IT FIGURES IN THEIR FUTURE: ASSESSING THE IMPACT OF EVERFI, A
VIRTUAL ENVIRONMENT, ON LEARNING HIGH SCHOOL PERSONAL
FINANCE

by

Ellen M. Nosal
A Dissertation
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Doctor of Philosophy
Education

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Development

Date: _____ Fall Semester 2013
George Mason University
Fairfax, VA

It Figures in Their Future: Assessing the Impact of EverFi, a Virtual Environment, on Learning High School Personal Finance

A Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at George Mason University

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Dedication

This dissertation is dedicated to my family, without whose love and support I would not have been able to complete this document and degree. My special thanks goes to my husband, Tim; my two wonderful children, Stacy and Peter; and my mother, Virginia. I am so fortunate to have such loving and supportive people around me.

Acknowledgements

I would like to thank the many friends, relatives, and supporters who have made this happen, especially my loving husband, Tim for his support and understanding. Special recognition and many thanks go to Dr. Priscilla Norton for the hours spent talking over iced tea and Diet Coke. Your guidance and direction were always brilliant. To my committee members who were invaluable with their ideas and suggestions. Thank you all for taking this journey with me.

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Abstract

IT FIGURES IN THEIR FUTURE: ASSESSING THE IMPACT OF EVERFI, A VIRTUAL ENVIRONMENT, ON LEARNING HIGH SCHOOL PERSONAL FINANCE

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George Mason University, 2013

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This quasiexperimental study assessed the impact of a program called EverFi in helping high school students learn personal finance and reports on students' content knowledge, behaviors, attitudes, and perceptions of financial literacy. Since the housing crisis in 2005, the need to improve financial education has become critical. In response, states have enacted legislation requiring a financial education course for graduation from high school. Literature has suggested the greatest indicator in financial success is completion of a financial education course that presents content centered on student interests and that is delivered in an engaging manner. This premise was followed by a report from the Financial Literacy and Education Commission that identified a need for further research on personal-finance-related topics and best practices for the classroom. Through a survey of behaviors, attitudes, and perceptions of knowledge as well as content assessment and interviews, this dissertation reported on the impact of educational technology, such as

virtual environments. These environments validate experiential-based, authentic situations and simulations on learners as part of classroom instruction and found learning that used entertainment, engagement, simulation, personal interests, and experiences with virtual environments such as EverFi can be a best practice in high school financial education.

Chapter 1

Introduction

In 2005, a drastic housing market correction hurled homeowners into shock and

debt. This market correction was due, in part, to the poor practices of subprime mortgage

lenders and overextension of credit by lenders and borrowers alike (Foote, Gerardi,

Goette, & Willen, 2008). This ember ignited a firestorm of financial difficulties for many

Americans who considered themselves well off but who were really overextended on

credit. The growing financial crisis for so many American families pointed to the need

for initiatives to ensure financial literacy. To quickly combat the lack of knowledge about

personal finance, states began looking to schools to offer classes covering personal

finance and economics. Although 23 states in 2000 had financial education embedded in

other classes and some mandates for material to be covered, instructors lacked direction

for content and curriculum (Tennyson & Nguyen, 2001). In the scramble of financial

woes, many state school boards began mandating and implementing new personal finance

courses as graduation requirements. By 2008, five states had mandated a required

financial course and, in 2009, the number of states with a required financial course rose

to 13 (Grover, 2010). Presently, 25 states require some form of economics or personal

finance course as part of graduation requirements (Jump$tart, 2012a) while the other 25

states have some form of standards incorporated in other subjects (Council for Economic Education, 2011).

With the growth in mandated courses came the subsequent need for solid curriculum and standards to guide instruction that addresses the goal of promoting personal finance education to create well-rounded financially stable citizens. According to the Jump$tart Coalition (Jump$tart, 2007a), "Financial literacy refers to an evolving state of competency that enables each individual to respond effectively to ever-changing personal and economic circumstances" (p. 5).

Much of the curriculum for personal finance has been adopted from economics courses and business courses such as accounting and marketing. Additional curriculum has been provided by financial institutions such as the Wells Fargo's Hands on Banking program (Wells Fargo, 2003). One of the first organizations to offer a comprehensive program for financial literacy that spanned the disciplines and grade levels was the Jump$tart Coalition (Jump$tart, 1995). This program has been growing since late 1995 and now serves as one of the major sources of curriculum standards for high school personal finance courses.

Background

Financial Literacy

Studies on financial literacy have come at the question from different angles: Tennyson & Nguyen reviewed finance-related research, focusing on state-mandated curricula, which, according to findings, had had dramatic effects on students overall financial success but lacked data on specific content such as spending habits and credit

(2001). Other studies have looked at the spending habits of high school graduates transitioning to college and projected future financial situations (Yates & Ward, 2001). The findings of these studies indicated the importance of having financial education as early as possible. Lusardi et al confirm, "It is likely beneficial to provide financial education before individuals engage in financial contracts and before they start making financial decisions" (2010, p. 376). This recommendation is echoed by others (e.g., Mandell & Klein, 2009; Tennyson & Nguyen, 2001). Additionally, 41% to 50% of financial education comes from the home (e.g., Jump$tart, 2010; The National Foundation for Credit Counseling, 2010), and the mother's level of education and employment status are positive factors in a young person's future financial success (Yates & Ward, 2001; Mandell & Klein, 2009; Lusardi et al, 2010). A study comparing urban and rural high- school-aged students and their financial competencies concluded the content in their financial courses was similar; however, the study did uncover some differences in the topic of living conditions. Urban students tested better on concepts related to housing and food costs while rural students scored higher on assessments involving automobile-related topics (Valentine & Kyayum, 2005). The authors recommend such an alignment of personal finance curriculum and a student's interests and experiences; others have concurred (Walstad, Rebeck, & MacDonald, 2010). Making the learning that takes place in a financial course meaningful to the learner has become a focal point of curriculum design. When students are engaged, entertained, able to reflect on the material, and able to use what they have learned in this classroom setting,

researchers found that the lessons were more useful to students with high interest and students earned better grades (Yates & Ward, 2001; Walstad et al., 2010).

Virtual Worlds and Simulations

In recent years, technological advances in computer-aided instruction have introduced new instructional innovations including virtual worlds and simulations. These innovations represent a merging of gaming and social interaction (Messinger, Stroulia, & Lyons, 2008). The researchers explored the history of the gaming industry, organization of the virtual environment, and its expansion to the Internet to create an expansive gaming arena with corresponding real time social interactions. The possibility of using virtual worlds as online learning environments has led to ever growing amounts of educational information and research.

Early research began with understanding the complexities of what virtual environments entail (Messinger et al., 2008) and how to navigate the dangers of a virtual world (Elliot & Kruck, 2008). Education professionals saw virtual worlds as a medium for online or distance education. Carpenter (2009) focused on the expansive potential for education in this new computer-based setting. The virtual world known as Second Life was designed initially to be an experiment in virtual culture, society, and the world, but the researchers and educators alike perceive the potential for expansive learning and a remarkable educational future.

In the literature on virtual environments in education, a wide range of topics have been explored. This literature review focuses on participants of specific ages. Studies include subjects from college age to elementary school age. An examination of the

research reveals that several studies have explored virtual environments with college-age participants, one with a focus on project management (Conrad, 2011), another with ethics of preservice teachers and pedagogy and innovations in academics (Campbell, 2009a; Campbell, 2009b) and still another on collaboration strategies for students in museum studies (Barrett & Gelfgren, 2011). Studies focusing on elementary-aged participants were dedicated to specific content areas, specifically science inquiry (Harvard University, 2007), and reading and writing (Atlantis Remixed, 2008). Studies conducted at Harvard University (Ketelhut & Nelson 2010; Clarke & Dede, 2005) and Indiana State University (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005) have demonstrated that students learning in this type of environment show an increase in knowledge, which can be attributed to their engagement and interaction with the material.

Significance of Study

This study is important because it adds to the body of research examining the efficacy of a technology-driven curriculum to deliver instruction in a creative and engaging way so that students can understand personal finance and relate those concepts to their situations. Arici (2008) compared academic achievement of elementary students who used the program, Quest Atlantis, with those who did not use the program. In her mixed method design, she tested whether students who had used the program performed better on assessments than those who had not. The control group had normal classroom setting instruction while the treatment group used the Quest Atlantis program. She found a statistically significant difference in learning and comprehension between the two groups with the treatment group scoring higher, and these findings were supported by

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student interview data. Other research probing the connection between instruction using technology and achievement involved high school participants in the areas of science inquiry (Wellman & Arreguin, 2011), English language (Huang, 2010), and business economics in this last, participants were gifted and talented students at a governor's school (Slator & Dischinger, 2006).

Studies of particular interest to this research involve the use of virtual environments to teach the concepts of personal finance. Many projects have demonstrated the effects of using games and simulations to promote understanding of personal finance and economics. Studies on a program called the Stock Market Game (Lestor & Williams, 2010; Wood, O'Hare, & Andrews, 1992) identified successful uses of the game for instruction with participants gaining increased knowledge of financial concepts. This learning transferred to more personal awareness of financial literacy. This literature review also covers research conducted on the use of technology to teach personal finance. Treatments included games (Huang & Hsu, 2011), simulations (O'Neill, 2008) and (Sardone, 2008), mobile learning (phones) (Chambers & Shufflebottom, 2010), and virtual environments (Liu, et al., 2011; Berzins, 2011).

On July 16, 2012 the President's Advisory Council on Financial Capability, the lead members of the Financial Literacy and Education Commission, met to discuss proposed research priorities for the 2012 year. Of the nine proposed research topics, first and foremost was the need to identify best practices in financial literacy education. The aim of the commission was to guide the research into effective delivery mechanisms for

all age groups, specifically identifying an effective mix of financial education for improving financial well-being (Financial Literacy and Education Commission, 2012).

In support of the research agenda set by this commission (2012) and this research study, two important studies focusing on the union of financial education and virtual learning environments appeared in 2011. The first focused directly on the impact of a virtual world and learning financial concepts (Liu, et al., 2011). The other looked at the relationship between participants' use of a virtual environment and whether and to what extent they became more informed consumers of financial products (Berzins, 2011). Both of these studies focused on relating the importance of financial decisions to students' real life experiences.

The Problem

Although there is an emerging body of research that explores the use of virtual worlds in adult settings, and a second body of research that examines teaching high school students financial literacy, there is a gap in research that focuses on the use of virtual environments to promote high school financial literacy. The current study sought to begin to bridge that gap, in alignment with research proposed by the Financial Literacy and Education Commission aimed at determining if virtual environments should be part of a best practices model of financial education. Specifically, this study is an examination of the impact of a particular virtual learning environment, EverFi, on high school students' financial literacy learning.

Research Questions

To understand the impact of EverFi as an instructional strategy to promote high

school students' financial literacy learning, these research questions were developed:

1. Does the basic knowledge of personal finance of high school students

    whose personal finance course includes the virtual environment, EverFi,

    differ from the basic knowledge in this area of those whose personal

    finance course does not include this component?

2. Do the attitudes about personal finance of high school students whose

    personal finance course includes the virtual environment, EverFi, differ

    from the attitudes of those whose personal finance course does not include

    this component?

3. Do the behaviors of high school students with respect to personal finance

    whose personal finance course includes the virtual environment, EverFi,

    differ from the behaviors of those whose personal finance course does not

    include this component?

4.   Do the perceptions of knowledge about personal finance of high school

    students' whose personal finance course includes the virtual environment,

    EverFi, differ from the perceptions of those whose personal finance course

    does not include this component?

5.   Is there a relationship between high school students' demographics (age,

    grade, gender, or employment status) and their knowledge, behaviors,

    attitudes, and perceptions of knowledge with regard to personal finance?

6.   Is there a relationship between the instructor in a personal finance course and high school students' reported behaviors, attitudes, and perceptions of knowledge with regard to personal finance?

To explore students' impressions and thoughts about their experiences with the EverFi program, the following research questions were formulated:

7.   What did high school students report about their experiences with the EverFi modules?

8.   What did high school students report about their experiences with the EverFi financial simulation?

Researcher's Approach

This study evaluates the impact of the virtual environment, EverFi, on high school students' understanding of personal finance concepts. As a researcher, it is my goal to contribute to the body of literature studying virtual environments and, specifically, how virtual environments can be used in educational settings to help students learn difficult concepts. These goals and research potential are motivated by the concept that simulation can replicate a real world experience without the real world financial pitfalls. This general motivation solidified into a personal research goal of understanding virtual environments and applying principles of education and learning to those virtual environments. These ideas become the foundation of this proposal and the research that ensued. This research can add to the research that seeks valid educational alternatives, like virtual environments, to traditional methods. Such alternative tools can bolster the instruction of personal finance and the curriculum as a whole.

Conceptual Framework

During my career as a high school mathematics teacher, part of my course duties included teaching a personal finance course. I gained insight from this teaching experience in the best practices of teaching and learning personal finance. I believe understanding the use of money depends on the personal experiences and the unique situation of each student, and students reach a true understanding of finance when situations related to their own lives are integrated into classwork.
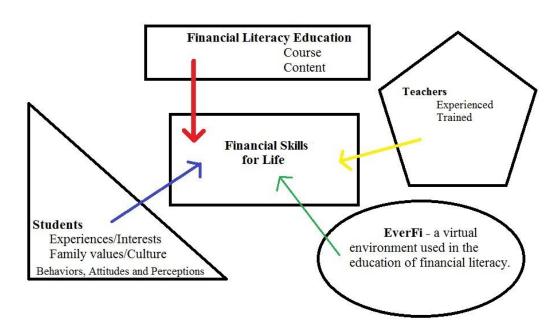

Figure 1.1. Conceptual framework identifying the various influences affecting acquisition of financial skills.

The framework shown in Figure 1 is derived both from personal classroom experiences and research. The arrows indicate the relative influence each factor has on

students' success in learning useful financial skills. First and foremost is completion of a financial education course. As research demonstrates, the course itself is a foundational platform for successful future financial endeavors (Lusardi et al., 2010). Students who complete such a course, taught by an experienced instructor, see a respectable 20-point increase in achievement on assessments (Walstad et al., 2010).

Students' interests and family foundations are the next ingredients of financial success. Students gain a majority of their personal finance knowledge at home (Council for Economic Education, 2011) as well as self-beneficial activities like saving money (Balint, Bradford, & Weinberger, 2012). Strong family input, combined with an effective classroom situation—experienced instructors who use a variety of teaching methods, including technology—lead to students who are far more engaged in learning about personal finance than those who lack some of this input (Ketelhut & Nelson, 2010). It has been shown that engagement and relevancy heighten learning and embedding knowledge in authentic tasks supports financial skills for life (Mandell & Klein, 2009). These various elements constitute my core beliefs on effective learning of personal finance; they have led me to theories like experiential learning, situated cognition, and transfer as constructs for reflecting on the learning potential of virtual environments.

Through the study of experiential learning, I have gained an understanding of phrases such as experience is the best teacher and practice makes perfect and believe that experiential learning is an important part of the growth and learning of an individual. According to Titelman (2000), these phrases moved to the proverb stage as their use and reliability grew over the centuries. Traditionally, experiential learning took shape in

career training for craftsmen (Collins, Brown, & Holum, 1991), but in the field of education, humans identify with the practice of adapting to our surroundings in the process of learning. Kolb (1984) writes, "We are a learning species and our survival depends on our ability to adapt" (p. 1). Kolb researched these precedents; drew from the previous work of Dewey (1933), Lewin (1948), and Piaget (1955); and added a focus on reflection (Kolb, 1984).

Combining experiences within natural surroundings to make learning more meaningful is at the center of the theory of situated cognition—learning while in the midst of the problem. Linking experiential learning with unique, real world experiences forms a foundational experience, which a user can draw upon for reference. Thus, the theory of situated cognition (learning in context) plays a vital role in understanding best practices for learning personal finance.

Situated Cognition

In the early 1970s, artificial intelligence researchers began looking at how the brain makes decisions to better understand the role of logical thought in their [the AI researcher's]creations (Clancey, 1997). Their work led to a definition of situated cognition in the study of how human knowledge develops as a means of coordinating activity, within the activity itself (Clancey, 1997, p. 4). From this research, roughly two decades later, situated cognition moved to the classroom. From the works on situated cognition of Clancey (1997) to educational researchers like Lave (1991) and Brown, Collins, and Duguid (1989), this question arose, "Why not teach concepts in context?"

These researchers began by examining how people learn. A pivotal point occurred when the researchers identified how some learners were shown what to learn through apprenticeships, both physical and cognitive. Using the everyday workplace as lesson instruction, employers demonstrated everything from effective methods of interaction with customers, in a sales environment, to proper techniques for creating a product. Trainees immersed in everyday actions quickly acquired target skills, and mentors who were directly involved with delivering feedback on completion of the task helped learners improve efficiency. This in-depth cultural view of learning was then compared to classroom instruction. The researchers noted students who practiced authentic activities were enculturated and learned those concepts better and were able to call upon the skills at a faster rate than students who did not engage in such activities (Brown et al., 1989). Lave (1991) also researched this learning phenomenon but from the viewpoint of society and postulated, "learning is a process of becoming a member of a sustained community of practice" (p. 65). She stated that learning is the act of developing an identity in a community of practice; this identity includes knowledge and skills and adds meaning to the community. This act of moving to becoming a skillful member of the community requires the assistance of the community of practice and individuals obtain mastery through a legitimate peripheral participation (p. 81).

