MEASURING COLLEGE STUDENT FINANCIAL

LITERACY

By

MARY TAGGART GATTI

Bachelor of Science in Design, Housing, &
Merchandising
Oklahoma State University
Stillwater, OK
2014

Master of Science in Educational Leadership Studies
Oklahoma State University
Stillwater, OK
2016

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Dissertation Approved:

Ki Cole
_____
Dissertation Adviser

Jam Khojasteh
_____

Mwarumba Mwavita
_____

Kate Mielitz
_____

Kerri Kearney
_____

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Abstract: There has been a lack of consensus among researchers and practitioners about how to define financial literacy, but there is agreement that financial education changes depending on the stage of life to which people belong. This study provides consensus on what topics are considered a part of financial literacy specifically for traditional aged undergraduate college students. Many students take on debt to finance their college education and college is the time that people are laying the foundation for their financial future. The rising costs of a college education, combined with low levels of financial literacy amongst this population, indicates the need for financial education at the college/university level. In the past, there has been no definition of exactly what college students need to learn during this stage of life regarding financial planning. This lack of definition has also made it hard to measure financial literacy of college students. This study addresses both of these concerns. Utilizing the Delphi method, experts generated a list of financial planning topics that should be included in financial literacy for all traditionally aged undergraduate students. Those results were then used to create an instrument that measures financial literacy, which includes financial knowledge, financial attitude, and financial behavior. The instrument was refined utilizing multiple methods including item-score correlation, the items' contribution to Cronbach's α, the Q3 statistic, exploratory factor analysis, confirmatory factor analysis, and item response theory. Through the refinement process, a final instrument was created with 4 subscales: a 26-item scale measuring financial knowledge, a 5-item scale measuring financial planning attitude, a 5-item scale measuring financial management attitude, and a 15-item scale measuring financial behavior. These findings are relevant for both researchers and financial planning practitioners.

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CHAPTER I

INTRODUCTION

The average cost of a college education continues to rise, which in turn has caused the average student loan debt to rise. As of 2017, 70% of college students had student loan debt or planned to have student loan debt by the time they graduated (Ehrlich & Guilbault, 2017). Because cost and debt continue to rise, colleges and universities have a responsibility to provide their students with the financial education necessary to make informed financial decisions in college and after graduation. However, many institutions lack in-depth financial education programs (Geddes & Steen, 2016). Those that do provide financial education to students struggle to measure students' financial literacy and the effectiveness of the available programs.

The Problem

Financial Literacy

There is no consensus among researchers as to how to define financial literacy. Many studies define financial literacy their own way (Durband & Britt, 2012; Johnson & Sherraden, 2007; Lusardi, 2008; Vieira et al., 2020), which has resulted in several definitions of financial literacy and many different measures of financial literacy. Some define financial literacy as simply financial knowledge, while others consider financial literacy to be comprised of financial knowledge, financial attitudes, and financial behaviors (Lusardi, 2008; Vieira et al., 2020). Others define financial literacy as somewhere in between those two extremes (Hung et al., 2009). The lack of a consistent definition can cause problems for researchers. It makes it challenging to compare results across studies if definitions are not similar, and it also makes it challenging to create a measure of financial literacy.

In addition to the lack of common definition of financial literacy, there is also a wide variety of topics that researchers believe financial literacy and/or financial knowledge should cover. During a review of previous financial literacy research spanning from 1996 to 2008, Huston (2010) found that most financial literacy measures were not made up of the same topics. Some focused on money basics, borrowing, investing, and protecting resources (Huston, 2010). Others include topics like retirement planning, insurance, time value of money and credit scores (Durband & Britt, 2012; McReynolds, 2016). Additionally, some believe that the definition of financial literacy and/or financial knowledge is different depending on the stage of life someone is in. The topics that one may need knowledge of during college could be different than those that someone approaching retirement needs. For example, Kabaci (2012) surveyed professionals in financial planning and found that many would consider knowledge of student loans to be a piece of financial literacy when talking

about college students. Student loans might not be something that are considered important for people approaching retirement.

Importance of Financial Literacy

Overall, Americans have relatively low scores on measures of financial literacy and many report that financial knowledge is something know they are lacking (Ehrlich & Guilbault, 2017; Geddes & Steen, 2016). There is no definitive reason as to why Americans have low financial literacy scores. Most suggest that it is due to a lack of financial education (Geddes & Steen, 2016; Danns, 2016). Since we know that financial education is limited, it would make sense that low literacy scores are a result of that limited education. Additionally, the quality of some financial education could contribute to low literacy scores. According to Geddes and Steen (2016), it is hard for high schools to adopt financial education programs because K-12 teachers are not certified to teach personal finance. There is also potential that low literacy scores are partially due to issues with measurement. The lack of a clear financial literacy definition, coupled with the lack of research on the psychometric properties of financial literacy scales, means that measures of financial literacy may need improvements to better gauge true financial literacy scores.

High financial literacy scores are correlated with many different benefits, throughout all stages of life. In general, higher financial literacy scores lead to more informed, self-beneficial financial behaviors (Geddes & Steen, 2016; Mandell & Klein, 2009). As debt, especially among college students, is increasing, high levels of financial literacy mean individuals will be able to better manage their debt (Geddes & Steen, 2016). Low financial literacy scores in college students can also lead to financial problems in college, which in turn impacts their future family's finances and their future professional life (Sarigül, 2014).

Additionally, many believe that financial literacy is important for the country's fiscal sustainability; some think that low literacy scores could have contributed to the economic recession in 2008 (Geddes & Steen, 2016). Additionally, levels of literacy have an impact on individuals' ability to grow wealth and income (Sarigül, 2014). Finally, financial literacy also helps people to feel more confident leading into retirement (Geddes & Steen, 2016).

Some high schools have adopted financial education programs in order to help Americans become more financially literate, but that is not enough on its own. Scores show that even students who have financial education in high school still have low overall financial literacy (Geddes & Steen, 2016). This provides an opportunity for colleges and universities to help provide the financial education that is desperately needed (Danns, 2016; Ehrlich & Guilbault, 2017; Geddes & Steen, 2016). In addition to knowing that Americans score low on measures of financial literacy, we also know that college tuition costs are continuing to rise, as is college student debt. It is important that colleges and universities are providing students with the financial knowledge and skills they need to finance their education and repay their debt upon graduation (Geddes & Steen, 2016).

Financial Education

Financial education can occur in many ways. Most commonly, financial education is provided through group education such courses, seminars, or workshops. Financial counseling is another form of financial education, which can be done as peer-to-peer counseling or as one-on-one counseling with a trained financial counselor. Also, online platforms such as blogs, podcasts, distance learning courses, etc. also serve as common forms of financial education.

Students who participate in financial education at the K-12 level do not perform better on measures of financial literacy than students who have not participated in financial education (Geddes & Steen, 2016). This lack of difference in financial literacy scores suggests that K-12 may not be the optimal time to focus on financial education. This presents a unique opportunity for colleges and universities to provide the financial education their students need to make informed financial decisions during college and post-graduation (Danns, 2016; Ehrlich & Guilbault, 2017; Geddes & Steen, 2016).

Currently, there is limited financial education at the college level. The financial education that does exist is primarily in the form of "for-credit" coursework, although it is rarely required (Durband & Britt, 2012). Also, many of the financial education courses are focused solely on investing, and do not present a holistic approach to personal finance (Durband & Britt, 2012). Additionally, there is a lack of standard evaluation procedures for financial education programs. There is no consistently used measure of financial literacy and many studies create their own instruments without statistical validation (Chen & Volpe, 2002; Hung et al., 2009). The use of a more standardized measure of financial literacy is important because it will allow comparisons across studies. It will also allow financial education programs to determine strengths of their program and areas of growth.

Measures and Tests of Financial Literacy

Because of the lack of a consistent definition of financial literacy, there is no "typical" way that researchers measure financial literacy (Knoll & Houts, 2012). The lack of a consistent definition and consistent instrument makes it hard to compare results across studies. There are many different instruments used to measure financial literacy, but perhaps the two most commonly used instruments are the "Big 5" and the Jump$tart survey. Other

common measures are the FLA and ALP. All of these measures are tests, meaning that the questions have correct/incorrect answers. However, financial literacy is broader than just correct/incorrect questions of financial knowledge. Financial literacy also includes how people act on their knowledge and their attitudes about finances. Those pieces of financial literacy cannot be measured solely by test questions that are marked as correct vs. incorrect; they must use other types of questions that allow them to self-report behaviors and attitudes on a continuum.

Financial Literacy in College

Students who participate in financial education at the K-12 level do not perform better on measures of financial literacy than students who have not participated in financial education (Geddes & Steen, 2016). This lack of difference in financial literacy scores suggests that K-12 may not be the optimal time to focus on financial education. This presents a unique opportunity for colleges and universities to provide the financial education their students need to make informed financial decisions during college and post-graduation

With the increased cost of a college education, paired with the increased average student loan debt upon graduation, it is imperative that financial education be prioritized on college campuses. Some colleges and universities offer financial education to their students, but many institutions do not offer any form of financial education (Danns, 2016; Geddes & Steen, 2016). Of those that do offer financial education, many focus solely on investing instead of financial planning as a whole (Geddes & Steen, 2016).

Most definitions and measures of financial literacy are focused on the general population. The list of topics that is recommended to cover for general population financial literacy is different than recommended topics that are covered in a financial education course

(Ehrlich & Guilbault, 2017). This means that even those institutions that are offering financial education to their students are limited in ways that they can measure students' financial literacy progress. Very few research studies have attempted to create a measure of financial literacy that is tailored specifically to college students, and those that did create a measure specific for college students only designed the instrument, but the instruments were not validated or evaluated (Chen & Volpe, 1998; Chen & Volpe, 2002; Ehrlich & Guilbault, 2017; Jorgensen, 2007). Therefore, there is a need for a measure of financial literacy specific to college students that is psychometrically tested and validated (Cude et al., 2006).

Purpose of the Present Study

The purpose of the present study was to define financial literacy specific to college students. This study aimed to determine what financial planning topics experts say are key for students to know during and/or immediately after college. Based on those identified topics, the present study then created an instrument to measure college student financial literacy. Finally, the present study used the created instrument to evaluate a financial literacy program.

Definition of Terms

Financial literacy

- There are a variety of definitions of financial literacy. Some definitions are unidimensional and focus on understanding and knowledge of facts (Lusardi, 2008). Other definitions take a multidimensional approach to include knowledge, attitudes, and behaviors (Durband & Britt, 2012). More detail on the varying definitions of financial literacy are provided in Chapter 2.

Financial education

- "the process by which people improve their understanding of financial products, services, concepts, so they are empowered to make informed choices, avoid pitfalls, know where to go for help and take other actions to improve their present and long-term financial well-being" (USGAO as cited in Geddes & Steen, 2016, p. 350)

Financial Knowledge

- "understanding of concepts and risks of financial products" (Vieira et al., 2020)

College student

- "those students who proceed to college after graduating high school and fall between the ages of 18-22" (Adams & Corbett, 2010)

Personal finance

- "Personal Finance encompasses tools such as financial statements, checking and savings accounts, and investment vehicles and techniques such as cash flow management, risk assessment and management, tax, retirement, and estate planning" (Schuchardt et al., 2007)

Financial stress

- "the inability to meet one's financial obligations, but can also include psychological or emotional effects" (Northern et al., 2010 as cited in Heckman et al., 2014)

Financial wellness

- "active and desirable status of financial health; made up of four sub-constructs: objective status, financial satisfaction, financial behavior, and subjective perception" (Joo, 2008)

Research Questions

1. What topics are a part of financial knowledge specific to college students?

2. To what extent is the designed instrument a valid and reliable measure of financial literacy?

3. What are the underlying dimensions of financial literacy?

Significance of the Present Study

Clearly defining financial literacy for college students lead to the creation of a valid and reliable instrument for measuring financial literacy in college students. This benefits multiple parties on college/university campuses. Financial planning programs could use this instrument in their classes/programming to demonstrate changes in financial literacy as a result of participation. Financial aid professionals could use this to get a better understanding of financial literacy in the students on their own campuses, which would help them better serve the general student population. Financial education "centers" could also use this instrument to demonstrate changes in financial literacy as a result of participation in their programs. Additionally, it could allow these "centers" to identify deficiencies in financial literacy that they could then target for future programming.

Assumptions

The present study assumes that participants had knowledge of the most basic financial principles, like how to use a credit card. It was also assumed that the financial professionals surveyed were experts in the field and were the best suited to identify areas of financial literacy that are important for college students.

Limitations

A limitation to the present study was that financial attitudes and financial behavior were measured using self-report measures. Self-report measures of financial behaviors were subject to social desirability bias, meaning that participants might alter their responses based on what they think is the "right" response (Kelly et al., 2017). This could mean they over-reported "good" behaviors, or they might have under-report "bad" behaviors. Another limitation of the present study was that it utilized convenience sampling, which had the possibility of introducing selection bias into the study.

Summary/Organization of the Study

This chapter serves as an introduction to the topic by describing the problem, purpose, justification for and significance of the study. Chapter II is a detailed review of related literature. Chapter III describes the methodology of study in detail, including the instrument used. In Chapter IV, detailed results of the study are presented. Finally, in Chapter V, there is discussion of the results, implications for practice, limitations, and directions for future research.

CHAPTER II

REVIEW OF LITERATURE

Review of Existing Research

Financial Literacy in College

Definition

Financial literacy does not have a universal definition that is agreed upon in financial planning research. Each researcher seems to define financial literacy slightly differently. The U.S. Government Accountability Office (GAO) defines financial literacy as "the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial wellbeing" (as cited in Geddes & Steen, p. 350). This definition seems to be the most frequently used in research, but others are used as well. Durband & Britt (2012) define financial literacy as "a comprehensive term, which includes knowledge, skills, and resources" (p. 126) and believe that financial literacy is not merely comprehending terms but is the ability to analyze, manage, and communicate about financial topics. Others feel that financial literacy is simply knowledge focused (Lusardi,

2008); FINRA (2003) defines financial literacy as "the understanding ordinary investors have of market principles, instruments, organizations and regulations" (as cited in Durband & Britt, 2012, p. 94). Johnson & Sherraden (2007) say that financial literacy is simply financial capability.

Some researchers use the terms financial literacy and financial knowledge interchangeably, while others choose to view those as two distinctly different constructs. In the case that they are defined differently, financial knowledge would simply be understanding of financial concepts. Financial literacy, then, is more holistic and includes things such as attitudes, behaviors, application, etc. Vitt et al. (2000) define comprehensive financial literacy as also including "the ability to discern financial choices, discuss money and financial issues without (or despite) discomfort, plan for the future, and respond to life events that affect every day financial decisions, including events in the general economy".

Common across the more comprehensive financial literacy definitions is the idea that financial literacy is not just knowledge of concepts. Vieira et al. (2020) and Fessler et al. (2020) define financial literacy as a combination of financial knowledge, financial attitudes, and financial behaviors. Financial knowledge is the understanding of financial concepts and risks and the ability to learn and build confidence necessary for making future financial decisions that are safe. Financial attitude is defined as the information and emotions surrounding financial learning. This includes direct experiences individuals have with finances. These financial attitudes impact how ready an individual is to react favorably to given financial situations. Financial behavior is the "ultimate dimension" of

financial literacy. The behavior is how you put your financial knowledge into practice given your current financial situation.

In 2012, Kabaci attempted to reach a consensus definition of financial literacy for college students. Using the Delphi method, Kabaci surveyed financial professionals to determine what financial planning topics college students should be taught. Kabaci's study created a list of financial planning topics for each of the following student populations: undergraduate students, undergraduate students with loans, and first-generation undergraduate students. While this study was a great start at making a more concrete definition of financial literacy for college students, the separation of loan recipients and first-generation students from the main group, means there is still some confusion on what every college student should learn about financial planning. It is also not clear if the financial professionals surveyed for this project were providing topics necessary to learn and use during college or topics that should be taught during college but may not be used until later in life.

