Technology Effects on Financial Literacy

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Abstract—Financial literacy is the measure of personal finance best practices and actions. In this project proposal, the study reviews the efficacy of Lampo Group, LLC's *Financial Peace University* online compared to the traditional classroom curriculum. The study includes qualitative analysis of focus group surveys along with a larger quantitative survey of American paths to financial health. The study concludes with recommendations to personal finance educators to improve student results and next steps for further research.

1 INTRODUCTION

For the presentation, click here *or visit* https://youtu.be/SBCQeOykBkQ.

Financial literacy is declining in the United States (Peng, Liu, Lu, Liao, Tang, & Zhu, 2018). Exiting the housing crisis and recession of 2007-2009, student debt is the next major threat to the American dream. 4 in 10 students will go into default or delinquency on their student loans (Cunningham & Kienzl, 2011).

To combat the potential financial destruction of America, the education and financial industries offer financial literacy courses to educate citizens and positively affect financial behaviors. One of the most prominent financial educators in the United States is Dave Ramsey. The financial expert's company, Lampo Group, LLC, produces financial literature, media, and curriculum, targeting young children, high school students, and adults. Ramsey's most popular product, *Financial Peace University* (or *FPU*) is a nine-lesson program taught over several weeks – either in classrooms or online – to educate adults on how to manage their personal finances effectively and pay off debt. Traditional classes meet at community centers and religious organizations at little or no cost to the student. At the time of writing, there are 111 classes available in Greater Atlanta. The online version of the course compares in price to one credit hour at a community college.

Financial Peace University covers each of the major topics required to become financially literate: budgeting, emergency funds, debt management, investing, insurance, retirement planning, real estate & mortgages, and avoiding poor financial decisions. *FPU* uses mixed media to educate students via videos, worksheets, and interactive discussions. In recent years, *FPU* includes access to

Ramsey's budgeting tool, *Every Dollar*, to implement the lessons learned in the course after the first lesson.

FPU touts thousands of graduates interviewing on Ramsey's radio show, explaining their journey to financial literacy and good financial health. However, no public research exists that shows the *best* way to take *Financial Peace University*. The aim of this project is to qualitatively and quantitatively analyze if the online version of *Financial Peace University* improves financial literacy and well-being better than the traditional classroom version or no course at all.

2 RELATED WORK

Since the turn of the century, the Internet enables educators to create virtual classrooms to reach otherwise unreachable students. In the case of financial literacy, students with busy work schedules, families, and otherwise limited means to access financial education may use technology to learn and improve their financial well-being.

Slaughter (2006) states digital programs, such as *Practical Money Skills for Life*, successfully improve financial literacy for African American high school students by as much as 21% based on qualitative analysis. Slaughter (2006) implemented a two-phase method: preliminary interviews to understand financial attitudes and pre/post-testing within a web-based personal finance course quite like *Financial Peace University*. Unlike Slaughter's work (2006), this project will survey former and current *FPU* students to measure their financial well-being before and after the course; this project will utilize quantitative analysis with an expected large sample size rather than a qualitative study to understand the phenomena of financial literacy. Slaughter's questions (2006), such as demographics and attitudes, will influence questions in this project's survey.

In *Outcomes of On-line Financial Education for Chronically Ill Rural Women* (Haynes, Haynes, & Weinert, 2011), the level of intervention in the course is a key focus to determine financial literacy improvements with online education. Haynes et al. (2011) studied three groups: intense intervention with support from other classmates and experts, moderate intervention without support, and a control group. Haynes et al.'s study (2011) featured larger groups than Slaughter's (183 participants in total with pre- and post-test data). Like *FPU*, the course was an extended intervention (22 weeks) (Haynes et al., 2011). 60% of the Haynes et al. (2011) study participants were middle-aged or senior adults; a direct foil comparison to Slaughter's participants (2006). This project's participants will feature participants between the ages of 20 and 45, covering a different demographic for online financial education.

Way & Wong (2010) investigated if technology improves financial well-being. They found the opportunities to target both general and special groups are possible with technology, but they also found we must apply specific teach strategies to implement the technology effectively. Way & Wong recommended a focus on decision-making, human motivation, and meaningful engagement to improve success. In addition, they concluded a direct approach to "learn with" instead of "learning from" technology (Way & Wong, 2010, p. 64). The research duo found social media and forums as a key part in learning through shared experiences. This is also a feature of *FPU*.

The Federal Reserve Bank (FRB) of St. Louis measured the effectiveness of a single course, *Soar to Savings* (Wolla, 2017). Like Wolla's study (2017), this study will determine the efficacy of a specific course. The FRB concluded online courses have similar, positive effects to traditional courses. The government does not give Community Reinvestment Act (CRA) credits to banks for teaching courses online; the act requires an in-person class for banks to earn CRA credits. This affects current pedagogy used by financial institutions.

