Center for Financial Security

UNIVERSITY OF WISCONSIN-MADISON

Determining What Works
A Framework for Evaluating Financial Literacy Education in Elementary School

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Center for Financial Security
Working Paper

April 2012

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Abstract

School-based personal financial education has the potential to transmit financial knowledge and skills to elementary school students. These lessons may facilitate financial decision-making during the transition to adulthood and throughout the life course. Although many existing studies examine the effects of financial education on knowledge, few studies evaluate whether exposure to financial literacy education leads to improved financial decision-making capability. This paper proposes a framework for the evaluation of financial education offered at the elementary-school level (grades K-6). The multi-faceted framework emphasizes the underlying mechanisms that facilitate the translation of student knowledge into the ability to make sound financial decisions over the life course. Researchers and policy makers can use this financial capability framework to guide the formation of evaluations that examine both near-term and long-term outcomes.

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Introduction

Over the last decade, researchers have paid increasing attention to the level of financial knowledge of citizens across the world, and to what extent relative financial literacy levels are correlated with financial status or behavior (Lusardi & Mitchell, 2011). Although problematic financial behaviors do not typically appear until adulthood (see Campbell, 2006 for a discussion), a frequent conclusion in the literature—which is echoed by policymakers—is that including more financial education in the educational system, including the post-secondary level (Chen & Volpe, 1998), secondary level (Danes et al., 1999) and elementary-school levels (Suiter & Meszaros, 2005) would reduce this behavior. The proposed hypothesis is that financial education programs delivered earlier in the life course will help students obtain foundational knowledge and skills that will develop into the ability to make financial decisions in the future. This proposition has some support in the theoretical literature, but is generally untested.

A few studies demonstrate that teaching financial concepts in elementary school may help students gain financial knowledge and enhance cumulative learning (Buckles & Freeman, 1984; McCormick, 2009; Sosin et al., 1997).[4] Obviously, formal education is just one avenue for developing financial knowledge. Other studies describe the role of economic socialization within family and peer relationships (Moschis, 1985; Pritchard & Myers, 1992; Webley & Nyhus, 2006; Otto, 2009). Financial education in elementary school may enhance this informal learning, or even counteract misinformation (Suiter & Meszaros, 2005). Studies of cognitive development show that skills related to saving money (ownership, conservation, planning, deferred consumption) are formed as soon as early childhood (Webley & Nyhus, 2006; Scheinholtz et al., 2009). Thus, cognitive development theory and related research suggest that the elementary years may be a window of opportunity during which education can influence financial behavior in later life.

Programs aimed at elementary-school students vary dramatically in both scale and scope, ranging from 20-minute self-contained activities to comprehensive sets of lessons designed to span an entire semester or academic year. The wide range of offerings seems to reflect a lack of consensus about key components—or even the desired outcomes—of financial education programs. Therefore, as an increasing number of schools incorporate financial education into their curricula, research that determines the appropriate content and structure of this education is critically important.

Many existing studies highlight possible key components of financial capability education, but there have been few attempts to evaluate whether or not these factors, collectively or alone, actually lead to improved financial capability.[5] Evaluating long-term outcomes requires the longitudinal tracking of students through school (when education is offered) and into adulthood (when behaviors can be observed). Such studies are immensely complex and resource intensive. In the absence of decades-long panel survey studies, there remains an important role for shorter-term examinations of students' development of knowledge and skills, as well as behaviors that may serve as precursors to financial capability in later life. Because a number of financial literacy curricula are available, more research is needed to determine which curriculum components are likely to be most effective at improving these near-term outcomes. This type of research will aid in the development of models of financial learning and can serve as a foundation to develop and refine hypotheses that can later be tested using longitudinal evaluations.

This paper provides a framework to guide near-term research on the effectiveness of financial education at the elementary-school level. The framework is grounded in an understanding of the underlying mechanisms or processes that may promote financial capability

(Pawson, 2002). The framework facilitates the synthesis of the results of shorter-term studies and therefore guides the formation of both financial education curricula and the longitudinal studies evaluating these curricula, thereby offering several insights and providing directions for future research.

