Teaching Business Simulation Games: Comparing Achievements Frontal Teaching vs. eLearning

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Abstract. This paper addresses the issue of comparing results achieved by students taught the same course but in two drastically different – a regular, frontal method and an eLearning method. The subject taught required intensive communications among the students, thus making the eLearning students, a priori, less likely to do well in it. The research, comparing the achievements of students in a business simulation game over three semesters, shows that the use of eLearning method did not result in any differences in performance, grades or cooperation, thus strengthening the case for using eLearning in this type of course.

Keywords: eLearning, Synchronous eLearning, Simulation, Business Simulation Game, Management Game.

1 Introduction

eLearning systems, in various forms, have been in use for quite some time now. In its modern form, it started with "open universities", where teaching materials were sent to the students along with instructions regarding assignments that were required to be completed by a certain date and then mailed back to the teacher. The inherent sluggishness of mail systems made it quite cumbersome, but it still provided a solution when no physical access to the campus was possible. With the advent of modern telecommunications that enables fast, safe and reliable transfer of computer files between users who were quite remote physically from each other, eLearning took on a new form: instead of sending the materials and the assignments by regular mail, email was used. However, students and teachers were not required to be connected to the computerized system at the same time [1]. The rapid acceptance of the Internet and its capacity to enable many users, from all over the world, to be connected simultaneously to the same computers, spurred the development of synchronous eLearning systems which enable almost "live" lessons to be given through the intermediation of dedicated software systems [2], [3], [4], [5]. These systems have been used for teaching a variety of courses, but in most cases the courses chosen to be taught this way were those that were predominantly based on frontal lectures and the students' interaction – both with the teacher and among themselves – was minimal. The question that this work tries to answer is whether synchronous eLearning can have good results in

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courses requiring intensive interactions between the students and the teaching staff and also among the students themselves. We do this by offering the same identical course – requiring such interactions as an integral part - using both the formal teaching method and the eLearning method, and comparing the results obtained by the two groups. It is shown that there are no differences in the measurable achievements and satisfaction between these two groups, and thus synchronous eLearning may be successfully used for this type of courses in addition to the courses already offered using it.

2 "Business Management Simulation Game" Course

Management simulation games are widely used for training management teams and students [6], [7]. "Business Management Simulation Game" is an interdisciplinary course at the College of Management's School of Business Administration [8]. It is a mandatory course for all undergraduate students during their last year of studies. Integrative approaches used in this course enable students to gain managerial skills and to develop a broad-minded approach to the diverse operations associated with running a business corporation: accounting, marketing, finance, human resources management, manufacturing, resource planning, international activity and more. Decision-making processes and teamwork are inherent, by simulating a management board of a commercial firm.

Technically the course proceeds by simulation software. This software integrates all student teams' decisions and produces detailed reports and performance indicators. Students use various analytical and deduction tools (some computerized) in order to make their decisions.

The simulation process algorithm is based on several business models and represents the reaction of a competitive market to different prices and the perceived value of the goods and services the competing teams offer. Each team (representing a firm) comprises a group of 3 – 5 members, who play the role of a managerial team at a firm. The industry, regarded as the total number of teams, consists of up to twelve competing firms. The market reaction to a firm's decisions is measured by demand for its products, reflecting the appropriateness of the firm's decisions to the industry, on the one hand, and their edge over competitors, on the other. Thus, the firms' performance, like in the "real world", depends on the decisions made by the other groups, market conditions and the state of the economy. Each group meets one or more of the game's staff members every week for a consultation on the professional aspects and possible consequences of the decisions they make.

A decision set, loaded into the system every week, represents six months in the firm's life. The duration of the semester and the need to teach many of real-life business situations as well as technical points regarding usage of the software leave, in effect, only 8 game periods, equal to four years in a company's life, for the students to control.

A central control server is used for uploading decisions and downloading results. Every team receives a set of managerial reports that reflect its performance during the last period. The private management reports that are individually downloaded by each group include a summary of its decisions, operational data, financial reports (income and expense statement, balance sheet, cash flow) and market research. The

research includes industry information, consumer- related data and partial data about competitors.

Calculating performance points is based on a few factors, such as profitability, matching supply (manufacturing capacity) to market demand, financial resources, consistency between decisions and strategy, business ethics and the way each firm is evaluated by different stakeholders. In addition to the simulation process, students are required to hand in four home assignments, and to pass a midterm exam.

The course is supported by Web-based technologies that enable easy bidirectional access and smooth transactions.

3 Research Rationale

As at many institutions of higher education in Israel (and the world, actually), faculty members at the School of Business Administration have been debating the use of various eLearning methods, specifically the extent to which it should be used with traditional methods.

The chief subject of debate has been the question of how much eLearning is desirable. In order to answer this question appropriately, faculty members at the School felt that it was necessary to examine all the available courses and decide whether some of them were inherently unsuitable for eLearning.

The idea behind this research was to see if the decisions made by students taking the business simulation course by eLearning were qualitatively different from those of the students taking the course in the regular, frontal lecture mode. The students taking the course via eLearning were encouraged to use eLearning tools for their meetings, discussions and decision-making sessions. In other words, encounters between students would be electronic and not face-to-face or over the phone.