Situated Cognition and Personal Finance

In the movie version of the musical Cabaret (1972), the lead performers sing how money makes the world go round. But in 2005, that song could have been altered to Credit Makes the World Go Round. The understanding of money and credit ought to be a

very situated learning experience. Concepts of money must be taught in context, and this teaching usually begins at home.

In teaching personal finance, I have learned that money is a very personal topic. Students learn about money from family members first (Jump$tart, 2010), and not all students find it a positive experience. Many students' perceptions of personal finance come from experiences within their families; they then carry these beliefs into their own dealings with financial situations. Any gaps in knowledge and understanding of personal finances can be tracked to future pitfalls in a person's life. The goal of most personal finance and economics courses is to develop the understanding that money is a tool for making healthy financial decisions. However, making good financial decisions requires practice, and many people cannot afford losing money on situations that may require practice.

People learn about money by exchanging currency for a product or service. "Understanding is developed by continual, situated use." Brown et al., (1989) feel that learning from books overlooks the authentic representation of the event, stating that

Learning how to use a tool involves far more than can be accounted for in any set of explicit rules. . . . The occasions and conditions for use arise directly out of the context of activities of each community that uses that tool (p. 33).

Money follows this logic to the letter regardless of if the community in question is the household, the culture, or the society; this thinking led Brown et al. to focus on embedding the essential learning in authentic tasks.

While this process of understanding is vital for learning financial concepts and economics, Lave (1991) probed the question further and discovered that in learning the material students move toward becoming a sustained community of practice. For the purposes of this study, the community of practice is defined as a financially stable adult. Lave looked deeper into this idea of identifying practice situations that can generate experiences the learners can draw on. This idea of a cycle of promoting practice and then gaining experience from that practice aligns well with the complex properties of finance and economics. Lave calls for further research on what she terms "valued identities of mastery through legitimate peripheral participation" (p. 81).

The purpose of this study is to identify the impact of a virtual environment on students' learning of personal finance, using an electronic device as peripheral participation. This peripheral participation is in the form of a program called EverFi, and this study intends to establish that EverFi is a financially safe setting for experiencing money.

Summary of Methods

This study reports on the use of the virtual environment, EverFi, as part of the curriculum of a personal finance course. In the study schools, students could choose personal finance as an elective course to add to a 4 by 4 block schedule. This schedule is 4 courses for each term of Fall and Spring in a school year where students take eight classes during a school year. For this study, a convenience sampling was identified; the personal finance teacher who would be using EverFi volunteered two classrooms. At her

suggestion, two teachers at two other high schools in the county also agreed to participate.

The participants in this study were high school students enrolled in one of four personal finance courses. At the experimental school site, I worked with two sections of personal finance with a combined student pool of 50 students. The other two high schools [Control School L (CSL) and Control School F (CSF)] in the county had at least one class of personal finance each; the students in these classes comprised the control group. CSL and CSF had a combined student pool of approximately 50 students.

A comprehensive exam, Financial Fitness for Life (FFL), was administered before and after students took the finance courses. The exam results were used to answer Research Question 1: Does the basic knowledge of personal finance of high school students whose personal finance course includes the virtual environment, EverFi, differ from the basic knowledge in this area of those whose personal finance course does not include this component?

Every content module in the EverFi program (Modules 2–10) offers 3–5 preparatory questions, to be answered before students work through the module, and 10 posttest questions to be answered after the module has been completed. Once the researcher was added as an administrator to the EverFi program, she could access students' scores.

All students from both groups, experimental and control, self-reported on their behaviors and attitudes with respect to and their perceptions about financial literacy by taking a survey entitled Behaviors, Attitudes, and Perceptions of Knowledge (BAP). The

BAP had three parts: students' self-reported financial behaviors, students' self-reported attitudes regarding their personal finance experiences, and students' self-assessment of their understanding of personal finance. This survey was used to answer Research Questions 2, 3, and 4. (2. Do the attitudes about personal finance of high school students whose personal finance course includes the virtual environment, EverFi, differ from the attitudes of those whose personal finance course does not include this component? 3. Do the behaviors of high school students with respect to personal finance whose personal finance course includes the virtual environment, EverFi, differ from the behaviors of those whose personal finance course does not include this component? 4. Do the perceptions of knowledge about personal finance of high school students' whose personal finance course includes the virtual environment, EverFi, differ from the perceptions of those whose personal finance course does not include this component?) Students received all communications and assessments through a learning management system called Angel.

Research Questions 5 and 6 focus on identifying any relationships that may exist between demographics and student behaviors, attitudes, and perceptions of knowledge of personal finance and instructors and these behaviors, attitudes, and perceptions. (5. Is there a relationship between high school students' demographics [age, grade, gender, or employment status] and their knowledge, behaviors, attitudes and perceptions of knowledge with regard to personal finance? 6. Is there a relationship between a personal finance course instructor and student reported behaviors, attitudes, and perceptions of knowledge with regard to personal finance?)

The students in the experimental group reported on their experiences using the EverFi program through a 26-question survey entitled Student Assessment of EverFi Program (SAEP). The survey gave the students the opportunity to report on their overall program use and their experiences with the modules and simulation. The results of this survey were used to answer Research Questions 7 and 8. (7. What did high school students report about their experiences with the EverFi modules? 8. What did high school students report about their experiences with the EverFi financial simulation?)

Data were also collected through interviews with students selected from the experimental group. Students were rank ordered by overall module scores; those with the six highest scores and six lowest scores were asked for interviews. The information from these interviews also provided information to support Research Question 7. Continuing with a purposeful sampling technique, similar interviews were conducted to provide additional information to answer Research Question 8.

The first assessment was given approximately five days after participants had formally given their assent and consent to be part of the study, at the beginning of their course. The FFL pretest gave the researcher a baseline data set to use for comparison statistics. All students, from both control and experimental groups, completed these pre-course surveys soon after the FFL. During instruction time, both control and experimental groups received normal classroom instruction from teachers; students in the experimental group also worked with the ten modules in the EverFi program. Toward the end of the course, students in the experimental group completed the simulation portion of the EverFi program. Students were asked to use the simulation twice; they were scored on decisions

they made for their characters in the simulation. The students reported their simulation scores to the classroom teacher delivered electronically to the researcher.

In the planned analysis of data and to answer Research Question 1, which was designed to identify differences in content knowledge, t-tests were completed on the FFL. To answer Research Questions 2, 3, and 4, which were designed to identify any differences in attitudes about and behaviors and perceptions with respect to personal finance between the experimental and control groups, four t-tests were completed on the total BAP score and the respective sections. To answer Research Questions 5 and 6, which were designed to examine any relationships between (a) demographics and (b) the personal finance course instructor and student attitudes towards and behaviors and perceptions with respect to personal finance, statistical analysis software was used to identify any significant correlation coefficients. To answer Research Questions 7 and 8, which were designed to collect information on students' experiences with the EverFi modules and simulation, the researcher reported means from the SAEP on individual items. In addition, the researcher transcribed and open coded the student interviews using an emerging process to identify themes and organizational and substantive categories.

Definition of Terms

Attitudes: One's feelings about personal finance issues (Marsh, 2006).

Behaviors: One's responses to personal finance matters (Marsh, 2006).

Economics: Social science dealing with financial considerations, specifically the production and consumption of goods and services.

Experiential Learning: Active learning process in which ideas are formulated and re-evaluated thorough reflection on one's own experiences (Jump$tart, 2007).

Financial Literacy: Ability to use knowledge and skills to manage one's financial resources effectively for lifetime financial security (Jump$tart, 2007).

Financial Plan: Report including a person's financial goals, needs, and expected future earnings, savings, investments, insurance, debt management activities, and, typically, a statement of net worth.

Household Finances: Mathematics used to calculate the financial needs of a single family home, which may include budgets and other finances related to mortgages or other payment of debts.

Perceptions: Capacity for comprehension or, specifically, one's self-assessment about financial concepts.

Personal Finance: Set of principles and methods that individuals use to acquire and manage income and assets.

Transfer: Process of applying previously learned concepts to new situations for

successful outcome with greater retention, best used in a situated context with

variable opportunities to perfect.

Virtual Environment: Computer- and Internet-driven immersive environments.

Virtual Worlds: Computer- and Internet-driven three-dimensional immersive

environments where users animate and navigate an avatar as a virtual

representation of themselves.

Chapter 2

Literature Review

Personal Finance

The housing market correction jolted homeowners into reality with underwater mortgages, credit card debt, and other cascading financial difficulties. This state of affairs was serious trouble for many Americans who considered themselves financially stable.

States began looking to schools to provide education about personal finance and economics. In response, educational institutions scrambled to provide courses to combat this lack of knowledge about personal finance. In 2000, twenty states offered financial education as part of other high school courses and some states had mandates in place for specific content to cover, but instructors lacked direction for content and curriculum (Tennyson & Nguyen, 2001). In the face of these financial woes, many state school boards began mandating and implementing new personal finance courses for high school graduation requirements.

In 2008 only a handful of states had a required course; in 2009 that number rose to thirteen (Grover, 2010). Presently, some form of economics or personal finance course is a prerequisite for high school graduation in twenty-five states (Jump$tart, 2012b), with all fifty states having some form of standards with respect to personal finance incorporated into other subjects (Council for Economic Education, 2011). With this

growth in courses came the need for a solid curriculum and standards to guide teachers; many states looked to preexisting groups or financial institutions that had curricula in place, like Jump$tart and Wells Fargo's Hands on Banking program (Wells Fargo, 2003). The goal of personal finance education is to create a well-rounded, financially stable citizen. The validity of this goal is supported by a longitudinal study that found that increased higher-order thinking lead to an more positive outcomes in terms of financial choices (Chambers & Shufflebottom, 2010).

In a rash of recent web and print articles, CNN Money reported that the housing market was climbing back to levels that matched those of early 2008, and the number of homeowners with underwater mortgages had decreased to 11% nationally (Fox, 2012). Nonetheless, lack of curriculum plagues education. Meanwhile, in Oregon, public school systems are still dealing with personal finance issues. Sixteen years ago, Oregon Public Schools removed personal finance from their state curriculum assuming parents would educate their children on proper financial behavior. In light of the financial crisis, schools rushed to reinitiate this curriculum in the classroom. Beginning in the 2012 school year Oregon school systems will begin adding personal finance content back into the curriculum. However, such courses will not be mandatory for graduation (Hunsberger, 2012). This lack of financial education is not new information by any means. Another recent article that established the link between lack of education and record levels of debt, pointed out that although early education is key to avoiding debt, it is never too late to learn good spending and saving habits (Dvorkin, 2012). Many studies on personal finance have found that parents' modeling of good spending and saving habits is an

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important indicator of financial success (Block-Lieb & Boyack, 2012; Jump$tart, 2007; Watts, 2006).

In the fallout of the housing crisis, the federal government has taken a prominent position in financial literacy education: in its stimulus packages designed to assist the economy in springing back. Congress created two agencies, the Consumer Financial Protection Bureau (CFPB) (Block-Lieb & Boyack, 2012) and the Financial Literacy and Education Commission (FLEC) to assist consumers in becoming more financially aware citizens. These agencies have gathered a wealth of information.

The Consumer Financial Protection Bureau has taken a major role in the education on financial success. Their recent focus has been on a section of a financial education program known as the Division of Consumer Education and Engagement (Block-Lieb & Boyack, 2012). This division's goal is to treat financial literacy as a tool for consumer protection; its mission is to "provide other tools to consumers so they can make good financial decisions" (Block-Lieb & Boyack, 2012, p. 94). The program is working with educational institutions to ensure their message, "know before you owe," is reaching the right audience.

The Financial Literacy and Education Commission specifically attempt to help the educational community identify best practices for teaching financial concepts. The group offers financial assistance for research. The commission acts to support educational systems by expanding the body of literature on financial learning (Financial Literacy and Education Commission, 2012). In an earlier review of literature, these same concerns and more were identified, but within the context of an economics course rather than a

personal finance course (Watts, 2006). Watts examined mainly on financial education

programs and their effectiveness. In the findings, Watts identified a stronger correlation

of financial knowledge scores when courses were formal other than when instruction was

infused into other courses. The report concluded that more research was needed.

With guidance from government agencies and educational communities, much

recent literature has focused on the importance of financial literacy for everyone. In a

2009 review of literature, McCormick (2009) identified a number of studies that dealt

with personal finance and adults, but stated that published research on personal finance

education for K–12 was "spotty and limited" (p. 71). It is just in the last few years that

research on elementary and secondary financial education has become a popular research

subject, specifically, identifying best practices on how to deliver the material most

effectively. Neidermeyer and Neidermeyer, for example, stated that the proper

curriculum and experienced instructors were needed. They pointed out current problems

with elementary and secondary financial education, including outdated materials and

educators' lack of positive attitudes and expectations for the financial planning process.

They offered a list of ten essential items for a well-rounded program (2010).

Much of the curriculum for personal finance comes from economics and business

courses such as accounting and marketing; however, the Jump$tart Coalition was one of

the first organizations to offer content for all educators (Jump$tart, 1995). Originally a

clearing house of information, this Internet site pointed educators to information, free or

fee-based, on teaching personal finance. Since its inception, Jump$tart has been the

driving force behind instruction for high school students in the importance of

understanding day-to-day personal finance. Jump$tart has joined with 150 other financial institutions to promote awareness of financial literacy. This organization continues to expand its presence by publishing national standards for K–12 financial curriculum (which it has done since 1996) and, in 2007, releasing its third edition (Jump$tart, 2007). Forty-nine states are now affiliated with the parent organization (Jump$tart, 2012b).

Once the need for teaching personal finance had been established, many states scrambled to find qualified teachers to teach the material to students. The Virginia Department of Education drew up a list of endorsed teachers, which included, not unexpectedly, math, business, and economics (history department) teachers. This list also included other teaching disciplines such as agriculture, family and consumer sciences, and marketing (Virginia Department of Education, 2011). With such diversity in teaching backgrounds a definitive curriculum was needed, and Jump$tart supplied educators with a best practices information sheet (Jump$tart, 2008) describing an appropriate curriculum.

This paper identifies several concepts that are presented as part of a framework of study for the investigation of learning personal finance via a virtual experience. For the purposes of this study, money and learning about money are considered inherently experiential in nature.

The reviews of research on personal finance and the relationship to each section of a proposed framework are covered in the following sections. Transfer of knowledge, experiential learning, learning by doing, Vygotsky's Zone of Proximal Development, and situated cognition were all examined through the personal finance lens. As part of the

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review, personal finance was researched with respect to games, simulations, and virtual environments. Common standards, methods, and participants were sought to enable correlation between the findings of the current study and previous work.

Video games offer a unique educational setting. The combination of educational principles, content, and an enjoyable outcome-based situation creates a dynamic and entertaining alternative to the traditional classroom (Gee, 2003). Gee, Prensky (2006), and Aldrich (2005) have focused on games and simulations as valid learning tools. Their ideas and support have moved the game industry into forward-thinking classrooms over the last few decades. Theses advocates for games in the classrooms believe that these approaches enhance instruction.

For the purpose of this paper, the curriculum content is personal finance. Many of the papers reviewed here focus on content relating to personal finance or economics. Interwoven in this paper are research documents that support the contextual framework of this study. This study focused on using a game-based initiative in a virtual environment to teach personal finance. This study is grounded in the use of simulations as a medium for experiential learning; it also includes an examination of the transfer of personal finance skills from a game setting to real world experiences.

Experiential Learning

The well-known adages, "Experience is the best teacher" and "Practice makes perfect," point to the important role of experiential learning in an individual's growth and learning. These phrases have gained proverb status after their use and reliability have been proven over centuries (Titelman, 2000). The value of hands-on-learning is firmly

rooted in history. Traditionally, hands-on-learning was the preferred method for training and education in crafting fields or guilds. Medieval craftsman accepted young men as apprentices to train in a specific craft or trade. These students would learn from the master craftsmen and work for them for many years. After students reached the level of craftsman or master, they would then establish their own professions or business (Collins et al., 1991).

