A Literature Review of the Teaching Methods used in Financial Literacy Education

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Introduction

Financial literacy education and its presence, or absence, within the walls of a school, cubicles of an office building, or halls of a community center is a contested subject in terms of its delivery, overall effectiveness, or need at all. The importance of education is to increase one’s cognitive ability (Hanushek and Woessman 2008), and one’s cognitive ability “affects savings and investment decisions” (Cole, Sampson and Shastry 2012). The priority for financial education has been on the rise among various agencies and organizations (Braunstein 2008; Bernake 2006; Morton 2005; Greenspan 2005; Greenspan 2003) including President Obama’s recent establishment of the President’s Advisory Council on Financial Capability for Young Americans (Igata, Nomura and Kamiyama 2014). There exists a wide disparity in terms of financial illiteracy (OECD 2005), and Americans are continually found to make poor financial decisions (Chen and Volpe 1998; Volpe, Chen and Pavlicko 1996; Volpe, Chen and Liu 2006). “An important reason for the increased attention paid to financial literacy is the relatively recent
global financial crisis which highlighted the importance of financial knowledge and skills for consumers” (Miller, Reichelstein, Salas, Zia 2014).

**Broad need for financial literacy in classroom argument**

Martin (2007) offers a general statement that “a lack of knowledge about key personal finance issues contributes to mistakes, therefore increasing individual knowledge… yield[s] ‘better’ outcomes” which he concluded based on both Campbell’s (2006) and Courchane and Zorn’s (2005) studies on the efficacy of financial literacy programs.

Educators and researchers differ on the importance of financial literacy education. These beliefs range from the argument that financial education belongs in the high school classroom (Bernheim et al. 2001), to not in any secondary or tertiary classroom environments at all (Mandell 2011). Juxtaposing these recommendations are a litany of surveys complied by Jump$tart in 2014 which highlight a student revealed desire for increased levels of education on personal finance. Coinciding with students’ desire to learn, “financial education interventions are often associated with youth and programs taught in schools, [yet] these [studies comprise] only a relatively small share of the interventions which have been rigorously studied” (Miller et al. 2014). Only 4% of the 188 studies evaluated in the Miller et al. (2014) meta-analysis involve an intervention at the university level which is the addressed audience of our study.

When questioned regarding exposure to financial literacy education 72% of high school students profess to have learned about saving, yet only 49% learned about borrowing (CreditDonkey.com 2013). FINRA found that nationally, of those surveyed, respondents’ answers to five basic financial literacy questions averaged 2.88 correct answers (FINRA 2013). 67% of undergraduate students questioned at 5 universities scored a “D” or “F” when responding to a 50 question test “based on five core competencies specified by the US Department of Treasury Financial Literacy and Education Commission” (Incepta 2013).

The behavioral outcomes financial literacy confidence gap are illustrated in the College Savings Foundation’s 2012 survey which that found “recent college graduates are at least 50% more likely to put off life choices often associated with financial independent than those who graduated seven or more years ago” (College Savings Foundation 2012). However a 2008 Jump$Start survey revealed that “college students are far more financially literate than high school students… [but it] is really a measure of problem-solving ability rather than possession of a body of time-limited financial facts” (Mandell 2008).

The National Foundation for Credit Counseling found that “61% of US adults admit to not having a budget, even though a budget is considered a building block of financial stability” (National Foundation for Credit Counseling 2014). However a “one-size fits all education program will do little to stimulate saving and could even be a disincentive to participate in a financial literacy effort” (Lusardi and Mitchell 2007b). One must also consider the alternative sources people will seek if not offered a structured and vetted program. Van Rooij, Lusardi and Alessie (2007) found that Dutch adults with “low [financial] literacy are more likely to rely on family and friends as their main source of financial advice.” Agarwal, Driscoll, Gabais and Laibson (2007) reveal that youth and the elderly are most prone to committing financial
mistakes. The financial illiteracy of America’s youth is further exposed through the “American Life Panel and in the National Financial Capability study” (Lusardi and Mitchell 2009; Yoong 2010; Lusardi 2010).