Importance

Financial literacy is a concern for all Americans. Government policymakers are concerned at the low levels of financial literacy among American citizens and feel that it is a basic life skill that many are lacking (Geddes & Steen, 2016). Financial choices and complexities are growing in America, as is consumer debt (Geddes & Steen, 2016). Forty percent of adults give themselves a "C", "D", or "F" grade on personal finance (Ehrlich & Guilbault, 2017). These metrics show that financial literacy is low among Americans.

Many K-12 school systems have added financial literacy programs/curricula in attempt to help combat the low levels of financial literacy across the country. Forty

percent of states are given "A's" or "B's" for their financial literacy programs in secondary education (Geddes & Steen, 2016). However, research studies of these same programs show that students who have completed these financial education programs do not score higher on financial literacy exams than students who have no formal financial education (Geddes & Steen, 2016). Geddes & Steen (2016) suggest that this disparity is a result of three things: 1) teaching financial planning topics (i.e. retirement planning, debt management) is ineffective because high school students are not experienced enough with money management, 2) there is no training qualification required for high school teachers to teach personal finance – they may be teaching these topics without any financial planning experience, training, or professional development that is needed to be successful, and 3) the schools that do have financial planning courses available do not always enforce consistent pre-requisites (like math or economics) which means that some students may be taking these courses without some of the required foundational knowledge. Since some Americans never attend college, this does not mean that financial education should be removed from K-12 education. However, it does suggest that perhaps there is a better time for financial education than high school or that further enforcement is needed.

Those who are more financially literate are more likely to make self-beneficial financial choices (Babiarz & Robb, 2014; Geddes & Steen, 2016; Mandell & Klein, 2009; Xiao et al., 2011). People with high levels of financial literacy are better able to manage their debt and are more likely to accumulate wealth and income (Sarigül, 2014). College students with low financial literacy scores are more likely to have financial

problems, which is likely to then impact their future family and future professional life (Sarigül, 2014).

This presents an opportunity for colleges and universities to step in and offer financial education in hopes of increasing financial literacy among their students. College students are at a better age for being intellectually ready for financial concepts than K-12 students are (Danns, 2016). For many students, college is the first time they must get a job, have a budget, have a credit card, are exposed to debt financing options, and have the freedom to make financial choices. College may also be the last time for financial education before students become completely independent (Danns, 2016). This, coupled with the fact that college campuses house experts in finances, makes college the optimal time to provide financial education (Geddes & Steen, 2016).

In addition to better readiness, tuition costs and thus student debt are continuing to rise in America (Robb et al., 2011). Seven out of ten college students say they currently have loans or plan to have loans at some point in college (Ehrlich & Guilbault, 2017). In addition to student loan debt, many college students also have credit card debt (Cude & Kabaci, 2011). Twenty-one percent of college students have between $3000 and $7000 in credit card debt; the average college student graduates with $4100 in credit card debt. Many students also hold other forms of debt, such as car loans, in addition to student loan and credit card debt. Because of the varying types of debt that are common among college students, it is not uncommon for a student to graduate with $80,000 of debt (Durband & Britt, 2012). College and university campuses owe it to their student populations to educate them on (at the very least) how to manage their debt and what types of financing options they have.

The increase in cost of tuition and increased debt has also increased financial stress among college students (Robb, 2017). Freshmen appear to be just as stressed financially as graduating seniors, which could be a direct result of a lack of financial education (Durband & Britt, 2012). Financial stress has been found to cause negative consequences such as low academic performance, attrition, depression, anxiety, and poor health (Heckman et al., 2014). Financial wellness is a piece of holistic wellness. Colleges and universities place value on student wellness in terms of physical wellness, career wellness, etc. so they owe it to students to equally value financial wellness and give them the education they deserve (Durband & Britt, 2012).

College students have also expressed a desire for financial education. Sixty-seven percent of college students grade themselves with a "D" or "F" on their knowledge of financial concepts (Ehrlich & Guilbault, 2017). Durband & Britt (2012) conducted a needs assessment of various campuses across the country and found that students are aware of their need for financial education and want their colleges/universities to provide that education.

Existing programs

There are several different types of financial education programs that exist on college campuses. Durband & Britt (2012) surveyed institutions and found financial education in the form of financial counseling (peer to peer and one on one with financial professionals), group education (seminars, workshops, courses), blogs, podcasts, distance learning programs, etc. Regardless of the type, the majority of programs are not required of students (Durband & Britt, 2012).

Danns (2016) completed an in-depth look at financial education programs across the country. She surveyed 379 institutions and got responses from 92 different schools detailing their programs, 37 (40.2%) of which had no financial education. From this data, she categorized programs into four different types: (1) the academic model, (2) the full-fledged money management center model, (3) the seed program or aspirational model, and (4) the branch or interspersed model. The academic model is characterized by an academic unit within the university being responsible for financial education. This primarily happens through "for-credit" courses in personal finance and typically reaches a large number of students. The full-fledged money management center model is when there is some type of "Center" responsible for financial education. The money management center is not controlled by one specific department/unit and is interdisciplinary in nature. There are fulltime staff (i.e. professional financial counselors) devoted to working in the center. Their trained staff engage in one-on-one financial counseling as well as classroom presentations and other activities. This model typically reaches a large number of students but may only interact with students once. The seed program or aspirational model describes those programs where the "seed" of financial education is planted but it has not fully grown. This could be because of lack of institutional enthusiasm or lack of resources to grow/develop the program. These seed programs can be housed anywhere on campus; they are usually a result of a faculty/staff member who sees value in the program but cannot devote their entire job to the program. Because of the lack of dedicated resources, these programs are often characterized by low attendance and limited outreach. The final model, the branch or interspersed model, occurs when financial education is happening in several areas across a campus. For

example, there might be academic departments as well as student affairs offices engaging in financial education.

Of the programs that do exist, the most common is a "for-credit" course on personal finance, often offered through distance learning. Geddes & Steen (2016) reviewed course catalogs for the Top 105 Liberal Arts Colleges, the 117 members of the Council for Christian Colleges and Universities (CCCU), and the Top 100 National Universities as ranked by U.S. News and World Report (of 2014). This was done to see how many schools were offering for-credit financial education and what those programs were covering. Among the liberal arts schools, 65% of schools did not offer any type of financial planning course and 24% offered only a course on investing. From CCCU, 31% of schools did not offer any type of financial planning course and 41% offered only an investing course. Of the U.S. News Top 100 Universities, only 10% of schools have no financial planning courses, but 63% offer only courses on investing. This shows that while many schools are offering "for-credit" financial education, it is primarily focused on investing, which is not a holistic approach to financial literacy.

Evaluation of existing programs

There is no standard evaluation framework for financial literacy programs on college campuses because there are differing thoughts on what content, topics, and competencies should exist in financial education at the collegiate level. While many programs are making some type of evaluation effort, some programs omit evaluation completely. Of those that are evaluating their programs, there is little similarity in their approaches. The majority of programs are looking at immediate impact through satisfaction scores or changes in attitudes, knowledge, or skills. Of those that are

measuring changes in attitudes, knowledge, or skills, 80-90% of them are using self-reported measures (Durband & Britt, 2012). Those that are not using self-reported measures are using pre- and post-tests of financial literacy such as the Jump$tart assessment (McReynolds, 2016; Reams-Johnson & Delker, 2016). Another common metric used in financial literacy program evaluations is retention. There are mixed results on whether financial education impacts retention. Some do not think you can tie retention changes directly to a specific program, but regardless, it is a criterion used in some evaluations (Howard, 2018; Reams-Johnson & Delker, 2016). Perhaps the most common two methods used in program evaluation are anecdotal evidence and satisfaction surveys. While both have value, neither is fully demonstrating program impact and both should be accompanied with other data for a full evaluation (Durband & Britt, 2012).

Existing Measures

Because of the varying definitions of financial literacy and the lack of established evaluation criteria for financial literacy programs, it is no surprise that there is no "typical" way to measure financial literacy (Knoll & Houts, 2012). There are, however, a few tests that have been repeatedly used in assessing financial literacy.

Big 5

The Big 5 is one of the most widely used tests of financial literacy. It is composed of five multiple choice items measuring financial knowledge (Durband & Britt, 2012; Lusardi, 2008). It has no items to measure other aspects of financial literacy. There is limited knowledge about the psychometric properties of the Big 5. Knoll and Houts (2012) performed item response theory (IRT) analysis on the Big 5 and some other measures of financial literacy. However, no detailed parameter estimates of the Big 5

specifically were initially published. The purpose of this study was to evaluate

psychometrics of commonly used measures to then create a new scale (Financial

Knowledge Scale or FKS). In 2020, Houts and Knoll published a follow up to their 2012

article that does share a 3-Parameter Logistic (3PL) IRT parameter estimates of their new

scale, the FKS, which includes the questions from the Big 5. For the items originally

from the Big 5, they found difficulty values ranging from -1.52 to 0.92. Discrimination

values ranged from 1.53 to 3.18 and guessing parameters ranged from 0.21 to 0.61.

However, these items were calibrated with a larger set of items.

Jump$tart

Another commonly used test of financial literacy in colleges/universities is the

Jump$tart Coalition's Personal Financial Survey, typically referred to as Jump$tart

(Durband & Britt, 2012). Jump$tart was originally created in 1995 and was given to high

school seniors. The coalition has administered the survey to high school students six

times and one time to college students in 2008. It is comprised of 49 total questions, 31 of

which are multiple choice questions measuring financial literacy. The questions focus on

the areas of income, money management, saving/investing, and spending/credit. Though

it was not designed specifically for college students, it seems to be the most widely used

for this age group (Durband & Britt, 2012).

There is not much research that has looked at the psychometric properties of the

Jump$tart instrument. Lucey (2005) examined the validity of the Jump$tart instrument

and found a few concerns. First, Lucey (2005) says there are issues with face validity

because Jump$tart was only validated by financial professionals and educators; parents,

K-12 teachers, and students were not consulted. Second, financial literacy is a complex

construct. Jump$tart covers income, money management, savings/investments, and spending/credit. Because of the complex nature of financial literacy, these four areas are not sufficient enough to be considered financial literacy, meaning that the instrument lacks content validity. There is little information that has been published by Jump$tart about the methodology in the creation of their instrument, which suggests that there may also be issues with construct validity. Last, while Jump$tart has a moderately high overall internal consistency, the subscales (income, money management, savings/investments, and spending/credit) each have much lower measure of internal consistency (Lucey, 2005).

ALP

The American Life Panel (ALP) has also distributed four different surveys designed to measure financial literacy (ALP calls them "waves") (Durband & Britt, 2012). The first wave was a 13-item instrument consisting of five basic personal finance items and eight advanced investment items. The next wave was 70 items with a Likert-type response scale designed to measure confidence in financial knowledge on a variety of topics (portfolio diversification, time value of money, etc.). The third wave was a 23-item instrument that measuring three dimensions of financial literacy – basic, investing, and life insurance. The last wave used an investment experiment where financial literacy was equated with picking the hypothetical portfolio with the lowest fee funds. The ALP was found to be reliable, however there is limited evidence of validity and no details given on how the various topics and "waves" were decided upon (Durband & Britt, 2012).

FLA

Texas Tech University created the Financial Literacy Assessment Project to create a new assessment, the FLA (Durband & Britt, 2012). The FLA was targeted to anyone 18 and over. The FLA consists of twenty items. Eight of the items are designed to measure knowledge, eight are about application of knowledge, and four items are about confidence in applying the knowledge. The knowledge questions in the FLA focus on four different content areas: basic, borrowing, building, and protection. Each content area is weighted the same. The FLA does have a documented external review for construct validation by experts, which is rare among financial literacy tests. This is another instrument that was not originally designed for college students, but has been used with college students in prior research (Durband & Britt, 2012).

Other Measures

Knoll and Houts (2012) conducted IRT on some common measures of financial literacy. From that research, they created the Financial Knowledge Scale (FKS) and the FKS Short Form. The FKS is a 20-item, multiple choice test with difficulty parameters ranging from -1.52 to 0.97. Discrimination parameters range from 0.83 to 3.63 and guessing parameters range from 0.11 to 0.62. The FKS Short Form is 10 of the original 20 items. Looking at just the FKS Short Form questions, difficulty values range from -1.35 to 0.92. Discrimination values range from 0.83 to 3.63 and guessing values range from 0.13 to 0.48 (Houts & Knoll, 2020).

Vieira et al. (2020) created a measure of financial literacy that includes a Financial Knowledge scale, a Financial Attitude scale, and a Financial Behavior scale. The Financial Knowledge scale started as a 13-item scale. After conducting a 2PL IRT,

Vieira et al. (2020) decided to only retain 11 items. Of these 11 remaining items, the estimated difficulty values range from -1.66 to -0.06. Discrimination values ranged from 0.82 to 2.67. The Financial Attitude scale is 10 five-point Likert-scale items where respondents report how strongly they agree with given statements about their attitudes toward finances (1=strongly disagree to 5=totally agree). Average responses to the Financial Attitude scale range from 1.87 to 4.54. The Financial Behavior scale is made up of 27 five-point Likert-scale items where respondents report how often they engage in various financial behaviors (1=never to 5=always). Average responses range from 1.75 to 4.52.

Psychometrics

Factor analysis

Factor analysis is a method used to determine how underlying constructs influence responses to a number of measured variables (DeCoster, 1998). Exploratory factor analysis (EFA) is used to explore how constructs influence a set of responses, whereas confirmatory factor analysis (CFA) tests whether a specific set of constructs is influencing responses in the predicted way (DeCoster, 1998). For this study, factor analysis will be used to ensure that all items on the survey actually measure the intended constructs (financial knowledge, financial attitude, and financial behavior).

Principal components analysis (PCA) and EFA are both exploratory methods of looking at data. PCA is looking at the dimensional structure of data sets and is used for variable reduction. The goal of PCA is to reduce the number of observed variables into a smaller number of components while still accounting for most of the variance in the observed variables. EFA, on the other hand, looks to explore underlying relationships

among variables. It estimates factors which then influence responses on observed

variables and can be used to develop theories about relationships among variables.

There are multiple methods used to determine how many factors to retain in a

when doing EFA. The first option is to look at the scree plot, which is a downward curve

that shows number of factors on the x axis and eigenvalues on the y axis. Eigenvalues are

a measure of the amount of variance in a factor can be explained by the observed

variable. When looking at a scree plot, the point where the slope of the curve levels off

(also called the "elbow") indicates the number of factors that should be retained. The

second way to determine how many factors are retained in a solution is to look directly at

eigenvalues. Factors with eigenvalues ≥ 1 are retained. The third method of determining

the number of factors is to look at the percent of variance explained. This means choosing

the number of factors that account for a specific percentage of the sample variability. In

social sciences, it is recommended to choose factors that account for at least 50-60% of

the variance. The fourth option is to use parallel analysis, which uses a Monte-Carlo

simulation to compare eigenvalues extracted from the observed correlation matrix to

eigenvalues extracted from the simulated data. If the eigenvalue from the original data is

greater than the eigenvalue from the simulated data, then you retain that factor.

After determining the number of factors, factors are sometimes then rotated.

Factor rotation is a "process of turning the reference axes of the factors about their origin

to achieve a simple structure and theoretically more meaningful factor solution" (Hair et

al., 1995). Rotating factors helps with making the factor loadings more easily interpreted.

There are two overarching types of factor rotations – orthogonal and oblique. Orthogonal

rotations are used when factors are assumed to be uncorrelated. The three types of

orthogonal rotations are varimax, quartimax, and equamax. Oblique rotations are used when factors are theorized to be correlated. The two types of oblique rotations are promax and direct oblimin.

Finally, after rotation, comes interpretation. Variables that have a factor loading of .7 or higher are considered large. Loadings of < .3 are small. All variables should ideally only have a high loading on one factor. Also, each factor should have high loadings for only some of the variables (Pedhazur & Schmelkin, 1991).

After exploring factor structures using EFA, CFA is used to confirm the hypothesized model from the EFA. The model is determined ahead of time, based on the results of the EFA, including selecting the number of factors, which variables/items load on which factors, and how the factors are related. Then, the form of the model and its parameters are specified in a path diagram and model fit statistics are evaluated to determine how well the data fits the model (DeCoster, 1998). The comparative fit index (CFI) and Tucker-Lewis index (TLI) are measures to evaluate the data-model fit, and should be > 0.95. The root mean square error of approximation (RMSEA) should be < 0.05 and the standardized root mean square residual (SRMR) should be < 0.08.