While, in the field of education, humans identify with the practice of adapting to our surroundings in the process of learning. Kolb wrote, "We are a learning species and our survival depends on our ability to adapt" (1984, p. 1). Kolb drew upon the collective, previous works of Dewey (1933), Lewin (1948), and Piaget (1955) and then brought his own spin to the concept of experiential learning. Dewey (1933) offers the idea that experience tied together education, work, and personal development. Individuals' experiences mold and shape them into specific directions. Lewin (1948), with a background in training and organizational situations, developed his idea of the integration of theory into practice, while Piaget (1955) focused on experiential learning and the importance of cognitive development. These are the core frameworks for Kolb's theory, but he drew on the thinking of many others as well. A vital component of the experiential learning theory is reflection on one's experiences; for this aspect of the theory Kolb worked with the ideas of a variety of psychologists, including Jung (1989), Rogers (1961), Erikson (1963), Perls (1973), and Maslow (1955).

Kolb's (1984) focus on learning as a process stems from the collective workings of previously mentioned authors, but he further developed his ideas with the focus on

reflection. "Ideas are not fixed and immutable elements of thought, but are formed and reformed through experience" (p. 26). It is this process of reflection and forming abstract ideas that enhance experiences and affect future situations. The constant repetition of steps, according to the experiential learning theory, continuously alters the experience and thus, further changes the situation.

Kolb (1984) continued to develop the idea that learning involves a transaction between a person and the environment and described learning as an active, self-directed process to understand the world around us. Kolb also saw learning as a process of creating knowledge itself. Reflecting on experiences to better understand an event ultimately changes perspective on the event and how one might react to similar events. Kolb's definition states the process succinctly: "Learning is a process whereby knowledge is created through the transformation of experience" (p. 38).

Aldrich is another important researcher in the theory of experiential learning. On his website (Clark Aldrich Designs, 2012), he discusses multiple ways to deliver curriculum using alternative methods involving simulation and games. Aldrich has discussed educational simulations as immersive learning tools used to increase participants' mastery level in the real world (Aldrich, 2009). He has drawn up a list of six genres of simulations that help in teaching real world concepts; three deal with virtual immersive environments. He has stated adamantly that the safety of simulations is ideal for perfecting technique and training that incorporates immersive worlds and simulation can promote worker safety (Aldrich, 2005).

To foster and accelerate learning, many industries and companies employ various

methods to train staff on procedures and techniques. Some companies use simulations to

prepare staff to complete tasks requiring a measure of preparation to perform with skill

and accuracy, for example having a well-sharpened knife for carving meat. Adams (1973)

defined a simulation as a detailed model intended to reflect a situation found in the real

world. He explained that simulations exist for a purpose and proposes that one such

purpose could be to help students learn about life experiences in their own world (Adams,

1973, p. 4). He envisioned simulations that would allow participants to practice real

world skills and receive appropriate feedback, but without affecting real procedures. In a

simulation players must deal with real-life situations, the player's actions affect relevant

systems, and, finally, the evaluation of how those systems functioned. These actions will

produce constructive feedback and gain experience for future events. Major educational

significance can be found in the failure of these procedures, brought about by the players'

actions (Aldrich, 2009). A simulation allows for total mission failure without wasting

funds or causing loss of life. Reflection on the failure of the project or task gives insight

into and understanding of the importance of a successfully completed task (Aldrich,

2009). A fundamental concept for Aldrich (2005) in an educational context was to remain

faithful to the content; he stated, "At the highest level, an educational simulation's

pedagogical elements are learning objectives, and the reasons for building the simulation"

(p. 88).

Situated Cognition

Concepts of money must be taught in context, and these lessons usually begin at home (Jump$tart, 2010). This idea reflects the concepts of situated cognition, that learning is most effective when the material to be learned is presented in a real world setting, the learner's world. The discussion in this section focuses on understanding and defining the role of situated cognition in learning personal finance.

In the 1980s in the context of studies on artificial intelligence (AI), situated cognition became a topic of interest. The concept of systems thinking, where every action had an impact on another situation, was developed (Clancey, 2009). The integration AI and situated cognition and the educational environment became focal points for educators looking at curricula and striving to make problems contextual, especially within math curricula. Clancey (2009) discussed situated cognition in human knowledge as arising conceptually within a social context (and thus varying by populations), then being reproduced in society, and ultimately transformed by individuals who are in the process of adapting. Clancy also examined ideas related to artificial intelligence models of knowledge and the theory of constructivism, which argues that learning is an active, willful process, and understanding requires experience (2009, p. 24).

Students generally learn about money from family members first (Jump$tart, 2010), and the experience is not always positive. Many perceptions of personal finance come from the students' own experiences relating to money; they often end up guided by these perceptions through all of their future experiences involving money. Financial pitfalls later in life can generally be tracked back to gaps in knowledge and understanding

of personal finance. These pitfalls can be avoided if students learn early in life that money is a tool to be used to make healthy financial decisions; conveying this lesson is the goal of most personal finance and economics courses. Learning this lesson, however, requires practice, and not many people are willing to risk losing money while practicing.

People learn about money by using the currency to receive a product or service. "Understanding is developed by continual, situated use," Brown et al., (1989, p. 33). They discussed how learning from books overlooked the authentic representation of an event, stating,

Learning how to use a tool involves far more that [sic] can be accounted for in any set of explicit rules. . . . The occasions and conditions for use arise directly out of the context of activities of each community that uses that tool. (p. 33)

Learning about money follows this logic to the letter, no matter if the community is the household, the culture, or the society. The authors emphasized the need to embed essential learning in authentic tasks.

The process of learning in an authentic task is vital for learning financial concepts and economics, Lave (1991) looked deeper into this learning-by-doing process and found that through learning in this way students become members of what Lave deems a sustained community of practice. She expands the idea of identifying practice situations that can generate experiences for students to draw upon. This cyclical concept of promoting practice and then gaining experience from this practice aligns well with the complex properties of finance and economics. Lave pointed to the need for further research on what she termed "valued identities of mastery through legitimate peripheral

participation" (p. 81). This call for additional research motivated this study, which sought

to determine if a virtual environment is an effective peripheral device for learning about

personal finance.

Zone of Proximal Development

In the early 1960s, Vygotsky's research was introduced to the West. Vygotsky,

like Piaget, saw the child as an individual; however, his thinking diverged from Piaget's

on the role of society in education; Vygotsky felt that society could form and mold a

thinking process. This section looks specifically at the idea of the Zone of Proximal

Development (ZPD), an aspect of social cognitive theory that focuses on the speed at

which a child, working alone, can perform a task.

The ZPD is a relationship between learning and development. Vygotsky (1978)

probed this relationship by examining two complex problems: (a) a child's knowledge

base (what the child knows and how the child knows it) and (b) the specifics of the of that

school-age child (how the child uses this knowledge). Vygotsky contended that learning

took place long before children entered school. The learning was different from what

took place in traditional classroom settings but was learning nonetheless. Vygotsky

believed that, at the preschool stage, learning and cognitive development were unified

and that learning must come at the appropriate cognitive level (p. 86).

In looking at the capability of children to complete certain tasks, Vygotsky (1978)

specifically defined the ZPD as the distance between a child's actual developmental

level, as determined by independent problem-solving ability, and the level of potential

development, as determined through problem-solving, under adult guidance or in

collaboration with peers. Once psychologists and educators have used the ZPD to determine a child's developmental stage, they know what a child can do with assistance today and, thus, what that child can done alone tomorrow.

The ZPD was designed to focus attention on the relationship between educational instruction and cognitive development, while still being relevant to societal standards of education (Chaiklin, 2003). Chaiklin discussed the common conception that when a more competent person and a less competent person shared a task, the less competent person would gain knowledge and become proficient in the jointly completed task. Chaiklin identified three main common assumptions about the ZPD:

- Generality assumption: The ZPD is applicable learning in all subject matters. Chaiklin (2003) clarified that the ZPD was not the range of tasks performed, but rather the level of cognitive development attained from completing those tasks.

- Assistance assumption: Prearranged help from a more competent source will lead to the less competent person gaining knowledge. An adult working with a child is the more knowledgeable other who encourages a positive influential relationship,

- Potential assumption: Learners have the ability to comprehend the task; they are ready to learn, motivated and supported in their learning process

Fabes and Martin (2001) commented, "It is within this zone that a person's learning potential is strongest" (p. 42). In the ZPD, imitation becomes an important strategy for learning a new task. In the developmental process of learning, imitation is

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vital to comprehension. It is not a mindless process of copying actions, but a thought

process of replication, accompanied by understanding (Chaiklin, 2003).

With regard to this study, the premise is that simulation or aspects of a virtual

environment will represent a more knowledgeable other and have an effect on the ZPD.

A key assumption is that, as a result of the simulated experiences, less time will be

needed for learning about financial concepts in real life situations.

Transfer

Swinney (1989) described transfer of training as "an almost magical link between

classroom performance and something which is supposed to happen in the real world" (p.

33). Swinney's article focused on job training for companies dealing with project

management and employment systems, but from the classroom point of view, students

often utter sayings of the opposite in context as "when will I ever use this?" It is through

the lens of the classroom, specifically a personal finance classroom, that learning

personal finance via a virtual environment is examined.

Transfer: The Early Years. During the early 1900s noted psychologists

Thorndike and Woodworth (1901) began to look at the psychology of learning. In one

early experiment, the pair observed a subject who completed a task and then, using the

concept of transfer, completed another similar task. The study procedure for these

experiments indicated that participants would receive a specific amount of training and

then be asked to complete certain tasks that were closely related to the task they had just

been trained in. In one observational session, the authors coined the phrase "transfer of

practice" (p. 252) to explain why one subject was able to complete a specific task faster than another subject.

As formal educational techniques and understanding the human mind continued to expand and grow, research on cognitive development also expanded. In 1992, Perkins and Salomon (1994) cemented the definition and understanding of transfer as it applied to educational settings. The authors stated, "Transfer of learning occurs when learning in one context enhances or undermines a related performance in another context" (p. 3). The authors explained that this transfer involves understanding a concept and then applying the related lessons or strategies to accomplishing a separate task. The authors also identified several subset types of transfer: positive and negative transfer, near and far transfer, and low and high road transfer.

Types of Transfer. Transfer is using one set of learned practices and skills to complete a related task. In an educational context, positive transfer occurs when learning in one situation contributes to improved performance on another task. Conversely, negative transfer occurs when performance on the new task is reduced (Perkins & Salomon, 1994). The authors indicated that, in an educational situation, positive transfer is the goal while negative transfer usually resolves itself early in the childhood learning processes. For the remainder of this paper the term "transfer" means positive transfer.

A transfer is classified as near or far based on how similar or how dissimilar the related task is. It is the degree of separation to the task which identifies the type of transfer involved. Near transfer, the most common type of transfer refers to transfer of skills or concepts to relatively similar tasks. A typical example of near transfer is learning

to play the clarinet and then moving to the saxophone. The physical actions and movements are much the same. Far transfer is recognized as using a concept and applying learned ideas to a completely unrelated task. Far transfer is much more conceptualized and might require a longer period of expertise to master. Far transfer might present itself as a chess player using his or her understanding of strategy, learned from playing chess, to plan a military battle (Perkins & Salomon, 1994).

Low road transfer is successful completion of a task where little or no thought is required to complete the task. Participant responses or solutions are almost automatic. Conversely, high road transfer refers to situations where a great deal of thought is required to complete the task or reach the solution. According to Niedelman (1991), for high road transfer to occur students need four prerequisites: (a) mastery of a higher order skill, (b) an understanding that the higher order skill can be generalized to other situations, (c) an ability to decontextualize the skill from the learning situation, and (d) an ability to recognize the deep sameness between the learning and transfer. According to Perkins and Salomon (1988), for this type of transfer to take place, learners must make conscience, deliberate connections between previous learning and new situations.

Ormrod (2008) identified another set of subtypes: vertical and horizontal transfer. Both have foundations in classroom settings. Vertical transfer implies that knowledge of previously learned material is essential to the learning of new material, whereas horizontal transfer implies that the previously learned material is helpful, but not essential, for learning new concepts.

"Any learning requires a modicum of transfer" (Perkins & Salomon, 1994, p. 3), thus, there are not two types of learning: those that rely on transfer and those that do not; transfer is always occurring. However, the authors identified studies where transfer was expected but did not produce results. The researchers concluded that in those cases most types of performance are too different from one another for transfer to be expected. However, if transfer is detected, it will most likely be near transfer (Perkins & Salomon, 1994).

Conditions of Transfer. Many researchers have sought to determine under what conditions transfer occurs. In their review, Perkins and Salomon (1994) cited research stating, "…transfer may depend on extensive practice of the performance in question in a variety of contexts. This yields a flexible relatively automatized bundle of skills easily evoked in new situations" (p. 7). Many of the studies these authors reviewed identified some common traits that support transfer of learning. The authors identified explicit abstraction, the act of seeing an underlying concept as distinct from its related concrete activity, as a prime example of a learner trait indicative of the ability to transfer. In one study, participants were given an activity, and the participants identified the relevant abstract principles. When given another task, one of the participants applied the abstract knowledge garnered from the previous skill to the new concrete skill (Perkins & Salomon, 1994).

Another trait noted was active self-monitoring. The authors cited a study where students who actively engaged in their thinking and used reflective thinking while performing a task were more successful at transferring learning to similar tasks. This

active self-monitoring is similar to another trait known as arousing mindfulness. This term refers to learners' state of alertness vis-à-vis both their activities and their surroundings (Perkins & Salomon, 1994). This somewhat altered state fosters and elevates both the explicit concepts and an active self-monitoring process.

A powerful tool to support and deepen transfer is the use of a metaphor or analogy. Taking a situation from an "old" domain and gently linking ideas or concepts to a "new" domain can make it easier for the learner to grasp the material in the new domain (Perkins & Salomon, 1994, p. 7). Transfer is made possible when new material is paralleled or supported by previously learned material. A typical example is relating the digestive track to plumbing.

Perkins and Salomon (1994) concluded their article by identifying strategies for teaching in a way that encourages and enables transfer. The authors specified many situations where transfer would happen normally. For example, students may read for understanding when presented with a historical document in a history classroom or at home when they are reading the newspaper. The act of reading is an automatic crossovers and is expected form near transfer situations. However, in the same history class students might be less inclined to experience high road transfer relating to causes of the World War I and present political alliances.

The authors explained two strategies for fostering transfer in the classroom, which they refer to as hugging and bridging. Hugging is using teaching strategies that replicate actual assessment activities, for example, giving practice exams to students instead of explaining what the real exam will be like. Hugging, then, is hugging the desired

experience by getting as close as possible to it and, thus, ensuring low road transfer. Bridging relies on students' cognitive abilities to connect abstract concepts and, through thoughtful resolution, search for possible connections. The authors concluded that instruction that incorporates the experiential essence of hugging and the mindful, analytic characteristics of bridging would most likely yield richer transfer (Perkins & Salomon, 1994).

Problem Solving and Transfer. It should be clear at this point that transfer is a vital component of human functioning. For example, if transfer did not exist people would have to start from scratch in terms of behavior for every new circumstance; much time would be spent in trial-and-error learning (Ormrod, 2008). Problem solving is a form of transfer. Ormrod derived that a view of transfer from behaviorist and cognitivist perspectives; resides in a problem-solving frame of reference. Ormrod also included the importance of retrieval and of situated learning as factors that learners transfer. She emphasized the difficulties researchers have encountered in trying to prove that transfer is viable.

Ormrod (2008) explained several factors that influence transfer. She put forward that meaningful learning promotes better transfer than rote learning. With respect to retrieval of material, knowledge paired with a meaningful experience is recalled at a faster rate than knowledge lacking such a pairing; this meaningful learning is more available for use in new situations. Ormrod cited several studies from the late 80s and early 90s that validate that the probability of transfer increases when students know something well. She concluded that the more thoroughly something is learned, the more

likely it is that knowledge or skills will be transferred to a new situation. Some educational situations make learning slower and more difficult as might present in a math class where concepts are layered on preexisting knowledge. Ormrod noted that acquiring knowledge and skill takes time and practice. As for best practices for teaching for transfer, Ormrod advocated for teaching fewer concepts in depth.

The more familiarity learners have with a set of concepts, the more likely it will be that transfer will occur, and as a result, the greater the learning. Ormrod saw near transfer as the best method for successful transfer; she also cited similar conditions with related concepts as a situation where transfer will occur quickly. General principles, formulas, and rules make the best connections for moving from an old domain to a new one (Ormrod, 2008). Knowledge of general principles helps learners form connections between learning situations where there seems to be no obvious connection. These general principles are used and manipulated when a new situation uses far transfer (Ormrod, 2008).

For transfer to work properly, Ormrod (2008) suggested that students be offered numerous opportunities to practice. These practice sessions should make use of situated learning and offer a variety of examples for students to experience and deepen their learning. Ormrod also emphasized how cultural experiences can aid in transfer. Culture can be classroom, home, or workplace based. Teachers must set the tone for situational learning, providing learners with opportunities to explore ideas. Ormrod cited the work of several researchers that supports the claim that practice makes perfect.

Ormrod (2008) concluded with a definition of transfer: transfer is a process of applying information and skills learned in one situation to learning or performance in another situation. For the purposes of this project, transfer is expected to take place after the students experience and reflect on situations they encounter in the simulation or virtual environment. For the purposes of this study, transfer is defined as the process of applying previously learned concepts to new situations to achieve a successful outcome with greater retention; the approach is best used in a situated context offering varied opportunities to reach proficiency.

