CFS Research Brief (*FLRC 10-6*)
September 2010

Center for Financial Security
UNIVERSITY OF WISCONSIN-MADISON

HARNESSING THE POWER OF TECHNOLOGY TO ENHANCE FINANCIAL LITERACY EDUCATION AND PERSONAL FINANCIAL WELL-BEING: A REVIEW OF THE LITERATURE, PROPOSED MODEL, AND ACTION AGENDA

By Wendy L. Way and Nancy Wong

The development and use of technology-based tools for financial literacy education has grown rapidly in recent years, often based on the presumption that digital media will enhance past practice. However, little attention has been given to understanding *why* such technologies may be expected to enhance outcomes for either general or vulnerable populations. This literature review fills this gap by examining behavioral and educational theories that provide insight into how digital pedagogies may support personal finance-related teaching and learning.

The number of technology-based tools for providing and accessing personal finance education has grown exponentially in recent years. Practitioners have assumed that the use of digital media will improve previous financial education practices, but little attention has been given as to how or why improvements might occur. This paper fills the gap by examining a diverse group of behavior theories and their applicability to financial literacy education. Behavior theories address behavior in four progressively broader ecological contexts: individual, interpersonal, community/organizational, and policy/systems. The literature on the interaction between technology and learning is also reviewed and a model for technology-based personal finance education programs is presented.

Individual Models of Behavior

At the micro-level, behavior theories address behavior at the individual level. Proponents of the theory of planned behavior stress that intention is the main driver of behavior. Intention, in turn, is influenced by attitudes, social norms, and perceived control. In the integrated behavior model (IBM) four additional factors (beyond intentions) affect behavior: necessary knowledge/skills, the salience of the behavior, environmental constraints, and the extent of experience performing the behavior. IBM also highlights the need for different interventions for vulnerable populations. Advocates of the transtheoretical model of change emphasize that behavior change is a process, rather than a discrete event, and note the importance of tailoring financial education interventions to specific stages.

Interpersonal Models of Behavior

Interpersonal models of behavior focus on the interactions between individuals, especially those within the same immediate networks, such as families and peer groups. In social cognitive theory the most important influences on behavior are: outcome expectations, self-efficacy, collective efficacy, observational learning, facilitation (resources), incentives, and self-regulation. There is a focus on the ways to increase self-efficacy in order to control behavior. Some personal finance resources already use these methods of self-efficacy enhancement.

Researchers have found some long-term effects of family information and modeling on financial behavior; peers also influence

financial behavior, though to a smaller degree. When considering the role of technology in financial education, a focus on intimate social networks is especially pertinent given the rise of social media. Social interaction and social support are increasingly mediated through Internet-based media such as Facebook and Twitter. Financial education programs should take advantage of the popularity of social media.

Community and Group Models of Behavior

The context of larger social groups (e.g., communities, organizations) also affects behavior. The diffusion of innovations literature explores how, why, and at what rate new ideas and technologies spread through cultures. Successful financial education programs can use the findings from the diffusion literature to ensure they reach the maximum number of individuals.

The field of community organization highlights behavior change that occurs through grassroots organizing, coalition building, leadership development, political action, consciousness-raising, and culturally sensitive practices. Successful community collaborations include a shared vision, strong leadership, and a focus on process (not just tasks). A community strategy for behavior change may be especially helpful for vulnerable populations within an established community.

Policy and Systems Models of Behavior

The final group of theories addresses the factors that influence behavior at the broadest level: policy and social structure. One of these, social marketing, involves using marketing tools and strategies to influence behavior for the benefit of individuals and society rather than corporations.

Choice architecture, or designing environments such that individuals are 'nudged' to act in their own self-interests while retaining freedom of choice, is a final theory of behavior change that can inspire financial education programs. The concepts of framing and heuristics prove especially helpful here. Research on framing has demonstrated that the way the program costs, benefits, and risks are framed affects the choices participants make. Using these findings can help financial educators encourage individuals to make positive choices. Educators can also use heuristics to encourage good financial choices.