Impact of Being Financially Literate

A failure to acquire and retain a baseline level of financial literacy can lead to issues with a myriad of financial decisions later in life. Lusardi and Mitchell (2006) find that half of those they surveyed could not distinguish between nominal and real interest rates, nor did “an even larger percentage of respondents…know that holding a single company stock is riskier than holding a stock mutual fund.” Lusardi and Mitchell (2007a) build on their previous study to show that there is an inherent impediment to retirement savings based on the inability for their survey’s respondents to conduct basic interest compounding calculations. Lusardi and Mitchell (2008) also find that “those who understand risk diversification are much more likely to plan. In addition, knowledge about risk diversification strongly differentiates the sophisticated from the unsophisticated respondents.”

Measuring Efficacy and Uniformity of Studies

Few current studies that parse the outputs or outcomes of financial literacy programs as controlled for the method of delivery versus financial skills taught (Drexler, Fischer and Schoar 2014), save a meta-analysis of 188 papers conducted by Miller et al. (2014) which finds that:

Financial education can impact some financial behaviors, including savings and record keeping. These are both considered fundamental to good personal financial management and are potentially behaviors where individuals can exert greater control than in the case of other outcomes such as loan default. Meta-analysis was unable to provide insights regarding the importance of program characteristics on impact due to the nature of the sample and lack of direct comparability.

The use of common questions and/or survey instruments, such as those developed at the World Bank, DfID, and OECD in the past few years, to measure financial literacy and capability in a target population is a step in the right direction and will help increase the availability of comparable data on what is working in financial education.

Further convoluting the comparison is an inherent lack of uniformity when describing a treatment as “financial literacy training” (Drexler et al. 2014; Remund 2010; Huston 2010; Bernheim, Garrett and Maki 2001).

A consistent manner of measuring financial knowledge, or even the measurement of any intervention’s effectiveness, is absent from 90% of the studies currently populating the academic landscape (Miller et al. 2014). The lack of measurement further convolutes the significance of findings when coupled with the definitional opaqueness personal financially literacy or education in general. Hastings, Mandrian and Skimmyhorn (2012) aggregates and identifies nearly 25 years of financial literacy measurement efforts including the Consumer Federation of America’s

Although the Lusardi and Mitchell’s “Big Three” questions from the 2004 HRS have quickly become an international standard in assessing financial literacy, there is remarkably little evidence on whether this set of survey questions is the best approach, or even a superior approach, to measuring financial literacy.

Hung et al. (2009) compares and contrasts 16 different publications’ methods of measurement by identifying whether the results were evaluated through self assessment or a performance test to highlight the plethora of assessment criteria and methods used since 1996. Despite the diversity of measurement and its current lack of empirical proof that financial literacy imbues a positive change in financial behavior (Huston 2010; Hung, Parker and Yoong 2009), many do agree that financial literacy is an important component help individual make sound financial decisions (Perry 2008; Braunstein and Welch 2002).

Financial Literacy Education Does Work

Hilgert, Hogarth and Beverly (2003) proposes that “high school or college courses were also found to be a statistically significant way to learn about financial topics for those scoring high on [their study’s] credit management index.” Xiao, Newman, Prochaska, Leon, Bassett and Johnson (2004) suggest that financial education can serve as the catalyst for behavioral change. Cole, Sampson and Zia (2009) finds that “a financial education program has modest effects… for those with low levels of… financial literacy,” yet Cole et al. (2012) adds that financial education imposes a larger effect “on financial market participation and [a] smaller, but statistically and economically significant effect on financial management.” Cole et al. (2012) also “find[s] an additional year of education increases the probability of financial market participation by 7-8 percentage points, holding constant other factors, including income.” The aforementioned meta-analysis Miller et al. 2014 concludes that “financial education can consistently improve outcomes such as savings and record keeping, but does less well in preventing outcomes such as loan default.” Hilgert et al. (2003) addresses the potential correlation paradox regarding increased financial literacy improving behavior or the reversal that “people may gain knowledge as they save and accumulate wealth” instead of as a result of an education treatment.

Financial Literacy Education Does Not Work

For as many studies as there are which tout the efficacy of financial literacy education, there are nearly as many (Gale and Levine 2011; Mandell and Klein 2009; Willis 2009; Hathaway and Khatiwada 2008; Lyons, Palmer, Jayaratne and Scherp 2006; Mandell 2006b) which conclude that perhaps there is no correlation between financial literacy education and behavioral outcomes. Bell, Gorin and Hogarth (2009) reached a similar conclusion but offered that the method of measurement, or a mismatch between education provided and metrics
assessed, could contribute to an inconclusive finding regarding the efficacy of financial literacy education. Willis (2011) asserts that equipping consumers with a financial education as a result of any treatment may only produce an “illusion of knowledge.” This danger can lead to overconfidence in investing (Barber and Odean 2001) or poor financial behaviors (Bell et al. 2009).