Simulations and Gaming: Learning by Doing and Situated Cognition

Authentic learning is the comprehension of real world, complex problems and their possible solutions. Authentic learning situations are best experienced through case studies, problem-based activities, and in virtual communities of practice (Lombardi, 2007). Lombardi defined "portable" skills as those that can be easily transferred to new situations, virtual or real. The concepts of situated cognition and authentic learning flow throughout the experiential learning ideal. These ideas can be incorporated effortlessly with simulations and virtual communities. Specifically, a case study that assessed the design development and implementation of a virtual world, identified that the virtual world promoted learning in the situated content of a high school science curriculum that highlighted authentic learning and assessments (Wellman & Arreguin, 2011). Another study successfully used a virtual environment in learning about and practicing classroom-based apprenticeship (Muldoon & Kofoed, 2011).

Simulation is the imitation of a real world process. Aldrich (2005) defined simulations in detail, looking at specific elements of the simulation model. He identified three situations where simulations are useful: (a) Learning about systems: Users balance conflicting strategies, then resolve with diverse and unscripted outcomes. (b) Learning cyclical content: Users practice execution. Here timing and direction are critical in the decision-making process and (c) Identifying linear patterns to make use of straight cause-and-effect situations (Aldrich, 2005).

Simulations in education are not new. According to O'Neill (2008), 11 simulations appeared to have been effective in educating the public on the various financial difficulties that can be encountered over a lifetime. She stated that simulations provide an opportunity to experience a facsimile of the practical financial skills needed in life and the difficulties many people face on a daily basis. Simulations that deal with food stamp use and poverty challenge young people to make good choices in their simulated worlds (O'Neill, 2008).

A quantitative review of an online interactive program called MoneyU®. Naglieri conducted a study focusing on the positive results teens achieved in understanding personal finance content; the results were measured by pre- and posttest design (2008). This dissertation will use a similar design. A well-known study conducted by two University of Findlay researchers found that high school students exhibited a poor transfer of the knowledge of personal finance they had acquired in high school to their personal finance courses in college. In this study, Yates and Ward reviewed a survey, conducted by the Jump$tart Coalition, designed to determine to what extent high school

students retained the finance knowledge they had learned in the classroom (2001). The main recommendation from this study called for "a required stand-alone Personal Finance course for all high school students that utilizes active learning with engaging exercises and assignments" (p. 76).

Many studies in the personal-finance related literature focused on business related training or simulated market experience to train or teach for financial gains. The Stock Market Game, for example, has become a huge success for many students who are learning how to manage portfolios and expand their imaginary financial holdings (Wood et al., 1992). Another study of college students listed a number of financial pedagogies, including modular learning, case studies, a game approach, computer-assisted instruction, and the traditional lecture. Of these methods, students were more responsive to pedagogies to transfer skills from the classroom into a realistic forum (Vihtelic, 1996). Still another study focused on using free online money management games to teach college-age students personal finance skills (Huang & Hsu, 2011). This case study examined how in-depth experiences with games involving financial skills affected students' learning about money skills.

Promoting Transfer

Eck (2001) conducted a study focusing on problem-solving skills that looked at transfer of mathematics skills using a computer simulation. Eck determined that students experienced forms of transfer under what he deemed high contextual advisement. In this simulation, middle school students watched videos that provided problem-solving techniques. Still another study focused on the use of a business simulation and found

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greater transfer of knowledge occurred when participant had the opportunity to "discuss and make sense of material together" (Mayer, Dale, Fraccastoro, & Moss, 2010, p 79). The authors proposed that a deeper understanding of content and problem solving could be attained with the support of an idea exchange.

The ZPD and Experiential Learning

Vygotsky defined the ZPD as the distance between learning a concept and being able to reproduce that concept without help from a more knowledgeable other. In examining the relationship of this theory to financial literacy, one analysis looked at a peer-based financial literacy situation and found promising results. The review focused on a college course in which students were paired up with more knowledgeable peers for financial education and support. The Vygotskian more knowledgeable other had had training, completed relevant coursework, and demonstrated successful financial skills. This student modeled acceptable behaviors that were observed and reflected upon by the partners (Goetz, Durband, Halley, & Davis, 2001). The goal of the peered support program was to quickly develop financially responsible college students. The authors called for other investigators to queue up the multitude of research opportunities this program provides, noting that all areas of research would benefit from topics the program offers (Goetz et al., 2001).

Virtual Environments: The Glue

Immersive worlds act as the binding agent that glues these ideas and concepts together into a sound educational practice. This practice uses virtual worlds to parallel real world scenarios to emulate conditions that are vital, interesting, and motivating for

students. A report on immersive worlds, which summarized key findings from previous works, pointed to motivation as a major identifying factor in the use of the programs. The various case studies the author reviewed found that games were highly interactive and immersive in nature and were often experienced-based or exploratory, with role play being central to learning (de Freitas, 2006).

At its 2005 public opening, Second Life was advertised as a virtual society. However, since its inception, the program has morphed into an exceptional educational platform (Carpenter, 2009). This new medium of personal interaction has expanded the opportunities for research on virtual environments and education, spawning articles and giving birth to new journals, like The Journal of Virtual Worlds Research, and organizations, like RezED (2008), where researchers and educators can present their findings and share best practices. Articles on the topic cover the history and topology of virtual worlds (Messinger et al., 2008), the explanations and potential uses of virtual worlds (Sivan, 2008), and the limitless educational potential of this tool (de Freitas, 2006). Subsequent papers examined using a virtual environment's social and online collaborative feature to help students become better English speakers (Huang, 2010), understand ethics and decision-making skills (Campbell, 2009b) and to provide new teachers with preservice teacher training (Campbell, 2009a) and to teach the intricacies of project management (Conrad, 2011), to identify a few.

Many papers on educational pedagogy, with a focus on identifying best practices for teaching in a virtual world, have also appeared in research journals. Concepts include collaborative learning (Barrett & Gelfgren, 2011; O'Connell, Choong, Grantham,

Moriarty, Wyatt, & Wong, 2008) and coaching and modeling classroom-based apprenticeship (Muldoon & Kofoed, 2011). DeMers (2011) identified the ten best practices for using these immersive environments in education. Programs that worked well often contained the following: engagement; high and meaningful expectations; regular and timely feedback; awareness of values, beliefs, and preconceptions; activities that stretched students' styles and developmental levels; and real world applications. Additionally, the most effective programs led to students' understanding of assessments, created opportunities for student-faculty reflections and student-student interactions, and promoted involvement through well engaged time and high quality of effort.

After educational pedagogy, curriculum-based research is the next most heavily studied area, with the greatest interest directed at science content. In the segment of this area of research examining the use of virtual environments, simulations, and game experiences, a few papers stand out as pivotal in the understanding and uses of these programs in K-12 classrooms. Dede's groundbreaking work at Harvard University and the creation of The River City Project resulted in ten years of data on using a virtual environment to teach elementary school children about science inquiry methods (Harvard University, 2007). Children learned inquiry concepts in a virtual environment and then transferred these concepts to scientific inquiry skills, which they used in the real world (Clarke & Dede, 2005; Ketelhut, Nelson, Clarke, & Dede, 2010).

An offshoot of the River City Project, Quest Atlantis, was created at Indiana University (and later moved to Arizona University and renamed Atlantis Remixed) (Atlantis Remixed, 2008). This program focused on elementary school students (grades 4

through 8) and a science curriculum, but opened the door for many other curricula through exploration of math, English, civics, and history content. This virtual world has been used in many more classrooms than the River City Project (Barab et al., 2005).

Of the many varied topics reviewed in the process of developing a research proposal, the simulations and virtual environments rubric included dozens of papers related to education. In narrowing down this research, the focus became curriculum content and age; specifically, this study examines high school students and personal finance. Once this frame was in place, all of the subsequent research review focused on identifying participants and relevant content. The papers discussed below were all pivotal in focusing this research.

The next two papers deal with freshmen college students. These papers both focused on using preexisting programs, which offered education in personal finance and opportunities to practice using the new knowledge. Huang and Hsu (2011) had participants in a finance course work with six programs offered by consumer organizations free of charge. The students were then tested for content retention and recall. The researchers concluded that the games allowed for practice and mastery of the ideas and concepts being taught, but underlined the importance of the course in introducing the material, whereas the highly motivating games were for practice (Huang & Hsu, 2011).

King and Jennings (2004) found a statistically significant difference in results of a comprehensive assessment from a quasiexperimental design, where undergraduates, learning financial literacy as part of a financial management course, were given access to

augmented lessons via a technology-enhanced portfolio simulation. The scores of students' in the augmented group were statistically higher for the assessed outcome. Additionally, survey results indicated that the interest and motivation of students in the augmented group were also higher than those of students in the control group (King & Jennings, 2004). These articles demonstrate the powerful effect motivation can have on learning and the effect that technology can play on that motivation.

The study of greatest importance to this literature review correlates strongly with this proposed project. An Ohio University study (Liu, et al., 2011) examined the use of a virtual environment to teach personal finance concepts to high school students. The financial topics ranged from money management, to aspects of financial planning, to basic investing strategies.

The 54 participants in grades 9 through 12 were chosen as a convenience sample, as the researcher had access to a gate keeper, a finance classroom teacher. The second classroom teacher volunteered after initial contact with a colleague.

This study and the current study are identical in terms of subject matter content, participant age group, and use of technology. The two treatments differ with respect to creation and style. The researchers worked with Second Life and a company with an established presence in the virtual world. The participants' initial fees to use the virtual world were funded by a local credit union. The program was an interactive, multiuser virtual environment, which could support avatar-based interaction in conjunction with instruction on personal finance concepts. In this immersive virtual environment, students

role-played a recent high school graduate who was making financial decisions to plan for retirement.

Data were gathered using survey methods and a technique known as think alouds in which participants' speech is recorded while they are actively engaged in a task. The researchers also observed the sessions and took field notes while participants experienced the treatment. Surveys were delivered via an online service and used a reverse coding method. The back-ended situation involved a Likert scale that reflected what were assumed the opposite of the subject's feelings and attitudes. An example statement was: "I found this experience a waste of time," with responses stating 5 = strongly agree, 3 = neutral and 1 = strongly disagree.

The reverse coding approach assumes participants are attentive to question content with a high score indicating poor quality or a negative result, while a low score indicates usefulness or a positive result. This usability survey resulted in high scores, signaling to researchers that the game was difficult for participants to follow. They reported having trouble navigating in different regions. Inversely, the question about whether or not the game was a waste of time returned a low value. Further, data collected from think alouds confirmed that the participants were engaged and learning the content.

The authors concluded that the many technological glitches in the technology, which developers were working to fix, hindered effective use of the program. The key learning aspect of the game was the expectation that participants would fail multiple times throughout the simulation, thus allowing them to learn from their mistakes. This approach allowed students to understand how different financial decisions can lead to

different outcomes over time. This practice, in turn, allowed the students to learn material more effectively and understand the application of the learned material to future financial decisions. Ultimately, students were actively engaged and wanted to learn (Liu, et al., 2011).

EverFi

In 2008, Tom Davidson and Jon Chapman founded a start-up venture to help students understand personal finance. This company identifies itself as, "A new-media learning platform that uses the latest technology-video animations, 3-D gaming, avatars, and social networking—to bring complex financial concepts to life for today's digital generation" (EverFi, 2012). Since its inception, EverFi has expanded to include personal finance content for elementary, middle school, and high school students as well as content on digital education, civics, substance abuse, and promoting a healthy lifestyle.

The EverFi program used in this study was created specifically for high school students to use in understanding personal finance content. In this study, the program is used as supplemental curriculum in conjunction with a personal finance or economics course. The program directors call for 6 hours of seat time to complete the course and 90 minutes to complete the game portion (EverFi, 2012). The program is used in a variety of ways, but many instructors use it to enhance curriculum because it is entertaining and the pace is flexible.

EverFi is a web-based program that allows users to learn interactively about personal finance topics. This user-centered program allows for the creation of a unique identifier, which gives the student a sense of self within the program. The student can

navigate through the web-page-like environment using tabs to access information. The tabbed sections of home, curriculum, resources, glossary, and EverFi/next provide additional resources.

The focus of the program is on the curriculum tab, which gives access to links for ten modules for learning personal finance content. The modules are listed in order of real life use and difficulty:

1. Overview;

2. Savings;

3. Banking;

4. Payment, Interest Rates, and Credit;

5. Credit Score;

6. Financing Higher Education;

7. Renting vs. Owning;

8. Insurance and Taxes;

9. Consumer Fraud; and

10. Investing (EverFi, 2010).

Each module is divided into sections, which are explained in the overview. The sections direct the student's navigation in the module. The program has three videos of three narrators—two content experts and one novice—and interactive simulations with appropriate feedback and assessments. The program culminates with a simulation in a virtual environment.

Modules include other interactive experiences, for example, filling out tax forms, checks, and other finance-related documents, which give users experience with real world documents.

Three learning guides direct the learning process. They direct the user through sections and help track the content being learned. Two characters usually appear at the beginning of each module section to frame the content and introduce the virtual room the user will explore. The third narrator is a mistake-prone fellow in need of good financial guidance. It is through this character that the program focuses on mistakes in real life that users should avoid; the user's objective is to assist this character in making smart financial choices throughout the modules.

The program also deploys a series of instructional animations that are used to fill in educational content as needed. These are both entertaining and understandable for the student. These animations typically appear when new content is introduced to give the user sufficient background knowledge to scaffold further learning and content.

An important part of the program is that it can be customized to meet specific user needs and comprehension levels. Through adaptive pathing, the user is asked a series of knowledge-checking questions and, depending on the responses, is then either accelerated or remediated through key sections of the module.

The virtual aspect of the environment is displayed through various rooms where users interact, through mouse clicks, with items strategically arranged in the room. These items are linked to text or video that displays key content relative to the module. This

feature ensures a high degree of interactivity for the user. Users cannot continue until all key items have been discovered.

To complete each module the user must take a 10-question post assessment, covering that module's content. The user must score a seven out of 10 to receive certification for completion of that module and, once all ten modules have been completed with a minimum 70% pass rate for all modules, the user earns a certification for the entire course. The developers of the EverFi program state that the program allows for statistical interpretation of student performance for each module and the overall course (EverFi, 2010).

EverFi Life Virtual World Game. The activity culminates with a game in which students create a representation of themselves known as an avatar. This persona allows students to experience and interact with the environment. Through this avatar, students experience three stages of life—high school, college, and post college—where they are faced with real-life circumstances. Embedded in the program are media devices that give feedback to the users to help guide their choices. These social networking bursts are delivered in 160-character messages or social media updates. The user responds to the messages and then makes new unanticipated decisions, making the game and actions spontaneous and ever changing for each user.

Within the game experience, students must use budgets and other tools for managing their finances. As the students explore the virtual world by clicking on buildings and other triggered areas of the environment, they are exposed to everyday events and unexpected "wildcard" situations that randomly appear and alter budget

decisions made at the onset of the game. These wildcards appear as messages on a smart phone type device to tease the user into spending money, thus altering the monthly budget and spending/saving rituals. Students have access to the game when they have earned sufficient points through their wise financial choices. As the user progresses through the various stages of life, the game becomes increasing complex and allows for normal intellectual and financial growth with budgets and planning becoming commensurately complex.

The program offers a safe environment to explore future financial decisions that reflect decisions students will need to make in real life; however, in the program, of course, mistakes cannot lead to a bad credit rating in real life. Many scenarios in the game encourage the users to recall material they learned in the curriculum portion of the program through an assessment. Successful completion earns the user points.

A local banking institution usually underwrites the EverFi program. The bank takes the financial responsibility and offers the local school district yearly access to the program free of charge. These local banks ensure community support, partner with many classroom teachers, and hold contests and celebrations when students achieve certifications from the game, good grades, and strong real life financial skills.

The purpose of this study is to evaluate the impact of a virtual world on high school students' understanding of personal finance concepts. The researcher's goal is to add to the body of literature that supports and validates the use of these types of interactive immersive learning tools in the classroom.

Methodology

This study used a quasiexperimental design, which is a form of empirical study. This type of design is used when a true experimental design is not achievable (Creswell, 2008; Dimitrov, 2009; Campbell & Stanley, 1963). Obtaining a true experimental group in a school setting is not possible. Students cannot be placed in randomly assigned groups as they are enrolled in specific courses with specific instructors. The quasiexperimental research design allows for the adaptation of an experimental design that cannot be controlled (Campbell & Stanley, 1963).

A quasiexperimental design uses the same concepts as an experimental design. This study mimicked the experimental design to the degree possible by using an experimental design model and a pretest/posttest control group design (Campbell & Stanley, 1963); however, it was necessary to control for participants enrolled in a high school personal finance course. In the following chapter, the quasiexperimental design used in this study is described in more depth in the methods section.