The Impact of Technology on Learning

The literature on the interaction of technology and learning can provide beneficial insights into possibilities for using technology to enhance financial literacy education. Using the Internet for financial education has potential benefits and potential drawbacks. Internet-based financial education programs may better address unique learning styles, provide convenient access, facilitate greater autonomy and insight into the learning process, provide opportunities for supplemental and individualized learning, increase the depth of learning, and enhance motivation.

However, these programs may also lead to information overload and encourage passive learning; in addition, students have reported that Internet use interferes with concentration in class, is time-consuming, and creates a dependency on the Internet. Further, gender, culture, and disability status may be associated with differences in Internet-based learning and must be taken into account. Games and simulations are popular among Internet users and provide an alternative method to enhance technology-based financial education.

Technology and Motivation to Learn

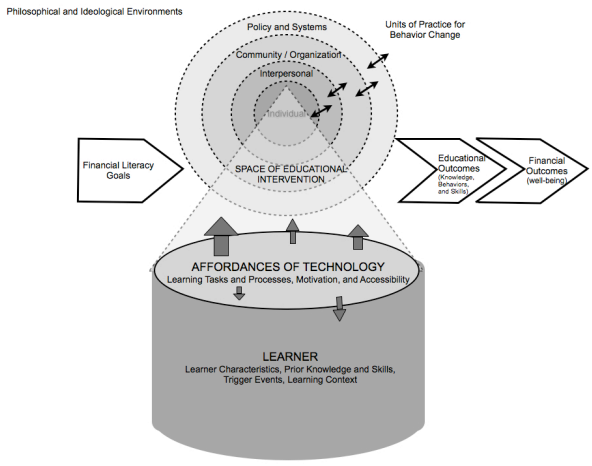
Further research is necessary to test whether technology motivates learners, and

if so, how. However, previous research and theory offer some helpful possibilities. Self-determination theory suggests that individuals are motivated to experience competency, autonomy, and relatedness. Digital technology, including games and simulations, can help individuals fulfill these needs, and therefore technology-based financial education programs may motivate individuals to learn more about personal finance.

Accessibility

In order to maximize the usefulness of technology-based financial education programs, access to technology and the ability to make full use of the technology must be enhanced as much as possible. Along with assistive technologies, employing the Universal Design for Learning, which encourages accommodating the needs of diverse learners, will help educators expand accessibility.

Figure 1: Ecological Model for Technology-Based Financial Literacy Education Intervention



Improving Technology-Based Learning

Previous research and theory suggest a few additional ways to improve technology-based financial education programs. First, professional development opportunities for educators should be expanded. Tools that help individuals *learn with*, rather than *learn from* technology improve the probability of successful learning. Ensuring that historic biases (based on gender, race, and socio-economic status) are not reinforced in education programs will enhance learning. Further, successful technology-based programs must avoid a deficit perspective, and instead draw on the learners' own experiences and appreciate their skills. Finally, informal learning opportunities are a promising domain for efficacious financial education programs.

Summary Model

The Ecological Model for Technology-Based Financial Literacy Education Intervention summarizes the ways in which technology can contribute to personal finance education. The model indicates that behavior emerges as a result of characteristics of the individual, as well as interpersonal and societal factors. While education has a role to play in creating positive financial behavior change, it is not the only factor influencing behavior; therefore the context of educational programs must be taken into account. The model addresses the role of technology in enhancing learning; but points out that this may not occur if optimal conditions of technology application are not met. The model also indicates that technology-based financial education programs may take place in formal, informal, and non-formal settings and can occur throughout the lifespan. Finally, programs that use a model of *learning with*, rather than *learning from*, will be the most beneficial. In sum, technology-based financial education programs can have positive outcomes, but the wider environment (financial, educational, and

governmental) frames the learning process and can enhance or constrain the outcomes.

Vulnerable Populations

Educational scholarship points out that when applied appropriately, technology can have special benefits for vulnerable populations. Technology can, for example, expand possibilities for educational participation for those facing restrictions of time, place, or mode of access; accommodate diverse learner needs related to content and/or learning process; and provide more engaging approaches to teaching and learning than traditional methods. The literature also points out that failure to address the potential role of technology in financial literacy education may not only serve as a missed opportunity to enhance educational outcomes and well-being among vulnerable populations, but may well exacerbate existing vulnerabilities.

