

Financial Literacy Simulation in Managerial Finance: Signing Up for a Mock 401(k)

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Much evidence suggests a growing need for financial literacy as a prerequisite to a lifetime of financial well-being. And while it has been recommended that U.S. colleges and universities implement a mandatory financial literacy course (President's Advisory Council on Financial Literacy, 2009; U.S. Financial Literacy and Education Commission, 2019), no such requirement has been imposed. Currently, only one quarter of college students report access to financial literacy education (Montalto et al, 2019). Guided by best practices and insights, this paper examines the opportunity for an upper-division core business course to support a focused, financial literacy learning opportunity for upper classmates by employing a simulated retirement plan enrollment. This work contributes to the body of work on financial literacy education and represents an efficient approach to providing relevant education to meet the growing financial literacy needs of college students.

Keywords: pedagogy, financial literacy, experiential learning, undergraduate students

INTRODUCTION

Individuals and families in the U.S. are assuming greater responsibility for financial decisions that are, at the same time, becoming increasingly complex. This combination of individual responsibility for complex decisions can be observed in several arenas of financial life but none more so, perhaps, than planning for retirement or paying for college. College costs have risen for decades at rates that outstrip inflation (FLEC, 2019), and retirement plans continue to shift from defined-benefit to defined-contribution (EBRI, 2021), forcing individuals and families to assume greater responsibility for planning and saving. Surveys on financial literacy reveal generally low levels across all age groups in America, and particularly for young adults (Lin et al., 2019, p. 34) which, combined with reports indicating the poor status of retirement planning and the ballooning size of student loan debt, prompt concern as to whether individuals possess the financial knowledge and skills to make decisions impacting a lifetime of financial security. Young adults are some of the most vulnerable when it comes to financial literacy and poor financial behaviors. The importance of financial literacy for college students is evident in the lasting impact of financial decisions made by young adults (Lusardi and Wallace, 2013). Budgeting, managing credit and managing debt, for example, can impact opportunities to pursue future life and financial goals such as career, home ownership and retirement saving.

Research suggests financial literacy can improve financial behaviors and economics outcomes (Angrisani et al., 2020; Lusardi and Mitchell, 2011; Miller et al., 2015). Yet, financial literacy education in the U.S. has been largely limited to a patchwork of state mandates at the secondary school level (Center for

Financial Literacy, 2017). This circumstance of limited financial literacy education at the collegiate level is remarkable given college financial literacy has been on the national agenda since 2008 when the President's Advisory Council on Financial Literacy recommended requiring college students take a financial literacy course as condition for receiving Federal financial aid (PACFL, 2008). In 2018 a similar recommendation was issued by the U.S. Financial Literacy and Education Commission (FLEC) directed at institutions of higher education to require mandatory financial literacy courses (2019). Today, despite these efforts, colleges and universities are not required to offer students a financial literacy course, and findings from the 2017 Study on Collegiate Financial Wellness suggest only 10.3 percent of students participated in a personal finance course or workshop while in college (Montalto et al., 2019, p. 13).

While not mandated, institutions of higher education are urged to help prepare students for making critical decisions impacting not only their own financial well-being but also the financial health of their families and communities. And, if the push for improving financial literacy is not driven at the college or university level, then individual educators need to consider ways to establish such learning opportunities, even if on a limited scope. This paper outlines a focused, financial literacy learning opportunity that can be efficiently integrated within the existing business core curriculum.

REVIEW OF LITERATURE

Trends in the U.S. economy have transferred the weight of effectively navigating financial decisions more heavily to the shoulders of individuals. The responsibility to plan and save for retirement, for example, has shifted largely from employer-directed, defined-benefit plans to employee self-directed, defined-contribution plans. In fact, by 2020, approximately 86 percent of private-sector retirement plans for active participants were defined-contribution plans (EBRI, 2021). Yet, "nearly 6 in 10 non-retirees with self-directed savings expressed low levels of comfort in making investment decisions with their accounts" (FRB, 2022, p. 81). Sometimes decisions focus too heavily on the near-term while sacrificing longer-term financial success, such as the 14 percent of those laid off in 2021 who borrowed or cashed out funds from their retirement savings (FRB 2022, p. 80). Underscoring this concern with current retirement planning, only 40 percent of non-retirees report being on track for retirement savings (FRB, 2022, p. 79), while 59 percent have not tried to figure out how much they need to save for retirement (Lin et al., 2019, p 17). Recently Vanguard (2022) reported median balances in retirement accounts for individuals age 65 and older at \$88,000 (p. 47), seeming to support this perception of individuals being under-prepared for retirement.