Chapter 3

Methodology

Research Questions

The purpose of this study is to evaluate the impact of a virtual world on high school students' understanding of personal finance concepts. For this study, the following research questions were formulated:

1. Does the basic knowledge of personal finance of high school students whose personal finance course includes the virtual environment, EverFi, differ from the basic knowledge in this area of those whose personal finance course does not include this component?

2. Do the attitudes about personal finance of high school students whose personal finance course includes the virtual environment, EverFi, differ from the attitudes of those whose personal finance course does not include this component?

3. Do the behaviors of high school students with respect to personal finance whose personal finance course includes the virtual environment, EverFi, differ from the behaviors of those whose personal finance course does not include this component?

4. Do the perceptions of knowledge about personal finance of high school students' whose personal finance course includes the virtual environment, EverFi, differ from the perceptions of those whose personal finance course does not include this component?

5. Is there a relationship between high school students' demographics (age, grade, gender, or employment status) and their knowledge, behaviors, attitudes, and perceptions of knowledge with regard to personal finance?

6. Is there a relationship between the instructor in a personal finance course and high school students' reported behaviors, attitudes, and perceptions of knowledge with regard to personal finance?

To explore students' impressions and thoughts about their experiences with the EverFi program, the following research questions were formulated:

7. What did high school students report about their experiences with the EverFi modules?

8. What did high school students report about their experiences with the EverFi financial simulation?

Study Methodology

This study compared two groups of students in a personal finance class; one group used a virtual environment, EverFi, as part of the classwork, the other did not. As this study was conducted in an educational setting, a true experimental design was not possible. The researcher could not randomly assign students to courses, but rather was required to use a predetermined course schedule for a sample population. Therefore, this

study was a quasiexperimental study with two groups, a control group and an experimental group (Shadish, Cook, & Campbell, 2003); the study was expanded with a qualitative component (Creswell, 2008). In this quasiexperimental study, two intact groups were studied with respect to a treatment program to examine its impact on financial literacy instruction. This study followed a pre- and post-design over 5 months. A pretest measured the student's knowledge and characteristics prior to taking the personal finance course; the posttest measured the student's comprehension and characteristics after content and treatment were applied. Dimitrov (2009) has further defined a quasiexperimental study as a nonrandomized pretest/posttest control group design since each of the participant groups remain intact as, due to situation constraints, groups cannot be altered.

Setting

The purpose of this study is to evaluate the impact of a virtual world on high school students' understanding of personal finance concepts. The course in question was an elective taught through the business department at each of the three participating schools. This one-credit course was generally recommended for juniors or seniors, but any students at any point in their high school career could enroll. Students could choose personal finance as an elective course to add to a 4 by 4 block schedule for a total of eight classes during a school year.

As stated in the program of studies published by the school district, the personal finance course was designed to help students understand financial decision-making processes through development of financial literacy skills and to develop comprehension

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of economic based principles to promote citizenship and career success. The course had

no prerequisites (Fauquier County Public Schools, 2011). This course was not an honors

course so any student enrolled in the general education population could register. This

course satisfied and incorporated the educational objectives identified in the education

Virginia Legislative Code §22.1-200.03B Standards of Learning With the passage of

Virginia legislative edict, students who entered 9th grade in 2011 must now pass a one-

credit course on economics or personal finance as part of graduation requirements (Virg.

Leg. Code, 2011). For the three participating schools, the term-long course (90

consecutive school days) was taught every semester for 90 minutes a day and, for this

research study, the session ran from January 22 until June 7 of the 2012-2013 school

year.

School District

This study was carried out in a suburban school division. This district, located in

Northern Virginia, had twenty schools—11 elementary schools, five middle schools, four

high schools, and an adult education program. All four of the classrooms participating in

this study had a classroom computer for every student. These Windows-based computers

had Internet access and the ability to print. As EverFi is a web-based platform, the

classrooms were well suited for this style of instruction.

The participants in this study, summarized in Table 3.1, were high school students

selected based on the criterion of enrollment in a personal finance course. Teens (13 to

19) in this district comprised approximately 11% of the population of the county of

66,000 people (Proximity, 2012), with over 11,000 students in grades K–12. The race and

ethnicity of the county's population was approximately 86% White, 8.4% Black, 2% Asian and Pacific Islander, and 5.3% Hispanic or Latino (National Center for Educational Statistics, 2011a). The county was classified as suburban and had a median income level of over $100,000 (U.S. Census Bureau, 2011).

Schools and Classroom

Four classrooms were secured for the study. Two were designated as the experimental group. These students used EverFi as part of their personal finance program content. The control group comprised one classroom in the southern part of the school district and another from the northern part. Neither of these control classrooms used EverFi as part of the personal finance program. The total participant count was 81 students from four classrooms taught by three different teachers.

A convenience sampling was used for this study. Convenience sampling identifies participants willing, available, and accessible to be studied (Creswell, 2008). This type of sampling was chosen because of the ease of access to and availability of participants. Specifically, finance classes were offered in the educational community where the researcher was employed. From this convenient participant pool, two classrooms at the researcher's school already included EverFi as part of the personal finance course. The researcher identified the students enrolled in these classes for the spring 2013 semester as a convenient sample population. After discussing the study with the researcher, the personal finance teacher volunteered her classrooms. Thus, these two classrooms, located at the high school in the western part of the district, were designated as the experimental group and identified as Experimental School K (ESK).

Experimental Group

ESK had two sections of personal finance that were solicited by the researcher. The convenience sampling identified a group prepared for research on the virtual environment's topic; one teacher taught both classes in this experimental group. The demographics of this experimental group reflected those of the school, which mirrored county statistics: 86% White, 7.1% Black, 1% Asian, 0.3 % Pacific Islander, and Hispanic 7.1%, with 96 students eligible for free or reduced lunch (National Center for Educational Statistics, 2011c). Actual study values identified for the experimental group included 39 participants, 20 male and 19 female. Among these students, medians were calculated for age and grade level; the typical experimental participant was a white 17-year old junior. In addition, 18 students identified themselves as employed; 21 indicated they were not, giving the group a 46% employment rate. The classroom teacher for the experimental group had over thirty years of experience and was then serving as chair of the business department. Her degree was in business and marketing education and she had taught personal finance for one year.

Control Group

This teacher suggested instructors the researcher could contact who might be interested in having their classes serve as the control group. From this list, the researcher found one personal finance teacher from each of the other two high schools in the county to participate in the study. The control group, then, consisted of a total of 42 students from two other high schools in the school district with one class of personal finance at each school, Control School L (CSL) and Control School F (CSF).

Control School

CSF was located in the northern portion of the school district. CSF's

demographics included a population make-up of 74% White, 9% Black, 3% Asian and

Pacific Islander, and 9% Hispanic; 235 students were eligible for a free or reduced lunch

(National Center for Educational Statistics, 2011b). The CSF educator was a graduate of

James Madison University with a degree in accounting. This teacher had worked as

certified public accountant for 15 years, she had been in the mortgage business for 8

years, and at the time of the study she had been teaching high school in that school

district for 5 years. She had used her business experience to foster a cooperative

atmosphere similar to the one she had known in her professional experiences. Her

students often worked in groups and were always involved in authentic situated activities.

Control School L

CSL was located in the southern portion of the district. CSL's demographics were

76% White, 11.5% Black, 1% Asian and Pacific Islander, and 8.9% Hispanic, with 312

students eligible for free or reduced lunch (National Center for Educational Statistics,

2011d). The instructor at CSL had been teaching for 10 years, eight of those in personal

finance. She had a degree in business marketing education from Christopher Newport

University. This teacher used the law of supply and demand to open every topic. This

approach fostered a real world understanding of price fluctuations in any subject

discussed. This instructor's main instructional strategy was to use a current event as a

launching point for learning or reviewing material. His classroom was open and active

with a heavy use of technology; most of his assessments were project- and current-event based.

The control group had 42 participants, 23 male and 19 female. Among these students, medians were calculated for age and grade level; the typical participant in the control group participant was a white 17-year-old senior. In addition, an even split of 21 students identified themselves as employed, giving the group a 50% employment rate. The demographics for both control group schools are more diverse than the statistics given for the experimental group and the county.

Table 3.1

Participant Numbers and Demographics

Group	No. of students	Gender		Med. Grade	Employed (%)	Med. Age	Race/ Ethnicity
		M	F				
Experimental	39	20	19	Junior	46	17	86% White
Control	42	23	19	Senior	50	17	75% White

Classroom Curriculum and Instruction

For this study, the classroom teachers were responsible for the curriculum in their classrooms. The instructors assisted this study in a gatekeeper capacity by collecting and forwarding consent forms and allowing students class time to access the Angel Learning

Management program and the EverFi web site for data collection during designated instructional time.

Curriculum for the business personal finance course as of the 2012–2013 school year was not mandated by the county. Classes followed the national standards as set down by the Jump$tart Coalition (2007) supplemented with other materials from the National Endowment for Financial Education (2011) and Family Economics and Financial Education (The University of Arizona, 2012). The classes were on a block schedule of 90 minutes and lasted for one term of a school year. For the purposes of this study, the term ran from January 22, 2013 to June 11, 2013 with data collection for this study occurring from January 22 through the middle of May.

In the control group classrooms, the curriculum was composed of topics ranging from basic banking skills to investing for retirement. Other content areas included interest rates, mortgages, loans, credit cards, and taxes. The instructors used life-based examples to promote content. Starting with the banking system and moving purposefully to job-related content kept students interested. The instructors moved on to college-level material, such as student loans, credit cards, and buying cars. As many of the assignments in the courses were primarily project based, teachers allowed for personal expression and freedom of choice in topics, making for more meaningful comprehension. Life-changing events, like insurance and taxes, caused the students to reevaluate choices, and the course progressed to the end of term when end-of-life issues—retirement, creating a will, and handling an estate—were addressed.

Instructional techniques varied from teacher to teacher, but the two educators in the control groups reported following similar patterns in lesson design. At the beginning of the class, students were prepped for the day's lesson with a quick reminder of the previous day's content and activity. Students then heard new content and were given a brief assessment of the day's topic. The classes differed in that one teacher distributed a worksheet for students to complete while the other required students to update a knowledge journal. Students were then tasked to begin or continue a project they had chosen to report on. For example, all the classes in personal finance did projects involving buying a car and purchasing or renting a home as well as a credit card study. Quarter grades were based on projects and class assignments.

In the experimental group, the same content was delivered at approximately the same time. Again, assessments were primarily project based, and students had the freedom to choose items they thought were important. The programs diverged when the experimental group began using the EverFi modules and simulation. Over a 4 to 6 week period, usually during the 3rd quarter of the school year, the instructor gave students access to EverFi. Students were expected to complete the 10 modules and do the simulation experience twice to receive a passing grade for their EverFi experience. The instructor used students' EverFi scores as grades that were computed into the final quarter average.

Data Collection Instruments

Financial Fitness for Life—High School Personal Finance Cumulative Exam

To understand the extent of student comprehension of personal finance concepts, a comprehensive exam was given to high school students as a pre- and posttest measurement device. The FFL was administered specifically to answer Research Question 1: Does the basic knowledge of personal finance of high school students whose personal finance course includes the virtual environment, EverFi, differ from the basic knowledge in this area of those whose personal finance course does not include this component?

This exam was used to measure student understanding of four core financial topics identified by the National Standards in Personal Finance from Jump$tart.org (2007): income, money management, spending and credit, and saving and investing. The organization of the FFL follows the basic flow of a personal finance course and its delivery of content. The test has 50 multiple choice questions, each with four possible answers; it was designed to be completed in 40 minutes. Twelve questions focus on income, 16 on money management, 11 on spending and credit, and 11 on savings and investing.

FFL was created and field tested by Walstad and Rebeck (2006). These researchers were employed to round out a curriculum package with a fully valid and reliable cumulative assessment for the program. They used guidelines from the curriculum as organized by the program material, Financial Fitness for Life Teacher Guide for grades 9–12, created by Schug and Morton (2001) and the National Standards

for Personal Finance as outlined by the Jump$tart Coalition in 2002. Council for

Economic Education board members, high school personal finance teachers, and FFL

curriculum committee members reviewed and validated questions.

These researchers field tested questions and analyzed responses and comments

about arrangement, test length, and administration from 214 high schools across the

United States. The researchers had extensive data to assess reliability and validity. Using

standard error of measurement (SEM) tests and Alpha coefficient measurements the

researchers reported scores within acceptable parameters (SEM = .86 and AC = 3.14).

The population means were twofold: 27.84/50 or 55.68% for the group who used the test

and combined curriculum and a mean of 22.34/50 or 44.68% for the group who did not

use the FFL curriculum. The test designers stressed that the FFL's reliability was

substantially higher than most teacher-designed tests of personal finance (Walstad &

Rebeck, 2006). The FFL is presented in Appendix A.

EverFi: Pre- and Posttest Assessments

Embedded within the EverFi modules are a series of pre- and posttest

assessments. For every content module, the program offers 3 to 5 questions as a pretest

for modules 2 through 10 and 10 posttest questions at the end of each module. Students

must score 7 out of 10 (70%) to show mastery on each posttest to advance to the next

module. As part of the program, the researcher was added as an administrator to the

EverFi program. Once added, the researcher could access students' posttest scores. The

EverFi program modules were available as soon as students accessed their accounts, and

they were then able to see the modules which needed completion. The instructor was able

to view all the module scores that students had completed. The scores were displayed as a percentage and time stamped upon completion. Once Module 1, Overview, was completed, students could work on any module. Once all 10 modules were completed, students were certified by the EverFi program, and information could be downloaded to a spreadsheet for data collection and analysis.

- Module 1 was is an overview of the program and is not part of the content testing procedures. Module 2: Savings has 5 pre-test questions and the standard 10 posttest questions. Module 3: Banking with 5 pre and 10 post test questions. Module 4: Payment, Interest Rates & Credit Cards has 3 pretest and 10 posttest questions. Module 5: Credit Score has 5 pretest and the standard 10 posttest questions. Module 6: Financing Higher Education has 3 pretest and 10 posttest questions. Module 7: Renting vs. Owning has 5 pretest and the 10 standard posttest questions. Module 8: Insurance and Taxes has 4 pretest and 10 posttest questions. Module 9: Consumer Fraud has 5 pretest and 10 posttest questions. Module 10: Investing finishes with 3 pretest and 10 posttest questions.

After finishing all of the modules, students receive certificates of completion for each module, the entire course, and high score awards for the simulation experience. The simulation portion of the program had three sections, arranged by stages in one's life: a high school student, a college student, and a professional who had graduated from college and was getting ready to settle down and plan for retirement. Students needed to keep track of their scores, as the program did not record them. However, students could see

who the leading simulation scorer was and what the leading score was for their class. Students were required to e-mail their scores to the researcher via the learning management program. A copy of these questions is in Appendix B.

Behaviors, Attitudes, and Perceptions Regarding Content Knowledge of Personal Finance Survey

The first survey instrument is the BAP. This survey was intended to report students' beliefs and actions regarding money. It is divided into three parts: students' self-reported financial behaviors, students' self-reported attitudes regarding their personal finance experiences, and students' self-assessment of their understanding of personal finance. The survey responses were analyzed to answer Research Questions 2, 3 and 4:

2. Do the attitudes about personal finance of high school students whose personal finance course includes the virtual environment, EverFi, differ from the attitudes of those whose personal finance course does not include this component?

3. Do the behaviors of high school students with respect to personal finance whose personal finance course includes the virtual environment, EverFi, differ from the behaviors of those whose personal finance course does not include this component?

4. Do the perceptions of knowledge about personal finance of high school students' whose personal finance course includes the virtual environment, EverFi, differ from the perceptions of those whose personal finance course does not include this component?

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The researcher wrote the survey questions, modeling the question style and scale on a survey designed by Marsh (2006). Marsh's survey was used to study the behaviors, attitudes and financial practices of college students at faith-based universities in Texas. Marsh defined attitudes as a person's feelings about personal finance issues and behaviors as a person's response to personal finance matters. For the current study, these definitions as well as perceptions of personal finance content were used. Perception is defined here as a person's self-assessed understanding of financial concepts.

The BAP survey was intended to measure information about students' behaviors vis-à-vis personal finance issues and their attitudes towards and perceptions of personal financial literacy with respect to their own financial experiences before taking the course. Students reacted to statements in the first two sections of the survey by choosing one of five choices from a Likert-type scale: strongly disagree, disagree, agree, strongly agree, and not applicable. Statements like, "When given a choice of a gift, I choose money," were part of the behaviors section of the survey and were designed to identify students' personal finance practices. The not applicable option was for statements that might not be relevant for a particular student, such as, "I always pay my bills on time."

