

# EXPERIENTIAL LEARNING AND STUDENT ENGAGEMENT THROUGH A STOCK MARKET SIMULATION GAME

Linda Meltzer

Queensborough Community College: The City University of New York  
LMeltzer@qcc.cuny.edu

## ABSTRACT

*The Virtual Stock Exchange is a stock market simulated game that can be successfully integrated into a finance curriculum. The games are an effective pedagogical learning tool for facilitators to create a positive learning environment for students, cultivating their engagement, motivation and enhancing experiential learning. As a supplemental part to the course, the games are an experiential learning activity that support active learning, make connections to financial concepts and build soft skills. This paper shows the effectiveness of blending a simulated game into the course curriculum helps students to achieve learning outcomes.*

*Key words: Experiential learning, simulated games, soft skills, finance, stock market investing, learning outcomes, digital, confidence*

## INTRODUCTION

The general concept of experiential learning is ancient. Aristotle wrote in *Nicomachean Ethics*, “for the things we have to learn before we can do them, we learn by doing them.” More recently, Dewey (1916), an experiential learning pioneer, advocated for curricula that accommodate activity-based learning, that “learning means something which the individual does when he studies. It is active, personally conducted affair.”

Today’s college students are digital natives who come from an environment that is dominated by being always-connected and enriched with simulations and games. The facilitator has a crucial role in striking a balance between creating a fun exercise and successfully engaging and motivating students to enhance their learning meaningfully. This paper shows the effectiveness of blending a simulated game into the course curriculum, helps students to learn financial concepts and build soft skills. The games are useful pedagogical tools for facilitators to create a positive learning environment. The experience of learning new skills, how to invest and using technology appeared to boost the confidence of many students. Their feedback through reflective blogs confirmed those beliefs.

Today, our college students are Generation Z (aka Digital Natives, Gen-Zers, iGen or centennials), born between 1996-2010, in a world significantly different than that of our faculty. Their environment from birth is dominated by being always-connected cloud-based technology in an environment enriched with simulations, video games and social media. They send, receive, process information and acquire knowledge in different formats. Straight lecturing is not the answer for this generation of students. (Prensky, 2009) once compared the students’ and faculty’s perception of educational technology as the digital natives/digital immigrants paradigm but sees development of “digital wisdom.” The digitally enhanced person will use advanced tools that provide access to more information and analytical powers.

There is still a significant perceptual gap between teachers and students according to Tao et.al (2012). Their study’s empirical evidence implies that adoption of business simulation games on the part of teachers may be challenged or impaired. The authors suggest that teachers should receive more support, if needed to adopt games in the classroom so that they may take advantage of the students positive perceptions.

Higher education has to adapt to the greater expectations of this generation. Experiential learning, that is, learning by doing, can be an important component. (Clark & White, 2010; Oblinger & Oblinger, 2005) depicted today’s middle, high and college aged students as *Net Generation* and characterized as those who like to be connected, need immediate responses, desire experiential learning, and social interaction.

Traditionally, higher education has been based on traditional podium-dominated lectures and rote learning. Student engagement and motivation can be greatly enhanced by simulated games supported by digital technology. As a result, games, if incorporated into the course curriculum, can help students build important skills that may positively impact academic learning.

Simulated games are readily available, cost-effective and desirable for these digital natives to capture their attention in and out of the classroom. A recent study indicated that the simulation system serves as a dynamic tool to accelerate the progress of learning environments by encouraging collaboration and communication among students which strengthens their learning abilities and increases performance because students practically perform all the theories in a risk-free environment (Zulfiqar et. al., 2018). Additionally, games have the potential to reach students who do not do well academically with traditional teaching and learning strategies (Annetta et. al., 2008).

Gee (2003) wrote: “Beyond using the learning principles that good games incorporate, I also argue that schools, workplaces, and families can use games and game technologies to enhance learning.” Blended learning by integrating a simulated game into lessons and assignments provide learning benefits to both students and faculty.

College faculty need to adapt to this new environment by introducing learning activities that are both a fun and stimulating act as learning aids or supplements to the traditional course curricula, guiding students to fulfilling learning outcomes. According to Pratt & Hahn (2016), fun elements maximize the learning process. Educators should encourage feedback from students regarding usefulness, easiness, and learning so that the course can be modified accordingly.