Background

In the United States no consensus has emerged regarding standards for financial education delivered in schools. Instead, a variety of national and state guidelines related to economics and financial education have evolved (McCormick, 2009). In 46 states, the education requirements include personal finance to a certain extent, with most emphasis on personal finance in high school (Council for Economic Education, 2011). Standards may govern the integration of financial education into existing math, social studies, consumer sciences, and economics lessons. As of 2011, 36 states required some type of financial education in public schools, up from 28 in 2007.

Scholars have conducted relatively few formal evaluations of financial education programs at the elementary-school level in recent years. Table I summarizes eight studies that are illustrative of evaluations in this field since 1997. While most of these studies show that financial education in elementary school has positive results on knowledge, they tend to be small in scale, often lack control groups, and evaluate a very heterogeneous set of interventions. For example, in a pilot study of third graders (n=31), Grody et al. (2008) found statistically significant gains on a post-test of savings and banking knowledge, by comparing 15 students who read a story containing financial literacy concepts to 16 students who did not. A study of a more formal set of classes offered to third grade students (n=58) found that the 25 students who

received 20 hours of financial education had better financial knowledge test scores than a control group. Importantly, the results were statistically significant when measured both after ten days and again after four months (Berti & Monaci, 1998). In a larger study of second and third graders (n=316), Schug and Hagedorn (2005) found significant improvement in financial knowledge in a pre-post analysis of the Money Savvy Kids curriculum, however the study did not include a control group.

While these studies and the others in Table I typically indicate gains in financial knowledge, the conclusions are limited by the research designs: sample sizes tend to be small by social science standards, 'treatment' is not standardized, there are no comparison groups, and follow-up periods and measures are often short. In addition, these studies do not contribute to an understanding of the effect of these knowledge outcomes on short-run behavior, let alone their effect on financial decision-making over the longer term, including into adulthood.

A framework for financial education research in elementary school

The development of a framework that links knowledge transfer to financial capability in both the near-term and later in life may help advance evaluation research in the field of financial education in elementary school. At the core of our proposed framework is an explicit focus on the underlying mechanisms that Pawson (2002) describes as a basic theory about how resources will influence the actions. In the current context, these mechanisms represent the processes through which the education program impacts financial behavior and, ultimately, capability.

We argue that the focus of research and evaluation must move beyond whether a specific program is effective to focus on the efficacy of mechanisms. Pawson (2002) refers to this paradigm as a 'realist synthesis' of evidence-based policy evaluations. The result of this type of

research will not be ‘Program A is better than Program B,’ but a discussion of the context within which each mechanism is most successful (i.e., ‘Program B works well in situation X with students from group Y by influencing behavior Z’).

As advocated by Lucey and Giannangelo (2006), this approach facilitates comparisons of individual studies based on curriculum components, and promotes the development of interventions tailored to students’ social and economic environments. Furthermore, understanding the effectiveness of individual mechanisms will allow curricula to be adapted to educators’ needs, because the mechanisms can be transferred to different instructional designs and settings. In the context of limited class time and resources, this is a vital consideration. Persuading educators’ to incorporate evidence-based practices into their curricula presents many challenges (Pressley et al., 2006), and flexibility will improve the likelihood that educators will adopt effective curriculum components.