Decisions on how to pay for college have also become complex, largely due to increasingly unaffordable price of higher education. Between 2004-05 and 2015-16, the cost of attending college at public institutions in the U.S. increased 34 percent more than the rate of inflation (FLEC, 2019, p. 1). In 2021, total student loan debt in the U.S. exceeded \$1.75 trillion (Hanson, 2021b) while average student loan balances continued to balloon, growing from approximately \$18,000 per borrower in 2007 to over \$37,000 in 2021 (Hanson, 2021a). Individuals and households need the knowledge and skills to make effective financial decisions in the face of increasing complexity (Lusardi and Mitchell, 2007; 2014). Yet, research suggest these decisions are being made often without full understanding of financial implications as student borrowers underestimate the amount of their student loans and express general loan and debt confusion (Andruska et al., 2014). Montalto et al. (2019) found only 18 percent of students with a student loan had a good idea of what their student loan monthly payment would be upon graduation while 7.5 percent did not know how much they had borrowed (p. 7). Similarly concerning, Lin et al. (2019) found 51 percent of student loan holders did not understand details of the loans they were taking out (p. 28). Even after passage of the CARES Act in 2020 which paused payments on federally held student debt, 12 percent of borrowers with student debt were behind on payments (FRB, 2022, p. 5).

Financial Literacy

Financial literacy, as defined by the President's Advisory Council on Financial Literacy (PACFL), is the ability to use knowledge and skills to manage one's financial resources effectively for lifetime financial security (2008, p.4) and, as such, improved levels of financial literacy should help individuals navigate

these increasingly complicated financial decisions. Unfortunately, several studies have revealed levels of financial literacy across the U.S. population to be quite low (Angrisani et al., 2016, 2020; Lin et al., 2019; Lusardi and Mitchell, 2011, 2014; NCEE, 2005). Measures of financial literacy for college students are no more promising. Less than 28 percent of college students possess a basic knowledge of interest rates, inflation, and risk diversification (Anderson et al., 2018, p. 3) and, on average, answer only 3.3 questions out of 6 correctly on questions related to fundamental financial literacy (Montalto et al., 2019, p. 13). Supporting this assessment, 75 percent of surveyed financial aid administrators indicated their perception of college student financial literacy as “low” (Webster et al., 2017, p. 12). Other research finds financial literacy among younger adults lower than that of older adults and rapidly declining over the past decade (Lin et al., 2019, p. 34).

Fortunately, a growing body of research connects financial literacy to improved financial behaviors and economic outcomes. A pioneering study on the impact of financial education on subsequent financial behavior found increased exposure to financial education at the secondary school level elevated the rates of saving and wealth accumulation as adults (Bernheim, Garrett, and Maki, 2001, p. 462). More recently, higher levels of financial literacy have been linked to the positive behaviors of being able to meet unexpected financial hardship, developing a retirement plan, and making retirement savings calculations as well as improved satisfaction with overall financial condition (Angrisani, 2020; Lusardi and Mitchell, 2011; Miller et al., 2015). Better credit and borrowing behaviors (Xiao et al., 2014), higher credit scores and lower loan delinquency rates (Brown et al., 2014; Urban et al., 2020) are also associated with financial literacy. Alternatively, lower financial literacy has been associated with higher debt levels, higher cost of borrowing and higher fees (Lusardi and Tufano, 2015).

While the need to support financial literacy is evident, college student access to financial literacy education is, at best, uneven. The recommendations of required financial literacy education for all college students (PACFL, 2008; FLEC, 2019) have not been implemented. Even at business schools, financial literacy education is not the norm. Less than half of AACSB schools offer some type of personal finance course (Ary et al., 2010; Bianco and Bosco, 2011). And when offered, such courses are typically electives and not required for degree completion. Financial literacy continues to be absent from the knowledge or skill expectations set by business accrediting bodies (AACSB, 2020; ACBSP, 2021; IACBE, 2018). As such, the decision to establish financial literacy education within the business curriculum often falls upon the business educator.