This paper will demonstrate how the *Virtual Stock Exchange* as a simulation game provided benefits to our business students in finance classes through greater enhanced student engagement and motivation in their learning. In addition, they attained new skills and increased their confidence. The study is attempting to provide additional qualitative evidence to support current findings in the literature.

This paper also shows how both the teacher as facilitator and students integrated *The Virtual Stock Exchange*, a simulated stock market game as a fun tool embedded in our finance course. After a few weeks of trading stocks, the students are creating a portfolio for “their clients” to analyze how each stock performs relative to their portfolio and the S& P 500 as their proxy for the market. The students report on their portfolio performance based on real financial news such as Federal Reserve action, company earnings results and any relevant financial news.

This approach provides a virtually real way to have students engage with key financial concepts, achieve learning outcomes and gain important skills that are valuable in the workplace.

## LITERATURE REVIEW

Simulated games (often referred to as serious games) have been used in many disciplines (eg. business, engineering, biology, and nursing) for many years. Results have often been as diverse. There are many studies that have examined the connection and effectiveness of using digital games for enhancing better learning outcomes.

It appears that the question as to whether simulated games as a pedagogical tool for cognitive learning is effective remains unsettled. Some have pointed to games as enhancing learning of important skills. The how, when, and where to apply business concepts may be learned most efficiently through the adoption of experiential exercises such as business simulations in a business school curriculum.

Research has studied the use of simulations and experiential learning of activities in academic institutions conveying laudable benefits:

- Greater student engagement and motivation.
- Cognitive/ Non-cognitive learning for business students.
- An important role for the facilitator.

### Greater Student Engagement And Motivation

In their review of literature on computer games and serious games, Connelly et. al. (2012) saw potentially positive effects on teenagers’ learning, skill enhancement and student engagement. Findings revealed that playing games is linked to a range of perceptual, cognitive, behavioral, affective and motivational impacts. Most frequently occurring was knowledge acquisition of content, understanding and motivational outcomes. Experiential exercises and games and subsequent debriefings turbocharge participant engagement and enhance learning (Palia, 2019).

While studies are inconclusive about the impact of student learning, motivation and engagement seem to be primary factors raised by proponents of the update of the games (Lameras et. al, 2016). That is to say, if new and innovative technologies (such as educational games) are more engaging and appealing to students and if in turn these learners are motivated to interact with these learning environments longer than with traditional print materials then this, in itself, may justify the use of and deeper investigation of these technologies (Annetta et. al. 2008).

Mayer et. al., (2012) conclude students’ motivation and attitudes toward game-based learning before the game, their actual enjoyment, their efforts during games and quality of the facilitator/teacher are most strongly correlated with the learning satisfaction. The degree to which the experiences during the game were translated back into underlying theories significantly determines students’ learning satisfaction. Rowe et. al. (2011) study found a strong positive relationship between learning outcomes, in-game problem solving and increased engagement. In a study by Fekula (2012), students created a website in a business management course that looked as real as that of existing business. The purpose of the experiential exercise was to engage the students with key concepts of the course.

## **Cognitive And Non-Cognitive Or Soft Skills**

There are a variety of reasons why business educators are increasingly using games. Faria et. al. (2009) identified five major educational and learning objectives in order of frequency mentioned in articles in rank order by decades. For the 2000s, “*Experience gained*” was in first place, followed by strategy formulation; learning outcomes and objectives; decision-making skills; and team work . A major force causing these changes is the broad movement in business education to demonstrate learning relevance, accountability, and value through outcomes measure of business learning.

A number of authors have studied the impact of using trading or investing simulations in business courses and especially in finance. Using a portfolio-based trading program, Huffman et. al. (2012) reported finding over 87 percent of students agreed that the economic analysis provided more educational value as a group project than as an individual project. Authors said certain relevant concepts, notably technical analysis, hedging and income generation could have been more formally incorporated into the game. King & Jennings (2004) found technology-based experiential exercises increased student learning when trading simulation was used.

The facilitator needs to integrate games into the course to supplement and illuminate course topics, enhancing the learning process. Huang & Hsu (2011) reported statistical results that indicate integrating online games into coursework significantly enhanced student learning outcomes. Authors suggest that online games should be treated as a learning aid, rather than major learning vehicle given that games are good at providing practice opportunities but less good at transferring large amounts of knowledge. Though simulations provide a number of learning benefits, authors Lean et. al. (2014) point out that they are not self-teaching, as they are best employed as part of a theoretical foundation for the simulation, but also opportunities for reflection. The Riley et. al. (2013) paper presents a learning strategy that demonstrates how integrated business simulations can be used to enhance in accounting education. The simulation aligns accounting and related financial data with business processes and performance outcomes so that students are able to exploit the value of relevant accounting for better decision making. As a result, students gained confidence in their abilities.

