The Utilization of Simulation Games to Enhance Student Learning in Colleges and Schools of Business: A Case Study

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ABSTRACT

Recent advancement in technology, software design, and business knowledge has made it possible for educators in schools and colleges of business to utilize a number of computer-oriented simulation programs. This case study deals with a simulation designed to assist students to understand the fundamental aspects of managing a business enterprise. It provides participants with an opportunity to manage a virtual firm that engages in business activities in different regions of the world. The simulation was utilized in an undergraduate international business course. It was found that the educational benefits – in terms of business knowledge gained and class performance – of the simulation were noticeable as compared to previous semesters during which no simulation was assigned. The majority of participating students felt that the challenge to translate business principles, theories, and concepts into practice was enjoyable and intellectually rewarding.

INTRODUCTION

Business simulation programs (also referred to as games, exercises, or software) have in recent years become key tools in the educational process of graduate and undergraduate studies in many schools and colleges of business in the United States and elsewhere around the globe. For example, a simulation called "Glo-Bus: Developing a Winning Strategy" was reported to have been utilized in business strategy courses in spring 2012 by 31,000 students in 20 countries (http://www.glo-bus.com).

A simulation – in the context of business courses application – is typically a computer-oriented online program that enables individual students, or student teams, enrolled in a course to compete with each other by managing a virtual company. Instructors can determine the level of sophistication of the simulation assigned to their students by increasing or decreasing the scope of managerial tasks to be performed. The more the functions of the virtual company are, the greater will be the degree of sophistication of the game.

Moreover, a simulation game is intended to help students (or other participants) translate business principles, concepts, and theories into practice, thus making the learning process an interesting, interactive, and long-lasting experience. A simulation called Go Venture: Any Business Computer Software Company was assigned to students enrolled in the international business

(MGMT 352) course for the fall 2012 and spring 2013 semesters at the College of Business of Bowie State University in the state of Maryland.

There are a number of well-structured simulation games currently available on the market, including Glo-Bus, Cesim, and GoVenture. They differ in terms of target audience, price, and complexity. For instance, the first two simulations are primarily aimed at business strategy courses, while GoVenture games are more suitable for other business courses such as international business, entrepreneurship, and small business management.

The purpose of this study was to assess the effectiveness of the simulation to enhance students' performance in the course relative to the performance of other students who were enrolled in the same course in the fall 2011 and spring 2012 semesters, but they were not assigned the simulation. Student grades were used as proxy for class performance. In addition, during a class session, students were asked a few questions (appendix1) to solicit their views about the deployment of the simulation as a required activity for the course. The simulation was also intended to help accomplish the following goals:

- To improve students' skills and knowledge in the field of international business.
- To help disseminate the utilization of simulation programs in the College of Business.
- To assist in the development of a College learning guide for the use of simulation programs.

LITERATURE REVIEW

Scholars have expressed an increasing interest in the subject of business simulation over the past decade. The interest is mainly attributed to the perceived effectiveness of simulation games in learning and skills building. For example, Marriot (2004) pointed out that the utilization of simulation in the context of teaching accounting courses would promote students' understanding of business problems in realistic settings. Farrell (2005), in utilizing a simulation game in an international business course, found out that the game as compared to traditional teaching methods (e.g., textbook and cases) was a highly beneficial learning tool about cross-borders business activities, fostering teamwork, and stimulating students' interest in the subject matter.

In the same vein, Reid, Brown, and Tabibzadeh (2012) pointed out that, while traditional teaching methods are characterized with shortcomings, simulation programs provide the best learning platform. Kachra and Schnietz (2008) indicated that business simulations play critical role in helping students enrolled in the master of business administration (MBA) programs to acquire practical, integrative skills demanded by the business community. Moreover, in a study conducted by Raymond and Black (2008), the authors concluded that the deployment of simulation in an undergraduate calculus class improved student knowledge about the behavior of dynamic systems. In another study, Arias-Aranda and Bustinza-Sanchez (2009) indicated that a

simulation game that the authors utilized increased students' positive results for personal control and self-esteem.