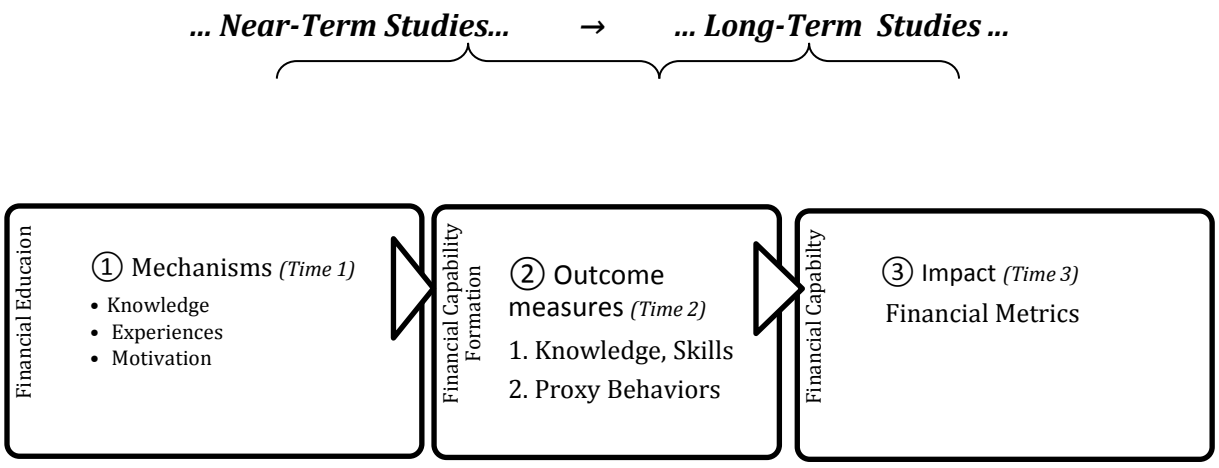
Our proposed framework, which is intended to serve as a roadmap for future research, consists of the following steps:

1) Identify a set of potential *mechanisms* for financial capability education,
2) Develop *outcome* measures for financial capability and associated proxies, and
3) Evaluate mechanisms to determine their *impacts* on financial capability.

Figure 1 presents these three steps. At Time 1, mechanisms are developed in the context of an intervention, curriculum, or program. These mechanisms may include knowledge, experience, and motivation (discussed in more detail below). At Time 2, outcomes—such as knowledge, skills, and behaviors—that are indicators of financial capability (e.g., financial goal setting) are measured. At Time 3, impacts can be observed, including financial behaviors (e.g., regular savings) and statuses (e.g., net worth). Notably, the framework is equally viable for children and

adults. An education program can be evaluated in the near-term (from immediately post-program to a few months later) to measure knowledge, attitudes, and precursor behavior that serve as proxies for financial capability. Later, longer-term impacts on financial status can be assessed. The span between Time 1 and Time 3 is generally much longer when studying elementary school students—perhaps 15 years or more.

Figure 1: Framework for Synthesis



(1) Identifying potential mechanisms

The first step in the process is careful consideration of the numerous possible mechanisms through which individuals can achieve financial capability. We initiate this conversation by outlining a few of the mechanisms used in existing programs. We recognize that insights from the education, psychology, economics, and sociology literatures—and theories of cognitive development, in particular—must play a critical role in the selection of appropriate mechanisms. While a thorough treatment of these issues is beyond the scope of this paper, we include a limited discussion of the connections between mechanisms and relevant theories in the discussion that follows.

Imparting knowledge

Imparting knowledge is certainly the most common, and frequently the only, mechanism underlying financial education programs for children. Although there is some debate about appropriate content, existing curricula at the elementary-school level typically cover basic money management concepts such as saving, budgeting, banking, investment, credit, the time value of

money, and financial decision-making. For example, Grody et al. (2008) argue that programs should go beyond defining terms and basic formulae to cover real-world activities such as withdrawing cash, making investments, establishing and using credit cards, and other more applied topics.

Of course, for this mechanism to be effective, educational content must be age appropriate. For example, from the ages of six through ten, children understand the concepts of deposits and withdrawals; at around age ten, they begin to understand loans, and at age 12 they can conceptually connect savings deposits to banking loan programs (Berti & Monaci, 1998; Otto, 2009). In addition, from ages eight to 11, children understand financial exchanges between individual parties, but do not have a unified sense of financial systems (Webley, 2005).