In a study of equity trading simulation’s impact on learning, results show 66 percent of students report the simulation is effective or very effective at increasing their knowledge of investments. Most students, 86 percent, indicate that the simulation increased their interest (a little or greatly) in investments and equity markets (Moffitt et.al., 2010).

With respect to stock investing simulations, Daniel R. Hall (1987) found students enhanced their learning of macroeconomic concepts such as fiscal and monetary policy using the stock market game. Their writing also improved. The game also stimulated class discussions on financial events provided by faculty. In another study using a stock investing simulated game, Day (2014) found that students with higher learning gains in the SMG (as measured by pre/post-tests) are also more likely to report that the game changed their view of financial risk. In the majority of instances reported , the students reported planning to be more careful with their money as a result of the game, and their responses were affected by what students learned about investing. In a study implemented by three business professors, their findings affirmed that a simulated investing game motivated and engaged students (Sarkar et. al., 2016).

Faria (2001) identified what business games teach among three important areas addressed by the members of the Association for Business Simulation and Experiential Learning (ABSEL). The other two areas were correlates of simulation performance and the effectiveness of business simulation performance and the effectiveness of business simulation/games in the strategic management courses. The many topics taught as suggested by ABSEL articles include specific job skills like motivating (Schreier, 1976a), basic financial concepts (Jauch & Gentry, 1976), interpersonal skills (Certo & Newgren, 1977), communication skills (Connelly et. al., 1977) and problem-solving skills (Beatty & Kulish, 1977). Teach & Govahi (1988) surveyed business executives who rated simulation/games as a very effective approach to teaching communication skills and decision-making skills. Faria (2001) pointed out Washburn & Gosenpud (1994) study that suggest that less skilled students learn more from simulations than do students with greater skills.

According to Teach (2018), non-cognitive skills may be more predictive than “the cognitive measures we have used in the past.” Teach (2018) pointed to the study by Tim Kautz et. al. (2008) that measures skill levels of “...non-cognitive skills such as perseverance skills (“grit”), conscientiousness, self-control, trust, attentiveness, self-esteem and self-efficacy, resilience to adversity, openness to experience, empathy, humility, tolerance of diverse opinions and the ability to engage productively in society, which are valued in the labor markets, in school, and in society at large.” Reed & Jeremiah (2017) point to grit as a great contributor to student success. Motivation or a strong will to achieve goals can be invaluable where employees are focused as problem solving and/or innovation.

Business programs teach to a specific competency in the respective courses such as finance. Yet, higher education needs to prepare students for their careers by elevating their competence of employable skills. The fast changing labor market requires that student graduates are employable. Business leaders note the quality of students and the lack of soft/transferable skills that should be part of their business education (Clarke 2017). A study by Avramenko (2012) supports the view that business stimulation is a valuable tool to enhance students’ confidence and employability as a supplement to traditional methods such as lectures, seminars and tutorials.

### **The Facilitator Role Is Key**

It is the facilitator who designs the course and adapts the simulated game to the curriculum for maximum student

engagement, motivation and attainment or strengthening of their cognitive and soft skills. An important goal of the facilitator and higher education overall is to foster long term benefits that help students in their careers.

The facilitator needs to integrate games into the course to supplement and illuminate course topics, enhancing the learning process. Huang & Hsu (2011) reported statistical results that indicate integrating online games into coursework significantly enhanced student learning outcomes. Authors suggest that online games should be treated as a learning aid, rather than major learning vehicle given that games are good at providing practice opportunities but less good at transferring large amounts of knowledge. Though simulations provide a number of learning benefits, authors Lean et. al., (2014) point out that they are not self-teaching, as they are best employed as part of a theoretical foundation for the simulation, but also opportunities for reflection.