Students also responded to 10 statements in an attitudes section. Here, the statements were designed to identify what students believed to be true about their experiences with money. These statements all started with, "I believe," for example, "I believe that I have learned all I need to know about personal finance from my parents." The final section of the BAP survey concluded with 11 statements on personal finance and the students' perception of their knowledge. Each statement began, "Rate your

knowledge about." For instance, statement 25 was, "Rate your knowledge about CREDIT BUREAUS." The Likert-type scale for this section had four possible responses: poor, fair, good, very good, and excellent. At the end of the survey students were asked for basic demographic information, including age, gender, grade, school, race or ethnicity, and employment status, bringing the total number of items on the survey up to 38.

For this study, the BAP was administered to both the control and experimental groups three to five days after the students had taken the pre-FFL. Students received a link through e-mail to the web-based survey management program. The BAP was designed to take approximately 20 minutes to complete. The survey opened with a basic instructions page and a reminder to the recipient about their options for participating in a research study and about the directions for their completing the survey. The students were asked to enter their school ID numbers and begin responding to the statements in the three sections: behaviors, attitudes, and perceptions of knowledge. At the conclusion of instruction in early May, students in both the control and experimental groups took the BAP again after completing the post-FFL. This survey was used to compare the behaviors, attitudes, and perceptions of knowledge of students who used EverFi and those that did not. In addition, the BAP and FFL were used to answer Research Questions 5 and 6 and identify any relationships between high school students' demographics (age, grade, gender, or employment status) (Research Question 5) and personal finance course instructor (Research Question 6) with respect to their behaviors and attitudes toward personal finance, and perceptions of knowledge about personal finance.

To establish reliability, as recommended by the survey researcher Fowler (1995), the researcher worked with other personal finance teachers in designing question styles and types and field tested the surveys with students who were enrolled at that time in a personal finance course. The BAP questions were field tested by 25 randomly selected high school students from the experimental group. Students responded with suggestions on wording and organization of the questions; their feedback was incorporated into a revised version of the survey. This survey is presented in Appendix C.

Student Assessment of EverFi Program (SAEP)

After the experimental group had finished using EverFi, they took the SAEP survey. The 26-question survey covered the setup, use, and effectiveness of the EverFi program as part of a personal finance course and was designed to be completed in less than 15 minutes. Responses from the SAEP were used to help answer Research Questions 7 and 8. (What did high school students report about their experiences with the EverFi modules? What did high school students report about their experiences with the EverFi financial simulation?)

This survey had three sections:

1. Instructions, one-question student identifier, and overall program analysis, 13 questions. Students responded to statements such as, "I can act with confidence on the information I learned from this program," with a 4-point Likert scale: strongly disagree, disagree, agree, and strongly agree.

2. Experiences with EverFi modules, 7 questions. Students reported on their experiences by responding to statements like, "Because of the information in these modules, I can make good financial decisions."

3. Experiences with simulations, 5 questions. Students reported on their experiences by responding to statements like, "I found the simulation experience useful for real life."

The researcher wrote the statements used in the SAEP, modeling her work on the industry-standard survey, which measures software and hardware usability, the Software Usability Measurement Instrument (SUMI) (Kirakowski, 2011). The researcher's questions were field tested by students enrolled in a personal finance class that included EverFi as part of the course. To establish reliability, the researcher worked with other personal finance teachers and technology instructors to design question types and styles. The SAEP was field tested with 23 students as recommended by Fowler (1995). These students reported issues with syntax and meaning, which were promptly corrected. Students also suggested matching questions with modules and presenting questions in smaller groups. This survey was administered through a web-based commercial survey creation and delivery tool, and a direct link was sent to participants in the experimental group using the school-based learning management system. This SAEP is presented in Appendix D.

Interview 1: Module Experiences

The next data collection instrument was comprised of interviews with strategically selected students. A purposeful sampling strategy was used to target a

specific population to explore a central phenomenon (Creswell, 2008). The use of

purposeful sampling focuses responses gathered after the data collection has begun; this

type of sampling was used to answer Research Question 7 (What did high school students

report about their experiences with the EverFi modules?). Students were asked to give an

overall impression of the impact of EverFi on their learning experience in their personal

finance course.

To select students for the interview, the researcher used the averages of the top six

module scores and the bottom six module scores. The selected participants were rank

ordered and asked if they would agree to being interviewed. These participants were

selected regardless of age, gender, grade, and ability levels, but their student status was

recorded for coding and analysis purposes. These participants were expected to give the

researcher a student's view of experiences with the module portion of the program. The

module interview protocol is presented in Appendix E.

Interview 2: Simulation Experience

Continuing with a purposeful sampling technique, similar interviews were

conducted to gather data on students' experiences with the simulation portion of the

EverFi program. The interviews were conducted to answer Research Question 8 (What

did high school students report about their experiences with the EverFi financial

simulation?).

All students in the experimental group took the SAEP to establish a score for their

overall impression of the EverFi program. To select students for a more detailed

interview to explore their EverFi simulation experience, a specific sampling of students

was performed. For insight to student's experiences, the researcher interviewed the same six students who had been interviewed on their experiences with the EverFi simulation. The simulation interview protocol is presented in Appendix F.

For both the module and simulation interview protocols, questions were field tested with 23 students who had previously used the EverFi program as part of their personal finance course and by students in other courses. Students responded via the learning management system and to the researcher's informal polling on the mechanics of the survey delivery and the survey content. The researcher used the student responses to revise the interview instruments, improving content and clarifying the purposes. The researcher recorded and transcribed the interviews. Table 3.2 follows with a detailed listing of the specific instruments used, when the tool is deployed and to which group the instrument is targeting. The table also identifies which variable are tested.

Table 3.2

Instrument Identification and Administration Guide

| Instrument Name | RQ | Administered | | | Variables | | | |
		Pre	Post	Content Knowledge	Attitudes	Behaviors	Perceptions	EverFi
FFL	1	C	EX	X				
BAP Survey	2,3,4	C	EX	X	X	X	X	
EF Mod. 2: Savings	1		EX	X				
EF Mod. 3: Banking	1		EX	X				
EF Mod. 4: Payment, Interest Rates and Credit cards	1		EX	X				
EF Mod. 5: Credit Score	1		EX	X				
EF Mod. 6: Financing Higher Education	1		EX	X				
EF Mod. 7: Renting vs. Owning	1		EX	X				
EF Mod. 8: Insurance and Taxes	1		EX	X				
EF Mod. 9: Consumer Fraud	1		EX	X				
EF Mod. 10: Investing	1		EX	X				
SAEP	5,6		EX		X	X	X	X
Interview 1 Modules	5		EX	X	X	X	X	X
Interview 2 Simulation	6		EX		X	X	X	X

Data Collection

The timeline for this research project began when, in preparation for this study,

the researcher secured permissions from the school district supervisors, school principals

and classroom teachers, for inclusion of students taking personal finance courses in the

study. Having received the approval of both the Institutional Review Board (IRB) and the

dissertation committee, the study began at the beginning of the second term, on January

22, 2013. The researcher had previously met with the teachers of the personal finance

courses included in the study and prepared them for collecting consent forms from the

students. Between January 23 and 24 the researcher attended the classes and met with

students to explain the study to the perspective participants. Parents had an opportunity to

read the consent forms before parents signed them; parents were encouraged to contact

the researcher by e-mail or phone with any questions. Students were asked to return the

parental consent forms by January 28.

Once all assent and consent forms were handed in, the students who had agreed to

participate in the study and classroom teachers were added to a learning management

program and asked to communicate and complete assessments through this program. This

program provided links to all the instruments. Students took the first assessment, the FFL,

during their personal finance course on the planned date of January 30. This 50-question

personal finance content assessment gave the researcher a baseline data set to work from

for comparison statistics. The students had 50 minutes to complete the test during their

90-minute class period. Three days after administration of the FFL, teachers instructed

students to take the web-based survey. All students, from both control and experimental

groups, were required to complete these precourse surveys. From February to mid-March, students in both the experimental classrooms and the control classrooms followed the normal curriculum. In mid-March, the experimental group began working with the EverFi program as supplemental material. During that time, the researcher had access to data collected through EverFi on student achievement via the program's embedded pre- and post assessments for each module. The control group continued with their normal nonaugmented program.

From January to June of 2012 teachers of both groups presented and then assessed comprehension of content. During instruction time, students in the experimental group worked with the ten modules in the EverFi program. Using the administrative access provided by the experimental group's instructor, the researcher obtained EverFi posttest module scores, which she copied to a spreadsheet.

Toward the end of April, students in the experimental group completed the simulation portion of the EverFi program. Students were asked to engage in the simulation twice; they were scored on the basis of decisions they made for their characters. Both the classroom teacher and the researcher had access to these scores; once scores from the second simulation had been reported, administration of the posttest data instruments was scheduled.

At the beginning of May, approximately three-fourths of the way through the course, all students took the FFL again. Two to three days later, all participants took the BAP. The experimental group also took the SAEP to report on their EverFi program experiences. For the final data collection piece, select participants were interviewed.

All interviews were completed and recorded by the middle of May so as not to inconvenience teachers who needed to focus on standards-based assessments and preparation for graduation and other end-of-year events. During the remainder of the school year and the summer, the researcher compiled the data.

Data Analysis

To answer Research Question 1 (Does the basic knowledge of personal finance of high school students whose personal finance course includes the virtual environment, EverFi, differ from the basic knowledge in this area of those whose personal finance course does not include this component?) t-tests were used to compare the two groups. To answer Research Questions 2, 3, and 4 (2. Do the attitudes about personal finance of high school students whose personal finance course includes the virtual environment, EverFi, differ from the attitudes of those whose personal finance course does not include this component? 3. Do the behaviors of high school students with respect to personal finance whose personal finance course includes the virtual environment, EverFi, differ from the behaviors of those whose personal finance course does not include this component? 4. Do the perceptions of knowledge about personal finance of high school students' whose personal finance course includes the virtual environment, EverFi, differ from the perceptions of those whose personal finance course does not include this component?) t-tests were used to compare the experimental and control groups. To answer Research Questions 5 and 6 (5. Is there a relationship between high school students' demographics [age, grade, gender, or employment status] and their knowledge, behaviors, attitudes and perceptions of knowledge with regard to personal finance? 6. Is

there a relationship between a personal finance course instructor and student reported behaviors, attitudes, and perceptions of knowledge with regard to personal finance?) the researcher reported Pearson correlation coefficients from analysis on results of the SAEP with reference to specific variables.

To answer Research Questions 7 and 8, (7. What did high school students report about their experiences with the EverFi modules? 8. What did high school students report about their experiences with the EverFi financial simulation?), means were calculated form the SAEP.

A qualitative approach was also used to analyze the interview data. Qualitative analysis procedures emphasize the participant's view; in other words, the subject of the study is interpreted from his or her perspective. This process is inductive in that themes emerge during the process of categorizing, coding, and organizing data. In this analysis, the researcher used the categorizing process Maxwell (2005) called coding. In the coding process, the researcher examined student reflections and coded the reflections using an emerging process to identify themes. Throughout this process, the researcher extracted coded quotations and examined them for subthemes, guided by the research questions. Representative quotations were selected to reflect students' voices and used to illustrate the emerging themes and subthemes.

Chapter 4

Results

The purpose of this study was to examine the impact of a virtual learning environment, EverFi, on high school students' financial literacy learning. This chapter provides an explanation of the methods and a description of the data collected during the period from January to May 2013.

Research Question 1

Research Question 1 asks: Does the basic knowledge of personal finance of high school students whose personal finance course includes the virtual environment, EverFi, differ from the basic knowledge in this area of those whose personal finance course does not include this component? To answer this question, students took the FFL before and after instruction. The FFL consists of 50 multiple-choice questions with four possible answers each. To establish comparability of the experimental and control groups, a Levene's Test of Equality of Error Variance was conducted on pretest scores. Analysis of this test resulted in a value of $p = .465$. Clearly, the groups were comparable.

To answer Research Question 1, an independent-samples t-test was performed on the posttest data. Statistics for the control group ($N = 37$) were a mean test score of 61.73% and a standard deviation of 16.75 points. The experimental group ($N = 36$) had a mean score of 69.44% and a standard deviation of 12.35 points.

The results of the t-test of independent samples on the post-FFL exam resulted in a t-value of t(71) = -2.234. This result showed a significant difference in the mean scores on the FFL exam between the control group and the experimental groups, a two-tailed p = .029. Further, the 95% confidence interval of the difference indicates the mean FFL score experimental group outperformed the control by at least -14.60 points but no more than 83 points. These results are presented in Table 4.1.

Table 4.1

t-test Independent Samples on FFL Exam

Group	*N*	M	SD	*t*	*p*	95% CI
Experimental	36	69.44	12.35			
				-2.235	.029*	[-14.60, -.83]
Control	37	61.73	16.75			

Research Question 2

Research Question 2 asked: Do the attitudes about personal finance of high school students whose personal finance course includes the virtual environment, EverFi, differ from the attitudes of those whose personal finance course does not include this component? The BAP was intended to report student's behaviors and attitudes related to and perceptions of knowledge about money. Attitudes about personal finance were addressed by 10 questions from the BAP. Students responded to these questions using a Likert-scale of strongly agree (4 points), agree (3 points), disagree (2 points), strongly

disagree (1 point), and not applicable (0 points). The survey was given before and after the course.

To analyze for equality of the groups, scores for 10 questions relating to student attitudes about personal finance were totaled, and those scores were compared using a Levene's Test. The results of the test indicated the two groups were equal, returning a value of $p = .126$. The scores for the 10 questions were totaled, and this value was used for interpolation. The postattitudes questions were analyzed using an independent sample t-test. The control group ($N = 37$) had a mean raw score of 26.97 and a standard deviation of 5.82 points. The experimental group ($N = 38$) had a mean raw score of 28.16 and a standard deviation of 3.94 points.

The results of the t-test of independent samples on the postattitude survey results returned a t value of $t(73) = -1.035$ with a returned two-tailed p-value of .304 with no significant difference in the mean scores on the attitudes about personal finance between the control and the experimental groups. Further, the 95% confidence interval of the difference indicates that the experimental group outperformed the control group in terms of attitude by at least -3.47 points, but no more than 1.1 points. Results are presented in Table 4.2.

Table 4.2

Student Attitudes Regarding Personal Finance—Postsurvey Results

Group	N	M	SD	t	p	95% CI
Experimental	38	28.16	3.94			
				-1.035	.304	[-3.47, 1.1]
Control	37	26.97	5.82			

Research Question 3

Research Question 3 asked: Do the behaviors of high school students with respect to personal finance whose personal finance course includes the virtual environment, EverFi, differ from the behaviors of those whose personal finance course does not include this component?

To analyze for equality of groups, 10 questions from the BAP relating to student behaviors about personal finance were totaled, and those scores were compared using a Levine's Test. The results of the test identified an equality between the two groups returning a value of p =.634. This confirmed equal variance between the two groups. Continuing with postsurvey results, the scores for the 10 questions were totaled, and this value was used for interpolation. The postbehaviors questions were analyzed using an independent sample t-test. The control group (N = 37) had a mean raw score of 24.43 and a standard deviation of 4.58 points. The experimental group (N = 38) had a mean raw score of 26.74 and a standard deviation of 3.72 points.

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The results of the t-test of independent samples returned a p-value with a significant difference in the mean scores on the related questions about behavior and personal finance between the control group and the experimental groups with t(73) = 2.394, and a two-tailed p = .019. Further, the 95% confidence interval of the difference indicates the experimental group outperformed the control group in terms of the behaviors score by at least -4.223 points but no more than -.386 points. These results are presented in Table 4.3.

Table 4.3

Student Behaviors Regarding Personal Finance—Postsurvey Results

Group	N	M	SD	t	p	95% CI
Experimental	38	26.74	3.72			
				2.394	.019*	[-3.47, 1.1]
Control	37	24.43	4.58			

Research Question 4

Research Question 4 asked: Do students who used EverFi as part of a personal finance course report having a greater perception of knowledge about personal finance than students who did not? This question was explored as part of the BAP and was intended to report student's perceptions of knowledge with regard to money. This portion

of the survey totaled 11 questions and rated students' perception of knowledge about personal finance concepts.

The results of the questions were totaled for the pre- and posttest data with the pretest result used to identify the equity of the control and experimental groups. A Levine's Test was performed on the pretest responses and returned a value of $p = .995$. The posttest results ware totaled and analyzed with an independent t-test. The postperceptions-of-knowledge questions were analyzed using an independent sample t-test. The control group ($N = 37$) had a mean raw score of 35.03 and a standard deviation of 8.12 points. The experimental group ($N = 38$) had a mean raw score of 31.0 and a standard deviation of 6.49 points.

The results of the t-test of independent samples returned a p-value with a significant difference in the mean scores on the related questions about perceptions of knowledge and personal finance content between the control group and the experimental groups with $t(73) = 2.375$, and a two-tailed $p = .020$. Further, the 95% confidence interval of the difference indicates the experimental group outperformed the control group in terms of the perceptions of their knowledge score by at least .648 points but no more than 7.407 points. The results of this test are presented in Table 4.4.