How to Design a Curriculum

The level of understanding and ability to internalize the subject matter certainly plays a pivotal role in a student’s propensity to enact a behavioral change after the completion of a course. Marton and Saljo (1976) identifies two distinct levels of learning as “deep learning” and “surface learning,” the prior resulting in a greater propensity to result in a lasting impact versus the latter; this conclusion is further substantiated by Leamnson (1999).

A curriculum can be stratified into three layers: formal, informal and hidden (Mann 2002). The formal education consists of the explicit learning objectives, while informal education is comprised of implicit outputs or outcomes a course strives to impart on its students (Mann 2002). The hidden curriculum is rooted in the actual program plan, such as offering personal financial education via two delivery methods; how “time [is] allocated… may transmit a message about the value placed on particular content” (Mann 2002).

The length of a course produces different outputs in students’ ability to answer personal finance questions (Mandell 2011). A compilation of data from the biennial Jump$tar$t surveys ranging from 2000-2008 finds that students who receive a full semester course in money management answer 6 questions consistently below average while others that only play a stock-market game answer no questions consistently below average (Mandell 2011). Mandell (2011) also finds that students who received a “small amount of exposure to personal financial planning in high school as well as those who had at least some exposure to economics also did better than those students who took a full semester course in personal finance.” Simplification and its outcome regarding financial decision making is also gaining growing support (Beshears, Choi, Laibson and Mandrian 2013; Choi, Labison and Mandrian 2009).

“It’s financial education programs are likely to be more effective when targeted [at] specific groups of the population” (Van Rooj, Lusardi and Alessie 2011). Mandell and Klein (2007) suggests that if students are made to understand the lasting life-long impact of learning to become financially literate they may be self-motivated enough to internalize the subject matter resulting in a positive behavioral outcome. Furthermore, Alban (2012) identifies that “several studies have demonstrated that personal finance education is most effective when the learner is seeking to accomplish a financial goal, such as purchasing a home or setting up a retirement account” which is a similar finding to several other studies (Freddie Mac 2001; Mandell and Klein 2007; McCormick 2009).

It may thus be inferred that short, focused and simplified financial literacy interventions occurring immediately prior to an event in which the student may directly apply the acquired knowledge is a viable prescription for inducing positive outputs and outcomes (Mandell 2011). This is further substantiated by Bernheim et al. (2001) which finds that while high school
students who took a personal finance course did trend towards saving more than those who did not, most “savers” did not recall the course years later in life.

A problem paramount to any form of education is a lack of retention based on the student’s immediate need, or lack thereof, to exercise the recently learned material (Mandell 2011). The timing of the education has a statistically significant impact as Bell et al. (2003) observed through their “Financial IQ” questionnaire which found that:

Households that scored high on the financial practices indexes were more likely than those scoring in the low or medium group to prefer the Internet as an information source. In general, these sources have "just in time" availability for people who want to learn on their own—those households that want to access education and information resources when they are preparing to make a decision and at times and places that are convenient for their lifestyle.

Mandell (2011) offers that the rationale for mandating personal finance instruction at the high school level is due to the immediacy of its use in terms of upcoming important financial decisions. Mandell’s more recent findings demonstrate his willingness to keep pursuing the potential efficacy of “school-based” personal finance (Mandell 2009), and counters his earlier finding (Mandell 2006b) in which he surmised that the “just-in-time” method was ineffective. Willis (2011) suggests that the financial marketplace changes so often, and that “major personal financial decisions are episodic,” so education needs to be consumed as closely as possible to the impending financial decision in “teachable moments.”

Using the High School Financial Planning Program (HSFPP) supplied by the National Endowment for Financial Education (NEFE), Danes (2004) found that students displayed a positive immediate output in their responses to “financial knowledge, behavior and confidence questions.” Danes (2004) also found that the HSFPP produced a lasting outcome on the financial behavior of the same students who displayed sustained behavioral changes three months after the course. Bell et al. (2009) supports Danes’ (2004) finding with a study of soldiers’ financial behaviors who, given a prior high school financial education, have a greater propensity to possess a savings account, emergency fund, and pay off their credit card balances. The soldiers observed in Bell et al. (2009) are in their early 20’s which suggests a greater propensity to recall and apply the financial knowledge attained from their respective recent high school experiences.