Other researchers found behavior and psychology plays a significant role in financial wellness (Fernandes, Lynch, & Netemeyer, 2014). Confidence has a positive correlation with financial independence (Farrell, Fry, & Risse, 2016). Media on the subject also influences behavior and moods on personal finance, targeting middle-to-upper income families and shifting Americans towards neoliberalism (Davidson, 2012). *Financial Peace University* and Dave Ramsey/Lampo Group, LLC materials follow this pattern, encouraging students to win financially and become self-reliant.

3 MATERIALS & METHODS

3.1 Hypothesis

The average student achieves better financial health when completing *Financial Peace University* online compared to the traditional course or not taking the formal course but consuming Dave Ramsey/Lampo Group, LLC materials.

3.2 Methodology

3.2.1 *Data Gathering*

The researcher conducted initial need finding through online interview surveys with a small population of financial education students to gather qualitative information about their experiences.

The researcher performed need finding with a preliminary survey to find high-level themes and to show previously unknown phenomena prior to conducting a large-scale survey. Interviewees took the survey which included qualitative questions to find context. The need finding part of the project detected biases within the population and the researcher and connected moods to behaviors as well as determined if *FPU* responds to the needs of its students. The preliminary survey subjects were a focus group prior to large-scale research.

The researcher used survey research to gather information from *FPU* students and graduates. This second survey dove deeper into the details to find pedagogy successes and failures within *FPU*.

The survey gathered demographic information, using semantic differential scaling to measure financial attitudes and behavior, asked situational questions to assess financial literacy, and asked participants before-and-after financial health questions related to their time in *Financial Peace University* or consuming related materials created by Lampo Group, LLC.

By applying stratified random sampling, the study split participants into four groups:

1. Traditional FPU graduates
2. FPU online graduates
3. Non-student consumers of Dave Ramsey/Lampo Group, LLC materials (video, audio, or literature)
4. Participants who are not consumers of Dave Ramsey/Lampo Group, LLC materials (video, audio, or literature)

Georgia Tech hosted both surveys on their Qualtrics survey software-as-a-service (SaaS) platform.

Focus group and primary survey responses are available on GitHub at https://github.com/ZackWhiteIT/technology-effects-on-financial-literacy.

The researcher recruited participants the survey across multiple channels: word-of-mouth, the CS6460 discussion board on Piazza, Facebook, Twitter, and Reddit. Specifically, the researcher focused on personal finance Facebook groups affiliated with Dave Ramsey. The researcher recruited participants from Reddit communities related to personal finance and academic research; the research recruited academic research groups as a control group.

3.2.2 *Analysis*

The need finding part of the study focused on qualitative analysis. The output included graphics such as word maps and distributions of participants prioritized needs within the scope of financial literacy. This part of the study also found oddities and extrema from the focus groups.

The researcher performed cross tabulation analysis to find patterns and trends in survey responses. Following the first data analysis, the researcher performed a SWOT analysis to make recommendations for program improvement and conclude how the study relates to the financial education technology industry.

4 FOCUS GROUP QUALITATIVE SURVEY RESULTS

4.1 Demographics

To gather the focus group, the researcher used convenience sampling. The study gathered a group of 8 participants to complete a qualitative survey. The group was inadvertently only a subset of the expected population for the primary survey: white, wealthy, educated, and male. There was only one female participant. The primary survey addressed potential bias such as this by using random sampling.

4.2 Financial Health

7 participants were in good financial health, as seen in Figure 3 (Appendix 9.3). The mean household income was $109,375 (US dollars). All FICO credit scores were greater than 719 (above average).

5 PRIMARY QUANTITATIVE SURVEY RESULTS

5.1 Demographics

The survey included 131 participants with 111 completing survey. The researcher included partial submissions for analysis.

82.8% of participants were White (not Hispanic), as seen in Figure 4 (Appendix 9.6). 73.6% of participants were between the ages of 25 and 44 (see Figure 5, Appendix 9.7). 80.8% of the sample population held a 4-year degree or higher. 68.8% of the sample population was married, and half of participants had children. 92% of participants were United States citizens (see Figure 6, Appendix 9.8).

Participants were a broad range of ages with most between ages 25 and 44 (Millennials and Gen X).

5.2 Technology Utilization in Personal Finance Curricula

The researcher found a notable phenomenon such that participants favored digital resources to learn personal finance. Specifically, participants learned popular personal finance methodologies (Dave Ramsey's Debt Snowball, the Debt Avalanche, and FIRE) through free, online platforms. YouTube and other video-on-demand streaming services played an integral part in many participant's personal finance educations. Personal finance podcasts were also a popular learning medium (see Figure 1 below). The survey allowed participants to select all methods that applied to them.