Furthermore, Parisi (2011) investigated the effectiveness of simulation games in developing superior performance in organizations. The author concluded that the games as compared to traditional lectures could bring about more positive, real-time effects on participants. Lefebvre (2011) discussed the role of business simulation in accelerating the transfer of tacit knowledge held by employees, while Brown (2011) highlighted the importance of simulation in team building and organizational development. Finally, Reid and Anderson (2012) underscored the relevance of simulation in improving students' critical thinking.

THE BUSINESS FIRM

In a free market country such as the United States, well-managed business firms are guided by a vision to accomplish the following goals (Kaplan and Norton, 1992; Thompson, Peteraf, Gamble, and Strickland, 2014):

1. Financial goals – to survive and realize profitability.
2. Operational goals – to achieve operational excellence.
3. Customer goals – to attain customer satisfaction.
4. Innovative goals – to be positioned for business distinction by introducing new or improved goods and services.

THE SIMULATION*

Business simulations are designed to help participants to practice managerial responsibilities and in the process accomplish key goals of the firm as indicated in the previous section. This is also the case with GoVenture-Any Business. The simulation is an educational tool whereby student teams are assigned to manage a virtual company. Team members (three to five students each) act as co-executives by assuming such positions as chief executive officer of the firm, vice president of finance, vice president of marketing, and so on. Virtual companies formed in a class section compete with each other for the same target market. The size of the market – in terms of total revenue to be generated – is fixed during the time period of the simulation. The instructor defines the nature of the product to be produced and marketed.

In the business simulation, the participants' ultimate goal is to build a successful business as defined by such performance measures as revenue, profit, market share, brand loyalty, stock price, and the like. A team is to manufacture and sell a product while at the same time compete with firms managed by other team members or the computer. The simulation progresses in preset periods as determined by the simulation manager (i.e., instructor). The players (e.g., students) must make decisions for each time period about resource allocation for various aspects of the business enterprise, including manufacturing, research and development, sales, promotion, ad-

* This section and the one that follows are heavily drawn on GoVenture user's guide.

vertising, price, and employment. As is the case in a perfect competition model, the simulation permits participants to monitor market conditions and performance of other competing teams.

GoVenture Any Business is a highly customizable simulation and relatively easy for many students to practice. The instructor can define any product, any industry, and any market using a simple point-and-click form. As indicated earlier, the simulation is an online program accessible from any Internet-enabled computer that makes it easy for participants to cooperate while they are in different geographic locations.

The instructor creates a simulation competition via a special company website. He/she needs to provide simulation numbers to students. Students can play on their own or in teams. The simulation competition runs for a given number of periods. Teams are provided with certain amount of capital to invest in each period. They decide on such decision issues as product price, production level, and the amount of money to spend on R&D and marketing strategy.

Investing in R&D, for example, could improve the features of the company's product that, in turn, will help differentiate it from competitors' products. Likewise, investing in sales and marketing could improve the product brand equity. Of course, greater levels of investment will lead to higher total cost for the company and, consequently, would influence the price to be charged for the product. In any event, the simulation system enables teams to penetrate international territories to take advantage of market opportunities. The simulation also provides participants with market research reports to assist them in making sound decisions.

The simulation competition is planned to continue in duration until the designated number of periods – say twelve periods each of which represents a month – have been completed, unless the instructor chooses to end it sooner. The simulation also provides student teams with an opportunity to review their performance versus that of competitors. The review can help individual teams to revise business strategies or approaches in managing their firm in order to achieve desired goals.

PARTICIPATING IN THE SIMULATION

Go Venture offers participants two ways to master key aspects of the simulation: (i) a user's guide, and (ii) a step-by-step video presentation. Participants are recommended to review both to learn the ins and outs of the simulation under consideration. According to Go Venture's instructions, the steps required to participate in the simulation are as follows:

1. **Joining a simulation competition**

In order for a student to join a simulation competition he/she must first enter the simulation number provided by the instructor onto a specific page on the website of the simulation provider.

2. **Simulation interface**
The main purpose of the simulation interface is to help participants navigate through the simulation as well as getting advised from online virtual experts. The interface has five main areas: (a) progress window, (b) smartphone, (c) virtual advisor, (d) business menu, and (e) save button.

3. **Company screen**
The company screen provides participants with a detailed view of the simulation that they joined.