Table 4.4

Student Perceptions of Knowledge Regarding Personal Finance—Postsurvey Results

Group		M	SD	*t*	*p*	95% CI
Experimental	38	31.0	6.49			
				2.375	.020	[.648, 7.42]
Control	37	35.03	8.12			

Research Question 5

Research Question 5 asked: Is there a relationship between high school students'

demographics (age, grade, gender, or employment status) and their knowledge,

behaviors, attitudes, and perceptions of knowledge with regard to personal finance? To

answer this question, the results were organized, and the following assessments were

used as dependent variables: behavior total, attitude total, perception of knowledge total,

and the post-FFL exam scores. These variables were compared with demographic

information to identify any significant correlations between the tested variables. The

independent variables included the student's age, grade level, gender, and employment

status. The Pearson correlation coefficients were used to determine which variable had

the greatest contribution to student learning, and values were used to identify variables

that could forecast student behaviors and attitudes regarding and perceptions of

knowledge about personal finance. The results showed obvious significances between

age and grade and employment status and grade but also revealed a significant positive

relationship between behaviors and attitudes about personal finance. Conversely, the

results showed no significant correlations between gender and any of the other variables,

and no correlation between employment status and financial knowledge, behaviors, or

attitudes. Both the positive correlation between age and content knowledge (FFL) and the

negative correlation of grade and content knowledge are noteworthy. The correlation

matrix is presented in Table 4.5.

Table 4.5

Summary of Pearson Coefficients for Respective Variables

Variable	1	2	3	4	5	6	7	8
FFL	-							
Behavior	.069	-						
Attitudes	.072	.570[**]	-					
Perceptions of Knowledge	.130	.071	.119	-				
Gender	.029	.004	.083	.034	-			
Age	.285[*]	.192	.126	.883	.017	-		
Grade	-.285[*]	.141	.094	.169	.127	.770[**]	-	
Employed	.048	.096	.213	.002	.135	.181	.220[*]	-

Research Question 6

Research Question 6 asked: Is there a relationship between a personal finance

course instructor and high school student reported behaviors, attitudes, and perceptions of

knowledge with regard to personal finance? To answer this question, the postdata results were organized, and the following assessments were used as dependent variables: FFL exam scores, behavior total, attitude total, and perception-of-knowledge total. These variables were compared against the independent variable, which identified the participant's teacher. This information was used to ascertain any significant correlations between the three instructors. The Pearson correlation coefficients were used to determine which variable had the greatest impact on student learning, and values were used to identify correlations between variables that could forecast student behaviors and attitudes related to and perceptions of knowledge about personal finance. The experimental group returned statistically significant coefficient values compared to the control group, and one control group (at one school) outperformed the other (at a different school). The correlation matrix is presented in Table 4.6.

Table 4.6

Summary of Pearson Coefficients for Respective Variables

Variable	1	2	3	4	5	6	7
FFL	-						
Behavior	.069	-					
Attitudes	.072	.570**	-				
Perceptions of Knowledge	.130	-.071	-.119	-			
Experiment Teacher	.256	.270*	.120	-.268*	-		
Control Teacher L	-.433**	-.225	-.199	.251*	-.515**	-	
Control Teacher F	.112	-.092	.052	.065	-.625**	-.347**	-

Research Question 7

Research Question 7 asked: What did high school students report about their experiences with the EverFi modules? As part of the review process, students in the experimental group were surveyed using the SAEP.

SAEP: Overall Perceptions

The SAEP has three parts; Part 1 and Part 2 were used to respond to Research Question 7. Students reported on the use of the program as a whole and then focused on individual modules. The 13 questions of the program overview covered the use and presentation of the program.

SAEP EverFi Program

In this section, students in the experimental group (N = 36) rated the program on its overall usability. Students responses regarding the overall usability of the program were very positive, with most students responding agree or strongly agree (M = 3.5). Conversely, the students' found the interface to be difficult (M = 1.69). The students judged the program only moderately entertaining (M = 2.72) and scored the narrators similarly (M = 2.44). The students concluded that the program was effective for learning personal finance (M = 3.17) and would recommend it to others who needed to learn personal finance (M = 2.97). Students also thought positively of the program and felt confident about taking financial actions after having used the program (M = 3.03). Results of the survey are presented in Table 4.7.

Table 4.7

Mean Responses to EverFi Program—Overall Program Use

Survey Question	*M*
Overall, the program was easy to use.	3.5
This program met my expectations for learning personal finance.	3.25
The program was entertaining.	2.72
The program was effective in teaching personal finance.	3.17
The interface was difficult to use.	1.69
The presentation of the material was organized.	3.08
When using the program, my time was well spent.	2.94
The way the program delivers information is understandable.	3.19
The narrators were effective in the program.	2.44
The program pace was too fast.	1.69
I can act with confidence on the information I learned from this program.	3.03
This program is well suited for the age level of high school students.	2.89
I would recommend this program to someone needing to learn personal finance.	2.97

SAEP Modules

In this section of the SAEP, students (N = 36). responded to survey questions about the EverFi modules on a Likert scale. The students' responses showed indifference

toward the simulation experience, with a score of 2.5 reflecting neither agree nor disagree.

Student responses were neither positive nor negative, with the highest ratings given to the statement: "I liked the idea of working the module until I got it right" (M = 2.92). The students did not find the modules challenging (M = 1.94) and felt only moderately confident to make financial decisions based on what they had learned from the modules (M = 2.89). Students were evenly divided on appreciation of the badges they earned for completing the modules (M = 2.50), but were uniformly strongly against posting those badges to a social network (M = 1.56). These results are presented in Table 4.8.

Table 4.8

Mean Responses to Module Questions

Module Question	*M*
I found the information in the modules to be very useful.	2.86
The modules were a challenge.	1.94
Because of the information in these modules, I can make good financial decisions.	2.89
I appreciated the badges I earned from the modules.	2.50
I posted my badges to my social network.	1.56
I liked the idea of working the module until I got it right.	2.92

Note: M = Means

As part of the module question set, the participants were shown the list of nine content modules and asked to identify the three most and the three least interesting modules. The participants in the experimental group chose Module 6: Financing Higher Education, Module 2: Savings, and Module 9: Consumer Fraud as the three most interesting modules. For least interesting, they chose Module 10: Banking, Module 8: Investing, and Module 5: Credit Score. These results are presented in Table 4.9.

Table 4.9

Modules Listed in Order of Student Ranking

Modules Listed in Order of Student Ranking

Ranking	Module No. and Title
1	Module 6: Financing High Education
2	Module 2: Savings
3	Module 9: Consumer Fraud
4	Module 7: Renting vs. Owning
5	Module 4: Payment, Interest Rates, and Credit Cards
6	Module 3: Banking
7	Module 10: Investing
8	Module 8: Insurance and Taxes
9	Module 5: Credit Score

Research Question 8

Research Question 8 asked: What did high school students report about their experiences with the EverFi financial simulation? After completing the modules, the students in the experimental group were asked to complete the three sections of the simulation experience: the financial situations of a high school teenager, a college student, and a young person getting the first professional job in his or her chosen career. For the high school student portion, the participant was to achieve certain financial goals and prepare to pay for college. The environment was presented on screen and the participant had to establish sound financial habits and make good choices to succeed in the mission. The goals included getting a driver's license and obtaining financing for college. To achieve success, the participant needed to draw on content from the modules on savings, banking, and financing higher education.

The second simulation encouraged the participant to explore a college campus and work through financial situations that lead the avatar to more financial freedom and self-sufficiency. To succeed in this simulation, the participation needed knowledge from the modules on payment, interest rates, and credit, and, again banking.

In the final simulation, the student portrays was a 25–30 year old professional working toward a first career-oriented job and a establishing a home. Participants had to navigate home buying, investing, and retirement options. To be successful, participants had to recall knowledge from the modules on credit scores, renting versus owning, and investing. In some cases, the successful completion of the simulation required knowledge from different aspects of some modules. Module 8, Taxes and Insurance, in particular,

were used in all three modules, but for different specific situations. The modules on credit

and consumer fraud were used in a similar fashion.

SAEP Simulations

In this section, the students responded to statements about the simulation aspect of

the EverFi program (N = 34). Students' responses reflected indifference toward the

simulation experience; the score of 2.5 indicated neither agree nor disagree. The highest

score from this survey was in response to the statement: "I enjoyed playing the

simulation," which scored a mean of 2.91. These results are presented in Table 4.10.

Table 4.10

Mean Responses to Simulation Questions

Simulation Question	*M*
It mattered to me that I could alter the look of my avatar.	2.24
I found the simulation useful for real life.	2.62
I found the simulation experiences to be redundant.	2.50
Working the simulation was a challenge.	2.26
I enjoyed playing the simulation.	2.91

Note: M = Mean

Interviews

Twelve students from the experimental group were asked to report on their experiences using EverFi. These students were chosen on the basis of their module scores. Students with the six highest and the six lowest cumulative module scores were asked to be interviewed and consented.

Four males and two females were in the high-achieving group. Both of the females were 18-year-old seniors; only one was employed at the time of the interview. Two of the males were 17-year-old seniors, one was a 17-year-old junior, and one was a 16-year-old sophomore. Only one of these seniors was employed at the time of the interview. The cumulative scores were tallied by averaging the nine module scores; all of these students' cumulative scores were in the 90th percentile or greater. Further investigation showed that the students were doing predominantly honors-level coursework, and had all enrolled in Level 7, honors, or AP coursework at some point during their high school career.

The low-achieving group comprised four males and two females. The females included an 18-year-old senior who had a job and a 15-year-old sophomore. The four males included three 17-year-old seniors, all employed, and a 16-year-old junior. Their cumulative scores averaged in the 70th percentile and above, up to 82% for one student. Only students who earned a 70% or better on all the modules could be "EverFi certified." Further investigation revealed that two of these students had reading disabilities and one had severe Attention Deficit Hyperactivity Disorder (ADHD). All the students were

enrolled in coursework at the Level 3/average or Level 5/above average ability, depending on subject matter; no students were enrolled in Level 7/honors courses.

Students were assigned a letter to correspond with their responses to the oral interview questions (see Appendix A for a list of the questions) that were recorded, transcribed, and coded. The text was coded for organizational or initial categories, such as the independent variables of this study, and was then analyzed for emerging themes. Content knowledge, attitudes, behaviors, program, modules, simulation, and any substantive emerging themes were related back to the appropriate research questions. Substantive themes were identified from students' responses and included entertainment, engagement, alternative instruction styles, course content support, and increased confidence in attitudes about and knowledge of personal finance. A summary of interview participants is presented in Table 4.11.

Table 4.11

Interview Participants

	Module Score (%)	Age	Grade Level	Gender	Employed
Student A	78	17	Jr.	M	Yes
Student B	82	17	Sr.	M	Yes
Student C	82	17	Sr.	M	Yes
Student D	83	15	So.	F	No
Student E	82	18	Sr.	F	Yes
Student F	84	17	Sr.	M	Yes
Student G	100	17	Sr.	M	Yes
Student H	97	18	Sr.	F	No
Student I	96	17	Sr.	M	No
Student J	97	18	Sr.	F	No
Student K	96	16	So.	M	No
Student L	94	17	Jr.	M	No

Note: Module score is the average of the nine module scores. Jr. = Junior; Sr. = Senior; So. = Sophomore.

EverFi Program

The researcher asked students to describe the EverFi program to others. Many responded using the terms "fun," "interactive," "interesting," and "entertaining" to qualify the interest level of the program. Students also spoke of engagement and how the content held their interest, and many found the program entertaining as well as educational. All the participants made connections between the coursework and the EverFi program. Student L commented, "…I enjoyed the program, but still needed the class."

Some students focused on the online aspect of the program, and all students commented that the program taught personal finance via the web. The students could access the program from home, though none of the students interviewed did. Students found the program easy to use and liked the interface and the idea of working at their own pace.

Several students chose one particular type of activity as their favorite: the virtual room exploration at the beginning of each module. Students' task was to find key vocabulary words for that particular lesson that were hidden in the virtual space. Students commented on how they appreciated the high interest level of the activity and the simplicity of the interactive design. All the students found that the entertaining nature of the games kept them interested in the activity and in learning. In response to a question about which activities helped them learn, Student H commented,

> I think the hidden vocabulary words [helped me learn]. You had to find them and
> read about them before it [the program] let you go on. You were engaged in trying
> to find them and once you found them you wanted to read it because you [had]
> spent the time trying to find it.

The theme of engagement is apparent as many of the interviewees expressed opinions similar to those of Student H; they commented on enjoying the sense of exploration and discovery. All of the students interviewed appreciated the games embedded within the modules. Many students said they enjoyed learning when the fun element was apparent and that they appreciated the entertainment value of the program. A theme of alternate learning styles was identified as many students echoed how EverFi

was a nice break from the traditional lectures and slideshow-based note-taking activities

of a typical class. Student B admitted to sleeping through these traditional parts of the

class, but reported being attentive and highly engaged when using the EverFi program.

He commented, "We would be doing worksheets and I would fall asleep, then I would

get on EverFi and I would be giggling to myself and actually be paying attention."

Several students added that the program was effective in filling in knowledge gaps, and

all agreed it was better than lectures and taking notes.

Students were split on how they reacted to the characters in the program: half

found them highly engaging; the others viewed them as bothersome. Students who scored

higher on the module assessments tended to see the program as "silly" and felt the

narrators were "annoying" and "irritating", while the students with the lower scores

found the program and characters "fun" and "entertaining", and the narrators helped the

students to "stay focused".

Modules

The responses of the twelve students who were interviewed reflected the survey

results which ranked the modules in their order of interest. Students ranked financing

higher education as most beneficial and savings and credit as second most beneficial.

Taxes and investing was their third choice. This module placed much lower in the survey

ranking. When asked which modules were not needed, a majority of the students

commented, "none" and added they were all necessary content in the program.

Interviewees liked the presentation of the modules, and Student I called them "very methodical." Others commented on the smooth transitions from content to assessments and on the layout and order of the modules.

Students appreciated the idea of mastering content before being allowed to move on to other sections or to assessment. For example, Student A took advantage of conclusion questions to ensure he had mastered the content. In contrast only Student I, from the high-achieving group, noted, "Honestly, it [the EverFi program] was too easy; if you failed, you could just take the quizzes again without any repercussions." These sentiments were not shared by any of the other students, and most were willing to work on the modules until they achieved a minimum score of a 70%, and many choose to achieve much higher scores.

Simulations

In response to the survey, the students gave nondescript feedback on the simulations. The interviews seemed to indicate that many of the students did not properly complete the simulations. The interviewees commented that they ran out of time and just "clicked" to get through the experience without actively partaking in the activity. Students who did complete the simulation reported it was very different from the modules, lacking structure. Within the simulation, students had to accomplish tasks and meet goals to score points. Student J commented that she "did poorly, but was able to see why and where [she had] made mistakes," while others played the simulations to extremes. Student B purposefully made all wrong choices, by the end of the simulation the goals were not achieved, and the character was in debt. Conversely, Student I did well

in the simulation and achieved all the goals, but commented in an "unrealistic way."

When prompted to explain, Student I admitted he would not allow the character to have

any "fun" activities and saved all his money toward the goal.

Both Student B and Student I were asked if these choices reflected their own

situations and both said "no," characterizing their actions in the simulation as extreme.

Along with Student J, the group said their extreme actions were not part of real life and

the game was supposed to model real-life situations, "the good and the bad." Student C

summarized the simulation as "a tool to learn and utilize personal finance material and

help someone make sound financial choices." The students who were interviewed

demonstrated a clear understanding of the program, its goals, and the actions required to

achieve those goals.

Knowledge

During the interviews, all of the students demonstrated their understanding of the

content delivered through the program with little or no prompting from the researcher.

The properties or substantive themes of content support and increased confidence and

knowledge became apparent in the student interviews. Many students used the correct

vocabulary and phrases for the content they found most interesting. Many students felt

the program filled gaps in their knowledge about specific subject matter; Student A, for

example, commented, "I didn't know everything about any of them and a little about a lot

of them." Student E said he had gained deeper understanding of the material through the

program and Student H felt the program rounded out her knowledge. Two students,

Student C and Student L, commented on what they identified as the "big picture" and

appreciated that the content, which was not relevant at that time, would follow them throughout their lives.

A majority of the students interviewed said that they still needed the personal finance course for a complete understanding of the material and felt the teacher was just as important as the content of the course. The students thought the EverFi program worked well with the course; there was a balance between lecture and notes and "games," which kept their focus.

Attitudes

In reflecting on their beliefs about personal finance after using the EverFi program, three students, B, F, and J, reported they felt more confident and that they knew the material well enough to make good financial decisions. These comments were used to identify the property of increased confidence and knowledge in learning personal finance.

Many students focused on modules and content which they found important in their present lives. Student D remarked the investing module was not needed, "The one through Wall Street, I will not use that now, maybe in a couple of years," while Student J choose financing higher education as the most important module, "because I am going to go to college next year so learning loans was most important."