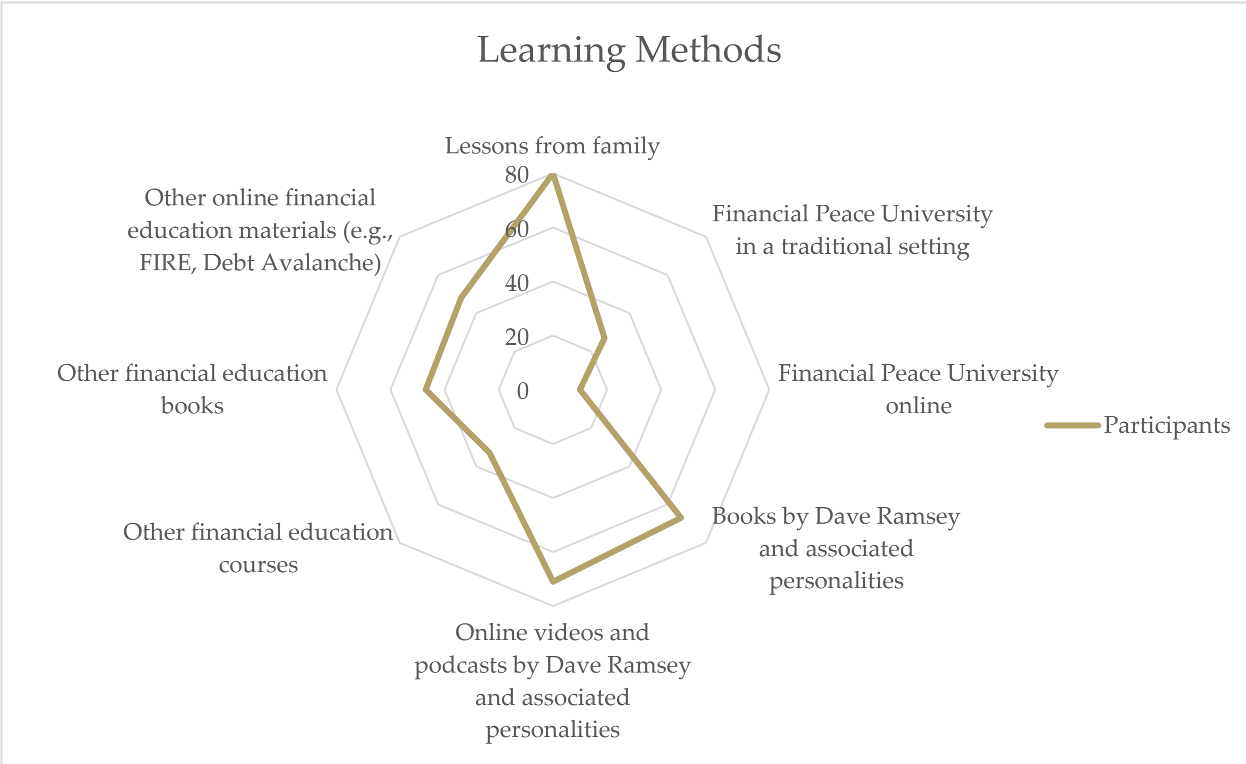

Figure 1 — Participants top three learning methods were financial lessons from family members, online videos & podcasts by Lampo Group, LLC, and books by Dave Ramsey and associated personalities (e.g., Rachel Cruze and Chris Hogan).

While taking personal finance courses, 71.6% of participants reported taking part in personal finance communities on social media websites, such as Facebook. Social participation decreased by 5% after completion of their financial education.

5.3 Financial Literacy Assessment

The sample population is budget-conscious (88% made a budget at least monthly). 27.1% reported managing a budget as a part of their daily routine. The data does not show a correlation between budget frequency and net worth.

55% of overspending occurs when participants buy food and drinks. Another 19% of overspending goes to entertainment (see Figure 7, Appendix 9.7). The survey allowed participants to select all options that applied to this question. 81 participants reported living within their means (or having money leftover at the end of the month). 10 participants reported living paycheck-to-paycheck. Only 1 participant reported a negative cash flow (more expenses than income).

The last section of the survey was a six-question personal finance quiz. The questions in Table 1 (see Appendix section 9.2) covered core topics that indicate financial literacy: interest accruals, inflation, investment risk, insurance, spending on depreciating assets, and lending.

On average, participants correctly answered 5.04 out of 6 financial assessment questions (or 84/100 on a standard 100-point test scale). The smallest score was 2 out of 6, and the largest score was 6. The researcher chose the standard 95% confidence level. With a standard deviation of 1.03 and *p-value* of 0.05, the study found a confidence interval of financial assessment scores of **5.04 +/- 0.19 out of 6.** This equates to a scaled test score range of 80.8 to 87.2 out of 100.

Reviewing the hypothesis of the study, the researcher wanted to determine if *Financial Peace University* online graduates were more financially literate than traditional *FPU* graduates. Online graduates had a mean score of 5.3, scoring higher than their traditional counterparts (5.12). Due to small sample sizes of the two groups (*n=10* and *n=15*, respectively), the results are statistically insignificant, and the hypothesis requires further study.

One subgroup outperformed their peers with a large enough sample size to have statistical significance. Students learning from Dave Ramsey's online videos and podcasts (mean score of 5.31, *n=68*) as well as those that learned through other online curriculum (mean score of 5.3, *n=47*) outperformed their peers. Figure 2 outlines the results for various methods with varying degrees of statistical significance.