Beyond targeting materials by age, the form of instruction and the particular instructor are also important. Clearly, classroom, computer-based, and self-completed programs will have differing degrees of delivery (Clark, 1983). Instructor quality also matters. Prior studies show that a teacher's prior knowledge and attitudes are critical (Lucey & Giannangelo, 2006). Smith et al. (2011), for example, found that middle-school students' financial literacy test scores differed significantly by classroom teacher. There is also evidence of a high degree of variation across teachers in terms of confidence and ability to provide financial education content (Holden & Way, 2009; McCormick, 2009). To that end, training for instructors is likely to be an important factor, both to standardize delivery and improve affective characteristics that may influence quality. Sosin et al. (1997), for example, found that elementary- and middle-school teachers taking a graduate-level course on teaching economics reported significant gains in their enjoyment of and confidence in teaching an economics curriculum. Even less intensive training has positive results on teachers' capacity to transmit content (McCormick, 2009). Moreover,

even with well-prepared teachers, the classroom format may be limited in its effectiveness. Delivering financial education in a classroom setting is generally efficient and may allow for financial education to be integrated with other topics, such as math (Beverly & Burkhalter, 2005), but can fail because if parents and family engage in poor financial practices at home. Programs that involve parents may help overcome the influence of negative financial socialization and improve learning (Lucey & Giannangelo, 2006).

Providing experience

Educators have debated the role of applied learning in formal education for many years. American John Dewey wrote about the 'instinct of investigation' in 1938, and a myriad of studies since that time have shown positive effects of learning by doing.[6] Students may be more likely to retain financial knowledge when they apply the concepts they have learned in a concrete situation. Experiences or applications, therefore, are another set of mechanisms; they may take many forms, including making decisions about how to manage money or interacting with financial products and services, either through simulations or in-school bank and credit union branches (O'Neill, 2008).

Kotlikoff and Bernheim (2001) find an association between reported childhood experiences with a savings account, investment, or allowance and savings in adulthood. The authors propose that 'habituation' as a child may encourage savings as an adult, although there are no longitudinal studies capable of showing such effects. In the United States there are a number of local or state in-school banks in partnership with banks or credit unions (Johnson & Sherraden, 2007). While not a direct measure of the influence of a curriculum to actual savings activity, among high school students having a savings account is positively correlated with

scores on financial literacy tests (Sherraden et al., 2011, citing Mandell, 2009 and Peng et al., 2007). Experiential learning allows learners reflect on concrete experiences and then test concepts and assumptions (Kolb, 1984; Kolb et al., 2000). In school-based banks these programs may help expand access to basic financial services, especially in low socioeconomic status schools, and thus may help overcome one of the contextual barriers to developing financial capability later in life (Lucey & Giannangelo, 2006; McCormick, 2009). In a four-year study, Sherraden et al. (2011) found that elementary-school students who were enrolled in a savings program combined with a financial education curriculum scored significantly higher on a financial literacy test than a control group whose members neither received the formal financial education nor participated in the savings program. While the study was not an explicit test of the effects of applied learning versus learning with no direct application opportunities, the results are suggestive. Similarly, studies of interactive stock market simulation games show that participation is associated with gains in financial knowledge (Harter & Harter, 2010).

Motivating

In addition to knowledge and application, motivation is a third important mechanism through which financial education may shape behavior and promote financial capability. Motivation as a mechanism is broadly defined, incorporating incentives as well as psychological factors such as self-efficacy, time preferences, and goal orientation (Mandell & Klein, 2007; Howlett et al., 2008; Meier & Sprenger, 2008; McCormick, 2009; Otto, 2009). The development of these constructs depends on a multitude of factors, including non-school-based influences, and motivation may also be rooted early in child development. Clearly, however, a person's attitude about managing finances is important; feeling efficacious at doing so, as well as setting goals and

having focused intentions will increase the likelihood that knowledge is incorporated into behavior.