Recommendations Regarding Financial Literacy Education

The development of financial literacy education needs to be guided by findings and recommendations within the literature, including decisions on the timing and content of financial literacy education. To improve the potential impact of education on eventual financial behaviors, financial literacy education should deliver actionable, relevant and timely information that improves key financial skills and builds upon student motivation while making it easy to follow through with good decisions (FLEC, 2019). For example, a senior-year learning opportunity should focus on topics relevant and motivating to individuals becoming financially independent (Ary et al., 2010). One suggestion aligning content and timing is an advanced offering for college seniors on lifecycle topics associated with new employment, such as retirement planning (Abt Associates, 2021).

Recommendations guiding choice of pedagogy include learning that is experiential, hands on, and authentic (Abt Associates, 2021; Sardone, 2011) employing role play (PACFC, 2013) or a problem-focused approach (Ary et al., 2010). The use of visual tools to support learning is particularly effective for processing that requires extensive computations (Lusardi et al., 2017). Graphical representations, such as online financial calculators with graphing capabilities, can serve to support student learning by removing the computational effort and allowing students to process concepts aiding in decision making (Puntambekar and Hubscher, 2005). Other studies have shown videos (Kuntze et al., 2019; Lusardi et al., 2017), digital tools (Yin et al., 2022), web research exercises and budget applications (Angel, 2018) as particularly effective in supporting financial literacy education. Use of digital and virtual tools are recommended to complement rather than substitute in-person classes or workshops (Abt Associates, 2021; Angel, 2018).

Examination of current financial literacy offerings in business schools also informs this discussion. Financial literacy programming in business schools, when available, varies considerably by size and scope. Smaller-scale programming is represented by Handy et al.'s (2021) series of strictly voluntary financial literacy seminars or Lafond and Leauby's (2014) series of financial literacy writing assignments added to a freshman accounting class. Examples of broader scale programming include financial literacy assignments embedded across entire courses in business finance or accounting (Martinez, 2014; Rakow, 2019). The most extensive programming is often found as a stand-alone personal finance course, such as that offered by Brau et al. (2015) which culminates in a personal financial plan for each student. While such financial education programs vary in scope and purpose, common across the development of each are considerations of administrative and faculty buy-in as well as financial and human resource limitations (Crain, 2013). As perhaps a nod to such practical considerations, FLEC's recommendation to require financial literacy education offered an option of integrating financial education into existing mandatory courses as an alternative to implementing stand-alone, required financial education courses (2019, p. 21).

Guided by these best practices and insights, this paper outlines how a core business course required for upper classmates can support a focused, financial literacy learning opportunity. This approach also offers a unique combination of design features not found in existing programs. As the literature highlights, aligning the topic and timing of financial literacy, and employing an active and experiential pedagogy, improves student motivation and learning. This paper contributes to the literature by demonstrating use of a novel financial literacy simulation within an upper division college course, connecting the financial literacy activity to a topic of interest particularly to students nearing graduation. Also highlighted in the literature, financial and other considerations often limit the development of new educational offerings. By demonstrating the adaptation of existing financial literacy educational resources and integrating their use into an existing college course, this paper provides a roadmap for an efficient and effective means of supporting both financial literacy and course learning goals.

DESIGN DECISIONS

Curriculum design decisions require answers to several questions. Will the financial literacy education be voluntary or mandatory? Will the education be delivered through a stand-alone course or integrated across the curriculum? Will the education be part of the curricular or co-curricular offerings? This paper outlines a financial literacy learning opportunity designed to maximize student access in a setting where financial literacy education is not required by either the college or academic program, and financial and human resources are assumed to be limited. To accommodate these parameters, the sequenced set of activities are embedded in an existing course. The host course, Financial Management, is an upper-division course required of all business and accounting majors and, thus, is uniquely positioned to impact most if not all business school students.

Financial Literacy Topic

Students are motivated by a topic that is both relevant and actionable (FLEC, 2019, p. 8). Since Financial Management is scheduled to be taken by college juniors and, often, seniors, the financial literacy topic needs to be relevant to a student nearing the end of their undergraduate education. Retirement planning was chosen as relevant to the lifecycle location of students soon to experience, potentially, a new employment setting. The knowledge, skills and abilities gained through a retirement planning simulation is replicable, making it easier for students to carry out their retirement planning intentions with their own 401(k) or IRA plan enrollments (FLEC, 2019, p. 9). The learning necessary for effective retirement planning also supports key learning outcomes of this host course.