It is the role of the teacher as facilitator to successfully use simulated games as a tool to harness student motivation and student engagement. By making connections between the game and the specific curricula at hand, the teacher can drive learning outcomes. Facilitators need to have a well thought strategy when introducing games for balancing learning with play. Learning attributes such as learning activities, learning outcomes, assessment and feedback and teacher roles are further decomposed as to provide a framework for linking learning with play. Faculty need to fully integrate these attributes into the lesson plans and the learning process as a whole (Lameras et. al., 2016). It requires careful planning on the part of teacher in the facilitator role to move students to make connections between the game and course to acquire knowledge and develop analytical skills, critical linking and problem-solving. The facilitator has to strike a balance to limit the time students play the game and achieving gains in learning. Merchant et. al., (2014) found evidence for novelty effect for game-based studies. The result indicated that if students spent more time playing games, the learning outcome gains start to diminish.

All of these principles are integrated or experienced using a stock market simulation into the finance course as will be shown below.

## RESEARCH REVIEW AND METHODOLOGY

The research field for this study was an urban campus that serves community college students who are commuters. The campus does not have a dormitory or residential housing. The overall mission of the college is for students to attend this two year institution as the gateway to transfer to a four year college or university. Over half of the students transfer to a four year City University of New York (CUNY) college after earning their Associate degree. The student population is ethnically diverse. By percentages in fall 2018, the population was African American (26%), Asian or Pacific Islander (30%), Hispanic/Latino (29%), Caucasian (15%), and American Indian, Native Alaskan, or Other (1%). The students represent 127 nations of birth and 78 native languages. 34% of fall 2016 students spoke a language other than English at home (QCC, 2017). More than half of the students come from a family with an income level below \$25,000. According to the American Association of Community Colleges (2019), the median age of community college students was 24. The six year college graduation percentage for students who entered in fall 2012 was 34.1%

The time period of this study was three years. Over the past three years, (N=120) students played the stock market game in two finance classes per term. These classes were partially online with “Writing Intensive” requirements. A higher percentage (as compared to the average college graduation rate) of students in the finance classes go on to graduate and attend four year schools shortly after completion of this advanced course.

The assessment is qualitative, predominantly through reflective blogs submitted by students at the start and end of the term, participant observation, four module writing assignments, including updated stock portfolio tables, meeting with students, class participation, discussion boards, and anecdotal evidence.

## OVERVIEW

The simulation used for the finance classes is a free web-based game called *MarketWatch Virtual Stock Exchange*. *MarketWatch* is a top financial information and news website owned by Dow Jones and Company. The finance course focuses on money and banking topics, specifically financial markets, institutions, securities, monetary policy and fiscal policy. The goal of the facilitator was to blend *the Virtual Stock Exchange* into the curriculum to better connect with students raised on the internet and social media. All of the resources to do research for the class are free and readily available.

A simulated stock market game has been incorporated into our finance courses for several years as a supplement to textbook readings, lectures and videos among other resources. The finance classes are partially online, meeting two hours in class per week while required videos, assignments, the stock market game, and resources are geared to at least one hour of learning outside the classroom.

## FACULTY ROLE

The first week of class, faculty introduces the stock market game as an integral part of the course and assignments. The students are responsible for two reflective blogs. The purpose of the reflective blogs is for the faculty to gauge student level of experience before and after the experiential exercise using the simulated stock market game.

The students submit the first reflective blog within the first week of classes. The first blog asks a series of questions inquiring whether they have ever taken a finance class, invested in the stock market (real or simulated) or have taken a class partially online.

They submit a second and final reflective blog on the last day of the class. The final blog asks for student feedback on the finance course itself, about their experience investing in the market via the simulated game, having a partially online class and how they found the course overall. The students are also queried as to whether they may consider investing in the future and how the course will help with their careers.

Students are given login instructions and rules and begin trading. The facilitator participates in the game as well. Out of 25 students, typically less than five students have any experience in stock investing through their families or own their own. However, they were very enthusiastic and open to the idea of learning about stocks and how to invest. Our finance students, like other community college students, tend to be older, in the mid-to-late 20s, than students attending four year senior colleges. The students' lack of investing experience is more likely associated with their upbringing by families of more modest means.

Faculty sets up each class's game customizing for desired settings. Each student's account is funded with simulated dollars in the amount of \$1,000,000. The class's game is private and only classmates and the faculty member can see each other's positions and rankings. As soon they register they may make their purchases, sales and trade for the first week or two, before managing their own portfolio. The trades are based on actual market prices with a slight delay.

In conjunction with the stock market game and faculty's initial lectures, discussions in class center on different type of securities, including common stock. We address risk and return, dividend yields, diversification in their holdings, and where investors get information on publicly traded stocks. Students are actively asking questions and commenting about the stock market game, comparing stocks they recently bought.