For Further Reading

Beetham, Helen and Rhona Sharpe (2007). *Rethinking Pedagogy for a Digital Age: Designing and Delivering E-learning.* New York: Routledge.

Dell, Amy G., Deborah A. Newton, and Jerry G. Petroff (2008). *Assistive Technology in the Classroom: Enhancing the School Experiences of Students with Disabilities.* Upper Saddle River, NJ: Pearson Education.

Dondlinger, Mary Jo (2007). 'Educational Video Game Design: A Review of the Literature,' *Journal of Applied Educational Technology,* 4(1): 21–31.

Hadhazy, Adam (2010). 'Wireless Internet Use Soaring Thanks to Young People and Minorities.' *TechNews Daily*. http://www.technewsdaily.com/wireless-Internet-use-soaring-thanks-to-young-people-and-minorities-0824/. Accessed August 8, 2010.

Laurillard, Diana (2003). *Rethinking University Teaching: A Framework for the Effective Use of Educational Technology,* 2nd ed. London: Routledge.

Lefebvre, R. Craig (2010). 'Financial Literacy and Education Meets Social Marketing,' *International Business Times.* http://www.ibtimes.com/contents/20100323/financial-literacy-education-meets-social-marketing.htm. Accessed July 23, 2010.

Rose, David H. and Anne A. Meyer (2002). *Teaching Every Student in the Digital Age: Universal Design for Learning.* Alexandria, VA: Association for Supervision and Curriculum Development.

Selwyn, Neil, Stephen Gorard, and John Furlong (2006). *Adult Learning in the Digital Age: Information Technology and the Learning Society.* New York: Routledge.

Shaffer, David Williamson (2006). *How Computer Games Help Children Learn.* New York: Palgrave Macmillan.

United States Department of Education (2010). *Transforming American Education: Learning Powered by Technology*. Office of Educational Technology. http://www.ed.gov/sites/default/files/NETP-2010-final-report.pdf. Accessed August 1, 2010.

Williams, Dmitri, Nicole Martins, Mia Consalvo, and James D. Ivory (2009). 'The Virtual Census: Representations of Gender, Race, and Age in Video Games,' *New Media and Society,* 11(5): 815–834. http://dmitriwilliams.com/VirtualCensusFinal.pdf. Accessed August 1, 2010.

Acknowledgments

Wendy L. Way is Professor and Associate Dean of the School of Human Ecology and Nancy Wong is Associate Professor of Consumer Science, both at the University of Wisconsin-Madison.

The research reported herein was performed pursuant to a grant from the U.S. Social Security Administration (SSA) funded as part of the Financial Literacy Research Consortium. The opinions and conclusions expressed are solely those of the author(s) and do not represent the opinions or policy of SSA, any agency of the Federal Government, or the Center for Financial Security at the University of Wisconsin-Madison.

The Financial Literacy Research Consortium

The Financial Literacy Research Consortium (FLRC) consists of three multidisciplinary research centers nationally supported by the Social Security Administration. The goal of this research is to develop innovative programs to help Americans plan for a secure retirement. The Center for Financial Security is one of three FLRC centers and focused on saving and credit management strategies at all stages of the life cycle, especially helping low and moderate income populations successfully plan and save for retirement and other life events, including the use of Social Security's programs.

The Center for Financial Security

The Center for Financial Security at the University of Wisconsin-Madison conducts applied research, develops programs and evaluates strategies that help policymakers and practitioners to engage vulnerable populations in efforts which build financial capacity. The CFS engages researchers and graduate students through inter-disciplinary partnerships with the goal of identifying the role of products, policies, advice and information on overcoming personal financial challenges.

For More Information:

Center for Financial Security
University of Wisconsin-Madison
Sterling Hall Mailroom B605
475 N Charter St.
Madison, WI 53706
(608) 262-6766
http://www.cfs.wisc.edu/