Item response theory

Item response theory (IRT) models show relationships between ability levels (symbolized θ) of respondents and an item response. IRT has two different types of models – dichotomous and polytomous. Dichotomous models are used for dichotomous data where responses to items have two options, e.g., right/wrong answers. Polytomous models are for polytomous data, which comes from responses to items that have more than two answer choices, like Likert-scale responses or partial credit data.

Unidimensional IRT has four assumptions: (1) a single latent ability (or composite of abilities) is being measured, (2) local independence, meaning that examinees' response to different items are statistically independent, (3) item invariance, meaning that estimated item parameters are independent of the sample from which the items were estimated, and (4) correct specification of the item response function.

The item response function of a dichotomous 3PL model is

$$P(X_j = 1 | \theta, a_j, b_j, c_j) = c_j + (1 - c_j) \frac{e^{a_j(\theta - b_j)}}{1 + e^{a_j(\theta - b_j)}} \tag{1}$$

The a_j parameter in this model represents item j discrimination. Discrimination refers to how well the item discriminates or distinguishes between examinees of different ability levels. The higher the discrimination value, the better the item discriminates across ability levels. The b_j parameter is item difficulty for item j. The larger the item difficulty, the harder the item is. The c_j parameter is the guessing parameter and represents the probability of a correct response on item j by pure chance. The parameter θ corresponds to the estimated ability of the respondent.

The Graded Response Model is a polytomous model and specifies the probability of a person responding in a category k, or above, as opposed to being in a lower category. This is expressed as

$$P(X_j = k | \theta) = \frac{1}{1 + e^{-a_j(\theta - b_{jk})}} - \frac{1}{1 + e^{-a_j(\theta - b_{jk+1})}}$$

(2)

The a_i parameter in this model represents the discrimination of item i, which is consistent across all categories. The b_{ik} parameter is the threshold parameter, which shows where an examinee with ability $\theta = b_{ik}$ has a 50% chance of scoring at or above

category k to item i. The person ability parameter, θ, is similar to that in the dichotomous model.

Need for this study/gap it fills

Financial literacy has many definitions across different research studies. This lack of a clear and consistent definition makes it hard to accurately measure financial literacy. Additionally, it has been suggested that the financial planning topics important for college students to learn are different than topics important for the general population. Kabaci (2012) did start the process of identifying financial planning topics specific to college students. However, that study did not define topics for general undergraduate college students. Additionally, no validated measure of financial literacy for college students has been created. This study clearly defined financial literacy for all undergraduate students, as determined by financial planning and financial aid professionals, and then provided a valid and reliable instrument for measuring financial literacy for college students.

Research Questions

1. What topics are a part of financial knowledge specific to college students?

2. To what extent is the designed instrument a valid and reliable measure of financial literacy?

3. What are the underlying dimensions of financial literacy?

Summary

Financial literacy does not have one clear agreed upon definition in research. Thus, it is hard to compare results across studies. Additionally, there is a lack of agreement on what topics are included in financial literacy for college students. Because

there is a lack of agreement on topics specific to college students, there is also a lack of a

valid and reliable instrument to measure financial literacy in college students.

Researchers typically use one of the measures of financial literacy created for the general

population. However, even these measures created for the general population are not

always valid and reliable. Thus, there was a clear need for a definition of financial

literacy in college students and a valid, reliable measure of said construct. This study

aimed to fill those voids in the literature.

CHAPTER III

METHODOLOGY

Introduction

The present study utilized a variety of methods to operationally define financial

literacy for traditionally aged college students and to create an instrument to measure

financial literacy in college students. First, a Delphi approach was used to consult with

experts in order to properly operationally define financial literacy for traditionally aged

college students. After topics were solidified, questions were written to measure three

components of financial literacy – financial knowledge, financial attitude, and financial

behavior. The new instrument was distributed to college students at various institutions.

Then EFA, CFA, and IRT models were used to test the instrument and determine which

questions need to be adjusted or removed from the final instrument.

Research Design

Delphi Method

Because of the variety of definitions of financial literacy and the lack of grounded theory on financial literacy among college students, the present study utilized a Delphi approach to determine exactly what topics are important components of financial literacy for college students. The Delphi method is a method used to achieve convergence of opinion concerning real world knowledge (Hsu & Sandford, 2007). The Delphi method achieves consensus through a series of questionnaires that solicit expert feedback on the given topic. It is an iterative method, and can be continuously iterated until consensus is achieved, but many researchers have found three iterations are typically sufficient enough to reach consensus (Hsu & Sandford, 2007).

The first round of the Delphi process starts with an open-ended questionnaire that solicits specific information about a content area. The researcher then turns the received information into a questionnaire that is used in round two. In round two, participants receive the questionnaire and are asked to rate or rank-order items to establish priorities amongst the group. This is when consensus begins forming and actual outcomes can be presented among participants' responses. In the third, and typically final, round, participants receive another questionnaire that includes the rankings of the group from round 2. Each participant is then asked to either revise their judgments or to explain why their opinions remain outside of group consensus. If a fourth round is utilized, then each participant receives the list of remaining items, their ratings, minority opinions, and the items that have already achieved consensus. Participants are provided one more opportunity to revise their judgments (Hsu & Sandford, 2007).

The most important part of the Delphi method is that participants are highly trained and competent in the specialized area of knowledge. It is recommended to have over 13 respondents in a Delphi study, so that it is possible to have reliability of at least 0.80 (Dalkey, 1969). It is also important that Delphi studies have (1) anonymity – group participation must remain private, (2) controlled feedback – feedback between rounds is systemic and interactions are controlled, and (3) statistical group response – the group opinion is defined as an aggregate of individual opinions (Dalkey, 1969). These three features are important in minimizing the potential bias from dominant participants and of pressure to conform to the majority group opinion (Dalkey, 1969).

Instrument Creation and Testing

Utilizing the results from the Delphi, a new instrument measuring financial literacy for college students was developed. This instrument was then distributed to college students at various institutions.

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Participants/Sampling Information

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Phase 1: Financial Planning Experts

Population. The population considered for the Delphi phase of the present study was all financial planning experts that work with college students. This included faculty in financial planning programs at colleges/universities, financial aid counselors, and financial planning counselors at colleges/universities.

Sample. A list of Certified Financial Planning (CFP®) and Association for Financial Counseling and Planning Education (AFCPE®) registered programs was obtained from the CFP and AFCPE websites, as well as contact information for faculty in each program. Faculty members from this list were randomly selected and asked to

participate in the Delphi portion of the study. The Delphi method suggests having a

minimum sample size of 13, so the goal was to have a sample size of 15-20 participants.

Sampling method. The Delphi method required experts as participants, so

purposive sampling was utilized. Faculty from CFP® and AFCPE® registered financial

education programs were contacted to participate.

Phase 2: College students

Population. The population considered for the second phase of the present study

was all traditionally aged college students (i.e., ages 18-24).

Sample. The sample was comprised of undergraduate college students from

various colleges and universities in the United States. The goal sample size was

dependent upon the number of questions in the instrument.

Sampling method. Phase two of the study utilized convenience sampling. The

experts identified in Phase 1 were asked to send out the instrument to college students in

their own classrooms. Additionally, at Oklahoma State University, the instrument was

submitted to the SONA system for student participation; also, students in Family

Financial Planning courses were asked to participate in the survey.

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Data Collection

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Data collection began with the Delphi portion of the study. Financial planning

professionals received three rounds of surveys in Qualtrics. The first round was an open-

ended question about what topics they feel are important for college students to know

during and/or immediately after college. Like topics were combined and listed in a new

survey. The second survey listed topics from the first round and asked participants on a

scale of 1-5 (1=extremely unimportant, 2=unimportant, 3=neutral, 4=important,

5=extremely important), how important is each topic for college student financial literacy during/immediately after college. Topics from this round that had an average rating of ≥ 4.0 and had no rating lower than a 3.0 achieved consensus and were retained for the final instrument. Any topics that did not reach consensus after round two were listed in a new survey for round three. This time, participants were asked to "please answer whether you think each individual topic should be included in the final list of financial planning topics that traditional aged college students need to know during/immediately after college". Participants chose yes/no the topic should/should not be included. Topics that had at least 85% of participants voted 'yes' they should be included were also retained for the final instrument. Also, during round three, participants were given the opportunity to explain why any topics they chose 'no' on were not necessary for the final instrument.

Instruments

Round one of the Delphi method was simply an open-ended question asking, "what financial planning topics are important for college students to know during/immediately after college?". After collecting the responses, a second survey (round two) was distributed asking, "on a scale of 1-5, how important do you feel the following topics are for college student financial literacy?". The topics listed were all topics that respondents listed in round one. Topics from the round two survey reached consensus if they had an average rating of ≥ 4.0 and no rating lower than a 3.0. The topics that did not reach consensus were moved on to a third survey (round three). This time participants were asked to "please answer whether you think each individual topic should be included in the final list of financial planning topics that traditional aged college students need to know during/immediately after college" with yes or no response

options. If a participant answered 'no' a topic did not need to be included, they were also asked to provide a reasoning behind their decision. Topics from round three that had a minimum of 85% of participants say 'yes' they should be included were also considered to have reached consensus and be moved on to the final instrument.

The topics and themes from the Delphi portion were then be used to create the new instrument. At least three questions were created for each them – one measuring knowledge of the theme, one measuring attitude about the theme, and one measuring behavior surrounding the theme. For some themes that were broader or higher ranked by participants, there were more than three questions measuring that theme. Additionally, demographic questions about gender, age, race, year in school, and how much financial education they have received were included in the final instrument.

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Data Analysis

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Delphi

Responses to round one of the Delphi portion of the study were coded qualitatively. Like responses were grouped together before distributing the survey for round two. In round two, each response was listed, and participants were asked to rate how important each topic was. The Delphi method does not provide guidelines on what scores/rankings qualify an item to be retained and used in the final instrument. That decision is made subjectively by the researcher. The retained topics were used to create the new instrument measuring college student financial literacy.

Data Structure

After distributing the new instrument to college students, data obtained was cleaned and split into three subsets – knowledge, attitude, and behavior. Upon looking at

the initial eigenvalues of the knowledge data, the first eigenvalue was large enough to suggest that the data could be unidimensional. A Rasch IRT model was fit to the data and local independence was tested using the Q3 statistic (Yen, 1984). Residuals with an absolute value greater than 0.2 indicates items might have violated local independence, and thus a one factor solution would not fit. If no residuals are greater than |0.2|, that confirms a unidimensional data structure.

For the attitude data, the dataset was split into two equal sized sets; the first for EFA and the second for CFA. Exploratory factor analysis was used to explore and then confirm the data structure. To determine if EFA was appropriate for the data, the correlation matrix, Bartlett's test of sphericity, and the Kaiser-Meyer-Olkin measure were used. In order to proceed with EFA, the determinant of the correlation matrix must be between 0 and 1. If that condition is met, the next step is to look at Bartlett's test of sphericity, which tests whether or not the sample size is sufficient for data reduction. If $p < .05$, the sample size is sufficient for EFA. The last step in determining if EFA is appropriate for the dataset is to look at the Kaiser-Meyer-Olkin (KMO) statistic, which indicates the proportion of variance in the variables that might be caused by the underlying factors. The KMO statistic must be $> .60$ to move forward with factor extraction. There are multiple methods of determining how many factors to retain – scree plots, eigenvalues, percent of variance explained, and parallel analysis. These methods were used to make sure there was consensus in how many factors to retain. Initially, an oblique (Promax) rotation was used, assuming that factors would be correlated. However, the initial extraction indicated that factors were not correlated, so a new model was run using an orthogonal (Varimax) rotation. When evaluating the EFA, there are several

things to consider. First, each variable should ideally have a high loading (> 0.6) on only one factor. Each variable should also have a zero loading (or close to 0, i.e. < 0.3) on at least one factor. Each factor should have high loadings for only some of the variables. Items may be removed if they have low loadings on all factors or if they have high loadings on multiple factors.

After the EFA was used to explore the structure of the attitude data, a confirmatory factor analysis (CFA) was used to confirm that the hypothesized structure was correct. Multiple indices were used to evaluate the fit of the CFA, including the comparative fit index (CFI), the Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). CFI and TLI values should be > 0.95. RMSEA should be < 0.05 and SRMR should be < 0.08. After evaluating the model-fit statistics, the residuals of the observed and reproduced covariance matrices were evaluated. Residuals would ideally be $\leq |2|$. Items with many residuals > $|2|$ may be deleted. The EFA was completed using SPSS and CFA was done using the lavaan package in R (Rosseel, 2012).

Because behavior is not a latent construct and those questions simply measured the frequency of respondents engaging in particular behaviors, it was not necessary to confirm data structure through Q3 or factor analysis. Instead, response distributions were analyzed to see which behaviors are common among college students.

Item Response Theory

After confirming the structure of the data, two different Item Response Theory (IRT) models were used to further evaluate the knowledge and attitude components of the instrument. IRT shows relationships between ability levels measured by the instrument

and an item response. First, a dichotomous 3PL was used on financial knowledge questions because they were dichotomous, having right/wrong answers. The 3PL model has four assumptions. The first assumption is that a single latent ability (or composite of abilities) is being measured. The second assumption is that there is local independence, meaning that examinees' response to different items are statistically independent. The third assumption, item invariance, means that estimated item parameters are independent of the sample from which the items were estimated. The fourth and final assumption is that the correct specification of the item response function has been made.

The 3PL model estimates three different item parameters: difficulty, discrimination, and pseudo-guessing. Item difficulty, represented by b, tells how difficult an item is. The larger the b parameter, the harder the item is. Because the instrument is meant to measure a variety of ability levels, the b parameter values should fall between -3 and 3. Item discrimination, represented by a, is how well the item discriminates or distinguishes between examinees of different ability levels. The higher the a value, the better the item discriminates across ability levels. Item discrimination values ideally should fall between 0.8 and 1.8. Pseudo-guessing, represented by c, represents the probability of getting a correct response on an item by pure chance. The larger the c value, the more likely it is for a respondent to be able to guess the correct answer by chance.

A 2PL model was also run on the knowledge questions and the two models were compared to see which was a better fit for the data. The 2PL model has the same assumptions as the 3PL model, but only measures two item parameters: difficulty (b) and discrimination (a).

A GRM was used on each of the financial attitude factors (financial planning attitude and financial management attitude). GRM was chosen because these questions utilize a polytomous Likert-type response scale and because the GRM assumes ordinal responses. The assumptions for the GRM are the same as the assumptions for the 3PL model listed above (dimensionality, local independence, item invariance, and correct specification). The GRM estimates two parameters, item discrimination and the threshold parameter. In the GRM, item discrimination is still represented by a and is consistent across all categories. The threshold parameter, b, shows where an examinee with $\theta = b_{jk}$ has a 50% chance of scoring at or above category k. Depending on the parameter estimates and observations from item characteristic curves and item information curves from the IRT models, questions were edited or removed to create the strongest possible instrument. IRT analysis was using the ltm package in R (Rizopoulos, 2006).

Summary

The purpose of the present study was to operationally define financial literacy for traditionally aged college students and to create an instrument to measure financial literacy in college students. In order to do that, the Delphi method was used to consult financial planning professionals to operationally define financial literacy for college students. Then, using the results of the Delphi, an instrument was written to measure three components of financial literacy – financial knowledge, financial attitude, and financial behavior. This instrument was distributed to traditionally aged college students at various institutions and analyzed using EFA, CFA, and IRT.

CHAPTER IV

FINDINGS

Introduction

Utilizing a Delphi approach, financial professionals identified 29 unique topics

that should be considered a part of financial literacy for college students. Those 29 topics

were condensed into 9 components: budgeting, credit, insurance, benefits/retirement,

investing, debt management, taxes, banking, and other. An instrument was created using

those 29 topics and 9 components that was intended to measure financial knowledge,

attitude, and behavior. After confirming the data structure of the instrument, it was

determined that financial knowledge items were unidimensional while financial attitude

was actually two distinct factors: financial planning attitudes and financial management

attitudes. Utilizing multiple techniques, including EFA, IRT, and item correlation to total

score, items were removed that did not best fit the desired structure. After those

adjustments were made, the final instrument

contained 26 financial knowledge items, 6 financial planning attitude items, 6 financial management attitude items, and 15 financial behavior items.