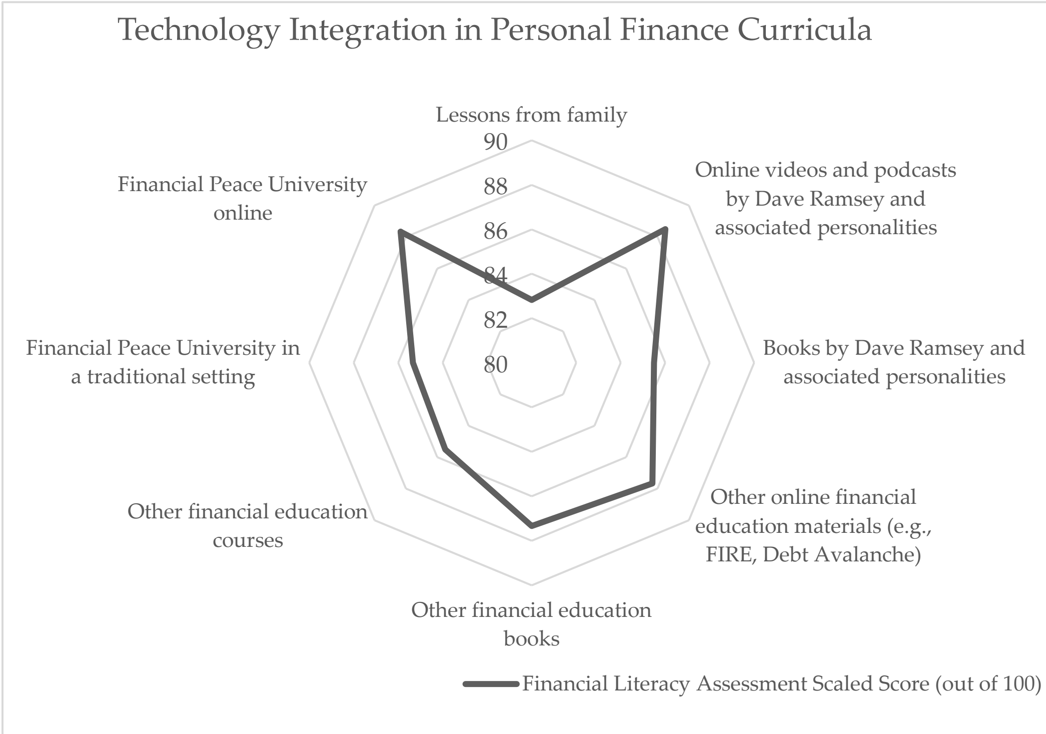

Figure 2 — This radar chart shows online, often free financial education resources result in higher financial literacy rates than traditional methods.

The data shows limited, but positive correlation in financial assessment scores and a participant's description of their financial health (major groups are within one standard deviation of the mean). Those reporting excellent financial health scored higher on the financial assessment.

The study saw limited to no correlation between various demographic factors and financial literacy. The researcher did not find a correlation between net worth and financial literacy; participants with a net worth less than $100,000 scored 3rd best among their wealthier pairs with, averaging a score of 5.33 out of 6 (88.8% of questions answered correctly). Similarly, education level did not correlate with financial literacy; doctorates answered 77% of questions correctly compared to 87% by those with some college or a graduate degree. While those holding graduate degrees had a higher mean score (87%) than those with 4-year degrees (83%), the difference between the two scores is statistically insignificant.

5.4 Financial Health

The study sample reported their financial health improved from "average" to "good" after consuming financial education materials (a mean of 3.09 improved to 2.07 with a value of 1 being the highest on a five-point scale).

Only 3 out of 12 millionaires in the study reported taking FPU in a traditional setting. The financial education path, or *Millionaire Track*, involves two resources:

- Reading financial education books
- Watching free videos and listening to podcasts by Lampo Group, LLC

Like the study group results, the researcher did not find a correlation between FICO score and financial health. Expectedly, there is a correlation between annual household income and financial wealth.

6 DISCUSSION

6.1 Findings Summary

The responses from 131 participants do not prove the study's hypothesis that the online version of *FPU* results in higher financial literacy than the traditional course setting. However, the results call for further research into the topic.

The survey responses show a phenomenon of free educational resources resulting in statistically significant improvement in financial literacy. The videos and podcasts teach the lessons in *Financial Peace University*, and the authors repeat said lessons five times per week through Dave Ramsey's radio show. With the saturation of content by Dave Ramsey's team, Americans have a practical way to learn and improve their financial health if they have internet access.

The study also found social inclusion through social media groups mimics the interaction in *FPU* classrooms. The responses show higher financial literacy with those who took part in social media groups on a routine basis.

6.2 Limitations

In context of the American population, it is difficult to generalize the results of the study due to participation biask. For students that have already chosen Dave Ramsey's materials as one of their resources for financial education, the study can help them choose the best method to learn.

