, our primary goal has been to provide a quality, effective teaching and learning resource for all facets of financial literacy.

Creation of the Test

Conceptually, the StockTrak Pre- and Post- test has been in development for over 5 years. Our goal was originally to create an internal assessment tool to ensure our platform was having the intended impact on improving outcomes in financial literacy education. This, in turn, focused efforts to establish what exactly those end goals were – leading to the development of both what could be a broadly-accepted concept of “what is financial literacy”, and “how can we test this in a concise manner?”.

This test was created wholly outside our planning and design process for our own products, and instead based entirely on published external standards. The goal of this test is a flexible and portable tool that can be used to assess the efficacy of any financial literacy program.

The Standards

Our efforts began with a comprehensive review of all published sets of National and State standards for financial literacy in the United States, with particular emphasis on the National Standards in K-12 Personal Finance Education, published by the Jump\$tart Coalition, and the National Standards for Financial Literacy, published by the Council for Economic Education. Our first goal was to align our own resources with these (and state-level) standards, while identifying the areas of strongest overlap to determine our focus.

These areas of the strongest overlap formed the basis of our Pre and Post test – and we purposefully avoided any “best practices” that may be in one set of standards but not another or may have disagreement among financial literacy experts (for example, the exact number of months’ living expenses that should be in a healthy emergency fund).

We have also been cognizant of the shortcomings of the other efforts to build these assessments and have ensured that our questioning distribution covers the widest possible range of financial literacy, while remaining compact enough to be adopted by many classrooms.

Our Unique Advantage

StockTrak's classroom resources are designed to be used for the entire duration of the semester, and every student utilizing our platform has a unique login. While we do not track personal or demographic information on the students, we are able to follow a single unique student on their activities on our platform for the sake of teacher reporting.

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This offers a pre- and post- test administrated through the StockTrak platform two distinct advantages:

- We can ensure an exact 1:1 measurement, by tying the results from the pre- and post- tests to unique users, so we can ensure we have exactly-matching cohorts.
- For questionnaire design, StockTrak caters to a wide audience of users in and outside of schools. This gives us a uniquely large audience for preliminary testing of the tests.
- Eventually we plan to implement across our entire audience, ensuring a nearly 100% body of adoption

Limitations

The unique features of the PersonalFinanceLab platform for classrooms also creates a drawback for standardized testing – namely the customizability available to each teacher. This means that few classrooms utilize our entire standards-aligned personal finance curriculum and both of our available games wholesale, meaning that real-world results from a “typical” classroom may not perform as well as a school with complete PersonalFinanceLab adoption (for example, some teachers may not be utilizing our Budgeting Game and related lessons, so we would not expect to observe as strong improvement in the questions related to Spending, Savings, and Budgeting compared to a classroom that did).

We also observe a much higher completion rate of our pre-tests than post-tests. To control for these limitations, our analysis focuses on matching 1:1 users who completed both the pre-test and post-test to measure improvement.

The Test Structure

We have limited our assessment to 29 questions, broadly covering the following 5 subject areas:

- Spending, Saving, and Budgeting
- Risk Management and Insuring
- Using Credit and Debt
- Investing
- Earning Income/Employment/Income Tax

Question Selection Methodology

Our team created a starting test bank of 90 questions across these categories, plus the 5 GFLEC questions were added to the test bank. We divided these questions into 9 sets of 10 questions each (plus an additional 10th set containing just the GFLEC questions).

Each of the 10 sets of questions was administered independently to each of our 3 main audiences to ensure results were not biased by education level:

- High school students
- University students
- Users outside school

With each question set, we also asked a survey question at the end – “what, if any, financial literacy courses have you ever taken?”, with options

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- Personal Finance/Financial Literacy
- Investing/Portfolio Management
- Home Economics
- Other (with an input field)
- No class focusing on financial literacy

We also asked users to self-identify their own level of financial literacy (ranging from 1 to 5) before starting the questionnaire.

Results were analyzed between these three groups and subdivided by level of financial education achieved thus far. Since the goal of the pre- and post- tests is to measure the growth of general financial literacy skills, we eliminated questions from the 95-question test bank based on the following criteria:

1. If over 75% of all persons with no financial literacy education got the questions right, the question was rejected as “common knowledge.”
 - a. An example of a rejected question is “Due to inflation, will an item that costs \$1.50 today cost more or less 1 year from now”.
 - b. If the results of the pre-test are too high, it would be come difficult to measure improvement.
2. Questions with no statistically significant improvement based on whether the respondent had previously taken a financial literacy course were rejected, as the concept tested by the question may not be broad enough to cover general financial literacy achievement.
 - a. We typically observed high school students as the lowest initial performers (median score: 4/10), followed by the public (5/10), followed by university students (6/10), which was in line with our initial expectations.
 - b. We “Scored” each test-taker based on whether they had previously completed a financial literacy course:
 - i. If the survey taker had previously had a Personal Finance, Financial Literacy, or Home Economics course, they were scored “1”
 - ii. If they had an Investing course, they were scored “0.5”
 - iii. If they had no previous course, they were scored as a “0”.
 - c. The results for each question were run through a linear regression based on this score.

Questions that could not demonstrate a significant difference (at 95% confidence) based on whether a user had or had not previously taken a personal finance course were rejected.

This second criteria rejected nearly 2/3 of our test bank, bringing the final approved questions to a total of 29. The same 29 questions are asked in both the Pre test and Post test.

The Tests

This is the finalized list of the pre- and post- question banks (each question is multiple choice, but the answers are omitted here).

Question Bank	
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What is NOT tracked on a credit report?	Credit
Which type of loan typically has the highest annual interest rate?	Credit
A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less.	Credit
Imagine you are making a \$1000 purchase with different payment options. Which of the following would you pay the LEAST (you may need a spreadsheet or calculator)?	Credit
Which of the following is not considered income?	Income
How is Social Security funded?	Income
Which of the following is a type of insurance?	Insuring
Why would a car owner with a low deductible be less likely to lock their car?	Insuring
What is Self-Insurance?	Insuring
If interest rates rise, what will typically happen to bond prices?	Investing
Buying a single company's stock usually provides a safer return than a stock mutual fund.	Investing
Which investment type has the highest historical rate of return?	Investing
The Rule of 72 means...	Saving
An Emergency Fund is cash set aside for...	Saving
Opportunity Cost is...	Saving
Which of the following would cause your credit score to go down?	Credit
After how long an unpaid debt get removed from your credit report?	Credit
When you get a mortgage on a house, how much money are you borrowing?	Credit
Imagine you are making a \$1000 purchase with different payment options. Which of the following would you pay the LEAST (you may need a spreadsheet or calculator)?	Credit
Which of the following statements about tax deductions and tax credits is true?	Income
If you are a full-time employee, which form would you get from your employer showing how much income you earned in a year?	Income
Which of the following is NOT covered under the long-term care insurance?	Insuring
If you rear-end someone in a traffic accident, which type of insurance would pay for the damage to the other person's car?	Insuring
Coinsurance is....	Insuring
How are the prices of stocks determined?	Investing
How does a dividend investment strategy work?	Investing
Which of the below are risk-averse investors most likely to invest in?	Investing
Which of the following donations is NOT deductible on your tax return?	Saving
Imagine you have a savings account with a 5% interest rate, and you deposit \$100. After 2 years, your balance will be...	Saving
Which of the following would NOT be included in a personal financial plan?	Saving

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