Behaviors

Survey results indicated that student behaviors reflected their attitudes about personal finance; these results were confirmed by the interviews. The student's pre-EverFi behaviors focused on savings and checking accounts, and some students reported using credit cards. After completing the EverFi program, interviewees reported behavior

changes. Two students opened savings accounts, several students reevaluated their credit card use, and many others began to try to obtain funding for college. Student B admitted, "…after listening to others, I realized I needed to get savings going because the people there [in the class] started way earlier…and I needed to save way more." Some students had bank accounts pre-EverFi and the personal finance course, but behaviors with respect to these accounts evolved post-EverFi. Student A, for example, who had opened a savings and a checking account for work, indicated that post-EverFi he was more active about personal finance decisions and able to apply his knowledge to get better interest rates and better banking services. These comments support the theme of increased confidence in and knowledge about personal finance.

Summary

Through a survey on behaviors and attitudes regarding and perceptions of knowledge about personal finance as well as content assessment and interviews, this chapter reported on the impact of the EverFi program on students who used it. The study compared the experiences of an experimental group that used EverFi as supplemental material for a personal finance course and a control group that took a personal finance course and did not use EverFi.

Results in the categories of content knowledge and behaviors and perceptions of knowledge were statistically significant. No significance was found in attitudes between the control and experimental groups. Analysis also identified no correlations between age, gender, employment status and content, behaviors, attitudes, and perceptions of knowledge, although a correlation was identified between attitudes and behaviors.

Further analysis identified a strong positive correlation between financial knowledge and

the teacher. Results are further discussed in Chapter 5.

Chapter 5

Summary

This quasiexperimental study assessed the impact of a program called EverFi in helping high school students learn personal finance and reported on students' content knowledge, behaviors, attitudes, and their perceptions of financial literacy. Since the housing crisis in 2005 (Foote et al., 2008), there has been a critical need to improve financial education (Jump$tart, 2012a). The literature suggests the greatest indicator of financial success is completion of a financial education course that is content-centered on students' interests and engaging in curriculum delivery (Council for Ecomonic Education, 2011). This connection is in step with communications from a federal commission that has identified a need for further research on personal finance related topics and best practices for the classroom (Financial Literacy and Education Commission, 2012). In response, states have enacted legislation making a financial education course a requirement for graduation from high school. Through a survey of behaviors, attitudes, and perceptions of knowledge as well as content assessment and interviews, this dissertation reported on the impact of the EverFi program, comparing an experimental group that used EverFi as supplemental material for their financial education course and a control group that did not use EverFi.

Results indicated statistical significance was found between the two groups in the categories of content knowledge, behaviors and perceptions of knowledge. No significance was found in attitudes between the two groups. Analysis also identified no correlations between age, gender, employment status and content, behaviors, attitudes and perceptions of knowledge, although there was a correlation between attitudes and behaviors. Further analysis identified a strong positive correlation between students' financial knowledge and their teacher.

Twelve students from the experimental group were interviewed about their use of the EverFi program. Through open coding, entertainment, engagement, alternative instruction styles, support of course content, increased confidence in knowledge and attitudes, and behaviors regarding personal finance were identified as themes. It was the researcher's goal to add to the body of research on virtual environments. It has been an additional goal to add to research in personal finance best practices and the use of games and simulations in the high school classroom. The findings of this study also support the importance of having qualified and experienced educators and groups with different abilities do not have the same level of engagement in course material.

Conclusions

This study found that EverFi, an alternative content support program used as part of a personal finance course, is useful for helping students learn financial skills. This study concluded that:

1.   Students who used EverFi as supplemental material as part of a personal

      finance course scored significantly higher on a test of basic knowledge

      about personal finance than students who did not use EverFi.

2.   Students who used EverFi as supplemental material as part of a personal

      finance course had significantly more positive behaviors related to

      personal finance than students who did not use EverFi.

3.   Students who used EverFi as supplemental material as part of a personal

      finance course had significantly more positive perceptions of their

      financial knowledge that students who did not use EverFi.

4.   Students who used EverFi as supplemental material as part of a personal

      finance course were found to have the same attitudes about personal

      finance as students who did not use EverFi.

5.   Results of analysis of demographics of all students, in both groups,

      enrolled in a personal finance course showed a correlation between

      students' behaviors and their attitudes regarding personal finance;

      however, there were no correlations between any other demographic

      factors (age, grade, gender, and employment status).

6.   Results of analysis on scores of all students, in both groups, enrolled in a

      personal finance course found a strong correlation between the instructor

      and student-reported behaviors and perceptions of knowledge.

The following are conclusions about the EverFi program:

7. Some students in the experimental group reported the program modules were engaging, entertaining, an alternative instruction style, and provided course-content support, and these students demonstrated an increased confidence in their knowledge of, behaviors and attitudes concerning, and their perceptions of knowledge about personal finance.

8. Some students in the experimental group reported the program simulation was interactive, and they demonstrated increased confidence in their financial practices and indicated they felt more prepared for real world uses of their personal finance knowledge.

9. Student interest in content was directly related to their personal experiences and age. The participants reported high engagement and interest in content areas that had a direct effect on their present or near future. Students' content interests focused on material they dealt with daily or would be dealing with over the next eighteen months.

10. Students of high academic ability reported negative reactions toward the use of EverFi in their personal finance course. Students who were enrolled in a majority of honors or advanced placement courses typified the EverFi games and simulation experiences as comical and nonsensical. These students did not value that part of their personal finance learning experience and felt their time could have been better spent elsewhere.

Discussion

In July of 2012, the President's Advisory Council on Financial Capability proposed nine topics for research. First on their list was a need to identify best practices for educating people about personal finance. The direct aim of this organization was to guide the research into effective education delivery methods to enhance financial well-being (Financial Literacy and Education Commission, 2012). This research study has done exactly as the commission proposed.

Researchers have demonstrated that using games and simulations as part of a learning environment can increase knowledge and confidence in learning through engagement, and entertainment (Arici, 2008; Clarke & Dede, 2005; O'Connell et al., 2008; Barab et al., 2005). This study's findings support these conclusions. Students whose personal finance course included EverFi as part of course content scored significantly higher on a test of basic financial knowledge, a survey about behaviors related to personal finance, and a survey about perceptions of knowledge about personal finance. In addition, in interviews students reported that the program was engaging, entertaining, and that they had benefited from the inclusion of EverFi in their personal finance courses. The majority of participants appreciated the game atmosphere the EverFi program offered. These activities helped most students stay engaged and actively participate in learning difficult financial concepts.

Yates and Ward (2001) reported that taking a personal finance course in high school positively predicted future financial success. This study demonstrated that participants in the experimental group performed better on a test of financial knowledge

than students in the control group. Specifically, students demonstrated an increase in knowledge about personal finance. When they used EverFi as part of a personal finance course, they had better retention and recall of financial concepts than the control group. Coupled with the statistics of the benefits of taking a personal finance course, these results could further predict students' future financial success.

Several advocates of games in the classroom (Aldrich, 2009; Gee, 2003; Prensky, 2006) urged educators to use games and simulation techniques as part of learning strategies to help students gain experiences in proposed real life events, thus transferring practiced knowledge to authentic skills. This study found that the simulation part of EverFi gave students increased confidence in their perceptions about personal finance. The study also reported students had an increased confidence in their ability to make sound financial decisions.

According to Huang & Hsu (2011), games help college students learn and retain personal finance content. This study reported high school students who used EverFi had significantly higher content scores and more positive behaviors related to personal finance than students who had not used EverFi. Similarly, this study reported that students who used EverFi had more positive perceptions of knowledge about personal finance concepts than students who had not used EverFi. These positive reactions and the supportive results of knowledge retention demonstrated that students who used interactive and engaging gaming situations have a greater propensity and better foundations for becoming financially stable adults.

However, this study found that students in the experimental group did not report more positive attitudes about personal finance than students in the control group. Attitudes were similar in the two groups. This result may indicate that attitudes might require more time than just one school term to evolve. A positive change in attitudes might have occurred if the course had been yearlong (180 days) rather than a semester (90 days). In some cases, attitudes may be supported by changed behaviors or may take on altered meanings when directly applied to student interests and experiences and attitudes need a longer time period for adjustment.

The findings did uncover a strong relationship between students' behaviors and attitudes regarding personal finance. Students in this study reported that they acted in accordance with what they believed to be true. Thus, the positive correlation between attitudes and behaviors suggests that, over an extended period and through many experiences, positive actions may lead those students to develop positive attitudes about personal finance as they evolve into financially stable adults.

Prior classroom experience led the researcher to hypothesize that older students at a higher grade level would benefit more from learning personal finance content than younger students and that younger students would not retain the information or make connections between newly learned content and their experiences and interests. Thus, the situated learning of students who are employed would promote better understanding of tax forms, for example. However, the data from this study did not support this hypothesis. Detailed analysis of age, grade, and employment status, and financial knowledge and behaviors and attitudes regarding personal finance returned no significant correlations.

One surprising finding was the significant correlation between the teacher in a financial literacy classroom and students' results on a test of basic financial knowledge. Students in the experimental group, taught by the experimental group teacher, outperformed students in the control group on tests of basic knowledge. However, one teacher's control group significantly outperformed the other teacher's control group. This top performing control group had scores that were more in line with, but still significantly less than, the experimental group's scores. As a result, it is difficult to conclude that the use of EverFi alone accounted for the differences between the experimental and the control groups. The possibility must be acknowledged that the differences in teachers might account for some of the differences in the groups' results. It is possible, however, that the choice of the teacher of the experimental group to use EverFi does account for some of the differences in the students' performance. Because of the overlap, it is difficult to separate the teacher's impact on the students' performance from the impact of the use of EverFi.

Valentine and Kyayum (2005) suggest that students do well on content that is of high interest to them or has a direct influence on their present lives. These researchers found that urban and rural high school students were interested in different financial topics. Students in rural areas focused on financial topics that gave them mobility, such as purchasing vehicles and interest rates that applied to vehicle purchases. Conversely, urban students focused on moving out of their parents' home, so topics of interest to them were finding a place to live, financing residency, and utility costs (Valentine & Kyayum, 2005). The two groups of students did share some interests, specifically earning money

and financing higher education. This dissertation also concluded that participants of this age have an expenditure outlook of at most eighteen months; high school students have a short term outlook.

Another unexpected finding was that the high-achieving students disliked the EverFi program. When interviewed, the high-achieving students said the program was comical, in a distracting way, and nonsensical. They said they did not like the mastery learning techniques and, in fact, felt cheated as others could continue working on modules until they succeeded.

Assuming the program designer's goal in creating a virtual world with superimposed video narrators and characters was to entertain while educating, clearly this high-achieving group of students was not entertained. The EverFi program does not explicitly state the reading level of the program materials, but as the target audience was high school students, it can be inferred that a 10th or 11th grade reading level was used.

These high achieving students have expectations about what learning should look like. They have a formula for education that they have successfully applied for many years. These students work hard to get correct answers the first time, and many are unaccustomed to seeing "game play" as work. These students achieved top scores on EverFi, but they had difficulty relating to situations where wrong answers or experimentation with failure was part of the learning module. In completing the simulations, these students reported striving to obtain the highest score possible, not experimenting with possible outcomes. They did not seem interested in or aware of the concept of playing a game to experiment with possible results and potential outcomes.

These students, and the other students using the EverFi program, would have benefited if the program had included a time for reflection on and sharing of their experiences with the program with others.

Recent literature assessing River City and Quest Atlantis focused on low-achieving, high-risk elementary school students (Clarke & Dede, 2005; Arici, 2008) and found those students showed marked progress after using the programs. Specifically, these studies found that the students were better able to process knowledge and that their ability to think critically had improved. The high achieving students in this study were excellent at retention and recall of content but failed to grasp the concept of the simulation and did not use time in the simulation to practice different outcomes for a particular scenario. These high achieving students, who had mastered rote and concrete learning, were unable to see past the experiential learning and demanded instantaneous final results. Reflection on and discussion of all the students' experiences could focus the learning not on right answers, but more on the behaviors and attitudes involved in a sound financial decision-making process.

Limitations of the Study

The researcher would have preferred to use a different financial assessment package, which more effectively supported the content taught in the business department. The researcher was not aware at the time of a program that the county school district was using as a culminating certifying assessment at the time the study was conducted. The W!SE program, acronym for Working in(!) Support of Education, is a nonprofit financial literacy program and certifying exam (W!SE, 2009). The New York based company has

many programs, including one on personal finance. Had the researcher been aware of this assessment earlier on, she would have chosen it rather than the Financial Fitness for Life Exam as W!SE coincided with the program content and pacing established by the county's business department.

The researcher had no control over the implementation of curriculum in the personal finance courses for either the experimental or control groups. Further, the researcher had no control over when or how the EverFi program was implemented as part of the experimental group's instruction.

Recommendations

Virtual Environments

Virtual environments and virtual worlds are constantly changing. The way we connect with others has expanded from text-based e-mails to avatar-centered altered virtual realities, and the possibilities continue to grow. More research is needed on all virtual educational experiences and researchers should continue to identify best practices in classroom settings. Expanding technology, mobile technology, Bring Your Own Device (BYOD) policies, schools' connection to the Internet, and educators' increasing awareness of the potential uses of virtual environments in the classroom, all point to the need for more research on the educational use of the virtual environments. One online conference, the Virtual Worlds Best Practices in Education (VWBPE), was in its fourth year as of 2013. This conference occurs virtually, bringing together educators using virtual worlds and environments for instruction; this study calls for continued research to support such efforts.

Personal Finance

This study supports continuing to identify best practices to teach personal finance. Additional research on high school students and personal finance should continue to verify this study's results. The lack of knowledge about improvement in high school students' understanding of personal finance when games and simulations are part of their coursework is diminishing but still needs to be strengthened and supported by further research.

This study identified the importance of a personal finance curriculum relating directly to students' interests. More research should be done to design personal finance curricula that align with students' interests and offer meaningful content and adequate time for reflection about the experience.

The personal finance research community would benefit greatly from a longitudinal study on the habits and the financial behaviors of students as they move from high school to college to a career. Through more research on financial skills, particularly positive habits, behaviors, and attitudes during various stages of life, researchers can identify traits and decision-making processes of financially stable adults. The present study can be amended by following the participants for a year or more to determine if any changes in attitudes have occurred or if any participants have made a significant financial decision and, if so, was this decision affected by lessons learned from EverFi? A follow-up study would reassess the participants to determine if their financial knowledge, behaviors, and perceptions of knowledge are still significant over a longer instructional period of time and as compared to the findings of this study.

Future research should be considered on other programs that help students understand personal finance; comparisons could be made with the findings from this research, including implementation of the EverFi program, controlling for the teacher. For example, a study could focus on several sections of personal finance taught by one instructor, with a control group who does not use the program. Alternatively, a study could focus on the teacher's impact on how well students learn personal finance by having a different teacher for each experimental group.

Participants

This study focused on high school students at suburban high schools learning personal finance using a virtual environment. The participants' demographics closely resembled those of the county as predominantly white. The personal finance community would benefit from comparable research on a more ethnically diverse or urban population to determine if those students had similar scores and similar interests in content.

<div align="center">

Conclusion

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Making financial decisions can be a daunting task, but with sound financial knowledge, experiences, and reflection success is possible. The literature suggests students will benefit by taking a personal finance course and having an experienced instructor. Research has shown that for effective instruction, content must be engaging, meaningful, and relevant to students' interests. To enhance learning, students need to reflect on experiences and be able to transfer simulated experiences to real life situations. This study's results support the literature, but more research is still needed in all areas of personal finance instruction and the use of virtual environments.

This study has added to the body of literature on the use of virtual environments such as EverFi as a best practice in high school financial education. As part of the personal finance enterprise, this study examined the impact of a virtual learning environment, EverFi, on high school students' learning of personal finance and found that instruction that incorporated entertainment, engaging activities, simulation, and material relevant to the students' personal interests and experiences made for meaning learning and added structure and support for a financially stable adult.

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Biography

Ellen M. Nosal graduated from Lackawanna Senior High School in 1986 and four years later, she received her Bachelor of Science from the State University of New York at Plattsburgh. Her first teaching experience was seventh and eighth grade math at the Holy Family School in South Buffalo, NY. In 1992, she completed a Master of Education from the University of Buffalo and married Tim Nosal later that summer. The couple moved to Illinois where her husband formally resided. In Chicago, Ellen taught Computer Science, began a career in Instructional Technology at Lourdes High School, and gave birth to their first child. Ellen later changed to the Chicago Public School system and taught computers to elementary school students at Sidney Sawyer Elementary School. In 2001 after the birth of their second child, the Nosals moved to Virginia. Ellen joined the staff of Liberty High School in Bealeton, Virginia and began a six-year career as a math teacher and technology rep. In 2007, Ellen Nosal became the Instructional Technology Resource Teacher (ITRT) for Fauquier County's newest high school, Kettle Run. Due to the deployment of her husband to Iraq in 2012, Ellen has since returned to the math classroom, but is still actively involved in technology. In December of 2013, Ellen Nosal was awarded a PhD in Education from George Mason University.