The researcher conducted the study during the 2020 COVID-19 (or coronavirus) pandemic. The psychological effects of an international quarantine are unknown and may affect the results.

The study focused on one curriculum, *Financial Peace University*. The researcher narrowed the scope of the study to complete it within the prescribed period (the Spring 2020 Georgia Tech semester). Research exists for other curricula, and results from those studies show similar successes for student financial health. The researcher chose *FPU* due to its popularity in the United States and the researcher's familiarity with the material to create a relevant survey about the material.

6.3 Analysis

A strength of the materials covered in the study are their accessibility. In the primary survey, responses show free and paid materials are of equal quality. There is potential the free resources are more effective because they have a lower barrier to entry, and curriculum authors post this content at a higher frequency. Students can learn at their own pace and tailor the curriculum to meet their needs. The daily engagement between Lampo Group, LLC and their students increases the odds of financial success by keeping financial education in the Facebook news feeds of their students. By repeating the same concepts in multiple scenarios and mediums, students have options to learn in the way that works best for them (lectures, reading, audio during commutes). The same concepts apply to other financial education providers.

The social interaction within the Financial Peace University further enhances the learning experiences of students by allowing them to share their successes and struggles. The community functions in similar ways to support groups, such as Alcoholics Anonymous and military spouse groups.

Most study group participants ranked the course software as a key part of their experience. This shows potential validation of other studies' findings. Unfavorable rankings of related online tools may show participants use more traditional tools to manage finances. This is an opportunity for financial technology companies, such as Intuit and PayPal, to improve budget tool offerings to make them more accessible. Lampo Group, LLC also offers a budgeting tool that is only relatively new the market and in active development. Results from this study can help inform the development lifecycle for such tools.

The sample gathered during the focus group is at the extreme ends of the American lifestyle: wealthy or extreme debt. All focus group participants were members of the same demographic group. The focus group does not stand for an "average" American. The primary survey addressed potential biases showed in the focus group with a different recruiting method (e.g., random sampling). However, demographics in the primary survey indicate Lampo Group, LLC may be more popular among Caucasians. This is an opportunity for the curriculum authors to review their marketing strategy and determine if they are inadvertently overlooking minorities. The researcher recommends placing more emphasis on minority personalities, such as Chris Hogan, and integrating their experiences into the *FPU* curriculum.

One weakness the data suggests is learning personal finances from family members, although popular, may be the least product way to master personal finance. This is likely to the concept of generational poverty and students learning bad money habits from relatives. This suggests companies dedicated to financial literacy offer value to the market.

One threat facing *FPU*'s business model is product cannibalization. The data shows competing products (YouTube and podcasts) may reduce market demand for a paid curriculum, and for-profit educators should watch this threat as massive open online courses (MOOCs) grow in popularity. The marketing strategy by the authors of *FPU* is introducing customers to free materials and selling supplemental materials (books and courses). However, survey responses show supplemental materials do not result in higher financial literacy than if a student learned from only free materials. The researcher assumes brand partnerships, book sales, and tuition subsidize the free materials. The subsidization could create an unsustainable business model if free materials continue to grow in popularity but do not result in sales conversions.

Another threat specific to technology-integrated financial curricula is access to technology. Many rural and impoverished communities in America lack access to computers and the internet. Many counties in the researcher's home state of Alabama have low rates of internet access (Archibald, 2019). It is in online financial education developers' best interests to promote rural broadband and free or low-cost internet for financially challenged communities.

6.4 Recommendations & Next Steps

Following this study, researchers may continue qualitative studies targeting other financial education programs to determine if the results from this study transpose to other pedagogy.

A follow-up survey with a larger sample size will determine if the financial literacy scores of online *FPU* graduates are statistically significant compared to traditional graduates. The purpose of such a study would be to answer the question proposed in this study's problem statement.

One question not answered in this survey is if financial literacy rates differ based on what step participants are on in the *FPU* Debt Snowball program.

Research into this could lead to better motivation techniques for educators to coach students.

Curriculum developers should look at the program and media strategy Lampo Group, LLC employs to determine if it is repeatable for other programs. There is an opportunity for smaller financial education proponents to curate the best of the free materials to create custom lesson plans targeting specific audiences.

Educators and psychologists may study the communities that have grown around programs like these to determine the positive and negative effects of student participation.

7 ACKNOWLEDGEMENTS

I would like to thank Ken Brooks for his mentorship over the past few months as I completed this research. Mentoring during a pandemic along with being a business leader cannot be easy, and I appreciate you investing time into my study.

I would like to thank my coworkers, family, and friends who completed the surveys and supplied open, honest feedback as the study progressed from the idea phase to the implementation phase.

Finally, I would like to thank my wife, Jessica, and my son, Parker, for their support. There were so many nights I had pizza delivered to my desk courtesy of a loving spouse and playtime breaks with a carefree little boy.