How to Deliver Financial Literacy

Given the professed desire for, or lack of exposure to, financial education the question pertaining to the most effective delivery is frequently the next most contested topic. The first match that must be addressed for any form of education is that of the relationship between the curriculum’s level and its associated tasks (Drexler et al. 2014). Glewwe, Kremer and Moulin (2009) find that merely proving additional textbooks does little to improve the educational outcomes of below-average performing students. Enriching the course curriculum, irrespective of method, may still have a positive output. Heinberg, Hung, Kapteyn, Lusardi and Yoong (2010) find that “financial education interventions appear to be effective… [with] no major differences by format in terms of knowledge change” when groups were offered the education in
both video based and narrative form. Games, such as a stock market simulation, are shown to help increase financial literacy according to Jump$tart five high school studies (Mandell 2006a).

**Experimental Design**

To achieve a directly attributable and measureable impact an immediate and subsequent post-treatment survey should be given to ascertain the instant and lasting behavioral impact of the course. Danes’ (2004) and Danes, Casas and Boyce’s (1999) surveys following NEFE course completion and Bell et al. (2009) survey of soldiers during a financial education course, immediately following the course, and a year later are three recent studies that are examples of an effective post-treatment efficacy aggregation.

The Department of Social Sciences at the United States Military Academy used a control group and randomized assignment, which was an acknowledged limitation in Cude, Kunovvskaya, Kabachi and Henry’s (2013) study of college seniors. We acknowledge that this study’s analysis based on immediate post-course survey results follows a similar limitation to prior works (Cude et al.2013) in that it does not observe the behavioral impact of financial literacy education beyond the performance on the post-education test. Pastor, Kaliski and Weiss (2007) observes that using a pre and posttest design allows for a greater confidence through the establishment of a pre-treatment baseline which Erwin (1990) further substantiates in his study on assessing student learning and development.

**Rules of Thumb Based Scholarly Articles**

Two prominent pedagogical methods we evaluate to help parse out the potential efficacy of personal financial education in general are “conventional” versus “rules of thumb.” The conventional method consists of teaching financial literacy in the same manner with which it was taught in the past. In the conventional course we explain the various equations behind topics such as Net Present Value, Compounding Interest and Real versus Nominal Interest Rates among others. It is of particular value to explore the research already performed surrounding a heuristic based “rules-of-thumb” method to better frame the question of which is most effective in teaching financial literacy and producing positive financial behavior outcomes.

The rule-of-thumb based method “focuses on simple heuristics or routines for financial decision making without aiming to provide comprehensive… knowledge” (Drexler et al. 2014). A number of studies find that rules of thumb can be an effective means of “reduc[ing] complex information to a simple and manageable set of choices… [and] help turn an intention into a realized action” (Datta and Schoar 2014). Heuristically based education enables the student to learn both “by observation and vicariously” and observe whether the effects of one’s actions “are rewarded, and whether they are effective or ineffective” (Mann 2002). Datta et al. (2014) offer that “the best heuristics are those that encapsulate useful information in a way that is intuitive to remember and act upon but that are also specific in their context.”

Influential works such as Simon (1955) and Baumol and Quandt (1964) provide the foundation for the current discussion of evaluating the efficacy of rules of thumb. Simon (1955) discusses the concept of bounded rationality by the “economic man” whose behavior is
compatible only with his “access to information and computational capacities” and thus tries to achieve the closest possible solution to a real-world decision through “satisficing.” Baumol and Quandt (1964) posit that “rules of thumb are among the more efficient pieces of equipment of optimal decision making.” Feldman (2003) finds in his study of concept learning that a “subjects’ ability to learn concepts depends heavily on the concept’s intrinsic complexity; more complex concepts are more difficult to learn.” Others in the field of cognitive psychology find that simple rules accompanied with less feedback on the correctness of a response may facilitate better learning (Maddox et al. 2008; Maes and Eling 2007). Datta et al. (2014) further dissects the effectiveness of heuristics by identifying that “simple information is more easily absorbed and recalled” (Kahneman 2011), “heuristics take less time to implement” (Bettinger, Long, Oreopoulos and Sanbonmatsu 2009), and “having a lot of ‘clutter’ around key information can make people less likely to absorb key messages” (Townsend and Shu 2010).