Learning Outcomes of the Host Course Relevant to the Retirement Planning Activity

While it may be quicker to simply "bolt" a new learning module to an existing course chassis, effective instructional design requires any new learning module on financial literacy to be integrated and aligned with the host course goals and learning objectives (Quality Matters, 2018). Five chapters in the Financial

Management course are of particular interest to any retirement planning activity, including the chapters on time value of money, bonds, stocks, market history, portfolios and diversification. The time value of money chapter lends itself to retirement planning activities where investments and withdrawals occur over a span of several years. The chapter on bonds provides an application of time value of money and opens the discussion to determinants of bond yield. In the chapter on stocks, students examine stock pricing and calculate returns on investment. The chapter on market history provides evidence of a historical relationship between risk and returns on various asset classes as well as the concept of market efficiency. Finally, the chapter on portfolios and diversification provides a glimpse into the mechanics of diversification on portfolio return and portfolio risk. The relevant learning outcomes for these chapters of the course are included in Table 1.

TABLE 1
ALIGNMENT OF OUTCOMES FOR FINANCIAL LITERACY AND COURSE LEARNING

Modules	Financial Literacy Learning Outcomes	Course Learning Outcomes
The Power of Compounding	<ol style="list-style-type: none"> 1. Analyze how compound interest works when saving and investing 2. Estimate how much you will need for retirement 	<ol style="list-style-type: none"> 1. Determine the present value of cash to be received at a future date 2. Determine the future value of an investment today 3. Interpret how time value of money is impacted by changes in key assumptions
Investing in Stocks and Bonds	<ol style="list-style-type: none"> 1. Explain what a stock is and how you make money from owning stock 2. Find and explain a stock quote 3. Analyze the performance of individual stocks over time 4. Explain what a bond is and how you make money from owning bonds 	<ol style="list-style-type: none"> 1. Estimate stock values 2. Determine shareholders' required rates of return 3. Estimate bond valuation 4. Calculate bond yields 5. Distinguish important bond features and types of bonds 6. Identify causes of bond value fluctuations
Investing in Funds	<ol style="list-style-type: none"> 1. Explain how mutual funds function 2. Analyze the composition of the S&P 500 3. Explain how investing in funds can diversify your portfolio and reduce risk 4. Evaluate how asset mix impacts returns 	<ol style="list-style-type: none"> 1. Calculate the return on an investment 2. Explain lessons from capital market history 3. Evaluate the implications of market reactions to market information 4. Identify the impact of diversification on portfolio risk and return 5. Differentiate between diversifiable and market risk
Investing for Retirement	<ol style="list-style-type: none"> 1. Explore factors that impact ability to meet retirement savings goal 2. Compare different types of retirement accounts 	
Signing up for a mock 401(k)	<ol style="list-style-type: none"> 1. Simulate enrolling in a 401(k) 	

Pedagogy

Promoting student experiential and active learning are worthy goals as they have been positively associated with important student outcomes such as learning, persistence, and satisfaction (Kuh et al., 2006) and improved reasoning and problem solving (Pascarella et al., 2009). Motivation to learn is enhanced when students see a real-world connection to the course content (McClure, 2012). Retirement planning lends itself to experiential and active learning where students learn by doing.

The financial literacy learning activities embedded in the host course include five modules related to retirement planning. The five modules incorporate many of the tools recognized to support financial literacy education, including online financial calculators with interactive graphing capabilities, web research exercises, and videos (Lusardi et al., 2017; Kuntze et al., 2019; Angel, 2018). The final module culminates in a simulation where students enroll in a mock 401(k) plan. As an instructional tool, simulations are an effective learning activity as they engage students in a simplified version of a real-world practice drawing upon what they already know while advancing further inquiry (Chernikova et al., 2020).

Financial Literacy Curriculum Resources

A number of organizations provide financial literacy curricula to support instructors and students. (See Appendix 1 for links to financial literacy curricula and resources). While many of these organizations target secondary education students, with modifications their resources can meet the goals of financial literacy at the post-secondary setting. One organization providing free financial literacy curricula is Next Gen Personal Finance (NGPF) (O'Neill, 2018). NGPF resources (NGPF, 2022) are available to verified instructors, including college and university faculty. NGPF provides ready-made learning modules to be modified or used as-is. NGPF taps into existing financial resources on the web and other media and also creates its own learning materials. NGPF additionally provides instructors free professional development opportunities in the content area of personal finance. NGPF's module on "Investing" serves as a foundational resource for the simulation outlined in this paper. Instructors create a verified instructor account by going to: <https://www.ngpf.org> and selecting "Create Free Account." After receiving the application, NGPF will confirm teacher status and respond, typically within 24 hours.