8 REFERENCES

1. Archibald, R. (2019). Rural disconnect: Majority in some Alabama counties do not have internet access. Available at https://www.al.com/news/2019/12/rural-disconnect-majority-in-some-alabama-counties-dont-have-internet-access.html.
2. Cunningham, A.F. and Kienzl, G.S. (2011). Delinquency: The untold story of student loan borrowing. Available at http://www.ihep.org/assets/files/publications/a-f/delinquency-the_untold_story_final_march_2011.pdf
3. Davidson, R. (2012). The emergence of popular personal finance magazines and the risk shift in American society. Media, Culture & Society, 34(1), 3–20.
4. Farrell, L., Fry, T., & Risse, L. (2016). The significance of financial self-efficacy in explaining women's personal finance behavior. Journal of Economic Psychology, 54(C), 85–99.
5. Fernandes, Daniel, Lynch, John G. Jr., & Netemeyer, Richard G. (2014). Financial Literacy, Financial Education, and Downstream Financial Behaviors. Management Science, 60(8), 1861–1883.
6. Haynes, D., Haynes, G., & Weinert, C. (2011). Outcomes of On-Line Financial Education for Chronically Ill Rural Women. Journal of Financial Counseling and Planning, 22(1), 3.
7. Mitchell, O. (2017). A financial Literacy Test That Works. Available at https://www.forbes.com/sites/pensionresearchcouncil/2017/12/14/a-financial-literacy-test-that-works/#1a95c484641f.
8. Peng, G., Liu, F., Lu, W., Liao, K., Tang, C., & Zhu, L. (2018). A spatial-temporal analysis of financial literacy in United States of America. Finance Research Letters, 26, 56-62.
9. Way, W. L., & Wong, N. (2010). Harnessing the Power of Technology to Enhance Financial Literacy Education and Personal Financial Well-Being: A Review of the Literature, Proposed Model, and Action Agenda. University of Wisconsin-Madison Center for Financial Security, (WP 10-6).

9 APPENDIX

9.1 About the Author

Zack White is a senior software engineer at Synovus, the largest financial institution based in the state of Georgia, United States. During his career, Zack worked in many engineering roles at Synovus as well as local government and other financial companies. His passions in technology include innovative culture, artificial intelligence, consumer privacy, DevOps, and financial systems architecture.

Zack graduated with special honors and a Bachelor of Science degree in Computer Information Systems – Information Assurance and a minor in Business Administration from Jacksonville State University in 2014. He is currently pursuing a Master of Science degree in Computer Science – Machine Learning from the Georgia Institute of Technology.

Zack married his high school sweetheart, Jessica Martin, in 2014. They and their son, Parker, live in Phenix City, Alabama – a mafia town turned military retirement community on the Chattahoochee River. In their free time, the family enjoys performing in church orchestra, traveling, and college football.

9.2 Table 1 – Financial Assessment Questions

Table 1 — The survey prompted six scenarios to participants. The researcher developed questions based on the *Financial Peace University* curriculum.

Question	**Topic**	**Answer**	**% Correct Responses**
Suppose you had $100 in a savings account and the interest rate was 2% per year. After five years, how much do you think you would have in the account if you left the money to grow?	Accrued Interest	More than $102	97
Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, how much would you be able to buy with the money in this account?	Inflation	Less than today	86
True or False: Buying a single company's stock usually supplies a safer return than a stock mutual fund.	Investment Risk	False	92

Question	Topic	Answer	% Correct Responses
John is shopping for life insurance and earns an annual income of $50,000. John's wife, Diane, is a home-maker, and they own a home with a $200,000 mortgage. John and Diane have two adult children with families and homes of their own. What amount of life insurance should John purchase to ensure his family's well-being?	Insurance	More than $200,00	96
Emily is a new college graduate and just received a job offer for $85,000 at a financial firm in New York City. Emily's employer gave her a $5,000 signing bonus and needs dependable transportation to commute into the city from New Jersey. What is the best means of transportation for Emily?	Spending on depreciating assets	Purchase a $5,000 used car in cash	90
True or False: Student loans are an effective way to afford a more prestigious school.	Lending	False	84