4. **Management screen**
The management screen allows participants to review budget details, set the ethical standard for the company, view industry events, and save their decisions.

5**. Product manufacturing screen**
The product-manufacturing screen allows participants to set retail-selling price for their products and determine the number of units to be sold. All companies in a given class section sell the same type of products but each of them are allowed to decide on product features to adopt.

6. **R&D screen**
The product R&D screen allows participants to allocate funds for R&D. The aim of R&D spending in this case is to enhance product features to make it more attractive to potential customers.

7. Sales and marketing screen
The sales and marketing screen allows participants to budget necessary funds for advertising and sales promotion in order to help build the company's brand equity and, therefore, to increase revenue. Student teams may also choose to seek new global territories to enjoy the benefits of more market opportunities.

8. **Human resources screen**
The human resources screen enables participants to manage the company's employees, including salaries, benefits, and training programs. It also allows participants to monitor employees' morale, productivity, and turnover.

9. **Customers and competitors screen**
In order to monitor industry trends, market developments, and competitors' strategies, the customers and competitors screen makes it possible for participants to purchase (from the system with their firm's funds) research reports and other sources of information for analytical purposes.

10. **Finance screen**
The company's current and past financial activities are reported in the financial screen so that participants can view and analyze them.

11. **Time advance**
The simulation is structured to run in simulated time intervals set by the instructor. A period of time is broadly defined by the system. For instance, it might represent an hour, day, month, quarter, or year. Participants must make business decisions at the beginning of, or during, each period. Decisions made by all competing teams for a given period of time are processed simultaneously in accordance to the schedule set by the instructor. For example, the instructor may choose to have decisions processed every Friday night. This means that student teams must make and save their decisions every week prior to the specified deadline.

12. **Saving decisions**
Decisions about resource allocation and other company spending must be saved in order for the simulation system to record and process them. Decisions can be saved, changed, and resaved as often as desired up and until the specified decision deadline. Once a decision deadline is reached, then decisions of all firms in the simulation competition will be processed. Results of the competition for the period would immediately be available to participants. As the simulation progresses, the system would also show the companies' past performance, including profitability, market share, and stock prices.

13. **Consumer purchasing behavior**
In real-life, business firms gather and analyze all sorts of information about potential consumers. The information so gathered could help the companies concerned to develop appropriate business strategies to enhance their market position. In GoVenture Any Business, the purchasing pattern of consumers is simulated and monitored to participants. However, to simplify the issue under consideration, virtual consumers make their purchasing decisions on the basis of a number of factors determined by the instructor.

14. **Individuals and teams**
The simulation is designed to be flexible in application. For this reason, participants can be assigned to work individually or in groups. Each participant or group is responsible to manage a virtual firm. Individuals in a group can log on onto the simulation at any time they desire and from any Internet-connected computer location. Although individuals have access to all business decisions concerning their firms, they must work together to make the best possible decisions. Individuals assigned to the same team can communicate asynchronously with each other using the so-called built-in strategy journal, a tool very much similar to a blog.

15. **Scoring and performance evaluation**
The simulation system has a built-in performance evaluation and scoring feature. Participants can access the feature from the simulation's smartphone screen. There are also other detailed and useful reports available to participants at the discretion of the instructor. Finally, the simulation is

equipped with a scoring formula whose components could be specified by the instructor. The formula is used to rank the performance of individual participants and their teams.

OUTCOME OF THE SIMULATION UTILIZATION

Table 1 below summarizes students' performance in terms of average class grades for the fall 2011 and 2012 as well as spring 2012 and 2013 semesters for the international business (MGMT 352) course. The average number of students during the fall 2011 – spring 2013 period was about twenty students – a reasonable class size for an undergraduate course. In both the fall 2012 and spring 2013 semesters, the simulation assignment carried a weight of fifty percent of the total grade for the course. The number of student teams created ranged from five groups in spring 2012 to seven groups in spring 2013. The average grade for the entire period under investigation was about 2.4 points (out of 4.0 points), which is equivalent to a C grade, a typical grade level for many courses in undergraduate studies.