FINANCIAL LITERACY LEARNING ACTIVITY: SIMULATED ENROLLMENT IN A MOCK 401(k)

This paper describes how financial literacy education can be implemented into a business core finance class through a simulated enrollment in a mock 401(k) using free resources provided through Next Gen Personal Finance. The simulated enrollment represents the last step in the students' financial literacy activities. Leading up to the simulated enrollment are four preliminary modules titled: the power of compounding, investing in stocks and bonds, investing in funds, and estimating retirement investing goals. Table 1 demonstrates how the financial literacy education activities support not only financial literacy education goals but also course learning outcomes.

In "The Power of Compounding" module, students calculate and graph compounding results using online calculators and other web resources. Students estimate retirement investing goals using an annuity computation, a retirement needs worksheet, and an online retirement calculator. (Student instructions for the activity "Estimating Retirement Investing Goals" are included in Appendix 2.) As part of the "Investing in Stocks and Bonds" module, students access and explain online bond and stock quotes, analyze yield curves using a dynamic online resource, and compute rates of return on market investments. With the "Investing in Funds" module, students utilize an online interactive resource to map changes in the companies and industry sectors comprising the S&P 500. They also evaluate online mutual fund fact sheets, contrast mutual funds with exchange traded funds, distinguish details of various target date funds, and consider the impact of asset allocation on portfolio risk and returns. In the "Investing for Retirement" module, students compare types of retirement accounts, consider tax-related benefits of Roth versus traditional options, create individual social security accounts, and identify contribution rules and limits.

In the “Signing Up for a Mock 401(k)” module, which follows the educational roleplay established by NGFP, students complete an online investor questionnaire to identify their investing goals, time horizon, experience, and risk tolerance. Students revisit their earlier computations on anticipated retirement investing goals and make any necessary adjustments. Finally, students complete a simulation in which they enroll in a mock 401(k) plan, reviewing investment options and selecting both deferral amounts and asset allocations. The activity concludes with students’ reflections on how their choices align with their retirement goals and risk tolerances. (Student instructions for “Signing up for a Mock 401(k)” are included in Appendix 3.)

CONCLUSIONS

At a time when financial decisions are becoming increasingly complicated and falling more heavily on the shoulders of individuals, levels of financial literacy in the U.S. is declining (Lin et al., 2019, p. 33). While some progress has been made at the state level to implement compulsory K-12 financial literacy education (Center for Financial Literacy, 2017), no comparable requirement exists at the post-secondary level. For many college educators, the goal to improve college student financial literacy can be initiated, and student access maximized, by implementing financial literacy education modules within existing core curriculum, particularly required core courses. Evidence suggests financial literacy improves economic outcomes (Angrisani, 2020; Lusardi and Mitchell, 2011; Lusardi and Wallace, 2013; Miller et al., 2015). Research further suggests active and experiential learning improves student learning (Kuh et al., 2006; Pascarella et al., 2009). Best practices for financial literacy education recommend tailoring the topic and timing of financial literacy education to the needs and interests of the user, resulting in financial skills that are relevant and actionable (FLEC, 2019).

This paper outlines one such financial literacy education opportunity, implemented as a retirement plan enrollment simulation within an existing business core course. By integrating the financial literacy opportunity as part of a required course, all business and accounting students are potentially impacted. Knowledge and skills that support retirement planning also support several existing student learning outcomes in the Financial Management course. Combined with experiential activities leading to a simulated enrollment, the retirement planning opportunity meets the goals of active and experiential learning and improves the chance of impacting behavior.

The importance of financial literacy related to retirement planning cannot be overstated as retirement planning decisions are falling more heavily on individuals. Delivered in a course nearer to college graduation and relevant to those potentially facing a new employment setting, the topic of retirement planning is relevant and represents a set of decisions and behaviors students may soon encounter. While supporting learning outcomes of the host course, this retirement planning activity is geared to help prepare students for real-world steps upon graduation and new employment. And, implementing good financial habits early in one’s working career can have a lifetime impact on financial security.