9.3 Focus Group Household Income & Net Worth Correlation

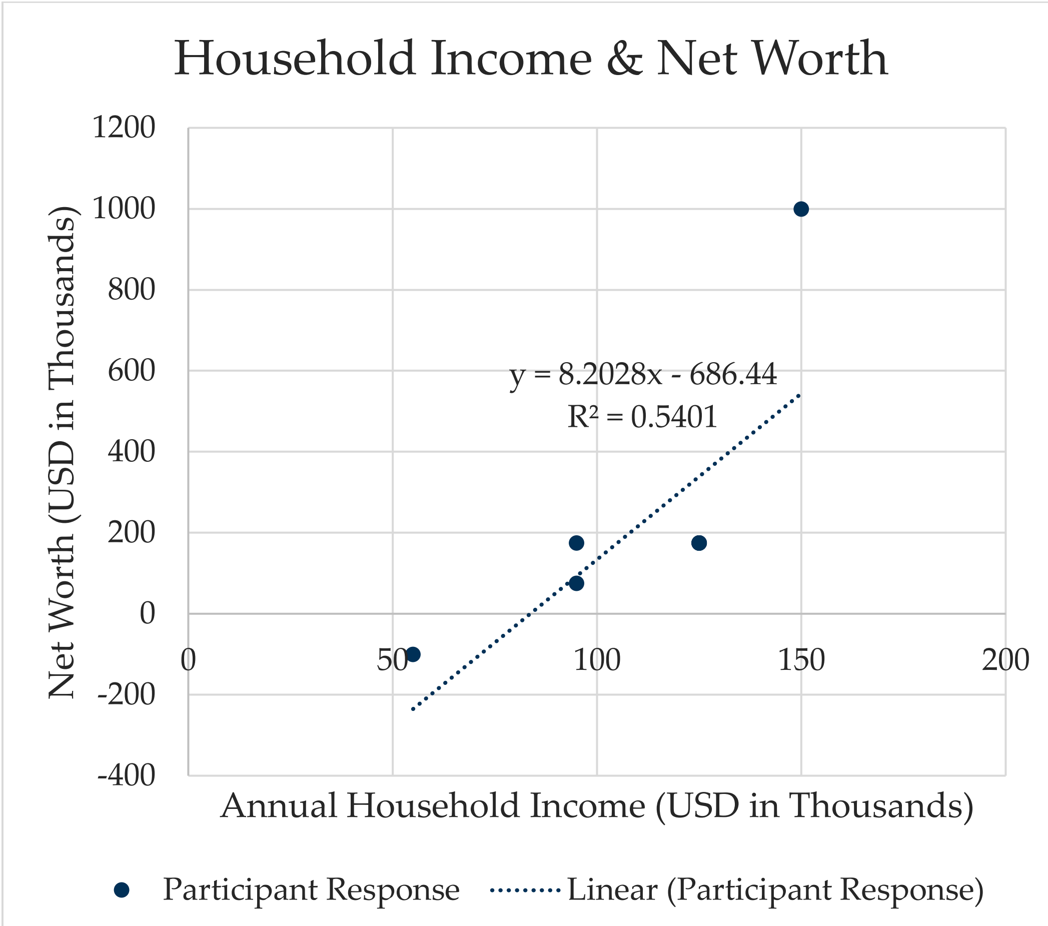

Figure 3— Financial health metrics gathered in the focus group included net worth and annual household income.

9.4 Survey Participant Ethnicity

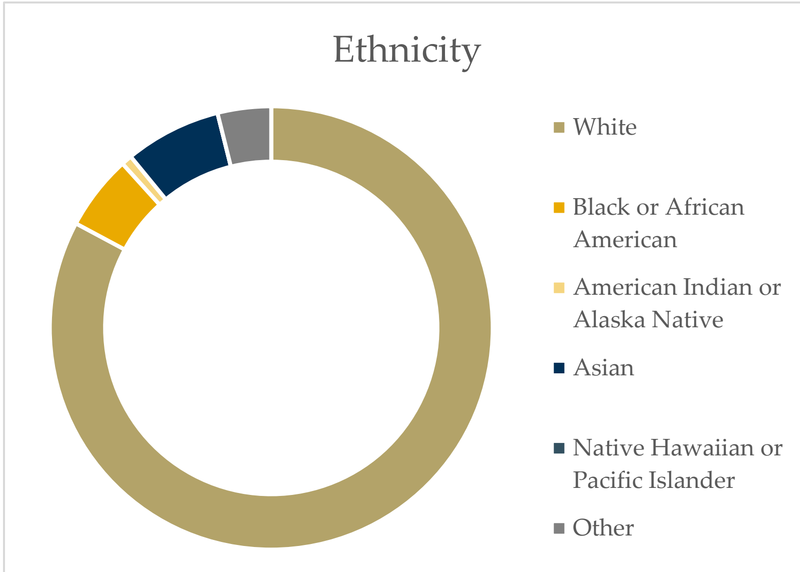

Figure 4— The researcher randomly sampled online personal finance & academic research groups (Facebook, Twitter, & Reddit) and the researcher's personal social network. The sample population was overwhelmingly White.