These factors can potentially be addressed in elementary curricula and programs (McCormick, 2009; Otto, 2009), however educators must be mindful of matching content to children's developmental stages. For example, according to Otto (2009), 12-year olds are better able than six-year olds to use strategies such as thinking about future goals to resist a present temptation to spend. Mandell and Klein (2007) argue that expectations of successful outcomes (from, for example, saving) increase the motivation to learn. Harter and Harter (2010) suggest that simulation games introduce additional affective factors that might enhance motivation during the activity and persist after the experience.

While using well-founded instructional techniques to incorporate selected financial topics into a curriculum may be relatively straightforward, addressing the psychological factors that affect financial learning may be more challenging. More research is needed to understand how education can influence these factors. For example, there is very little research about the way that children and adolescents acquire a future orientation (Smith et al., 2008) or about how children can improve self-control and master successful behavioral and cognitive saving strategies (Otto, 2009). Understanding how to incorporate these psychological issues into a financial education curriculum will require a better understanding of the development of these traits in children.

This research remains at the fuzzy intersection of psychology, education, and behavioral decision-making, but is critically important for a variety of fields including financial education. Research must shed light on the ways that knowledge is translated into actions, and how and why

the resulting behaviors persist over time. A better understanding of this phenomenon would also be informative for other fields such as public health (e.g., obesity and health eating).

(2) Developing outcome measures and proxies

In the evaluation literature, studies often define outcomes as the more proximal program-related measures estimated directly after a program is delivered. Outcomes, then, stand in contrast to impacts, which constitute program effects and are measured relative to a control group after an appropriate time period has elapsed to capture the persistence of effects. Educational evaluations need both outcome and impact measures; and the intended outcomes and impacts of a curriculum or program should be clearly and formally articulated during the initial design and development phase. Moreover, to evaluate the effectiveness of the mechanisms used in elementary-school financial education programs, specific metrics of success must be determined.

Unfortunately, the financial education field lacks a standardized set of measures. Indeed, the eight studies in Table I include a range of measures and measurement techniques. While standardizing outcome measures is often infeasible for individual programs, as the field develops, ideally, researchers will validate and replicate measures across studies. As the field moves toward at least a few common, reliable measures, the possibility of meta-analysis and synthesis of individual studies increases.

The search for common outcome measures begins with the identification of metrics of the financial capability of young adults. Although the intended goal of school-based financial education is to promote lifelong financial well-being, financial capability in young adulthood—a time when students start to make independent financial decisions—is a reasonable and more

easily measured outcome. The financial situations of young adults are likely to affect future financial well-being by establishing early asset accumulation, and perhaps more importantly early debt, as well as influencing educational opportunities that affect long-term income trajectories. When possible, longitudinal studies should be designed to follow subjects well beyond the transition to adulthood; however, opportunities for this kind of long-term research may be limited.

Ideally, common outcome measures should assess financial behaviors and skills, rather than merely measuring knowledge and attitudes (Sherraden et al., 2011); however, this task is largely unaddressed in the existing literature. Thus, future research efforts should expand the literature in ways that enhance the understanding of the relationships between financial knowledge and financial behavior among young adults.

Identifying appropriate metrics of adult financial capability is only the first component of this aspect of the framework; the second component involves generating proxies that can be observed in children. The need for proxies arises naturally given the overall objective of the framework, namely to facilitate the synthesis of the results of shorter-term studies in a way that guides the formation of both financial education curricula and the longitudinal studies evaluating these curricula. If the ultimate goal of financial education programs in elementary schools is to promote financial capability in adulthood as captured by a common set of measures (as discussed above), then researchers must bridge the gap between these measures and outcomes that are observable among children. More specifically, this goal requires an understanding of how behavioral outcomes observed among youth correlate with adult financial capability.

Suppose, for example, that timely debt repayment were identified as an outcome-based measure of financial capability among adults. Researchers would then attempt to determine what

behaviors in children most directly reflect the likelihood of repaying debt at older ages. The optimal process by which to identify such proxies remains unidentified, but existing work in areas related to development and behavior will certainly serve as an important resource.