We hoped that getting positive results – that is, showing that the decisions and achievements of the students taking the course by eLearning would be no worse than those of the students taking the course by the regular method – would help convince many in our school and college to expand the use of eLearning to more courses, including those courses requiring intensive, frequent, multi-partner cooperation among the students.

Since the course is given to a large group of students simultaneously (in a number of classes), it was possible to divide the classes into two categories. Some classes would continue to be taught in regular frontal lectures while the other category would consist of those students taking the course by eLearning. The classes would be given in the same manner as far as the materials, assignments, testing and grading were concerned. No special adjustments or changes in the course would be made for the eLearning class. The course would simply be given in the same manner, with the same teaching staff, during the same semester. Since the teachers in the eLearning classes would be the same teachers giving the frontal lectures (on different days and times, of course) the issue of teacher-related changes would be controlled. In addition, the large student numbers (about 600) would guarantee sufficiently large samples without any statistical compromises.

4 Methodology

All students started and finished the course at the same time during their regular semesters and as part of their study program. This was true for the students that took the course frontally as well as for the eLearning students. With the exception of the teaching method, the assignments, tests and course structures were identical. The students knew, when they registered for the course, which method would be used in their section. Periodically, a questionnaire was given to the students; answering it was a course requirement. The purpose of the questionnaire (Appendix 1) was to reveal to the staff the reactions of the students to the content delivered during the lessons and to the instruction method. In addition to collecting that information, the students were also asked to report on their management meetings – meetings that were held in order to "manage" their company. They were asked to report the meeting's quality, organization and outcomes. All answers were kept in a database that was later analyzed.

The hypotheses of this research were:

1. There would be no difference in the student achievements between the group that took the course using the traditional method and the group that took it using the eLearning method.
2. The quality of the "management meetings" would be the same for both groups.

In order to test these hypotheses, the following questions were answered by statistical analysis of the database:

1. Were the achievements in the courses correlated with the teaching method and, if so, what is the correlation?
2. Were the achievements in the courses correlated with the methods used for the "management meetings", and, if so, what is the correlation?
3. Was one method preferable to the other as far as group results were concerned?
4. Was there a significant difference in the duration of the management meetings" between those held face-to-face and those held over the Internet? If so, which method generated the longer sessions?
5. What was the level of student satisfaction from the two type of meeting methods and did the participants find them productive?
6. In both the regular method and eLearning approach, what was the overall level of student satisfaction from the course and its instruction method?

The research was conducted over three semesters. During the first of these three semesters, about 300 students took the course. In the second semester, about 660 students took the course. The third semester had about the same number of students in the course as the first one. Overall, about 1,250 students took the course. It should be noted that since all the students were required to fill out questionnaires, no sampling was required and the statistical tests were done on the entire population.

5 Main Research Findings

- There were no differences in the course achievements and grades between those students that took the frontal course and those that took it using the eLearning method.
- No correlation existed between the management meeting method and the achievements in the course.
- At the group level, too, there were no differences in achievements and grades between those groups that took the course using the traditional method and those that took it using the eLearning method.
- There were no differences between the two groups in the time the students from each group spent on their internal management meetings. Special attention was given to this issue, because we were interested to see if there were any learning patterns, particularly in those groups that used the eLearning method. It turned out that there were no differences between groups using the two methods throughout the semester. The same result was observed in the analysis of all the weekly questionnaires.
- No differences were found in the level of student satisfaction between the two groups.
- Satisfaction from the quality of the instruction given during the classes was significantly higher among the students that took the eLearning classes. Similarly, the students that took the eLearning classes were more satisfied with the learning materials than their colleagues in the frontally taught classrooms. This was not the result of superior teaching since the same teachers gave sessions using both methods.

6 Conclusions

The results show that a synchronous, distance-learning method for teaching a business simulation game course neither diminishes the course's effectiveness nor does it affect student performance. The grades of the students taking the distance learning course were essentially the same as that those of their colleagues who were taught conventionally during the same semester. On the contrary, if there was any difference in the results – taken broadly to include not only the grades and the achievements of the students, both individually and in groups, but also the overall satisfaction from the course and from the learning method – this difference was in favor of the eLearning method. Those students who took the course based on the distance-learning method had a significantly better learning experience than their colleagues in the conventionally taught course.

The business simulation game is a unique course in the sense that most of the teaching hours allocated to it are not lectures delivered by the teachers, but rather consulting meetings for analysis and decision-making. It also requires intensive efforts by the students within their teams. Thus, it is possible that the results obtained in this research were also unique, influenced by the specific nature of this course. In order to understand better the effects of eLearning, more research will have to be done on courses where the whole curriculum is based on frontal lectures vs. an eLearning

(synchronous) rendition of the same course. A comparison of achievements and satisfaction levels among students taking the same course but by different methods would sharply delineate the advantages and disadvantages of the two methods. It is fair to conclude that eLearning courses requiring intensive interactions among the participating students can be taught using the synchronous eLearning method.

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