Results/Findings

Phase 1: Delphi

Demographics

Sixteen participants responded to the first two rounds of the Delphi study. Fifteen of those participants also responded in the third and final round of the Delphi. The participants were all faculty members from Personal Financial Planning programs at four-year colleges and universities. They were from eleven different states (Alabama, Kansas, Georgia, South Carolina, Pennsylvania, Texas, Oklahoma, Maine, South Dakota, Montana, and Nevada) and all work with undergraduate students. Fourteen participants were from public colleges and universities (ten of which are land grant institutions), and one was from a private college.

Creating/Retaining Topics

In round one of the Delphi study, participants were asked "what financial planning topics are important for college students to know during/immediately after college?". Participants answered this question with as few or as many topics as they wanted. After taking out repeated topics, there were 55 unique topics listed during round one.

In round two, participants were sent a list of all 55 unique topics and asked "on a scale of 1-5, how important do you feel the following topics are for college student financial literacy?" (1=extremely unimportant, 2=unimportant, 3=neutral, 4=important,

5=extremely important). Table 1 presents the item-level descriptive statistics. Average rankings of the 55 topics were between 3.75 and 4.94. Topics that reached consensus during round two were automatically retained to be included in the final instrument. Topics reached consensus if (1) their average ranking was ≥ 4.0 and (2) no participant ranked the topic below a 3. Using these criteria, 26 (47.2%) of the 55 topics achieved consensus in round two.

In round three, the remaining 29 topics that had not reached consensus in round 2 were sent back out to participants. This time participants were asked to "please answer whether you think each individual topic should be included in the final list of financial planning topics that traditional aged college students need to know during/immediately after college'. Instead of ranking topics on a Likert scale, they chose 'yes' the topic should be included, or 'no' it should not. Table 1 presents the frequency and percentage of 'yes' responses to the 29 items in round three. In round three, consensus was achieved if at least 85% (13 of 15) of the participants said yes it should be included. Following this criteria, an additional 12 topics were retained for the final instrument.

In round 3, If a participant responded that a topic was not important enough to be included, they were given the opportunity to explain why. Of the participants that chose to explain why a topic did not need to be included, many said the topics weren't age appropriate (i.e. estate planning) or that the topic was probably covered under a different topic already. Others said that there were simply too many topics to cover with the average student and that they had to pick and choose which were the most important.

In total, 39 topics reached consensus as important enough to be covered in a final instrument. Table 1 below shows all 55 topics from round 1 and which 39 topics achieved consensus.

Table 1

Topics from Phase 1

	Round 2 M(SD)	Round 3 Frequency of 'Yes' response (%)
Budgeting*	4.94(0.25)	
Cash Flow Management*	4.75(0.45)	
Benefits packages**	4.67(0.79)	14 (93.33%)
Emergency Savings*	4.69(0.48)	
Employer match on retirement savings*	4.63(0.62)	
Credit*	4.50(0.63)	
Student Loans*	4.56(0.51)	
Best Practices of Credit Cards*	4.50(0.63)	
401K/employer sponsored retirement savings**	4.50(0.82)	13 (86.67%)
Setting financial goals*	4.50(0.63)	
Learning to Live Below Your Means*	4.47(0.64)	
Savings*	4.44(0.73)	
Managing Debt**	4.44(0.81)	14 (93.33%)
Time Value of Money/Compound Interest*	4.44(0.73)	
Making big purchases/debt planning**	4.40(0.83)	13 (86.67%)
Credit Cards*	4.38(0.81)	
Car Insurance**	4.38(0.81)	14 (93.33%)
Debt Repayment*	4.38(0.62)	
Credit Use & Function*	4.31(0.60)	
How credit scores impact rental applications, etc.*	4.31(0.79)	
Saving vs Investing*	4.31(0.60)	
Building Credit Scores*	4.25(0.77)	
Health Insurance*	4.25(0.77)	
Basic investing principles*	4.25(0.58)	
Basics of Retirement Planning**	4.19(0.83)	14 (93.33%)
Auto Loans*	4.13(0.62)	
Basic tax planning*	4.13(0.72)	
Insurance (general)**	4.06(0.77)	14 (93.33%)
Renter's Insurance*	4.06(0.68)	
Filing Taxes*	4.06(0.85)	

Banking*	4.06(0.68)		
Risk levels of investment types*	4.00(0.73)		
Seeking financial advice*	4.00(0.73)		
Checking & savings accounts**	3.94(0.68)		
Automation (setting loans/savings on automation)	3.94(1.06)	6	(40.00%)
Completing a W4 and 1040 for taxes	3.88(1.09)	10	(66.67%)
Impact of your financial socialization on decisions	3.81(0.98)	12	(80.00%)
How to communicate with others about money	3.81(1.17)	12	(80.00%)
Acquisition of Loans	3.75(0.86)	12	(80.00%)
Landlord/tenant rules/regulations**	3.75(1.06)	13	(86.67%)
General consumer protection laws**	3.69(0.95)	13	(86.67%)
Consumer Purchasing Processes	3.63(1.09)	8	(53.33%)
Developing a Net Worth Statement	3.63(1.09)	11	(73.33%)
Debit Cards**	3.50(1.15)	13	(86.67%)
Natural biases regarding money**	3.50(1.15)	13	(86.67%)
Homeowner's Insurance	3.44(0.89)	11	(73.33%)
Liability Insurance	3.44(0.73)	7	(46.67%)
Healthcare Directive	3.44(1.15)	10	(66.67%)
Life Insurance	3.40(0.99)	8	(53.33%)
Home Loans	3.38(0.96)	12	(80.00%)
Power of Attorney	3.36(1.22)	9	(60.00%)
Disability Insurance	3.31(1.30)	10	(66.67%)
Wills	3.19(1.11)	8	(53.33%)
Living Will	3.06(1.12)	9	(60.00%)
Basic Estate Planning	2.94(0.93)	12	(80.00%)

*Achieved consensus after Round 2; their average ranking was ≥ 4.0 and no participant ranked the topic below a 3.0

**Achieved consensus after Round 3; at least 85% (13 of 15) of the participants said yes it should be included

Note. 1=extremely unimportant, 2=unimportant, 3=neutral, 4=important, 5=extremely important

Final Themes/Components

The 39 topics that achieved consensus were then qualitatively coded to determine larger themes within the data among the topics. Coding results were triangulated with a Personal Financial Planning faculty member to make sure topics were grouped appropriately. At the end of this process, there were nine themes or components within the 39 topics: (1) budgeting, (2) credit, (3) insurance, (4) retirement/benefits, (5)

investing, (6) debt management, (7) taxes, (8) banking, and (9) other. Table 2 below

shows the topics within each component.

Table 2

Final Components

Component	Topic
Budgeting	1. Budgeting basics
	2. Cash flow management
	3. Learning to live below your means
	4. Setting financial goals
	5. Saving
	6. Saving vs. investing
	7. Emergency savings
Credit	8. Credit basics
	9. Credit cards
	10. Building credit scores
	11. Credit use and function
	12. Best practices of credit cards
	13. How credit scores impact other areas
Insurance	14. General insurance
	15. Renter's insurance
	16. Health insurance
	17. Car insurance
Retirement/Benefits	18. Employer match on retirement savings
	19. Benefits packages
	20. 401K/employer sponsored retirement programs
	21. Retirement planning basics
Investing	22. Saving vs. investing
	23. Basic investing
	24. Risk levels of various investments
	25. Time value of money/compound interest
Debt Management	26. Auto loans
	27. Student loans
	28. Debt repayment
	29. Managing debt
	30. Making big purchases/debt planning
Taxes	31. Basic tax planning

Component	Topic
	32. Filing taxes
Banking	33. Banking basics
	34. Debit cards
	35. Checking and savings accounts
Other	36. Seeking financial advice
	37. General consumer protection laws
	38. Natural biases regarding money
	39. Landlord tenant rules/regulations

Instrument Development

Themes to Items

The instrument consisted of three subscales: knowledge, attitude, and behavior (to align with Vieira et al. (2020)'s holistic approach to financial literacy measurement. The knowledge portion of the instrument contained 1-2 questions for each of the 39 topics that achieved consensus. Additionally, there were four or more items developed for each component so that each component was well represented in the instrument. The knowledge subscale had a total of 51 items.

The attitude and behavior subscales did not measure each of the 39 topics, but rather had 1-2 questions from each of the nine components. The attitude subscale contained 15 items with a 5-point Likert response scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The behavior subscale contained 15 items and utilized a 5-point Likert response scale (1=never, 2=rarely, 3=sometimes, 4=often, 5=always) with an option to select "N/A" for behaviors that did not apply to them. The attitude and behavior subscales were shorter to avoid survey fatigue and because some of the topics did not translate into attitude and behavior questions. Appendix A presents the initial instrument.

Phase 2

Demographics

      After creating the instrument, it was distributed to college students via Qualtrics.

Respondents were from a variety of states including Alabama, Kansas, Georgia, South

Carolina, Pennsylvania, Texas, Oklahoma, Maine, South Dakota, Montana, and Nevada.

Responses from each state were not tracked to keep the survey completely anonymous.

Table 3 below presents detailed demographics on participants. Overall, this sample was

primarily female (74.5%), white (64.5%), and had an average age of 20.11 years old.

Respondents were distributed across college classifications and just over half (53.2%)

have had some amount of financial education.

Table 3

Demographics

Item: Categories	Frequency	Percent
Gender		
Female	374	74.5%
Male	118	23.5%
Non-binary	6	1.2%
Prefer not to say	4	0.8%
Race		
American Indian or Alaska Native	10	2.0%
Asian	17	3.4%
Biracial/Multiracial	65	12.9%
Black/African American	46	9.2%
Hispanic or Latinx	36	7.2%
Native Hawaiian or Pacific Islander	2	0.4%
Other	1	0.2%
White	324	64.5%
Did not respond	1	0.2%
Classification		
Freshman	115	22.9%
Sophomore	96	19.1%
Junior	133	26.5%
Senior	155	30.9%
Other	3	0.6%

Item: Categories	Frequency	Percent
Financial Education		
Yes	267	53.2%
No	204	40.6%
Did not respond	31	6.2%
Item	**_M_ (SD)**	**Range**
Age	20.11 (1.455)	18-24

Item Level Descriptive Statistics

Table 4 below shows item-level information for knowledge items including how many people answered each item correctly and the objective the item measures. Table 5 shows the average percent of correct items based on each of the nine components. attitude, and behavior questions. Table 6 shows the item-level information for attitude items and behavior items.

Table 4

Knowledge Items Descriptive Statistics

Item	Objective	Frequency (Percentage) of Correct Response
1	Budgeting basics	484 (96.4%)
2	Budgeting basics	481 (95.8%)
3	Cash flow management	469 (93.4%)
4	Learning to live below your means	356 (70.9%)
5	Setting financial goals	481 (95.8%)
6	Saving	473 (94.2%)
7	Saving vs. investing	415 (82.7%)
8	Saving vs. investing	28 (5.58%)
9	Emergency savings	293 (58.4%)
10	Credit basics	122 (24.3%)
11	Credit basics	227 (45.2%)
12	Credit basics	126 (25.1%)
13	Credit cards	183 (36.5%)
14	Building credit scores	86 (17.1%)
15	Building credit scores	370 (73.7%)
16	Credit use and function	370 (73.7%)
17	Best practices of credit cards	299 (59.6%)
18	How credit scores impact other areas	453 (90.2%)
19	General insurance	306 (61%)

Item	Objective	Frequency (Percentage) of Correct Response	
20	Renter's insurance	356	(70.9%)
21	Health insurance	30	(5.98%)
22	Car insurance	10	(1.99%)
23	Car insurance	70	(13.9%)
24	Employer match on retirement savings	237	(47.2%)
25	Benefits packages	471	(93.8%)
26	401K/Employer sponsored retirement programs	270	(53.8%)
27	Retirement planning basics	307	(61.2%)
28	Retirement planning basics	378	(75.3%)
29	Basic investing	130	(25.9%)
30	Risk levels of various investments	397	(79.1%)
31	Risk levels of various investments	233	(46.4%)
32	Time value of money/compound interest	295	(58.8%)
33	Time value of money/compound interest	286	(57.0%)
34	Auto loans	115	(22.9%)
35	Student loans	271	(54.0%)
36	Student loans	391	(77.9%)
37	Student loans	454	(90.4%)
38	Debt repayment	289	(57.6%)
39	Managing debt	342	(68.1%)
40	Making big purchases/debt planning	76	(15.1%)
41	Basic tax planning	169	(33.7%)
42	Basic tax planning	190	(37.8%)
43	Filing taxes	198	(39.4%)
44	Filing taxes	403	(80.3%)
45	Banking basics	413	(82.3%)
46	Debit cards	404	(80.5%)
47	Checking and savings accounts	448	(89.2%)
48	Seeking financial advice	465	(92.6%)
49	General consumer protection laws	339	(67.5%)
50	Natural biases regarding money	474	(94.4%)
51	Landlord tenant rules/regulations	228	(45.4%)

Table 5

Financial Component Scores

Financial Knowledge Component	Number of Items	Average Score
Budgeting	9	87%
Credit	9	49%
Insurance	5	31%
Retirement/Benefits	5	55%

Financial Knowledge Component	Number of Items	Average Score
Investing	5	45%
Debt Management	7	55%
Taxes	4	48%
Banking	3	84%
Other	4	75%

Table 6

Attitude and Behavior Items Descriptive Statistics

Scale	Item	Objective	M (SD)	Frequency (Percent) of 'NA'
Attitude	1	Budgeting	3.96 (0.94)	
	2	Budgeting	4.36 (0.83)	
	3	Budgeting	3.88 (0.99)	
	4	Credit	2.00 (1.05)	
	5	Credit	2.79 (1.23)	
	6	Credit	3.09 (1.18)	
	7	Insurance	4.53 (0.75)	
	8	Benefits/Retirement	2.87 (1.49)	
	9	Benefits/Retirement	2.49 (1.39)	
	10	Investing	2.40 (1.25)	
	11	Debt Management	4.38 (0.84)	
	12	Debt Management	3.60 (1.13)	
	13	Taxes	3.12 (1.25)	
	14	Banking	2.97 (1.26)	
	15	Other	4.48 (0.84)	
Behavior	1	Budgeting	2.93 (1.13)	27 (5.4%)
	2	Budgeting	3.31 (1.08)	14 (2.8%)
	3	Credit	2.40 (1.40)	117 (23.3%)
	4	Credit	3.17 (1.58)	131 (26.1%)
	5	Credit	3.48 (1.36)	145 (28.9%)
	6	Insurance	2.52 (1.26)	39 (7.8%)
	7	Benefits/Retirement	3.39 (1.24)	22 (4.4%)
	8	Investing	3.39 (1.50)	45 (9.0%)
	9	Investing	2.50 (1.53)	85 (16.9%)
	10	Debt Management	4.19 (1.12)	21 (4.2%)
	11	Debt Management	4.31 (1.20)	26 (5.2%)
	12	Taxes	3.07 (1.36)	47 (9.4%)
	13	Banking	4.06 (1.26)	166 (33.1%)
	14	Banking	2.57 (1.45)	76 (15.1%)

Scale	Item	Objective	M (SD)	Frequency (Percent) of 'NA'
	15	Other	3.60 (1.34)	85 (16.9%)

Note. Response options to attitude items were: 1=strongly agree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree. Response options to behavior items were: 1=never, 2=rarely, 3=sometimes, 4=often, 5=always.

Scale Refinement and Item Level Analysis

Knowledge

The knowledge items had a binary response. The items were studied using Item Response Theory. First, the dimensionality of scale was investigated using the Q3 statistic (Yen, 1984). Then, items were evaluated using their correlation to total score and their contribution to the reliability of the instrument. Finally, difficulty and discrimination parameters of each item were investigated using item response theory.