(3) Incorporating mechanisms into curricula and determining their impacts

The final phase of the framework entails linking the mechanisms delivered at Time 1, through the outcomes developed and measured at Time 2, to impacts on financial capability at Time 3. Using the appropriate outcome measures (as discussed above), near-term studies can be designed to test the impact of selected curricula relative to no formal financial education. Studies of this type can help reveal the quality and scope of programs, as well as indications of potential future behaviors, attitudes, and motivations. In addition to using a 'no treatment' control group whose members are not offered financial education to measure the overall effects of programs, near-term impact evaluations can compare the efficacy of combinations of mechanisms, including experiential learning and programs that directly address psychological or attitudinal factors. These studies could also expose moderators and mediators, including effects among targeted populations of students. Detailed descriptions of the program design and the intended mechanisms in these studies would be critical to facilitate comparisons, including comparisons between factors and between mechanisms that are not the primary focus of the evaluation.

These studies could also test and compare the efficacy of various ways of teaching content within a curriculum. For example, students can engage in experiential learning in different ways—banking through school bank and credit union branches, games, simulations or role play (in person or by computer), or classroom activities that allow students to practice skills such as preparing a budget or filling out an account register—and these approaches vary in

resource intensity. Trade-offs between various strategies should be considered so that implementation recommendations can be specific about the types of interventions that are and are not effective, and individual educators can adapt curricula their needs. For example, in-school banking might increase the relevance of material for students and build self-efficacy in a way that simulation activities cannot. Such findings can help optimize the efficiency of the delivery of programs. These comparisons will also facilitate the understanding of the mechanisms responsible for effective education.

Obviously the intensity of programs must be an important consideration. It seems unlikely that a few days of instruction will have a lasting impact. The minimum effective level of exposure to a program is testable to the extent that student attendance and participation are tracked and documented. Likewise, there may be important peer or cohort effects as students interact with each other or as groups of students react to current events (e.g., via media coverage of financial issues) or macroeconomic factors (financial crises). Documenting these mitigating issues is also important, especially for studies occurring over longer time periods and larger geographic areas.

Using findings to inform longitudinal studies

Even among programs serving adults, the seeds planted in a financial education class may not sprout until much later. For example, a course on retirement planning for a cohort of 30-year-old employees may not produce observable financial behaviors for a decade or longer, and the ultimate goal of such programs—improving well-being in retirement—may not be measured for 30 years. Likewise, a program offered to 10-year olds may not influence observable traits associated with financial capability (e.g., debt load, savings) for 15-20 years.

Accordingly, well-designed longitudinal studies are the ultimate goal of near-term evaluations of financial education programs in elementary schools. These studies will profoundly advance how researchers and policy makers understand the overall effectiveness of financial education, in terms of its impacts on financial capability in young adulthood, as well as the trade-offs of different approaches. Longitudinal studies should draw on the findings of near-term studies, including results that suggest which combinations of components are most rooted in mechanisms that lead to positive behaviors. These approaches are also amenable to the cost-benefit analyses that are essential to the development of sustainable education initiatives.

Longitudinal studies are, of course, fraught with potential problems. Tracking students and capturing data on a regular basis becomes more costly each successive year. Attrition will cull the sample, and potentially lead to a biased dataset (for example, the most financially distressed respondents may also be the hardest to locate). Without randomization, treatment and control groups may represent innate motivations or other biases that confound the results. Detailed data must be collected on other educational activities for at least each year the respondent is in school because additional exposure to financial education and related topics might produce cumulative learning over time. Other factors, such as intelligence or other traits, must also be included in order to explore the quality of randomization and test for mediation or moderation effects.

Conclusion

Financial literacy is a relatively new field with a nascent evaluation literature for any given target audience. The literature for financial education in elementary schools follows this trend, with only a small number of disparate studies conducted in the last few decades. As

financial education efforts expand at the primary grade levels, the field at large is beginning to focus more on financial capability as the ultimate goal for an educated citizenry; however, moving from educational content aimed at six to 12 year olds to overall financial well-being in adulthood is a daunting task, however.