As table 1 (also appendix 2) shows, the average grade for the fall 2011 was 2.35 points while it was 2.31 points for spring 2011. These averages were for the semesters during which the business simulation was not required of the students enrolled in the course. On the other hand, the average grades for fall 2012 and spring 2013 were 2.41 points and 2.52 points, respectively. These averages were for the semesters during which the simulation was required of all students. A business plan for the virtual company and its class presentation were an integral component of the simulation exercise.

Table 1
Summary Results for Students Performance for the Fall 2011-Spring 2013 Semesters
International Business (MGMT 352) Course

Number of Students	Semester	Average Grades (Points)
20	Fall 2011 – no simulation was assigned	2.35
16	Spring 2012 – no simulation was assigned	2.31
22	Fall 2012 – simulation was assigned	2.41
23	Spring 2013 –simulation was assigned	2.52

Source: Appendix 2.

A review of the figures in Table 1 reveals that, in the fall 2012 semester, the average class grade increased by 6 percent as compared to fall 2011, a modest improvement in student performance. On the other hand, in the spring 2013 semester, the average grade increased by 21 percent as compared to spring 2012, a substantial jump in class performance. The data in Ta-

ble1indicates that the introduction of the simulation as a required activity for the course helped improve student performance especially for spring 2013 semester.

DISCUSSION

The data indicates that student performance in terms of grades was improved for the fall 2012 and spring 2013 semesters, a period of time during which a business simulation was required of students enrolled in the international business course. On this basis, a conclusion might be drawn that the improvement in grades is attributed solely to the introduction of the simulation in the course. However, the grade improvement could have been influenced by a number of factors such as:

- ✓ Students were more prepared for the course during the fall 2012 and spring 2013 semesters than students who were enrolled in the course in previous semesters.
- ✓ The time period that case study covers might be insufficient to make a definite conclusion about the issue under discussion.

In any case, a number of issues became apparent as a result of the simulation assignment and discussions with the students, as summarized below:

- ✓ Students prefer to select their own team members instead of being assigned to teams by the instructor.
- ✓ Students would like the instructor to view the simulation video in class with them and provide additional explanation about key aspects of the exercise.
- ✓ The instructor should carefully explain the user's guide as well as the nature and importance of the simulation as a learning tool.
- ✓ The instructor may want to assign the first two or three simulation decisions as practice decisions without grade assigned.
- ✓ The instructor should remind students about decision deadlines and periodically review with them their performance results.

Appendix 1
Questions Discussed with Students

In a class session, the instructor discussed the following question with the students enrolled in international business (MGMT 352) course. The purpose was to gather tentative information about their experience in using the simulation program as an integral part of the course.

1. Do you think a business simulation such as the one required in international business course is a useful learning tool?
   A. Strongly agree
   B. Agree*
   C. Strongly disagree
   D. Disagree

2. Do you recommend the instructor to assign the simulation in international business courses in future?
   A. Yes*
   B. No
   C. I am not sure

3. Do you think the simulation was:
   A. Too easy to use?
   B. Relatively easy to use*?
   C. Too difficult to use?
   D. Relatively difficult to use?

4. Do you think business simulations (of different kinds) should be assigned in most business courses?
   A. Yes*
   B. No
   C. I don't know

5. Did you benefit from the simulation in this course?
   A. Yes*
   B. No
   C. I am not sure

6. How much did you benefit from the simulation?
   A. A lot*
   B. A little
   C. None at all

* Response of the majority of students.

Appendix 2
Number of Students and Grades for the Fall 2011 – Spring 2013 Semesters
International Business (MGMT 352) Course

Student Number	Grades		Grades	
	Fall 2011	Spring 2012	Fall 2012	Spring 2013
1	C	F	B	C
2	C	B	B	C
3	C	C	C	D
4	C	B	A	C
5	C	B	B	F
6	B	A	C	C
7	C	C	B	A
8	B	D	C	A
9	B	B	C	D
10	C	B	C	B
11	F	B	C	A
12	C	C	C	B
13	B	C	C	B
14	B	B	C	A
15	B	B	C	B
16	C	F	C	B
17	A	-	B	C
18	D	-	C	C
19	C	-	C	C
20	A	-	B	B
21	-	-	C	A
22	-	-	B	C
23	-	-	-	C
Average Grade	2.35	2.31	2.41	2.52

Source: Student rosters.

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