Each student manages a \$1,000,000 portfolio. Faculty provides the rules of the game. They are instructed to create a stock market portfolio, with no more than \$200,000 in cash, and invest at least \$800,000 or 80% invested; each stock position should be in the amount of \$50,000-\$100,000. Their portfolio should optimally have about 8-14 stocks. They can trade for 1-2 weeks, getting a feel for the market. The game provides rankings for each player. The trades are priced based on the market with a delayed feed. Faculty can customize certain trading parameters. For example, the minimum price per share is \$2.00 per share. Commissions are \$10 per trade. Traded securities are limited to US equity, including ADRs. They are allowed to buy low cost index mutual funds and Exchange Traded Funds. They were not allowed to buy cryptocurrencies. Trading on margin (that is, borrowing from the brokerage firm) or "shorting" stocks were also disallowed. The preference is for the students to learn how to invest in a buy-hold strategy rather than day trading which is far more risky. The latter may provide more excitement by realizing gains and losses more quickly but will miss the point of relevant learning goals for the term. Through the rest of the term they maintain the stocks they have picked for their portfolio. A buy-hold strategy for their main portfolio helps to limit their playing time and turn their attention to their portfolio.

Our students essentially become "portfolio managers" building their portfolios through the stock market game. They are responsible for keeping track of their holdings on an Excel spreadsheet reviewed by the instructor. Through the game they have access to their rankings within the class, information about the market and respective stocks, graphs, and articles. Once their portfolio is assembled, they transfer their holdings to an Excel spreadsheet that allows for easy updates for new prices, performance data for each stock, total portfolio and the S& P 500 for each module in the course. They are encouraged to hold these purchases in a buy-hold strategy for the remainder of the semester. Separately, however, they may trade the stocks they have bought for the portfolio, sell them or get different stocks on the simulated stock market game. They are limited by the original \$1,000,000 funding. They can continue to trade their shares without rules on the stock market game all during the term. At the end of term, when they write their final reflective blogs, they may compare the performance of the buy-hold portfolio and the trading portfolio.

Other than issues related to the initial set up of the game which may be completed in class if they are having trouble, most of their work is done outside of the classroom using many resources provided on *Blackboard* or they have independently found.

At the end of the initial two week period, the stock market portfolio table has purchase prices, number of shares per position and current prices. The excel spreadsheet will calculate and purchase market value and current market value for each module assignment based on the students' updates. The table tracks updated dividend yields for companies that pay dividends, and indicate cash amount they will hold for the term. Students also track S & P 500 prices and performance against their own portfolio's performance.

There are 4 modules each term. Each module has an assignment that contains the Stock Market Game element.

**Module 1 Assignment:** The students are required to submit their excel spreadsheet to the instructor.

The beginning of the term is devoted to setting up their stock market game, making stock trades, settling on stocks for their portfolio, and transferring their stocks to the stock market table.

The emphasis on Module 1 assignment is to complete the table and all the calculations. For the first writing assignment, they are asked to discuss their stock picks for the portfolio. Picking what to buy in the market may be challenging for some. We discuss some ideas in class like picking their favorite sneaker company, favorite fast food restaurant, social media company and so

on. Students are guided to visit their company's websites, especially investor relations where they can download company reports.

They will update their stock portfolio four times during the term. They may continue to trade on the stock market game at any time. The game calculates their gains/losses and rankings. At the end of the term, they finalize their returns of their stock portfolio versus the S& P 500, that is, the market proxy. They can compare the returns of the S& P 500 to the returns of their stocks they have been trading all term.

**Module 2-4 Assignments:** There is a written assignment associated with each of the modules 2-4 which cover respective chapters for the course. Writing assignments are worth 40% of the final grade and include the updated stock portfolio table and two essays.

One essay is associated with the financial concepts the students are responsible for that respective module. The second essay for each module is to discuss the reasons for one stock's performance using research online, and in comparison to their total portfolio and S& P 500 index. They can pick any stock, usually the best or worst performing stock.

**Module 2 Assignment:** The students are writing an essay based on their analysis of latest Federal Open Market Committee (FOMC) meeting minutes and why the FOMC acted with respect to monetary policy. They will do research reviewing economic and inflation indicators that may have influenced the Fed. They will update their portfolio and discussion of the stock market portfolio performance and one particular stock for the second essay and what impacted their stock relative to the portfolio and the S& P 500 index.