This article proposes a framework within which to synthesize and extend the relatively small body of evidence about the impact of school-based financial education programs on financial capability. The framework is applicable to financial education in other contexts, but in this case is applied to financial literacy provided to children. The intent of developing the framework is to guide future evaluations by systematically defining mechanisms—including those that go beyond knowledge provision—as well as outcome measures and impacts that can be tracked over longer time periods. We review research in this field that has produced incremental contributions, from defining mechanisms and validating measures, to linking near-term proxy outcomes to precursory behavior consistent with financial capability, financial security, and well-being later in life.

Well-designed evaluations will enhance the decisions made by educators and policy makers about financial educational mandates, resource allocation across financial education strategies, and the opportunity costs of classroom time. If research can identify optimally-targeted financial education, its results will increase the potential to improve financial decision-making among youth and adults, and will ultimately enhance the financial well-being of citizens.

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[4] We recognize that elementary school might range from ages 5-14 depending on the context. Generally, we focus on grades K-6 in the United States.

[5] While there is not a standard definition for financial capability, we find the components described by the FINRA Financial Education Foundation informative: 1) making ends meet, 2) planning ahead, 3) managing financial products, and 4) financial knowledge and decision-making. What constitutes positive or negative behavior will depend on the context, but making informed and well-reasoned decisions in these areas based on available costs and benefits is fundamental.

[6] Indeed, Sophocles suggested “I do and I understand” 2,400 years ago.

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Table I: School-Based Financial Education Evaluations (Elementary through Middle School Grades)

Authors	**Journal (if any), Year**	**Level**	**Design: N's and presence of control group**	**Content**	**Measures**	**Results**
Schug & Hagedorn	*The Social Studies*, 2005	2nd- 3rd grades	316 (no controls)	Money-Savvy Pig curriculum	10 pre/post three-point Likert scale survey items (read aloud)	Gains for 7 of 10 items (6 at p=.01)
Grody et al.	2008	3rd grade	31 treatment; 16 controls	"Where the Money Comes From" storybook	10 pre/post multiple choice knowledge questions (read aloud)	Gains compared to control group (p=.05)
Diem et al.		6th-8th grades	500 (no controls)	Economics for Success	Pre/post knowledge and confidence/attitudes	Knowledge gains (p=.05); Attitude gains (p=.01)
Berti & Monaci	*British Journal of Educational Psych.*, 1998	3rd grade	58; 25 treatment (1 class), 33 controls (2 classes)	20 hours in 5 weeks on understanding "the bank"—deposits, ATMs, interest	Pre/post interviews (post=10 days later and 4 months later)	Knowledge gains at 4 months
Campbell Smith, Sharp, & Campbell	*Journal of Economics and Economic Education Research,* 2011	6th-8th grades	160 (no controls)	Financial Fitness for Life	Pre/post knowledge and attitudes/confidence	Knowledge gains (p=.01) ; No attitude/ confidence gains (p=.01)
Harter & Harter	2009	3rd-12th grades	No controls for 3rd-6th grades; Gr7 = 385, Gr8= 337, Gr10= 319, (including controls)	Financial Fitness for Life Themes 3, 4, and 5	Pre/post knowledge	Knowledge gains for all grades (p=.01)
Sosin et al.	*The Journal of Economic Education*, 1997	3rd-6th grades	150 treatment; 232 control	Economics curriculum	Pre/post knowledge	Knowledge gains for all grades (p=.-5).
Sherraden, M. S., Johnson, L., Guo, B., & Elliott, W.	*Journal of Family and Economic Issues*, 2011	K-4th grades	200; quasi-experimental design	4 year "I Can Save" program—Combination of education and savings accounts	End of 4th grade assessment—money management, savings, spending, income	Knowledge gains (p=.05), but not saving gains.

Determining What Works:
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Center for Financial Security Working Paper

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