Q3 Statistic. When looking at the knowledge scale, the first eigenvalue was very large (11.762). This indicated that the scale was potentially unidimensional. A Rasch IRT model was fit to the data to then check residuals and to test local independence using the Q3 statistic (Yen, 1984). The Q3 statistic suggests that residuals with absolute values > 0.2 might indicate a violation of local independence. Three pairs of items (items 4 and 6, 24 and 51, and 5 and 31) had non-zero correlations, but each non-zero correlation was less than 0.2, meaning the dataset was unidimensional.

Criteria for Retaining Items. The correlation between each item response and the total score was investigated for internal consistency. All items having a correlation with the total score of less than 0.2 were removed from the instrument. Seventeen (33.3%) of the items had a low correlation between the item response and the total score and were removed. These were items 7, 8, 11, 13, 16, 20, 21, 22, 27, 29, 32, 34, 40, 42,

50

43, 44, and 51. With the remaining 34 items, Cronbach's α for the overall dataset was 0.797. Items that lowered the overall α of the instrument (items 10, 12, 26, and 31) were then removed, increasing α to 0.806.

Item Response Theory. Both a 2PL and 3PL model were run on the remaining 30 items measuring financial knowledge. After comparing the AIC and BIC (2PL AIC=12673.96 and BIC=12926.08; 3PL AIC=12673.81 and BIC=13053.48) of both models, the 2PL model fit the data best. Then item parameters were evaluated. Items with difficulty values less than -3 (items 1 and 3) or greater than 3 (items 14 and 23) were removed (Baker & Kim, 2004). The item parameters for the remaining items are listed in table 7 below. Item characteristic curves (ICCs) and item information curves (IICs) are below in Figure 1.

Table 7

2PL Item Parameters

Item	Objective	b_j	a_j
3*	Cash flow management	-3.40	0.87
1*	Budgeting basics	-3.04	1.33
5	Saving	-2.53	1.69
6	Saving vs. investing	-2.52	1.32
15	Building credit scores	-2.48	0.43
28	Retirement planning basics	-2.47	0.47
2	Budgeting basics	-2.37	1.93
48	Seeking financial advice	-2.35	1.38
4	Learning to live below your means	-2.09	0.44
30	Risk levels of various investments	-1.97	0.75
50	Natural biases regarding money	-1.93	2.70
37	Student loans	-1.84	1.77
18	How credit scores impact other areas	-1.81	1.82
25	Benefits packages	-1.80	3.17
36	Student loans	-1.72	0.83
47	Checking and savings accounts	-1.66	1.97
45	Banking basics	-1.08	2.89
39	Managing debt	-1.06	0.81
46	Debit cards	-0.96	3.43

| Item	Objective	b_j	a_j
49	General consumer protection laws	-0.79	1.16
19	General insurance	-0.64	0.77
9	Emergency savings	-0.51	0.73
38	Debt repayment	-0.50	0.66
17	Best practices of credit cards	-0.46	0.99
33	Time value of money/compound interest	-0.26	1.40
35	Student loans	-0.25	0.69
24	Employer match on retirement savings	0.14	1.10
41	Basic tax planning	0.70	1.29
23*	Car insurance	3.66	0.52
14*	Building credit scores	4.45	0.36

Note. *indicates item removed from final instrument because of difficulty value. Refer to

Equation (1) on page 25 for more details of the a and b parameters.

The item response theory results show that many of the knowledge items have a

low difficulty value (between -2.5 and -0.25), which suggests the test may be best used

with individuals with lower levels of financial literacy. Many of the items have similar

difficulty values, but are measuring different pieces of financial knowledge. For example,

items 18 and 25 have similar item parameters, but the objectives of the items are

different. This information also confirms that there are not redundant items with similar

parameters measuring the same objectives.

Figure 1 below shows the item characteristic curves (ICCs) for the final 26 items

and the test information curve for the knowledge items. The ICCs show the same

difficulty and discrimination parameters as table 6. The slope of the ICC shows the item's

discrimination and the point of inflection of the ICC shows the item's difficulty. The test

information curve shows the amount of information a test provides for a given θ. This

shows that the test provides the most information for a respondent with $\theta \sim -1.5$,

confirming that the test is most suited for lower ability levels.

Figure 1

Item Characteristic Curves and Test Information Curve
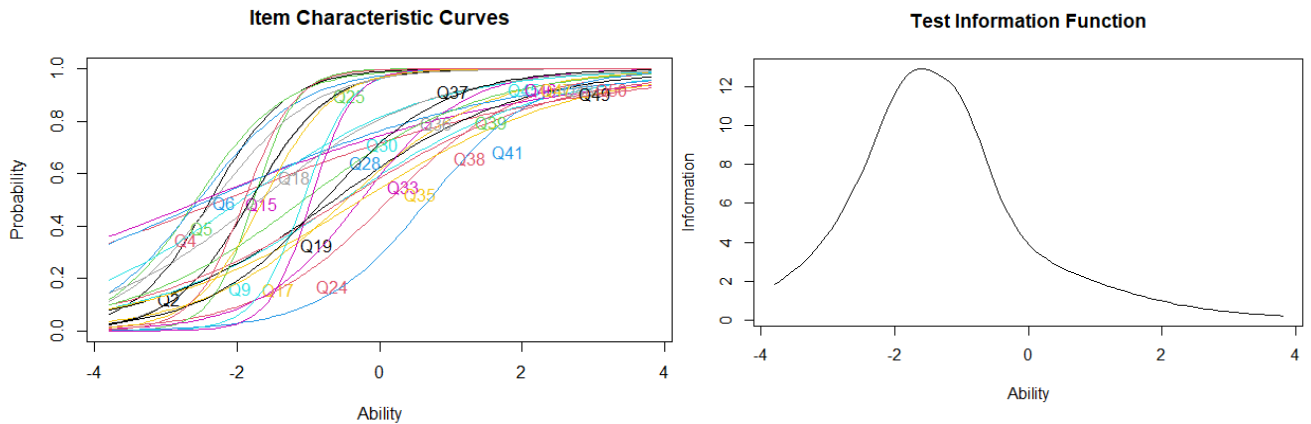
Attitude

The attitude items had a 5-point Likert-scale response (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The N = 502 dataset was randomly split into two equally sized datasets. On the first, EFA was conducted and on the second CFA was done. EFA was used to explore the data structure and determine the number of factors present. Then, CFA was used to confirm the hypothesized structure and evaluate model fit. Then, items were evaluated using a graded response model.

EFA. The determinant of the correlation matrix was 0.004. Bartlett's test of sphericity was significant ($p < 0.05$) and the KMO statistic was 0.799. These suggested that the data is sufficient for using EFA. Then, an EFA utilizing a principal axis factoring extraction and a promax rotation was completed, because factors were assumed to be correlated. The results suggested that the factors are not strongly correlated. The correlation between factor 1 and factor 2 was 0.240, the correlation between factor 1 and

factor 3 was -0.065, and the correlation between factor 2 and factor 3 was 0.060. Because

of these low correlations, a second EFA was run utilizing a varimax rotation.

Utilizing the modified EFA, there were three eigenvalues > 1 indicating three

factors present. The scree plot suggested a four-factor solution. Parallel analysis

suggested three factors, and a three-factor solution explained 57% of the variance, so a

three-factor solution was chosen.

Item 4 was removed because of low loadings on each of the three factors. Factor

loadings for a three-factor solution can be seen below in Table 8.

Table 8

Attitude Factor Loadings (3 Factor Solution)

| Item	Objective	Factor 1	2	3
Item 1	Budgeting	0.627		
Item 2	Budgeting	0.761		
Item 3	Budgeting	0.525		
Item 4	Credit	-0.296	0.275	
Item 5	Credit		0.791	
Item 6	Credit		-0.744	
Item 7	Insurance	0.730		
Item 8	Benefits/Retirement			0.808
Item 9	Benefits/Retirement			0.968
Item 10	Investing		0.575	
Item 11	Debt Management	-0.623		
Item 12	Debt Management		-0.479	
Item 13	Taxes		0.530	
Item 14	Banking		0.680	
Item 15	Other	0.756		

CFA. Using a three-factor solution, the confirmatory factor analysis model did

not converge. Estimated variances for items 8 and 9 were very high. Since those were the

only items on factor 3, a new CFA model was run without those items, using only a two-

factor solution. This solution converged with no issues. Items 8 and 9 were removed from the instrument and a two-factor solution was assumed.

Utilizing a two-factor solution, the model fit improved. The CLI was 0.873 and TLI was 0.841. RMSEA was 0.101 and SRMR was 0.085. Since none of the model fit statistics met the desired metrics, the residuals were examined. Item 12 had 7 residuals > |2| and item 3 had 5 residuals > |2|, so each of these items were removed from the instrument. A new CFA was run after these adjustments were made and the fit indices improved slightly. The CLI was 0.920 and TLI was 0.895. RMSEA was 0.089 and SRMR was 0.055. Figure 2 below shows the final two factor model.

Figure 2

Attitude CFA Model
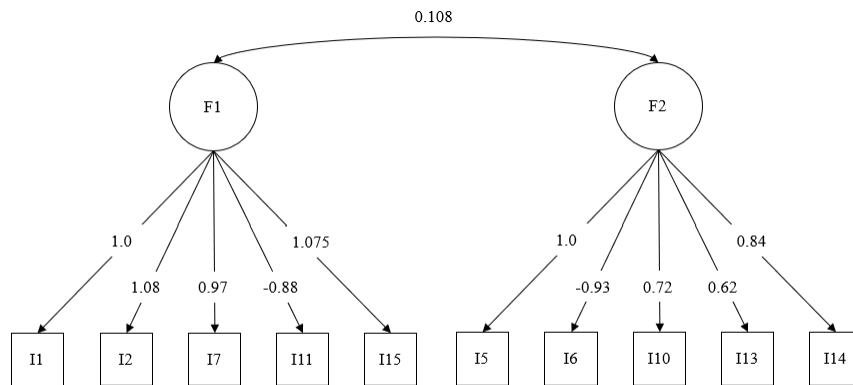
Factor 1 is financial planning attitudes and factor 2 is financial management attitudes. Financial planning is focused more on taking steps to plan out your current and future finances. Financial planning attitude items are about the importance of budgeting, adequate insurance, debt management, and utilizing financial professionals. Financial

management is the use/control of financial resources, so financial management attitude items are focused on attitudes toward using credit cards, investing, taxes, and banking.

GRM. After confirming the factor structure, graded response model was run on each of the two remaining factors. Table 9 below shows the item parameters for each of the remaining 10 items. All items have moderate to high discrimination parameters. The threshold parameters show where an examinee with $\theta = b_{ik}$ has a 50% chance o score at or above category k.

The threshold parameter, b, shows where an examinee with $\theta = b_{ik}$ has a 50% chance of scoring at or above category k. The low b_{i5} values on financial planning attitude items suggest that even respondents with low θ's may respond 'strongly agree'. The financial management attitude items have a higher threshold to get into 'strongly agree'. This may suggest that most participants have the right financial planning attitude, but that does not necessarily mean that their financial management attitude is equally as strong.

Table 9

GRM Item Parameters

			Factor 1: Financial Planning Attitude				
		a_i	b_{i1}	b_{i2}	b_{i3}	b_{i4}	b_{i5}
Item	Objective		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Item 1	Budgeting	1.77		-3.04	-2.21	-0.90	0.62
Item 2	Budgeting	2.59		-2.81	-2.40	-1.51	-0.08
Item 7	Insurance	2.52		-3.24	-2.53	-1.68	-.045
Item 11	Debt Management	-1.75		-0.23	-1.58	-2.77	-3.73
Item 15	Other	2.71		-2.63	-2.43	-1.51	-0.40

			Factor 2: Financial Management Attitude				
		a_i	b_{i1}	b_{i2}	b_{i3}	b_{i4}	b_{i5}
Item	Objective		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Item 5	Credit	2.91		-1.14	-0.15	0.60	1.45
Item 6	Credit	-2.63		1.33	0.34	-0.49	-1.53
Item 10	Investing	1.45		-0.82	0.30	1.17	2.17
Item 13	Taxes	1.16		-2.00	-0.77	0.30	1.81
Item 14	Banking	1.80		-1.56	-0.34	0.49	1.40

Figure 3 below shows the category response curves (CRCs) for financial planning attitude items. The CRC's show the probability of each response option based on the respondent's θ. For items 2 and 15, the CRCs show that no ability level is most likely to choose 'disagree'. For items 1 and 7, the range of θs that would most likely choose '2' (disagree) is narrow.

Figure 3

Category Response Curves (Financial Planning Attitude)

Item Response Category Characteristic Curves - Item: Q52_15
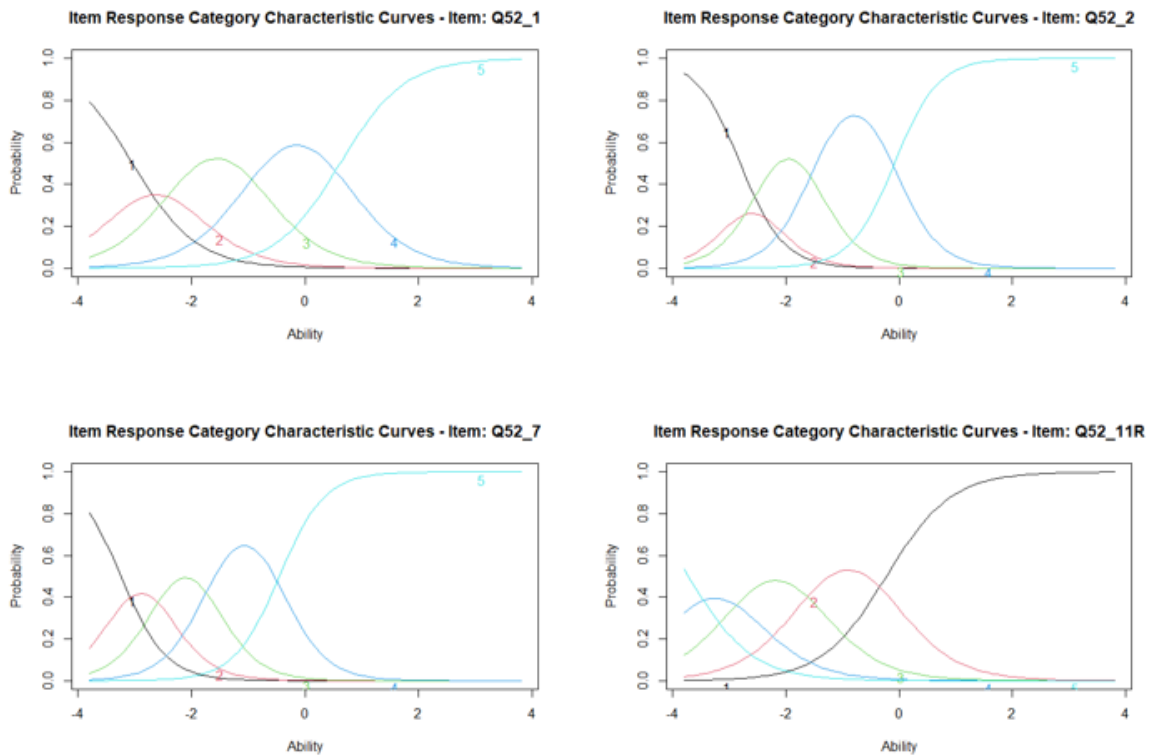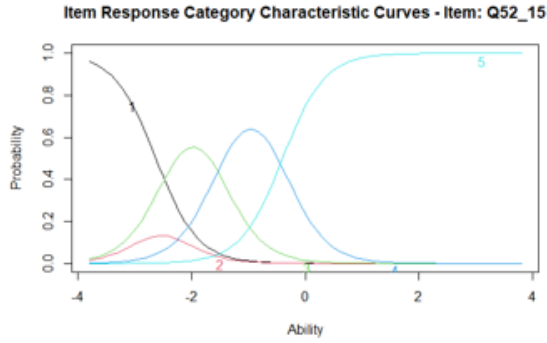
Figure 4 below shows the CRC for the financial management attitude items. These items responses are more evenly distributed than the financial planning attitude items. Items 10, 13, and 14 do have a narrow range of θ's most likely to choose 'neutral'. On item 10, the majority of respondents are likely to choose an extreme response (either 'strongly disagree' or 'strongly agree'), regardless of their θ.