The financial literacy opportunity outlined in this paper represents an effective and efficient approach to implementing financial literacy programming, particularly in circumstances that lack institutional support and/or economic resources for new financial literacy programming. Financial literacy educational resources are available from several organizations. These resources, such as NGFP’s mock 401(k) unit, can be adapted to meet the financial literacy learning needs of college students. Other instructors can replicate the approach demonstrated in this paper by incorporating financial literacy topics relevant to the learning outcomes of their courses. The financial literacy topics of credit and debt management, budgeting, and investing could reasonably fit across learning outcomes in courses such as accounting, economics, investments, finance, management, and human resource management.

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APPENDIX 1: COMPIATIONS OF FINANCIAL LITERACY CURRICULA AND RESOURCES

1. *U.S. Department of Education's You for Youth*: <https://y4y.ed.gov/financial-literacy-for-all>
2. *TeachFinLit.org*: <https://www.teachfinlit.org/new-teachers/>
3. *Coalition of Higher Education Assistance Organizations*: <https://coheao.com/taskforces-committees/financial-wellness/financial-literacy-task-force-resources/>
4. *Personal Responsibility Education Program (PREP) Financial Literacy*: <https://www.health.state.mn.us/people/adolescent/prep/financial.html>
5. *Brigham Young University*: <http://personalfinance.byu.edu> (copyright (c) Bryan Sudweeks)
6. *NextGen Personal Finance*: <http://www.ngpf.org>

APPENDIX 2: INSTRUCTIONS FOR STUDENTS: ESTIMATING RETIREMENT INVESTING GOALS

You are required to **estimate retirement investing goals** using three separate methods:

1. an annuity method using your financial calculator
2. the Retirement Planning Needs spreadsheet available at <https://personalfinance.byu.edu/retirement-planning-course>
3. the retirement calculator available at <http://www.kiplinger.com/tools/retirement-savings-calculator.html>

Three simplifying assumptions will be used. (Each of these assumptions can be relaxed when we recompute this estimate in Module 5)

1. You currently have zero retirement assets
2. You will not be eligible for social security or a pension
3. Retirement income needed will be at a 70% wage replacement rate.

Each of the three methods requires the following input data:

1. Your current age (CA)
2. Anticipated age at retirement (RA)
3. Anticipated age at death (DA)
4. Rate of increase in wages/income and spending while working (assumed to be the same) (H)
5. Rate of return on investments (R)
6. Current salary/income (if your current salary is not sufficient to meet your current spending needs, then use current needed salary) (CS)

First, compute your estimated retirement investing goal using the Annuity Method:
(remember to state i/y as a percentage)

Step 1: Inflate current annual salary to salary at point of retirement

$PV = \text{current salary}$

$N = RA - CA$

$i/y = H$

Compute FV. This future value represents your annual salary/income at the end of your working years. (FS)

Step 2: Calculate amount needed in retirement savings at the beginning of your retirement to replace 70% of your income.

$PMT(\text{due}) = (.70 * FS)$

$N = DA - RA$

$i/y = ((1+R)/(1+H))-1$

Compute PV. This present value represents the inflation-adjusted savings amount needed in retirement savings at the time you start your retirement. (IAS)

Step 3: Calculate your annual retirement investing goal

$$FV = IAS$$

$$N = RA - CA$$

$$i/y = R$$

Compute PMT. This payment is the annual contribution you need to make to retirement savings each year.

Next, recompute your annual retirement contribution using, first, the Retirement Planning Needs spreadsheet, available at <https://personalfinance.byu.edu/retirement-planning-course>, and second, Kiplinger's Retirement Calculator, <http://www.kiplinger.com/tools/retirement-savings-calculator.html>. Compare your annual retirement contribution estimates under these three methods. What additional assumptions do the second and third method allow you to consider that the Annuity Method did not? How do these assumptions change (if at all) your estimated annual retirement savings goal? Based on your analysis, what is your best estimate for your retirement investing goal?

