



# Unlocking Financial Success: Empowering Higher Ed Students and Developing Financial Literacy Interventions at Scale

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## ABSTRACT

Greater financial literacy is critically needed among young adults in the United States [10,35], but many financial literacy education courses have been less effective than hoped for by educators and researchers [7,15]. Additionally, many have not been designed around established curricula or learning science principles, rendering findings difficult for researchers to study empirically [6,34]. In order to better understand the psychosocial mechanisms that predict success in improving learner knowledge and behavior, online educational interventions at scale can be an effective path forward. We conducted interviews with subject matter experts and young adult students to explore the highest priority learning objectives for a brief course curriculum to improve the financial literacy of US young adults. We then leveraged our findings from this study and content from our open-source textbooks to develop the first of several brief online learning interventions for deployment on the large-scale OpenStax Kinetic research infrastructure [2]. In this work-in-progress paper, we discuss the next steps in our research agenda, including course content development and deploying this intervention, as well as our broader plans for our future financial literacy education interventions and translating research into practice with our institutional collaborations.

## CCS CONCEPTS

• Applied computing → *E-learning*. • Education

## KEYWORDS

Interventions; Financial literacy; Research methods at scale; Higher education; Adult learning; Qualitative data analysis

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## 1 INTRODUCTION

Financial literacy, which comprises both the knowledge and skills necessary to secure one's financial well-being [13], predicts a wide range of positive psychological and economic outcomes, such as higher savings rates, lower stress and anxiety, and greater overall well-being [4]. However, financial literacy among young adults in the US remains low, with as many as 40–50% of young adults failing various measures of financial literacy [10]. In a world of high inflation rates [28], new and complicated financial instruments, and greater personal retirement savings responsibilities [21], financial literacy skills have never been more critical for the next generation to develop.

Despite the importance of the topic, previous education efforts have often not incorporated established educational frameworks or learning science principles, making findings difficult for researchers to study empirically and make informed recommendations for future studies [1,6,34]. Moreover, many previous financial literacy courses have shown small or negligible effect sizes [7,15]. Researchers have offered various causes for failure, such as low motivation [23] and limited interest from participants [24], but the field offers little consensus on how to improve financial literacy education.

Finally, most financial literacy research explores correlational findings, while experimental research, which enables researchers to make causal inferences, is much less common [22]. Field experiments, which assess actual financial behavior instead of behavior in environments participants know are artificial (which lab experiments address), are even rarer [9]. In sum, this research area requires a greater understanding of how a new financial literacy course might succeed where so many others have failed.

Brief online interventions can be effective at producing positive psychosocial changes, such as improvements in mental health [8,33], as well as knowledge gains (e.g., [19,26]). These

findings indicate that an online financial literacy education intervention might be effective. However, many financial literacy interventions are classroom-based and therefore not scalable and/or rely on proprietary materials with limited ability to reach a wider student population (e.g., [16]). An ideal intervention, in the context of financial literacy, might be one that explores a psychosocial construct while ensuring that all participants receive meaningful financial course content regardless of their intervention condition.

In this paper, we first discuss our prior research, and then we describe our agenda for implementing scalable interventional learning research on financial literacy education. Our overarching research question as we plan our future work is: *What kinds of theory-based financial literacy interventions can be designed to be brief, meaningful, and deployable at scale?*

## 2 OUR PRIOR RESEARCH

To inform the development of the content areas and behavioral barriers a brief, large-scale, online intervention should address, we collected data from both young adult students ( $n=10$ ) and subject matter experts (SMEs;  $n=3$ ) in semi-structured qualitative interviews. Both groups of participants were asked to discuss where and why they believed financial literacy education courses failed young adults, as well as the most needed content areas.

Representative questions for the young adults include:

- *Which financial topics do you think you need to learn more about? Why do you think you need to learn more about these topics?*
- *In which ways (if any) do you think you do a good job managing your money? What about areas you need to learn more about or do a better job with? Why do you think you don't do these things?*
- *What do you think other people your age could do to improve their financial situations?*

Representative questions for the SMEs include:

- *In what areas do you think young adults struggle most with their finances?*
- *What do you think are the core financial planning topics that a young adult needs to know to succeed in life?*
- *Why do you think some young adults fail to implement the financial advice they receive?*
- *In your opinion, what would be the best way to motivate young adults to more proactively manage their finances?*

We discuss the process of analyzing and synthesizing findings from this study in detail in a separate needs assessment research paper [3].