Figure 4

Category Response Curves (Financial Management Attitude)

Item Response Category Characteristic Curves - Item: Q52_5

Item Response Category Characteristic Curves - Item: Q52_6R

Item Response Category Characteristic Curves - Item: Q52_10

Item Response Category Characteristic Curves - Item: Q52_13

Item Response Category Characteristic Curves - Item: Q52_14
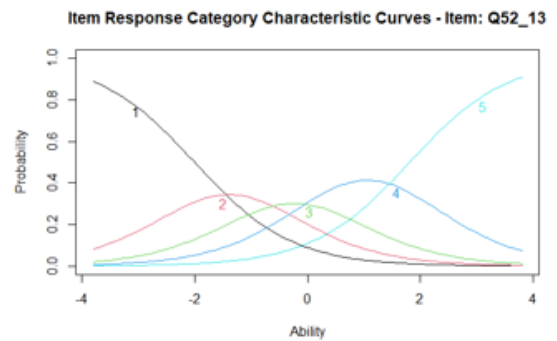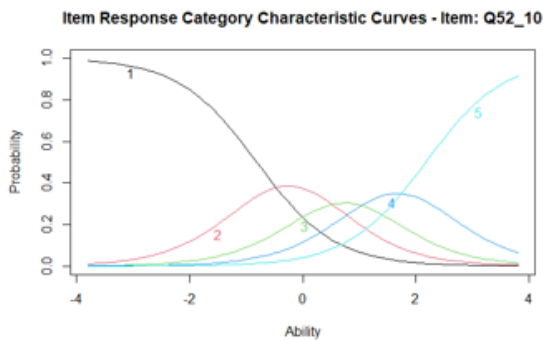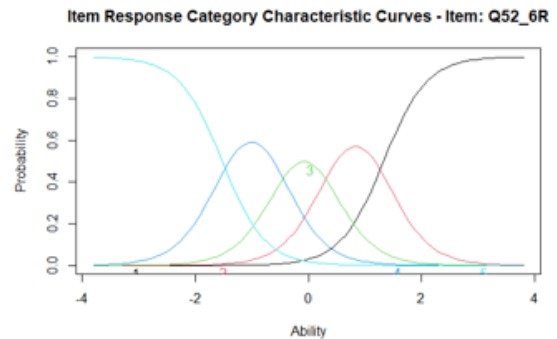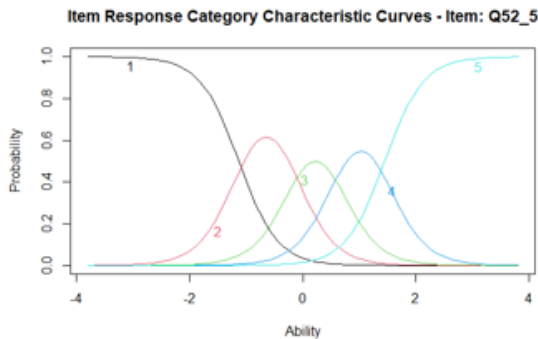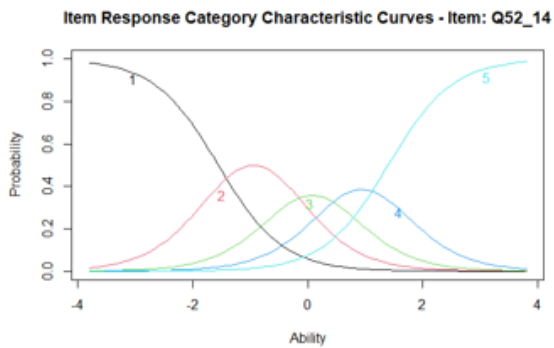
Behavior

Table 10 below shows the distribution of responses to behavior items. Most response patterns were skewed one way or the other and there was a high frequency of 'Not Applicable' responses to most of the questions. Items 4, 5, and 13 each had > 25% of respondents select 'Not Applicable'. Items 3, 6, 8, 9, and 14 each had > 25% of respondents say 'Never'. Items 13 and 15 had > 25% of respondents select 'Always'; items 10 and 11 had > 50% of respondents select 'Always'. Item 12 is the only item that is very evenly distributed across all response options. Cronbach's α for the behavior scale is 0.838.

Table 10

Distribution of Behavior Responses

Item	Objective	Response Frequency					
		1	2	3	4	5	N/A
Item 1	Budgeting	57	104	178	89	47	27
Item 2	Budgeting	31	64	191	127	74	14
Item 3	Credit	145	77	73	43	47	117
Item 4	Credit	101	23	72	62	113	131
Item 5	Credit	50	32	78	92	105	145
Item 6	Insurance	126	111	126	57	42	39
Item 7	Benefits/Retirement	43	70	131	124	110	22
Item 8	Investing	80	61	73	87	156	45
Item 9	Investing	171	58	66	48	72	85
Item 10	Debt Management	21	24	66	104	266	21

Item 11	Debt Management	33	17	45	56	324	26
Item 12	Taxes	75	88	114	86	91	47
Item 13	Banking	27	18	41	71	178	166
Item 14	Banking	147	73	86	54	65	76
Item 15	Other	46	44	83	100	144	85

Note. 1=never, 2=rarely, 3=sometimes, 4=often, 5=always, N/A=not applicable

Research Questions

Below are the three research questions established in chapter I followed by an explanation of how each question was answered through these results.

1. What topics are a part of financial knowledge specific to college students?

2. To what extent is the designed instrument a valid and reliable measure of financial literacy?

3. What are the underlying dimensions of financial literacy?

Question 1

The topics that are part of financial knowledge specific to college students were addressed through the Delphi portion of the study (Phase 1). There are 29 unique topics, which can be grouped into 9 different components. Table 2 on page 43 provides the full list of topics. These were: (1) budgeting, (2) credit, (3) insurance, (4) retirement/benefits, (5) investing, (6) debt management, (7) taxes, (8) banking, and (9) other.

Question 2

Through a Delphi study, an instrument was developed to measure three components of financial literacy: knowledge, attitude, and behavior (based off the research by Vieira et al., 2020). The initial financial knowledge instrument had 51 binary items; these were written based on expert responses to the Delphi study and reviewed by the experts. The same experts, as well as undergraduate students through the pilot study, were asked what they thought the items were measuring, confirming face validity. This

supports a valid set of items to measure financial knowledge. After administration, item statistics were investigated and item response theory analyses were applied, 26 items were retained. A Q3 statistic supported a unidimensional structure of the items, indicating all items measured the same underlying construct. The Cronbach's α for these items was 0.804.

The attitude and behavior scales each had 15 items. These also were written based on expert responses to the Delphi study and reviewed by the experts. The attitude items utilized a 5-point Likert response scale. The structure of the construct was investigated using EFA and CFA. Items were removed that didn't fit the EFA and CFA models well. A final two factor model was determined with 10 items; five items measured financial planning attitude and five items measured financial management attitude. The Cronbach's α statistic of each of these was 0.436 and 0.265, respectively.

The 15-item financial behavior scale utilized a 5-point Likert scale response with an additional option of N/A. The Cronbach's α statistic for these was 0.838.

Question 3

Based on the results of the Delphi Study, 29 unique topics were determined to be a part of financial literacy for college students. Those 29 topics can be grouped into nine components of financial literacy: budgeting, credit, insurance, investing, debt management, benefits/retirement, taxes, banking and other. Additionally, Vieira et al. (2020) identifies three components of financial literacy: financial knowledge, financial attitude, and financial behavior. The design of the instrument applied each of the nine components of financial literacy within each of the three broader areas of financial literacy (knowledge, attitude, and behavior). Results of the data analysis of the survey

responses indicated that financial knowledge (and the nine components measured within) measure a single construct.

Financial attitude had two underlying dimensions: financial planning attitude (towards budgeting, insurance, debt management, and financial advisors) and financial management attitude (towards credit, investing, taxes, and banking). However, since many participants answered the attitude/wellbeing items with extreme responses, that may suggest that financial knowledge and behavior are the most important dimensions. Also, the fact that the planning attitude and management attitude factors were not highly correlated also suggests that financial attitudes may not be influential to other areas of financial literacy. One element of financial literacy, benefits and retirement, was not a good fit within this construct.

Financial behavior of each of the nine components was measured within the financial behavior scale. While the scale was found to be valid and reliable, many respondents chose 'N/A' for one or more behaviors. College students each have a different level of financial responsibility, meaning that not all behaviors are applicable to all students. However, 198 out of 502 (~39.5%) respondents responded on the 5-point response for every behavior item. While each behavior item may not apply to each student, each student was able to answer multiple behavior items, which supports the inclusion of behavior as a part of financial literacy.

Summary/Conclusion

Through the Delphi method, 29 unique topics were identified as part of college student financial literacy; those 29 topics were condensed into 9 components. Those topics and components were used to create an instrument measuring financial knowledge,

attitude, and behavior. The final instrument after these analyses consists of 26

knowledge questions, 5 financial planning attitude questions, 5 financial management

attitude questions, and 15 behavioral questions. Responses from financial knowledge

questions were confirmed as unidimensional and investigated using IRT. Responses from

financial attitude questions were studied using EFA and CFA, and confirmed as two

separate factors: financial planning attitude and financial management attitude. The final

instrument is presented in Appendix B.

CHAPTER V

DISCUSSION

Summary of Results/Findings

Phase 1 of the study established a list of 29 topics that should be included in financial knowledge for college students. These 29 topics can be grouped into nine components: (1) budgeting, (2) credit, (3) insurance, (4) investing, (5) benefits/retirement, (6) debt management, (7) taxes, (8) banking, and (9) other. These topics and components were then used to create an instrument to measure college student financial literacy. Financial knowledge was confirmed as unidimensional and the final instrument has 26 items measuring financial knowledge. Financial attitude was found to be two separate constructs, financial planning attitude and financial management attitude. There are five items measuring each of those constructs on the final instrument. Fifteen items measured financial behaviors.

<center>**Comparison to Other Scales**</center>

Most other scales are focused on one area of financial literacy (i.e. knowledge only, behavior only, etc.). It is rare that instruments consider a holistic approach to financial literacy. Additionally, most are designed for use with general population, not specifically for traditional undergraduate students. This instrument is also unique because it can be used as one large instrument using all three subscales for a holistic look at financial literacy, or each of the subscales can be used independently to measure one aspect of financial literacy.

Big 5

Compared to the Big 5, this instrument is much longer and more thorough. It covers a wider variety of financial planning topics and covers more than just financial knowledge. The Big 5 was designed for use with the general population, whereas this instrument was designed specifically for undergraduate college students.

Jump$tart

Jump$tart measures financial knowledge only, but this instrument measures attitude and behaviors as well. Jump$tart has been used with many different populations in research, but was designed primarily for use with high school students; this instrument was designed for use with college students.

ALP

The ALP does not cover nearly as many topics as this instrument; the ALP focuses largely on investing knowledge. Additionally, the ALP has an application portion, which this instrument does not.

FLA

The FLA was designed for use with all ages; this instrument is specifically for undergraduate college students. The FLA has some knowledge questions but also application questions and questions about financial confidence; this instrument is knowledge, attitude, and behavior.

FKS

The FKS is financial knowledge items only; this instrument includes attitude and behavior as well. The FKS is twenty items, and has a short version that is 10 items; it does not have subscales like this scale does.

Vieira et al. (2020)

Vieira et al. (2020) created an instrument measuring knowledge, attitudes, and behaviors, similar to this instrument; however, Vieira et al. (2020) focused on behaviors more than knowledge or attitudes. Also, it was not specifically designed for use with college students.

Conclusions/Interpretations/Discussion

Phase 1

The findings from the Delphi portion of the study give a clear outline of what topics should be covered in financial education for all traditional undergraduate college students. This provides financial educators a guideline of what topics their programming should focus on. Financial knowledge is a very broad topic and can be overwhelming when trying to cover each piece; this list shows what to focus on but also shows what topics are better taught after college (i.e. estate planning, living wills, mortgages, etc.). No topics were deemed 'unimportant' by financial professionals, but rather that they

were more appropriate for a different stage of life. Additionally, some topics such as student loans were ranked of high importance in this stage of life that may not be during other stages. It is also worth noting that the process of narrowing down topics was challenging for many financial professionals. Some voted that all 55 topics needed to be retained on the final list. This struggle of narrowing down what topics are most important and pairing down the original list could suggest why this list of topics hasn't been created in the past. It could also be part of the reason why there is such a struggle with measuring financial literacy. Financial literacy is such a broad construct that creating an instrument to adequately measure it that is short enough to be usable in practice is challenging. Ultimately, nine components, each covering two to seven topics, were determined as most needed and most appropriate for traditional undergraduate college students. These can be found in Table 2 of Chapter 4.

Phase 2

Phase 2 involved creating an instrument to measure the nine components of financial literacy, administering the instrument, and analyzing data to evaluate and critique the instrument. Each of the nine components were measured within three subscales: financial knowledge, attitude, and behavior. After administering the survey and refining the instrument, there were 26 items measuring financial knowledge, 10 items measuring financial attitudes (5 measuring financial planning attitude and 5 measuring financial management attitude), and 15 items measuring financial behavior.

Item analysis from phase 2 of the study showed that items on the knowledge portion of the instrument were fairly easy, based on their difficulty parameters. However, since we know college students have very low levels of financial knowledge, this is not

necessarily a bad thing. For the time being, while knowledge levels are so low (Ehrlich & Guilbault, 2017), this could be the ideal instrument to use. Over time, as knowledge levels increase, items with higher difficulty parameters may need to be added so that the modified instrument reflects a wider range of difficulty.

From the knowledge portion of the instrument, students scored highest (based on the proportion of respondents answering the items correctly; > 94%) on items about saving, natural biases regarding money, budgeting basics, and setting financial goals. Students scored the lowest (< 20%) on items covering car insurance, saving vs. investing, health insurance, making big purchases, and building credit scores. These provide guidance on which topics our students need help with the most. When looking at the 9 components, the average scores were highest on budgeting (87%), banking (84%) and other (75%). Average insurance scores were very low (31%), followed by investing (45%), taxes (48%), and credit (49%). These scores also help educators with understanding what broad topics students need help with. Instead of focusing programming on teaching improvements on the topic of budgeting (which students already have a good understanding of), focus may be given on including or enhancing teaching on other topics such as car insurance, saving vs. investing, health insurance, making big purchases, and building credit scores.

Financial planning attitude item responses were not well distributed amongst response values. For items 2 and 15, there was no ability level most likely to choose 'disagree'. For items 1 and 7, the range of ability levels most likely to choose 'disagree' is very narrow. Additionally, on all items, respondents with positive ability levels are most likely to choose an extreme response ('strongly agree' on items 1, 2, 7, and 15;

'strongly disagree' on item 11). These extreme responses could suggest that students know what financial planning attitudes they 'should' have, so their responses are biased. These response patterns may also suggest that fewer response options would allow for more variation in responses. For example, using a 4-point Likert scale that would force participants to choose a 'positive' or 'negative' responses might provide better distribution of responses.

Financial management attitude item responses overall were more well distributed than financial planning attitude items, but there are still some concerns with financial management attitude response patterns. Responses for items 5 and 6 are well dispersed amongst all response options. However, item 10 indicates that most ability levels are going to choose an extreme response (either 'strongly disagree' or 'strongly agree'). Also, for items 10, 13, and 14, the range of ability levels choosing 'neutral' is very narrow. Again, this narrow range of ability levels choosing certain responses may suggest that a different response scale is a better fit.

Financial behaviors can be challenging to measure because college students are in a unique life stage where some financial behaviors deemed as important may not be applicable to them just yet. For example, one of the 9 components of financial literacy determined in chapter IV was retirement/benefits. Many traditionally aged undergraduate students are not in a place to enact behaviors like saving for retirement or making decisions on employment benefits. However, those components of financial literacy are still important because of the need for college students to begin utilizing that information and enacting those behaviors upon graduation.