APPENDIX 3: STUDENT INSTRUCTIONS: SIGNING UP FOR A MOCK 401(k)

In this Module 5, you will complete a simulated workplace retirement plan enrollment by signing up for a mock 401(k) (activity adopted from retirement planning roleplay resources available at <https://www.ngpf.org/blog/just-one-resource/just-one-resource-roleplay-sign-up-for-a-401k>). The decisions you make in Module 5 require you to draw upon the skills and knowledge you gained in the previous modules on The Power of Compounding, Investing in Stocks and Bonds, Investing in Funds, and Investing for Retirement. To complete this assignment, you need to perform the required computations, and respond to questions 1) through 13). Here are the details:

You have recently graduated from college and have been hired at a company that offers a 401(k) plan as well as a 50% match on up to 6% of your salary. You wish to participate and decide to begin the process of making decisions on how to enroll and invest.

Part I: Re-Compute Your Retirement Investing Goal Using the Retirement Planning Needs Spreadsheet

When you first estimated a retirement investing goal in Module 1, several simplifying assumptions were made. Now, instead, you wish to use new assumptions you feel are more accurate. These include:

- a. Instead of assuming you have zero retirement assets (as assumed in Module 1), use the actual value of any retirement asset you currently have.
- b. Instead of assuming you will not be eligible for social security (as assumed in Module 1), use the social security benefit you calculated this term. (If you need to recompute your estimate, use Social Security Retirement Estimator from Module 4 at: <https://www.ssa.gov/benefits/retirement/estimator.html>)
- c. Instead of assuming retirement income needed will be at a 70% wage replacement rate (as assumed in Module 1), choose a different rate, higher or lower, if you feel doing so would be a better planning assumption for you.
- d. Rather than assuming a single rate of return will be earned on your investments throughout your life (as assumed in Module 1), based on what you learned in Module 3 on investing in funds, asset allocation, and diversification you realize you may wish to assume one rate of return on investments while working and another rate retirement.
 - i. Consider how your investment mix may change during retirement and the historical returns by asset class we covered in class. Referencing our earlier resources on asset class returns may be helpful: <https://novelinvestor.com/asset-class-returns/> and <https://advisors.vanguard.com/VGApp/iip/advisor/csa/analysisTools/portfolioAnalytics/historicalRiskReturn>

- e. Rather than assuming a single rate of inflation for both working years and retirement years (as assumed in Module 1), you may wish to consider one inflation rate while working and another rate during retirement. To assist you may wish to reference Module 4’s resource on historical rates of inflation: <https://www.usinflationcalculator.com/inflation/historical-inflation-rates/>
- f. The average starting salary of new college graduates in 2022 is approximately \$55,000; but, you are not average! To calculate your retirement investing goal, you need a starting salary. Please consider using either \$60,000 or your actual salary for purposes of this Module.

Using your new set of assumptions, re-compute your retirement investing goal using the Retirement Planning Needs spreadsheet available at <https://personalfinance.byu.edu/retirement-planning-course>.

- Q1. What is your new annual retirement investing goal? How does this estimate compare to the estimate developed earlier this term?
- Q2. What assumptions for current salary, inflation, investment returns, replacement rate, and age at retirement did you use? Please explain your justification for using them.
- Q3. Is your retirement investing goal lower than the IRS limit on 401(k) contributions? Is it more than 6% of your salary? Do you believe you can commit to setting aside your computed annual retirement investing goal and still have enough income to pay for living expenses and other saving goals? If you answer “no” to any of these questions, explain what steps you plan to take and why.

Part II: Your Elective Deferral

- Q4. Complete the 401(k) enrollment form with your employer. Indicate (yes/no) if you request your company to defer a portion of your compensation. If yes, indicate the amount per month you wish to defer.

Part III: Your Asset Allocation

Next, you need to decide how to allocate your salary deferral between the investment options available to you as part of your employer’s plan. To help you decide, you complete a risk tolerance assessment such as this one available through Forbes (<https://www.forbes.com/advisor/investing/investment-risk-tolerance-quiz/>).

Forbes’ Risk Tolerance Questionnaire

- Q5. Based on your score, identify your risk tolerance.

**TABLE 1
RISK TOLERANCE ASSESSMENT SCORE**

Score	Risk Tolerance	Portfolio Allocation Profile
45-50	You have a high tolerance for risk.	Extremely Aggressive
36-44	You have an above-average tolerance for risk.	Very Aggressive
29-35	You have an average tolerance for risk.	Moderately Aggressive
21-28	You have a below-average tolerance for risk.	Moderately Conservative
10-20	Low risk tolerance	Conservative

Knowing your risk tolerance can inform your asset allocation decision. The asset allocation calculator put out by Smart Assets can help you in that process (<https://smartasset.com/investing/asset-allocation-calculator#zqrvmwvKpu>).