**Module 3 Assignment:** As well as writing about one stock's performance relative to their portfolio and the market, the written assignment focuses on debt securities, specifically money markets, long term Treasuries, municipals or muni securities, and corporate securities. The main essay asks the students to analyze current and historical (1980s) debt securities and their yields for differences in maturities, credit ratings, liquidity, and economic factors.

**Module 4 Assignment:** Once again, writing about one stock's performance relative to their portfolio and the market, the students read and analyze CEO Warren Buffett's latest annual letter to Berkshire Hathaway shareholders. They are required to find three topics that we addressed in class and discuss Buffett's thoughts. This is a particular favorite assignment for students. We address equity and its valuation at the end of the term.

Exams are worth 50% of their final grade. They are not tested on the stock market game or their portfolio. The remaining 10% of their grade is class participation and reflective blogs.

Many resources (videos, articles, important websites) are provided for the students on *Blackboard*. As the term evolves, they often discover their own sources to find research and supporting articles.

## RESULTS

The following seven significant outcomes are derived from this project.

### STRONG STUDENT ENGAGEMENT THROUGH EXPERIENTIAL LEARNING

The stock market game is an excellent example of learning by doing this activity from getting registered, starting to invest their money into their stocks and being ranked by the game. Once they are registered, the experience of buying stocks and seeing how they rank within the class is fun. Communication between students is generally strong from the beginning of the term and remains that way most of the term. Some students are shy but the stock market game is a commonality that makes it easy to connect with others. Students ask for help, share their stock picks, and help each other with building their stock market portfolio.

Students ask more questions and comment in the classroom, whether it was specific to the game, class assignments or asking "why did the market sell off this week?" While the stock market game was an individual, rather than a formal collaborative activity, the class reached out to each other. Sometimes they would discuss their portfolios with each other or in groups, comparing thoughts or articles they had read on certain stocks. They often viewed specific programs, notably Jim Cramer's *Mad Money* program.

### MOTIVATION AND COMPETITION WAS VISIBLE IN CLASS

The students were motivated to join the game and start buying stocks. A few students had difficulty with the login instructions and others were glad to help them so that there were more people to play with on the game. It's no fun to be ranked one or two if there are only two players. Once everyone was on the game, students checked their rankings.

Students were not rewarded with extra points ("extrinsic motivation") for being number one at the end of the term though buying their first stock was a big accomplishment. However, they were personally motivated to follow through on the completion of their purchases, updating their stock portfolio table or other activities for class. It was clearly stated that their ranking would not bear any impact to their grade. However, it must be noted that those who were ranked at the top felt very good about their positions. The game, though simulated, is akin to the real stock market. On the other hand, the one or two students who may be ranked at or

towards the bottom seemed worried, and usually ask in class if that ranking counts. Competition and peer pressure sometimes are motivating for students. In all classes, most students were conscientious and diligent in working on their module assignments.

### **HIGHER SELF-ESTEEM FROM PLAYING THE *VIRTUAL STOCK EXCHANGE***

For many, they are the first ones they know investing in the market. They are initially cautious about spending \$1,000,000 even though the rules require that they spend 80%, leaving no more than \$200,000 in cash. It takes students, some more than others, time to get comfortable to spend, rather than save their money in cash. We talk about the differences between spending and investing, and opportunity costs of leaving money in cash without interest income. Over the term, students gain self-esteem, feeling greater confidence and pride in playing the game and researching the stocks they bought. Some shy students gain greater confidence and better interpersonal skills as they talk about their stocks with verve.

### **BUILD CRITICAL THINKING AND PROBLEM SOLVING SKILLS**

Critical thinking, analysis and problem solving skills are essential soft skills for college students to build and strengthen to be successful in their careers. The finance course is a great place to acquire and evaluate data, facts and knowledge. A significant part of each writing assignment is to explain what issues caused their “best” or “worst” performing stock in their portfolio to perform the way it did. They need to research to find plausible answers. In class, students consider reasons that may impact the market, companies and their respective stocks. Students need to differentiate between relevant and irrelevant information.

Through discussions in class, using a Socratic method, faculty would help them find information that may be relevant to the recent performance. They would be directed to find a stock that was up dramatically that day, ascertain the latest news on that stock and see if there was a connection.