Also, it is important to note how many students responded 'N/A' to the behavior questions. There were 502 participants in the study and 304 answered 'N/A' to at least one behavior item. Some items it makes sense that students would answer 'N/A', but others should be applicable to everyone. For example, not all college students have student loans, so it makes sense that a student might say 'N/A' to item 10, 'I fill out my own FAFSA'. However, item 2 says 'I set financial goals'. In this case, an 'N/A' response likely should be a response of 'never' instead. While each student's financial goals can and will vary, they are all capable of having financial goals, so 'N/A' does not make sense in this case. It is important to consider this when looking at how often students are/are not engaging in particular behaviors. 266 (53%) participants said that they always fill out their own FAFSA and 324 (64.5%) said that they always keep track of how much money they owe on their debts. 145 (28.9%) participants said they never pull a copy of their credit report, 147 (29.3%) said they do not have a checking and a savings account, and 171 (34.1%) said they do not calculate compound interest on their savings. Credit and savings were highly prioritized topics among financial professionals, so it is worth noting that these are the behaviors that college students seem to be the least engaged in. This provides another focus for current financial educators: teaching students the importance of pulling their credit reports, keeping checking/savings separate, and learning how compound interest works. Regardless of what items are included in the final instrument, it seems clear that students are lacking in these areas.

Implications

Phase 1

The results from Phase 1 provide practitioners with a clear list of what financial planning topics to cover with all traditional aged undergraduate students. It differentiates this stage of life as an undergraduate student from other stages of life that practitioners may be working with. Financial educators, financial planners, financial counselors, financial aid professionals, etc. can all use this information when they are planning programming for college students.

Phase 2

The results from Phase 2 provide a holistic instrument measuring financial literacy in the areas of knowledge, attitude, and behavior, specifically for traditional undergraduate college students, which did not exist before. It provides financial educators, financial planners, financial counselors, financial aid professionals, etc. with a tool they can use in various ways. For example, it can be used in programming efforts to show differences in literacy levels before/after program participation. An instructor teaching a personal finance course could use it to assess their students at the beginning of the semester and tailor the semester's lesson plans based on that group of students' ability levels. They could also use it at the end of the semester to show how financial literacy levels have changed after having completed a personal finance course. It could also be used as an intake tool to see where a student's financial literacy currently stands, which allows a financial counselor or educator to best prepare for working with that student. For researchers, it provides a valid measurement tool they can use when studying financial literacy among traditional undergraduate college students.

<div align="center">

Limitations and Future Research

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Limitations

One limitation is that the sample from Phase 2 was heavily (74%) female. While

57% of undergraduate students are female (NCES, 2019), they were still

disproportionately represented in this sample. Also, the sample was predominantly White

(64.5%), which is not representative of the trends in racial identity that we see in higher

education. Historically, higher education has been systemically built for White students.

However, over the last 30 years, the number of non-White students (especially

Hispanic/Latinx students) has continued to grow. The proportion of White students has

dropped from 82% in 1976 to 52% in 2016, meaning that White students are

overrepresented in this study (NCES, 2008; ACE, 2016).

Additionally, it is important to consider that a large number of college students do

not fall into the definition of "traditionally aged." While about 80% of undergraduate

students at two and four-year nonprofit institutions fall into the category of traditionally

aged students (18-24), there are still about 1.9 million students at nonprofit institutions

that are not traditionally aged (The Hamilton Project, 2017). Two-year institutions are

about 65% traditionally aged and for-profit institutions are only about 35% traditionally

aged (The Hamilton Project, 2017). These differences in student populations suggest that

the designed instrument would be most applicable at four-year institutions.

The present research does not suggest a difference in financial planning topics for

students at public vs private institutions. The financial planning professional that

currently works at a private institution provided very similar responses in the Delphi

study to the participants from public institutions. This was to be expected since the

Delphi study asked what topics were important for all traditionally aged undergraduate

students, not just students from a specific institution type. However, it is important to

remember that the types of students at public/private institutions could differ, which may result in differences in financial literacy levels.

The reliability of both the financial planning attitude items and financial management attitude items is very low. The financial behavior items are self-reported, so there is always some assumed error there. While self-report measures are not ideal, financial behaviors are not something that is easily observable, so they are sometimes the best option.

Finally, the financial knowledge scale measures general financial education. It does not have subscales allowing educators or researchers to measure knowledge on a particular component (i.e. insurance or budgeting). Sometimes short-term financial education programs are focused on one topic specifically and would not want to use an instrument measuring topics they have not covered.

Future Research

This research has created the list of topics and components that should be included in college student financial literacy. Future research should focus on establishing subscales for each of the nine components that can stand alone. This would allow educators and researchers who are focused on one specific area of financial knowledge to have a reliable and valid tool specific to their programming.

As previously mentioned, the current instrument to measure financial knowledge has predominantly easy items. This works for now, given that college students currently have low financial literacy scores. As this trend (hopefully) changes over the next several years, future research could focus on taking the same topics/components and creating

more knowledge questions with higher levels of difficulty so that the instrument can better discriminate between students with higher ability levels.

Future research could look at financial attitudes and wellbeing of college students on a deeper level. The current instrument has a valid, but not reliable, measure of financial planning attitude and financial management attitude. This could be improved upon in future research. Both the planning attitude and management attitude scales were 5-point Likert scale items and most items had at least one response category that was very rarely used. Future research could explore how shifting to a 4-point Likert scale would impact responses. Additionally, future research could consider looking at whether college student financial attitudes are influenced by their ideas of what attitudes they "should" have, regardless of their knowledge and behaviors.

As mentioned above, this instrument is not applicable to nontraditional undergraduate students, which is a growing population in higher education. Future researchers could look to replicate this study but instead focused on nontraditional students so that there could be a measurement tool for both populations. Also, this study asked what topics would be important for traditionally aged college students; it did not specify students at a certain type of institution. Future research could look to determine if financial professionals would recommend different topics for students at two-year institutions vs four-year institutions. We know that students at two-year institutions are more likely to come from families with financial challenges, so another opportunity for future research would be to compare financial literacy scores from students at two-year institutions to students at four-year institutions to see if there are significant differences.

Another idea for future research would be to ask current undergraduate students what they would like to learn as a part of the financial education during this stage of life. This study sought opinion from financial planning experts about what they think undergraduate students need to know, but that may or may not align with what college students themselves want to learn about. Future research could compare the results, which could influence future financial education.

While this study primarily focused on the components of financial literacy and creating a valid and reliable instrument to measure financial knowledge, attitudes, and behaviors, the data will also be used to investigate the financial knowledge, attitudes, and behaviors of traditional undergraduate college students. This includes investigating differences in financial literacy based on gender, ethnicity, years in school, and received financial education. Additionally, the data will also be used to investigate the relationship between students' financial knowledge, financial attitude, and financial behavior scores.

Summary/Conclusion

There has been a lack of consensus among researchers and professionals about how to define financial literacy, but there is consensus that financial education varies based on the stage of life that people are in. From this study, there is now a consensus on what topics are considered a part of financial literacy for traditional undergraduate college students. College is an important time for students to receive financial education. Most students are taking on debt in order to get their college degree and they are laying the foundation for their financial future. The cost of college, combined with the low levels of financial literacy among today's college students, suggests a desperate need for financial education at the university level. Financial education looks different across

campuses, in part due to the lack of definition of what exactly college students need to know at this particular stage in their life about financial planning. Additionally, there has been a need for an instrument to measure financial literacy specifically for this population. This study has helped address both of these concerns.

This study provided a clear list of financial literacy topics that all traditionally aged undergraduate students need to know. This study also created a holistic measure of financial literacy, which includes financial knowledge, financial planning attitude, financial management attitude, and financial behavior. While the financial knowledge and behavior scales are strong, the financial planning attitude and financial management attitude scales need improvement in their reliability. Future research can look to establish financial planning attitude and financial management attitude scales that are more reliable. They can also begin to establish a valid and reliable instrument to measure each of the 9 components of financial knowledge. The current scale only measures general financial knowledge, but many practitioners would have use for a subscale measuring only the component(s) they need.

Financial educators, as well as researchers, can benefit from the results of this study. This study gives financial educators that work with this population a guideline of what to cover, what to assess, and how to build strong educational programming in the future. It also provides financial educators and researchers with a measurement tool designed specifically for undergraduate students, which had not previously been done.

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APPENDICES

APPENDIX A

Initial Instrument

Financial Knowledge Items

Objective	Question
Budgeting	

1.1 Budgeting basics	1. What is the purpose of using a budget?
	    A. It helps you to meet financial obligations and goals
	    B. It will help me make more money
	    C. It gains interest over time
	    D. There is no purpose in using a budget
	
	2. When planning a monthly budget, which of the following should you take into consideration?
	    A. Preparing for unexpected expenses
	    B. Household expenses
	    C. Fixed monthly expenses (i.e. rent)
	    D. All of the above

1.2 Cash flow management	3. What is the purpose of tracking your expenses?
	    A. To make sure I spend within my budget
	    B. To make better informed financial decisions
	    C. To keep up with how much money is in my bank account
	    D. All of the above

1.3	Learning to live below your means	4.	Which of the following corresponds to living "below your means"?
			A. Spending the same amount of money that you make each month
			B. Spending more money than you make each month
			C. Spending less money than you make each month
			D. Not tracking your spending each month

1.3   Learning to live below your means

4. Which of the following corresponds to living "below your means"?
   A. Spending the same amount of money that you make each month
   B. Spending more money than you make each month
   C. Spending less money than you make each month
   D. Not tracking your spending each month

1.4   Setting financial goals

5. (T/F) You are more likely to reach your financial goals if you do not plan for the future.

1.5   Saving

6. When preparing to purchase holiday gifts, it is best if you:
   A. Use the money from my paycheck closest to the holiday
   B. Save a little each month for holiday gift giving
   C. Put it all on a credit card and pay it off over the next 3-6 months
   D. Use a cash advance from a credit card

1.6   Saving vs. investing

7. Which of the following guarantees your money will be save over the next 10 years?
   A. Putting the money in a savings account
   B. Investing the money in the stock market
   C. Putting the money toward a new car
   D. Investing the money in a mutual fund

8. You are saving money for your child's future education. Which of the following is most likely going to grow your savings over the next 18 years?
   A. A checking account
   B. Stocks
   C. A US government savings bond
   D. A savings account

1.7   Emergency savings

9. How many months of expenses should you aim to have in emergency savings?
   A. 1 month
   B. 6 months
   C. 12 months
   D. 24 months

Credit

2.1   Credit basics

10. What site do you go to in order to obtain your free credit report from each of the 3 bureaus?

A. Creditkarma.com
B. Checkyourcredithere.com
C. Annualcreditreport.com
D. You can't check your own credit report

11. A credit report is best defined by which of the following statements?

   A. A score that represents your credit reputation

   B. A summary of your credit history

   C. A compilation of all public and private records relating to your finances

   D. An accounting of legal action taken against you to collect debts

12. How many times a year can you request a free copy of your credit report from each of the primary credit bureaus?

   A. As many times as you want

   B. 1 time

   C. 2 times

   D. 3 times

2.2 Credit cards

13. If a credit card account has a balance carried over from the previous month, when will interest charges usually begin on a new credit purchase?
   A. On the day of the purchase
   B. 1 month after date of purchase
   C. After a 2 week grace period
   D. After a 2 month grace period

2.3 Building credit scores

14. Which factors go into building your credit score? Select all that apply.

A. Your payment history

B. Amount of debt

C. Length of credit history

D. Mix of credit accounts

E. New credit inquiries

F. Age

G. Income

15. What is considered a good credit score?

   A. 450+

   B. 500+

   C. 700+

   D. 900+

2.4 Credit use and function	16. You're buying your fiancé's engagement ring online and you want to build your credit while paying for it. What is your best option? A. Use your debit card B. Use a credit card and pay it off over 12 months at a promotional 0% interest C. Buy now/pay later in 4 equal installments D. Use a loan from a bank or credit union at 12% interest for 12 months
2.5 Best practices of credit cards	17. Which of the following credit card users is likely to pay the GREATEST dollar amount in finance charges per year, if they all charge the same amount per year on their cards? A. Someone who always pays off their credit card bill in full every month

B. Someone who only pays the minimum amount each month (%)
C. Someone who pays at least the minimum amount each month, and more when they have more money
D. Someone who generally pays their card off in full, but occasionally will pay the minimum when they're short on cash

2.6	How credit scores impact other areas	18. Someone with a low credit score is more likely to be: A. Charged higher interest rates on loans B. Charged higher insurance premiums C. Denied an apartment based on their credit score D. All of the above

Insurance

3.1	General insurance	19. What is the insurance term which refers to the predetermined amount you must pay before an insurance company will pay toward your loss? A. Claim B. Premium C. Deductible D. Rider
3.2	Renter's insurance	20. If you are renting, what does your own renter's insurance typically cover? A. Loss of personal property B. Loss of the use of the property C. Personal liability D. All of the above
3.3	Health insurance	21. (T/F) An insurance copay is the maximum amount the insured individual is subject to pay.

| 3.4 | Car insurance | 22. | The portion of auto insurance coverage that pays for repairs of the covered automobile if the repair is not paid for by the insurance of the person who caused the damage is called: |

    A. Property damage liability

    B. Collision coverage

    C. Comprehensive automobile insurance

    D. Uninsured motorist

23. Coverage for theft of an automobile is provided for under this part of an automobile insurance policy.
    A. Property damage liability

    B. Collision coverage

    C. Comprehensive automobile insurance

    D. Uninsured motorist

Retirement/Benefits

4.1   Employer match on retirement savings

24. What is the benefit of an employer match on retirement savings?
    A. It's free money contributed to an employee's retirement account
    B. It saves money because the employee doesn't have to contribute anything to the retirement savings
    C. There is no benefit because it's taxable
    D. The employer pays the employee's insurance premium

4.2   Benefits packages

25. When comparing job offers, which of the following should be considered?
    A. Salary
    B. Insurance
    C. Employer-sponsored retirement plans

D. All of the above

4.3	401K/employer sponsored retirement programs	26. (T/F) Contributing to an employer-sponsored retirement plan is beneficial because it decreases your annual taxable income and increases the amount you have saved for retirement.
4.4	Retirement planning basics	27. (T/F) A Roth IRA is from money already taxed, so when it is withdrawn, it is tax-free.
		28. (T/F) A traditional IRA is from pre-tax money, so when it is withdraw, it is subject to current tax rates.

Investing

5.1	Saving vs investing	See 1.6
5.2	Basic investing	29. A single 25 year old with no dependents who is just beginning to invest for retirement should adopt an investment strategy of: A. Mostly money markets, some CDs, and some bonds B. Majority stocks and some bonds C. An equal amount in stocks, bonds, and treasury bills D. Half in bonds and half in treasury bills
5.3	Risk levels of various investments	30. Which of the following investment options has the highest risk? A. US government bonds B. Stock C. Mutual fund D. Municipal bond
		31. Which of the following investment options has the lowest risk? A. US government bonds B. Stock C. Mutual fund D. Municipal bond

5.4 Time value of money/compound interest	32. An investment of $1,000 compounded annually at an interest rate of 10% for 10 years will be worth _____. A. More than $2000 at the end of the 10 years B. Less than $2000 at the end of the 10 years C. Exactly $2000 at the end of the 10 years 33. Rob and Mary are the same age. At age 25 Mary began saving $2,000 a year while Rob saved nothing. At age 50, Rob realized that he needed money for retirement and started saving $4,000 per year while Mary kept saving her $2,000. Now they are both 75 years old. Who has the most money in his or her retirement account? A. They would each have the same amount because they put away exactly the same B. Rob, because he saved more each year C. Mary, because she has put away more money D. Mary, because her money has grown for a longer time at compound interest

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Debt Management

6.1 Auto loans	34. If you're going to borrow money to buy a new car, a down payment is important because _____. A. The value of the car depreciates as soon as you drive it off the lot B. Your lender will require a down payment amount C. The dealer will require a down payment amount D. It will help you get a lower interest rate
6.2 Student loans	35. Which of the following is an important difference between subsidized and unsubsidized student loans?

A. For subsidized loans, the government pays the interest while I'm in school, but not for unsubsidized loans

B. For unsubsidized loans, the government pays the interest while I'm in school, but not for subsidized loans

C. The interest rate differs for subsidized and unsubsidized loans

D. Anyone can get subsidized, but unsubsidized is harder to qualify for

36. (T/F) You're not required to fill out the FAFSA to qualify for student loans and federal grants.