Smart Assets Calculator

- Q6. What is the recommended mix between stocks and bonds based on your risk profile?
- Q7. What percentage will you invest in Stocks/Bonds/Other (total must add up to 100%)? If you chose a mix different than what was recommended by the calculator, provide a brief description of your thought process.

Part IV: Select Your Funds

You review the investment funds, past performance and fees associated with the investment options in your employer’s plan:

**TABLE 2
OPTIONS, PERFORMANCE AND FEES**

Investment Options	Average Annual Total Returns as of May 31, 202x				Fees	
	YTD	1 year	5 years	10 years	Gross Fund Exp	Admin Fee
Small Cap Stock Fund	-19.79%	-15.87%	11.14%	12.92%	0.66%	0.10%
Total International Stock Index Fund	-10.71%	-11.95%	4.66%	6.75%	0.07%	0.10%
Mid Cap Index Fund	-14.13%	-5.59%	10.61%	12.89%	0.03%	0.10%
Total Stock Market Index Fund	-14.20%	-4.01%	12.70%	NA ⁷	0.02%	0.10%
S&P 500 Index Fund	-12.77%	-0.32%	13.37%	14.39%	0.02%	0.10%
Dividend Growth Fund	-6.01%	5.76%	13.54%	13.70%	0.27%	0.10%
Balanced Index Fund (60/40)	-12.05%	-5.51%	8.31%	9.14%	0.06%	0.10%
Bond Income Fund	-7.63%	-7.23%	2.20%	2.86%	0.42%	0.10%
Total Bond Market Index Fund	-9.05%	-8.32%	1.17%	1.67%	0.03%	0.10%
Stable Value Fund	0.75%	1.85%	2.31%	2.20%	0.20%	0.10%
Money Market Fund	0.16%	0.23%	1.23%	0.77%	0.00%	0.10%
Target 2065	-13.52%	-9.12%	N/A	N/A	.07%	.10%
Target 2060	-13.52%	-9.11%	8.57%	9.77%	.07%	.10%
Target 2055	-13.53%	-9.12%	8.57%	9.76%	.07%	.10%
Target 2050	-13.25%	-8.84%	8.47%	9.71%	.07%	.10%
Target 2045	-12.93%	-8.56%	8.18%	9.51%	.07%	.10%
Target 2040	-12.53%	-8.26%	7.84%	9.08%	.07%	.10%
Target 2035	-11.77%	-7.55%	7.49%	8.60%	.07%	.10%
Target 2030	-9.65%	-5.54%	7.10%	8.05%	.07%	.10%
Target 2025	-7.22%	-3.51%	6.12%	7.01%	.07%	.10%
Target Income Fund	-6.40%	-3.22%	4.94%	4.77%	.07%	.10%

- Q8. When looking at returns, which funds are the most attractive?
- Q9. When looking at fees, which funds are most attractive?
- Q10. What should you keep in mind as you review the performance data?
- Q11. It’s time to make your asset allocation decision. Remember your total allocation must add up to 100 percent.

TABLE 3
401(K) ENROLLMENT FORM

INVESTMENTS	Percentage	INVESTMENTS	Percentage
Equity Funds		Bond Funds	
Small Cap		Bond Income Fund	
Total International Stock Index Fund		Total Bond Market Index Fund	
Mid Cap Index Fund		Stable Value	
Total Stock Market Index Fund		Stable Value Fund	
S&P 500 Fund		Money Market	
Dividend Growth Fund		Money Market fund	
Balanced and Target Date Funds			
Balanced Index Fund			
Target Retirement 2065 Fund			
Target Retirement 2060 Fund			
Target Retirement 2055 Fund			
Target Retirement 2050 Fund			
Target Retirement 2045 Fund			
Target Retirement 2040 Fund			
Target Retirement 2035 Fund			
Target Retirement 2030 Fund			
Target Retirement 2025 Fund			
Target Retirement Income Fund			
TOTAL			

- Q12. Explain your final portfolio allocation choice. How was it impacted by your retirement goals and/or risk tolerance?
- Q13. As you think about eventually investing in a retirement plan in the future, what are 3 key takeaways you have about investing in a 401(k) plan that may help you.