## 3 INTERVENTION DEVELOPMENT

Below we outline our plans for our first large-scale intervention. We expect our plans to evolve as we continue the content

development process and pilot test our intervention internally. Over the longer term, we aim to develop multiple different course curricula and interventional designs.

### 3.1 Course Content Development

Based on the previously mentioned paper, we identified *credit management* and *credit cards* as our first domain to study. Representative quotes from our SMEs on the importance of credit management are shown below.

- *"[A lesson on] credit cards... [and] the time value of money would go a mile, I think, with a lot of students, with real examples of how quickly you can descend if you're paying 18% or more [interest rates] on credit cards." (SME 1)*
- *"[We teach how to] control debt, control credit. [And] teaching... 'what is credit?'" (SME 2)*
- *"I've had kids... [who] don't want to acknowledge they have \$20,000 in credit card [debt]." (SME 3)*

Our planned content includes credit-related financial concepts independently brought up by the SMEs as critical to young adult students, such as interest rates, the time value of money, and how to check one's credit report. Our SMEs' responses are corroborated by quantitative research on consumers' challenges with understanding the full costs of using credit cards (such as a consistent underestimation of credit card payments that will be required to pay off a debt; [31]). One section of our content will also educate young adult students on how to responsibly manage credit cards and reduce or prevent credit card debt. We are currently collaborating with one of our SMEs to develop the first course for our intervention. The course curriculum will be text-based (with limited images as necessary) and incorporate relevant sections from the OpenStax *College Success* financial literacy chapter.

Our goal is to build an intervention that takes no longer than 30 minutes for the learner to complete; of that, only 15 minutes will be available for the course content. Because the reading speed of most native English-speaking adults is 200-250 words per minute [5], we plan on the first course to contain approximately 3,000 words of content.

### 3.2 Intervention Design

From our needs assessment, we found that many students do not seek out financial knowledge or actively engage with financial education because they believe it is not currently important or relevant to them.

Representative quotes from both SMEs and students include:

- *"[For some students] it's not a priority and oftentimes... [it takes until] it has been elevated to a problem and the problem has been elevated to a crisis [that] you'll get their attention. But typically what you'll see... is if it's important enough to the student to be resolved or address, they will make it a priority and they will complete and follow through... [with] action." (SME 2)*

- “*Most students don’t want to hear [financial advice] until they need to know it... It’s kind of on demand.*” (SME 3)
- “*It didn’t feel like I was old enough to engage in [my freshman year finance course]... It felt like it’s a ‘later’ me issue to figure out all these things... [But] now... it’s a ‘later’ me.*” (Participant 2)
- “*I [took] a financial literacy course in high school, but... I honestly couldn’t tell you anything I learned from it... Maybe high school was too early for some of that stuff.*” (Participant 5)
- “[Many finance classes are] not personal. No one’s going to care about that.” (Participant 9).

To counter these perceptions, our first intervention will incorporate *utility-value theory* [17,18]. This theory, which stems from research on achievement motivation and expectancy-value theory [36], states that people are more likely to complete tasks they find both achievable and relevant. Previous utility-value interventions have been found to improve relevant outcomes, including interest in the topic, expected performance on an assessment [17], and participation rates in relevant courses [14], with greater proportionate improvements for participants with the weakest ability perceptions and prior performance [30].

The writing exercise that captures utility-value theory will prompt students to complete a five-minute writing exercise on how one or more of the topics from the lesson could apply to their own lives. The control prompt will simply ask students to spend five minutes summarizing the lesson.

Finally, in order to control for existing differences in credit-related knowledge, students will complete both a pre and post-intervention multiple choice quizzes, also designed by the SME. The quizzes will be approximately 10 items each and will be designed and validated as parallel forms (two versions of a measure that assess the same constructs [11]), which will allow us to assess knowledge changes without administering repeated items to participants.

The full course design is shown below.

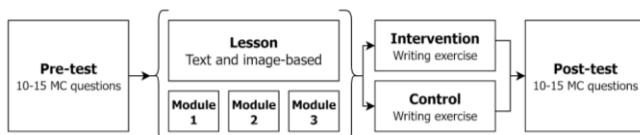


Figure 1: Credit financial literacy intervention design

### 3.3 Deployment on OpenStax Kinetic

OpenStax Kinetic [2,27,29] is a large-scale research platform designed to connect learners with research opportunities by participating in relevant online studies they might find interesting or useful. Participants use an OpenStax login to access the platform and receive virtual credits for participating in studies, which enters them into a raffle to win gift card prizes. An example study “card” that might appear on OpenStax Kinetic for this intervention is shown below.