One criticism of a rule-of-thumb based financial literacy curriculum is that it may lead to “individuals persistently and substantially underestimate exponential growth” otherwise classified as an “exponential growth bias” (Stango and Zinmann 2009). The term’s origins lie in a Chinese parable of a “pond and duckweed” in which even an experienced person may underestimate the amount of time it takes for a pond to be covered by duckweed given it doubles in size ever five years (Wagenaar and Timmers 1979). Moon and Martin (1990) and Houser and Winter (2004) show that while “individuals use heuristics that are quite close to optimal, [they] are still different from optimal search rules which have to be computed by backwards induction” (Winter et al. 2012).

The frequency with which people make decisions also plays a pivotal role which Stanovich (2003) addresses concerning the persistence of cognitive biases and the failure of “primitive” heuristics to assist in offering a correct conclusion. Stango et al. (2009) identifies that the failure of heuristics in Stanovich’s (2003) work fits the classification of many financial decisions households make with relative infrequency. Binswanger and Carman (2011) demonstrate that those who use rules-of-thumb in household decisions often have the same behaviors and outcomes as those that plan.

Love (2013) further refines the rules-of-thumb concept into “optimal rules of thumb” for savings and asset allocation. Instead of evaluating the rule-of-thumb as it stands, Love (2013) searches for “the best specification of a rule within a given class… that minimizes the welfare losses associated with that rule instead of one derived from a standard life-cycle model.” This suggests that rules such as Malkiel’s (2011) “place 100 minus your age in stocks,” among others may be suboptimal (Love 2013).

A variety of studies (Hall 1978; Flavin 1981; Hall and Mishkin 1982; Cochrane 1989; Campbell and Mankiw 1990; Weber 2000; Weber 2002) “assume that a fraction of the population behaves according to some simple rule of thumb such as ‘just consume your current income in every period’ whereas the rest of the population behaves optimally” (Winter, Schlafmann and Rodepeter 2012). Orman (2009) finds that a simple five step process can lead to financial security, namely paying off debt and creating a spending, saving and retirement action plan. Despite the number of studies regarding the impact of a simplistic, rule-of-thumb or heuristic based curricula, “until recently [this concept] played little role in theories of concept
learning. Similarly, the trend in business and financial literacy training appears to have been toward increasing complexity” (Drexler et al. 2014). Indeed, Willis (2011) explains that “financial product offerings today are too complex and consumer circumstances are too diverse for simple rules.”

Reducing the complexity of a curriculum, such as through use of a ‘rule-of-thumb’ influenced method, does produce better outputs and outcomes for the less financially literate (Drexler et al. 2014). The study found that lower skilled, less financially literate or those less motivated ex ante, micro-entrepreneurs performed better on end-of-training output and outcome evaluations after receiving rule-of-thumb based training versus standard accounting training (Drexler, et al. 2014).

Winter et al. (2012) pose an assumption that “even financially sophisticated individuals do not solve intertemporal optimization models when they make their saving and investment decisions. Rather, they often use simple or sophisticated decision rules, which [they] call rules of thumb.” Just as Winter et al. (2012) focus on rules-of-thumb in terms of a household’s savings behavior, other studies (Cocco, Gomes and Maenhout 2005; Gomes, Kotlikoff and Viceira 2008) use rules-of-thumb to evaluate how households allocate their portfolio. Eisenstein and Hoch (2005) find that when people are trained to accurately use the heuristic “Rule of 72” there is a 50% reduction in the error for calculating the interest on a loan. The common prevailing trend in most studies show that using rules-of-thumb for relatively simplistic behavior, such as saving, results in more optimal behavior than when used for a more complex action such as portfolio allocation.

While the study of micro-entrepreneurs’ financial literacy outputs (Drexler et al. 2014) is not identical to the observation of undergraduate students, commonalities with respect to motivation, incoming educational familiarity with the subject and measured outputs allow for an extrapolative comparison. The measure of effectiveness for Drexler et al. (2014) are also more robust than previous studies (Lusardi and Mitchell 2007a; Lusardi and Mitchell 2008; Stango et al. 2009) which rely on one to three questions with which to measure financial literacy. The explicit definitions of each treatment outlined in our study allow for additional confidence when comparing the two specific forms of financial literacy education as was also found with Drexler et al. (2014).
References:


Inceptia, First-Year College Students Score Poorly in Basic Financial Literacy, Inceptia Survey Reports, January 22, 2013, https://www.inceptia.org/about/news/jan-22-2013/, no link to study