Each of the module assignment required students to analyze and evaluate issues regarding their portfolio and the relevant topic we covered. For example, they are guided to pick a select but limited number of stocks (about 10-12 stocks), analyze the performance of their portfolio and evaluate why one stock performed the way it did. They researched and communicated through writing assignments and discussions in class

### **ACHIEVED COGNITIVE LEARNING OUTCOMES**

They achieved the required learning outcomes for the course by defining the role of financial markets, institutions, and securities. They were able to differentiate between relevant money market, debt and equity securities. They were able to demonstrate a greater understanding of equity markets.

Using the investing simulation to create a portfolio was an opportunity to discuss important areas in finance, notably how to assess risk, need for diversification, calculate and interpret some valuation measures. Students wanted to understand external forces that create uncertainty and volatility in the marketplace such as US-China tariff negotiations.

### **GREATER COMFORT WITH THE BASICS OF INVESTING**

As the majority of students had virtually no experience with investing in stocks, this was a new experience for them, albeit their participation was in the virtual market. The game is real enough to feel gains and losses. Learning how to save and invest, whether for retirement or brokerage accounts is an important part of better financial habits throughout life. If the simulation game motivates students to have greater understanding and confidence to invest for the long term and build wealth that is a great outcome. Student feedback overwhelming confirmed their interest to put small amounts of money into investment accounts.

### **FINAL REFLECTIVE BLOG WAS REVEALING**

This may be more an observation rather than an outcome. Invariably, at the start of the stock market game, and then when transferring their stock positions, it was notable that several students, about one third or more of the class, held on to cash, and had positions that were a fraction of the guided amounts of \$50,000-\$100,000 per position. Rather than having at most \$200,000 in cash, they had more than \$800,000. Individually, when meeting with them to review their tables, many of them would inform the facilitator that they have trouble spending so much money. At first, it seemed like it might a math problem or directions were unclear. However, that doesn't seem to be their difficulty. Later, they would switch the amounts by increasing their investments.

Their final blogs sometimes hinted at what might be the main problem. Many students at community colleges come from a lower socioeconomic status where paying bills are difficult. Having a \$1,000,000, even if only virtual, to spend on stocks may seem like a pipe dream for many students. They seemed to prefer hoarding money, not investing the money and were afraid to lose the money. This may be a topic to further investigate: Whether those from modest means, have built in difficulties to invest and prefer safety over the potential for higher returns.

Their final reflective blogs shared their enthusiasm for the game and how much they learned.

### **Some of the reflective blogs comments at the beginning of the term:**

*"I heard of the stock market game but I have never played it"*

*"I am concerned that I will need help in buying stocks. How do I start?"*

*"I need a writing intensive class but never wrote on finance issues."*

*"I have taken a partially online class for another course but I don't know about finance."*

### **End of Term Comments:**

*"Informative finance knowledge is the best part of the class."*

*"Every stock has a story."*

*"Real world events and real stocks helped me learn more than I ever thought possible."*

*"I can't believe how hard it is to play the market! It's risky."*

*"I was upset to lose \$53,000 of my money until I realized it wasn't real."*

*"I had a hard time investing so much money at one time! My parents couldn't believe it."*

*"Stock project and writing assignments were so relevant to the course topics and made the class easier for me."*

*"I felt like I knew the financial world better without reading countless pages in a textbook that I can't understand as well."*

*"Time was too short for this important class. It should be a four credit class."*

*"I had a great experience learning finance this way."*

*"I didn't understand stocks, bonds or interest rates before but the exercises helped."*

*"Real life experiences are always more enjoyable."*

*"I am glad I bought a lot of different types of stocks so I didn't get creamed as much as others did."*

*"You can make a lot of money doing this for a living. I might be an investment professional."*

*"I didn't like losing money."*

*"I like learned about Buffett, he's cool for an old guy."*

*"Well, at least, I could say I had a million dollars once."*

*"I liked learning about the Fed and what they do."*

## **CONCLUSION**

The *Virtual Stock Exchange*, a stock market simulated game, is an experiential learning activity that has been successfully integrated into partially online finance classes for several years. The game is an effective and excellent pedagogical tool particularly as a supplement to enhance learning of finance lessons. Students find the exercise fun, engaging and motivating to better grasp financial concepts, notably how financial markets work, monetary and fiscal policy, interest rate movements, market uncertainties, risk and return, diversification, and how to find and use resources.