37. Which of the following types of financial assistance is required to be paid back?

A. Scholarships

B. Grants

C. Federal student loans

D. Work-study earnings

6.3   Debt repayment

38. Which of the following actions would help you to pay off a loan quickest?

A. Paying only your minimum monthly payment each month

B. Paying your minimum monthly payment each month and more toward your principal balance when you're able to

C. Paying your minimum monthly payment each month and more toward your interest when you're able to

D. You can't pay off a loan quicker than the agreed upon term

6.4	Managing debt	39. What would be an example of "bad debt"?

        A. Having a student loan

        B. Having a car loan

        C. Carrying a credit card balance (i.e. not paying it off every month)

        D. It depends on the interest rate of the loan or credit card

6.5 Making big purchases/debt planning

40. The best indicator of the cost of a loan is the _____.

        A. Number of payments

        B. Monthly payment amount

        C. Interest rate

        D. Annual percentage rate

Taxes

7.1 Basic tax planning

41. Your take home pay from your job is less than the total amount you earn. Which of the following best describes what is taken out of your total pay? Select all that apply.
        A. Social security
        B. Federal income tax
        C. Medicare
        D. Property tax
        E. Sales tax

42. A common tax credit available to college students within their first 4 years as an undergraduate student is _____.
        A. American Opportunity Credit
        B. Lifetime Learning Credit
        C. Premium Tax Credit
        D. There are no tax credits available to students

7.2   Filing taxes

43. When filing taxes, what is the W4 form for?

    A. It's how you tell your employer how much tax to withhold from your paycheck

    B. It tells your employer how much to put in your retirement account

    C. It tells you how much you paid into federal and state taxes

    D. It tells you what your deductions are

44. (T/F) If you are claimed as a dependent on someone else's tax return (i.e. your parent/guardian), you may lose certain tax benefits for yourself.

Banking

8.1   Banking basics

45. You've saved $10,000 for your college expenses by working part-time. Your plan is to start college next year and you need all of the money you've saved. Which of the following is the safest place for you to save your college money in?

    A. Locked in your closet at home

    B. Invested in stocks

    C. Placed into corporate bonds

    D. Stored in a bank savings account

8.2   Debit cards

46. What is the difference between using a debit card and a credit card?

    A. A debit card charges you interest, but a credit card does not.

B. A credit card uses money from your checking account. A debit card borrows money you eventually pay back.

C. A debit card uses money from your checking or savings account, but a credit card always uses your checking account

D. A debit card uses money from your checking account. A credit card borrows money you eventually pay back

8.3 Checking and savings accounts

47. What is the difference between a checking account and a savings account?
   A. There aren't any differences - they are the same.
   B. A checking account is where you keep money for everyday spending. A savings account is where you keep money safe that you don't plan to immediately spend.
   C. A savings account is where you keep money for everyday spending. A checking account is where you keep money safe that you don't plan to immediately spend.
   D. A checking account pays you interest but a savings account does not

Other

9.1 Seeking financial advice

48. (T/F) As you set out on your financial journey, it is important to choose a qualified financial advisor that understands your financial goals and discloses all conflicts of interest.

9.2 General consumer protection laws

49. Who has primary responsibility for verifying information on your bank statement to detect any fraud or errors?
   1. You
   2. The businesses where you made payments by debit card or check

3. Any of the three credit reporting companies
4. Your bank or credit union where you have the account

| 9.3 | Natural biases regarding money | 50. (T/F) Your beliefs, values, and upbringing can influence the way you spend money. |

| 9.4 | Landlord tenant rules/regulations | 51. Your kitchen sink is broken and you have reported the issue to your landlord. It has been over a month, and they still haven't gotten it fixed. Should you withhold rent? |

A. No, you should never withhold rent because you're waiting on a repair

B. Yes, but only for significant issues

C. Yes, but only after it has been 3 months

D. No, but you can move out and get out of the rest of your lease

Financial Attitude Items

Rate each item on a scale of 1-5 (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree).

Objective	Item
Budgeting	1. Utilizing a monthly budget is important to me
	2. Setting financial goals is important for my future
	3. It is important to have savings set aside for emergencies
Credit	4. It is important to check my credit report annually
	5. I feel comfortable using credit cards
	6. It's not a big deal to carry a balance on my credit card and only pay the minimum monthly amount
Insurance	7. I feel confident that I could independently sign up for insurance (e.g. health, car, or renter's)
Retirement/Benefits	8. I feel comfortable comparing the benefit packages from various job offers
	9. I feel confident starting to plan for retirement
Investing	10. It is important to start saving money at a young age
Debt Management	11. I am stressed by the amount of student loans I have
	12. The amount of debt I have is overwhelming
Taxes	13. I feel comfortable filing my own taxes
Banking	14. It is important to have both a checking account and a savings account
Other	15. I feel comfortable asking financial professionals for financial advice

Financial Behavior Items

Rate each item on a scale of 1-5 (1=never, 2=rarely, 3=sometimes, 4=often, 5=always) or 6=N/A.

Objective	Item
Budgeting	1. I follow a weekly or monthly budget
	2. I set financial goals
Credit	3. I pull a copy of my credit report each year
	4. I use a credit card that is under my name
	5. I pay my credit cards and/or loans on time each month
Insurance	6. I have adequate insurance for myself and my personal property
Retirement/Benefits	7. I think about best ways to prepare for my retirement
Investing	8. I am saving and investing money for my future
	9. I can calculate how compound interest is affecting my savings account
Debt Management	10. I fill out my own FAFSA
	11. I keep track of how much money I owe on my debts (i.e. student loans, car payments, etc.)
Taxes	12. I complete my taxes myself
Banking	13. I keep my money in a federally insured bank
	14. I have both a checking and a savings account
Other	15. I seek help from trusted financial professionals when necessary

APPENDIX B

College Student Financial Literacy Scale (Final Instrument)

Financial Knowledge Items

Objective	Question
Budgeting	

1. When planning a monthly budget, which of the following should you take into consideration?
   A. Preparing for unexpected expenses
   B. Household expenses
   C. Fixed monthly expenses (i.e. rent)
   D. All of the above*

2. Which of the following corresponds to living "below your means"?
   A. Spending the same amount of money that you make each month
   B. Spending more money than you make each month
   C. Spending less money than you make each month*
   D. Not tracking your spending each month

3. (T/F*) You are more likely to reach your financial goals if you do not plan for the future.

4. When preparing to purchase holiday gifts, it is best if you:
   A. Use the money from my paycheck closest to the holiday
   B. Save a little each month for holiday gift giving*

C. Put it all on a credit card and pay it off over the next 3-6 months
D. Use a cash advance from a credit card

5. How many months of expenses should you aim to have in emergency savings?
A. 1 month
B. 6 months*
C. 12 months
D. 24 months

Credit

6. What is considered a good credit score?
A. 450+
B. 500+
C. 700+*
D. 900+

7. Which of the following credit card users is likely to pay the GREATEST dollar amount in finance charges per year, if they all charge the same amount per year on their cards?
A. Someone who always pays off their credit card bill in full every month
B. Someone who only pays the minimum amount each month (%)*
C. Someone who pays at least the minimum amount each month, and more when they have more money
D. Someone who generally pays their card off in full, but occasionally will pay the minimum when they're short on cash

8. Someone with a low credit score is more likely to be:
A. Charged higher interest rates on loans
B. Charged higher insurance premiums
C. Denied an apartment based on their credit score
D. All of the above*

Insurance

9. What is the insurance term which refers to the predetermined amount you must pay before an insurance company will pay toward your loss?
   A. Claim
   B. Premium
   C. Deductible*
   D. Rider

Retirement/Benefits

10. What is the benefit of an employer match on retirement savings?
    A. It's free money contributed to an employee's retirement account*
    B. It saves money because the employee doesn't have to contribute anything to the retirement savings
    C. There is no benefit because it's taxable
    D. The employer pays the employee's insurance premium

11. When comparing job offers, which of the following should be considered?
    A. Salary
    B. Insurance
    C. Employer-sponsored retirement plans
    D. All of the above*

12. (T*/F) A traditional IRA is from pre-tax money, so when it is withdraw, it is subject to current tax rates.

Investing

13. Which of the following investment options has the highest risk?
    A. US government bonds
    B. Stock*
    C. Mutual fund
    D. Municipal bond

14. Rob and Mary are the same age. At age 25 Mary began saving $2,000 a year while Rob saved nothing. At age 50, Rob realized that he needed money for retirement and started

saving $4,000 per year while Mary kept saving her $2,000. Now they are both 75 years old. Who has the most money in his or her retirement account?

A. They would each have the same amount because they put away exactly the same

B. Rob, because he saved more each year

C. Mary, because she has put away more money

D. Mary, because her money has grown for a longer time at compound interest*

Debt Management

15. Which of the following is an important difference between subsidized and unsubsidized student loans?

A. For subsidized loans, the government pays the interest while I'm in school, but not for unsubsidized loans*

B. For unsubsidized loans, the government pays the interest while I'm in school, but not for subsidized loans

C. The interest rate differs for subsidized and unsubsidized loans

D. Anyone can get subsidized, but unsubsidized is harder to qualify for

16. (T/F*) You're not required to fill out the FAFSA to qualify for student loans and federal grants.

17. Which of the following types of financial assistance is required to be paid back?

A. Scholarships

B. Grants

C. Federal student loans*

D. Work-study earnings

18. Which of the following actions would help you to pay off a loan quickest?

A. Paying only your minimum monthly payment each month

B. Paying your minimum monthly payment each month and more toward your principal balance when you're able to*

C. Paying your minimum monthly payment each month and more toward your interest when you're able to

D. You can't pay off a loan quicker than the agreed upon term

19. What would be an example of "bad debt"?

A. Having a student loan

B. Having a car loan

C. Carrying a credit card balance (i.e. not paying it off every month)*

D. It depends on the interest rate of the loan or credit card

Taxes

20. Your take home pay from your job is less than the total amount you earn. Which of the following best describes what is taken out of your total pay? Select all that apply.
A. Social security*
B. Federal income tax*
C. Medicare*
D. Property tax
E. Sales tax

Banking

21. You've saved $10,000 for your college expenses by working part-time. Your plan is to start college next year and you need all of the money you've saved. Which of the following is the safest place for you to save your college money in?

A. Locked in your closet at home

B. Invested in stocks

C. Placed into corporate bonds

D. Stored in a bank savings account*

22. What is the difference between using a debit card and a credit card?

A. A debit card charges you interest, but a credit card does not.

B. A credit card uses money from your checking account. A debit card borrows money you eventually pay back.

C. A debit card uses money from your checking or savings account, but a credit card always uses your checking account

D. A debit card uses money from your checking account. A credit card borrows money you eventually pay back*

23. What is the difference between a checking account and a savings account?
A. There aren't any differences - they are the same.
B. A checking account is where you keep money for everyday spending. A savings account is where you keep money safe that you don't plan to immediately spend.*
C. A savings account is where you keep money for everyday spending. A checking account is where you keep money safe that you don't plan to immediately spend.
D. A checking account pays you interest but a savings account does not

Other

24. (T*/F) As you set out on your financial journey, it is important to choose a qualified financial advisor that understands your financial goals and discloses all conflicts of interest.

25. Who has primary responsibility for verifying information on your bank statement to detect any fraud or errors?
    A. You*
    B. The businesses where you made payments by debit card or check
    C. Any of the three credit reporting companies
    D. Your bank or credit union where you have the account

26. (T*/F) Your beliefs, values, and upbringing can influence the way you spend money.

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*denotes correct response

Financial Planning Attitude Items

Rate each item on a scale of 1-5 (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree).

Objective	Item	
Budgeting	1.	Utilizing a monthly budget is important to me
	2.	Setting financial goals is important for my future
Insurance	3.	I feel confident that I could independently sign up for insurance (e.g. health, car, or renter's)
Debt Management	4.	I am stressed by the amount of student loans I have
Other	5.	I feel comfortable asking financial professionals for financial advice

Financial Management Attitude Items

Rate each item on a scale of 1-5 (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree).

Objective	Item	
Credit	1.	I feel comfortable using credit cards
	2.	It's not a big deal to carry a balance on my credit card and only pay the minimum monthly amount
Investing	3.	It is important to start saving money at a young age
Taxes	4.	I feel comfortable filing my own taxes
Banking	5.	It is important to have both a checking account and a savings account

Financial Behavior Items

Rate each item on a scale of 1-5 (1=never, 2=rarely, 3=sometimes, 4=often, 5=always) or 6=N/A.

Objective	Item	
Budgeting	1.	I follow a weekly or monthly budget
	2.	I set financial goals
Credit	3.	I pull a copy of my credit report each year
	4.	I use a credit card that is under my name
	5.	I pay my credit cards and/or loans on time each month
Insurance	6.	I have adequate insurance for myself and my personal property
Retirement/Benefits	7.	I think about best ways to prepare for my retirement
Investing	8.	I am saving and investing money for my future
	9.	I can calculate how compound interest is affecting my savings account
Debt Management	10.	I fill out my own FAFSA
	11.	I keep track of how much money I owe on my debts (i.e. student loans, car payments, etc.)
Taxes	12.	I complete my taxes myself
Banking	13.	I keep my money in a federally insured bank
	14.	I have both a checking and a savings account
Other	15.	I seek help from trusted financial professionals when necessary

APPENDIX C

Guide for Users

<u>Administration</u>

Administration of the instrument should take about 15 minutes for all 4 subscales.

<u>Main Purpose</u>

To measure financial literacy (knowledge, attitude, wellbeing, and behavior) in traditionally aged undergraduate college students

<u>Scoring</u>

Knowledge items should be dichotomized (0 incorrect/1 incorrect) using the answers provided in Appendix B. If a knowledge item says 'select all that apply', respondents must select all correct answers (and no incorrect answers) to score a '1' on the item.

Attitude and wellbeing items are scored on a 1-5 Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). Item 4 on the attitude scale and item 2 on the wellbeing scale are negatively worded and should be reverse coded.

Behavior items are scored on a 1-5 Likert scale (1=never, 2=rarely, 3=sometimes, 4=often, 5=always) or 6=N/A.

<u>Use</u>

This scale is only for use with undergraduate students ages 18-24. If you do not know that the sample you are surveying fits these characteristics, you should add questions to the instrument to confirm that they are (1) undergraduate students and (2) between the ages of 18 and 24. This scale is not meant to be used with high school students, graduate students, or nontraditional undergraduate students.

APPENDIX D

Institutional Review Board Approval Letter

Oklahoma State University Institutional Review Board

Date:	08/23/2021
Application Number:	IRB-21-338
Proposal Title:	Measuring Financial Literacy in College Students
Principal Investigator:	Mary Gatti Co-Investigator(s):
Faculty Adviser:	Ki Cole Project Coordinator:
Research Assistant(s):	
Processed as:	Exempt
Exempt Category:	

Status Recommended by Reviewer(s): Approved

_____

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which <u>continuing review is not required.</u> As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744- 3377 or irb@okstate.edu.

Sincerely,

Oklahoma State University IRB

.

VITA

Mary Taggart Gatti

Candidate for the Degree of

Doctor of Philosophy

Dissertation: MEASURING COLLEGE STUDENT FINANCIAL LITERACY

Major Field: Educational Psychology

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Educational Psychology at Oklahoma State University, Stillwater, Oklahoma in May, 2022.

Completed the requirements for the Master of Science in Educational Leadership Studies at Oklahoma State University, Stillwater, Oklahoma in 2016.

Completed the requirements for the Bachelor of Science in Design, Housing, and Merchandising at Oklahoma State University, Stillwater, Oklahoma in 2014.

Experience:
Senior Academic Advisor, College of Education and Human Sciences, Oklahoma State University, August 2018 – present
Student Success Coordinator, Housing and Residential Life, Oklahoma State University, June 2017 – August 2018
Retention Specialist, Sam M. Walton College of Business, University of Arkansas, January 2016 – June 2017

Professional Memberships:
American Evaluation Association, 2019 – present
National Association of Student Personnel Administrators, 2018 – present
Association for Financial Counseling and Planning Education, 2020 – present