9.5 Survey Participant Age

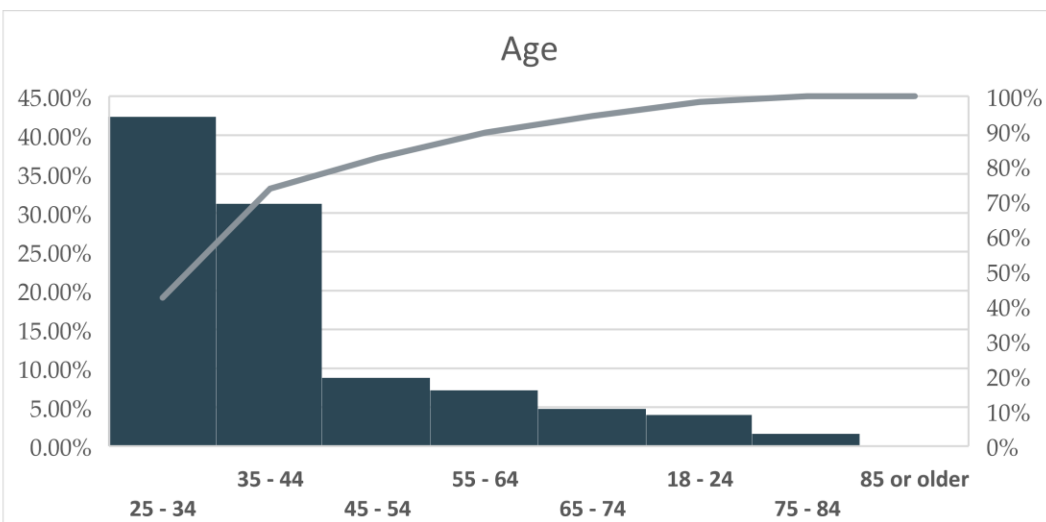

Figure 5— The survey targeted all ages of Americans but saw highest participation from Millennials and Gen X.

9.6 Survey Participant Citizenship

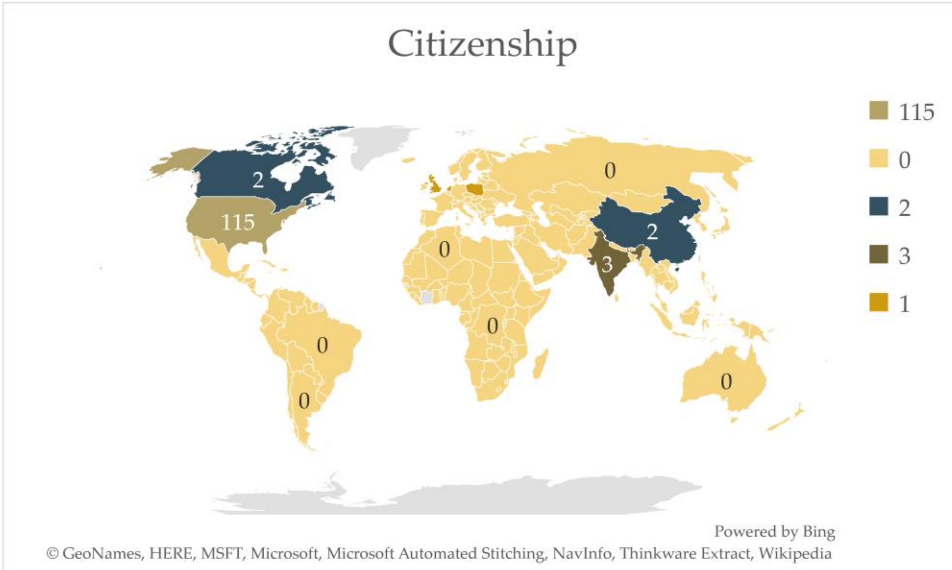

Figure 6 — The study targeted Americans as the population with international participants being distance learners in Georgia Tech's OMSCS program.

9.7 Survey Participant Overspending

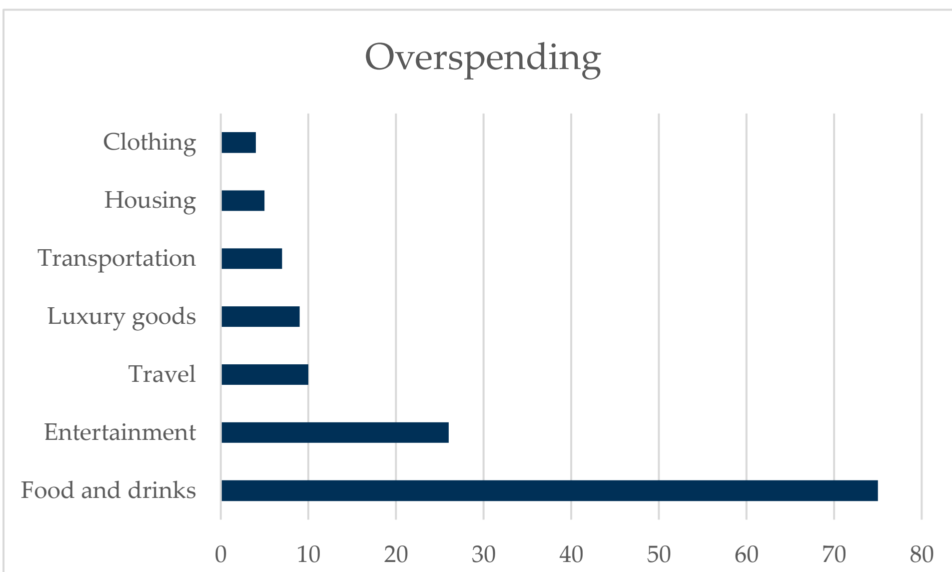

Figure 7 — Participants reported overspending on food, drinks, and entertainment most often.