Figure 2: Example participant view of call to action in OpenStax Kinetic financial literacy intervention

At the end of the intervention, participants will be shown their scores on the intervention, as well as feedback on the quiz items they got wrong. They will also have the option of downloading the full course for their own reference. Afterward, participants will be automatically returned to the OpenStax Kinetic platform and awarded their participation points.

### 3.4 Participant Follow-up on OpenStax Kinetic

Finally, the Kinetic research platform also enables us to follow up with participants a set period of time after they have completed a task. We will use this feature to follow up with participants by asking them to complete a brief self-report of their relevant behavior four weeks after completing this lesson. Research shows that financial behavior is more difficult to change than knowledge [32], but it is also the more important dependent variable to impact in terms of influencing financial outcomes [12].

This self-report questionnaire is still under development, but representative questions might include:

“Within the past four weeks, have you...

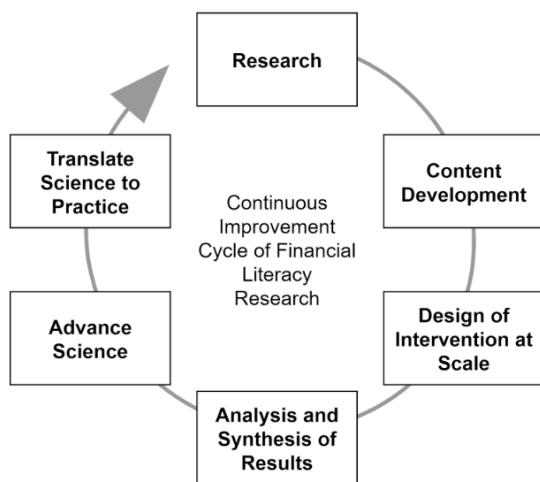
- ...requested a free credit report?”
- ...added together all the debts you owe?” (For participants who have indicated that they have credit card or other debt.)
- ...checked the current interest rate on one of your credit cards?” (For participants who have indicated that they have credit cards.)

Our goal is to ultimately assess the ability of this intervention to promote healthy financial behaviors among our learners, as well as whether the utility-value intervention is more effective than the control condition at reaching this goal.

## 4 FUTURE DIRECTIONS

Content development on our credit management course for our first intervention is actively underway with our research team and a collaborating SME. After completing internal pilot testing, we hope to deploy this study on OpenStax Kinetic by July 2023. We will assess the impact of this study in increasing learner knowledge and use the findings to guide our next steps in this research agenda. We also plan to add other online course content delivery methods (e.g., recorded video lectures, interactive elements) on our financial topics to determine whether the medium of instruction influences learners' knowledge retention and/or behavior.

See the figure below for an overview of the continuous improvement cycle we have developed for our financial literacy interventions research agenda.



**Figure 3: Overview of continuous improvement cycle for our financial literacy research agenda**

Because we have access to certain participant demographic information (e.g., first-generation status, level of formal education obtained, English language learner status) from another Kinetic survey that we can connect to the intervention data, we will also be able to assess group differences in intervention outcomes. Research shows that learners' contexts matter [25], and we will explore any differences from a DEI (diversity, equity, and inclusion) lens and develop solutions that will increase equitable learning outcomes.

Our curriculum development work, both material we develop internally and the material we develop with one or more SMEs, will also be used in future interventions. Some of our mostly highly prioritized content areas include student loans, budgeting, and investing. We will continue to use open-source materials

when available. In addition to *College Success* textbook content, we also plan to incorporate content from the "Money Management" chapter of OpenStax's recently published *Contemporary Mathematics* textbook when relevant.

Our longer-term plans include identifying other psychosocial theories (e.g., goal-setting theory [20]) that might be applicable in a scaled learning environment to design further interventions. We also plan to more extensively collaborate with other institutions and forge connections that eventually will allow us to offer the intervention to students in various classrooms directly. We will also be able to offer customized content for students of that institution, such as contact information for the institution's financial aid office and other student services. Conducting interventions via these institutional partnerships will allow us, with the approval of the IRB, access to course outcome data, such as grades and pass rates.

## 5 CONCLUSION

Deploying financial literacy courses at scale is an area of ongoing focus for our OpenStax research team. We have laid the groundwork for the topics and barriers US young adults face in increasing their financial literacy, and we are now developing the first intervention to explore the impact we can make on participants' financial knowledge. We also hope to further conversations on relevant psychosocial theories and experimental designs in online spaces. This intervention will be our first of many studies to explore whether and how we can improve participants' financial knowledge and behavior through large-scale, brief online interventions.

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