The games support active learning, help to make connections and provide immediate feedback to students. The role of the facilitator/teacher is crucial in successful integration of the games into the course lessons. Facilitators must provide guidance along with flexibility to students to improve critical thinking and problem solving abilities. The facilitator must strike a proper balance between the fun students had playing the games and maximizing the learning of financial concepts. Blending the digitally game-based learning with traditional learning methods may provide a win-win for both students and faculty. Although the finance courses are partially online, simulated games can be effective in classes that meet for full time.

The games created a positive learning environment, adding increased social contact between students in the classroom. The



experience of learning new skills, how to invest and using technology appeared to boost the confidence of many students. Their feedback through reflective blogs confirmed those beliefs.

Further research should be done to use more quantitative data collections utilizing before and after surveys that would be helpful to know more. Understanding what cognitive and soft skills the students themselves think they have learned using the games may be different than faculty observations. Also, are there gender or socioeconomic income differences when it comes to readiness in playing the games given student cautiousness in saving rather than investing the cash given at the start of the game.

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## APPENDIX 1

### REGISTRATION INSTRUCTIONS

The Stock Market Game is a project which we will work throughout the semester for each Module Assignment. Please feel free to jump ahead to look at the final assignment of the term. For now, I recommend Registration and practice “Trading” for the first two weeks of the firm. You will discuss your trading experience through posts on the Discussion board.

#### Registration

Registration is free. To register your account, go to <http://www.marketwatch.com/game/>

Login: to be provided by Professor

Practice trading for the next two weeks. Use the two week period to fully understand the game mechanics, try some strategies, and to get a feel for the stock market.

#### Rules of the Game:

1. You need to keep track of your initial positions as it will be required for your assignments, especially in Module 4. Your portfolio should be put together by week 3. You will receive \$1,000,000 in cash assets to begin investing for your clients.
2. Each position you buy must be a minimum of 5% of your assets (\$50,000 each) and a maximum of 10% of your assets (\$100,000).
3. Cash must not exceed 20% of your portfolio or \$200,000 at any time. You want to be invested in stocks, not sitting on the sidelines.
4. During the two week periods, look for both stocks you are familiar (eg. Disney, Google, Nike) with and stocks you are not as familiar with. Your portfolio should be diversified, meaning stocks in different industries (ie. Not concentrated in one industry like all bank stocks).
5. Have fun with this learning experience!

## APPENDIX 2

### REFLECTIVE BLOGS

Your First Reflective Blog will be 150-300 word document that you will post on blackboard using this link. Writing your blogs will allow you to reflect on your initial thoughts on taking this course, taking as at a partly online class, and how you will think the course will help in your professional life. Central to this course in a stock market simulated game.

#### Topics to consider in your first blog:

- What concerns do you have about taking a partly online?
- What concerns do you have about taking a finance class?
- Have you ever played a simulation game, such as a stock market game, and if so, can you explain your experience?
- Have you ever invested in the stock market on your own previous to this class.
- How do you think this class will help you in your professional career?
- How is this course relevant to your education and your future?

Attach your blog as a Microsoft Word file (doc or docx). Each blog is worth 2.5% of your grade, so failure to do so will reflect negatively on your final grade. Your blog is due on or before the last day of class. This assignment will be graded as a low stakes written assignment. While your content for this assignment will not be considered "incorrect" because it is your personal reflection, you are expected to use proper style, that is proper English, punctuation, spelling and such. Please proofread your work. This is a private blog and will only be read by your professor.

This Final Reflective Blog is very similar to your first blog back in September. Writing this blog entails reflection about what you learned while completing this course.

#### Topics to consider:

- How has taken this course as a partly online course changed your concerns you had in the beginning of the term (or not)?
- How do you feel about taking a finance course and how does it relate to your expectations?
- How did you find playing the stock market simulated game? Please explain your experience as it related to the relevant finance topics.
- Now that you have experienced some of the basics of investing, do you anticipate investing in the future?
- How will this class help you in your professional career and your future?

Attach your blog as a Microsoft Word file (doc or docx). Each blog is worth 2.5% of your grade, so failure to do so will reflect negatively on your final grade. Your blog is due on or before last day of class. This assignment will be graded as a low stakes written assignment. While your content for this assignment will not be considered "incorrect" because it is your personal reflection, you are expected to use proper style, that is proper English, punctuation, spelling and such. Please proofread your work. This is a private blog and will only be read by your professor.