

OUTCOMES AND OBSERVATIONS OF AN EXTENDED ACCOUNTING BOARD GAME

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ABSTRACT

This paper reports on the outcomes and observations of an exploratory study that aimed to determine the educational benefits of an accounting simulation game. Thirty-one students participated in an introductory financial accounting course, which was taught using a board game similar to Monopoly™. Students were evaluated using questionnaires at various points in the study. A control group was used to compare the responses of students participating in the game. The study made three observations. First, the treatment group enjoyed the course more than the control group did. Second, the learning that occurred in the game was mainly non-cognitive. Third, playing the game over a longer period of time resulted in noticeable behavioral and attitudinal changes that were not observed in the interim evaluation.

INTRODUCTION

The customary approach used to teach accounting to undergraduates has been, and to a large extent still is, through the use of lectures and practice set questions. Knechel (1989) regarded practice set questions as being 'relatively sterile' and failed to generate students' active participation. He set out to overcome some of the problems caused by this 'empty exercise' that seemed to 'reinforce the perception that accountants merely keep track of disembodied numbers' with a business simulation based on the board game Monopoly™. The use of an already familiar game allowed tutors to minimize the start-up time and students to settle comfortably into the game. Following Knechel, Albrecht (1995), Tanner & Lindquist (1998), Kober & Tarca (2000), and Clayton (2001) also used Monopoly™ to teach accounting. In addition to an increased understanding and application of financial concepts these studies reported an improvement in students' interpersonal skills. Simulations are generally regarded to be better at increasing students' interest and participation in the learning process. Washbush & Gosenpud (1993) observed that students exposed to simulations scored better on test scores than students taught using lectures and cases. In Gray (1973) students chose games (over traditional forms of instruction) as the most interesting way to learn. Tutors using simulations tend not set predefined pedagogical objectives as to what they expect students to learn from the simulation; instead learning was allowed to occur

spontaneously, Gosenpud & Washbush (1994). Certain aspects of learning are unique to simulations, which Parasuraman (1990) refers to as "something". Research is still in the process of defining the type of learning that occurs in a simulation and how that learning occurs, Faria (2001).

THE GAME DESIGN

The board game used was similar to that of Monopoly™. The properties represented on the board were a sample of actual properties in England – identified by post town and county. Chance and community chest cards were replaced with more pertinent transactions (for e.g. building maintenance costs, insurance premiums, legal fees, local council taxes etc.). The game was played each week during a two-hour session. Originally it was conceived to be played over one-semester (fifteen learning weeks) as part of an introductory financial accounting course. Each game year was spread over four actual weeks of play, and students played for two game years. Students were given a two-week interval between each game year to organize themselves for next year's play. The use of the simulation game covered two learning objectives: first, to create a learning situation in which students would have the opportunity to learn the principles of financial accounting through active application. Second, to encourage students to recognize the importance of teamwork in business practice. To encourage teamwork, each student assumed the role of shareholder-directors in a private limited real-estate company, and invested £100,000 in the business. The objective of the game was to maximize their individual wealth. Points were awarded to individual students based on their personal wealth accumulated through earnings from their director-salaries, dividends and a share of the proceeds from sale of the business. To trade in the game and make their fortune, students were required to cooperate with others. To begin playing, each business required a starting capital of £1 million, which comprised owners' capital and a loan from the bank. The bank would loan up to £500,000. The game rules prohibited a business to have more than five members. Therefore, students were encouraged to operate in teams of five; a lower number of members would result in the business increasing its leverage.

Each business bought, sold, developed and let real-estate properties. The game also used two independent economic variables: property prices and interest rates. These

variables were simulated to reflect actual changes over the years 2001 to 2004 (inclusive). The mortgage rates changed with the interest rate, changes in property prices meant that students had to revalue their properties and make the appropriate accounting entries to reflect these changes. The game rules facilitated the teaching of financial accounting. The directors of the business were required to maintain proper books of accounts and produce final accounts (income statement, balance sheet and cash flow statement). Part of the coursework required individual students to produce final accounts from their business' ledger, during a two-hour supervised class session. This ensured that individual students shared in the learning of the technical subject matter. Students took turns representing their team at the game board each week and updating the ledger for that week.

Businesses were required to submit the financial statements for each business year with the threat of fines if they failed to do so. The coursework required students to submit final accounts for two game years. Students were also required to have their financial statements audited (the role of auditor was played by the tutor). For the audit, each team was given a one-hour slot to meet the tutor with a completed set of final accounts and all documents relating to the business. The tutor collaborated with students in conducting the audit. The tutor would divide up the work among the students present and went through the process with them. Twenty-percent of the course mark was awarded for submission of the first year's final accounts, which was a team effort and a team mark was awarded for each student in that team. Thirty-percent of the course mark was awarded on an individual basis to students based on their ability to produce the final accounting statements for the second year from current ledger entries. This exercise was conducted in a two-hour class session supervised by a tutor. The remaining fifty percent was awarded on students' performance in the written exam.

At the end of the accounting course, tutors extended the original game version to include a business environment course. The syllabus was based on PESTLE analysis to study the macro-environment. The game simulated business risks emanating from the external business environment. The tutor would generate five such scenarios each week. In the previous week students were issued with some newspaper articles to give them clues as to what the risks are likely to be. Students could hedge against these risks by identifying five of them before the start of play. Students had to use a probability system to match their 'hedges' against the tutor's 'risks'. If a player has not hedged against the 'risk' the tutor had identified, the player is asked to give £10,000 to each of the other players who have hedged against that risk. At first, several teams lost money this way, and eventual business risks were taken seriously, and students paid greater attention to analyzing the articles they were given.

The purpose of the study was to determine whether there was evidence to suggest that the use of a simulation game as the central delivery vehicle resulted in observed learning outcomes that were significantly different to that of more traditional methods. Towards this end, the research observed the behavior of two groups of students on an introductory financial accounting course. The treatment group was taught using a simulation game as the dominant delivery method. The control group students were taught using standard lectures and tutorials. While the existence of the two groups greatly facilitated this research, they were not manufactured deliberately for the purpose of research.

Both groups of students were on a (first year) financial accounting course, which was part of their degree program. The treatment group was a mixed collection of both accounting and business majors. The control group was made up of accounting majors. A comparative profile of the two groups was developed using a questionnaire at the beginning of the course. In the treatment group, the number of business majors outnumbered accounting majors more than 4:1. Both groups consisted mainly of students between the ages of eighteen to twenty-one, who described themselves as fulltime students with part-time jobs. A majority of the students have studied some accounting previously, although 95% of students in the control group had taken accounting as a major compared to only 30% in the treatment group. This was expected as the control group consisted of accounting majors. Only 18% of the students in the treatment group aspired to be professional accountants, compared to 100% in the control group. A majority of the treatment group students did not feel that they would enjoy the financial accounting course, while the entire control group said that they were looking forward to it.

Both groups were taught only one course in financial accounting in the first year. The course lasted one semester (i.e. fifteen weeks or half-a-year). The syllabus content delivered to both groups was very similar.

The control group was taught using a one-hour lecture and a two-hour tutorial that employed standard practice set questions. They were assessed using one coursework assignment and an end-of-course written exam.

The treatment group was taught using a simulation game. The tutor took the first three weeks of the course to introduce students to the basics of financial accounting. These sessions consisted of two-hour sessions each week, where the tutor introduced the financial accounting principles through an intuitive process. For example, to introduce students to the principles of double entry, the tutor encouraged them to move play-money into and out of boxes – each box representing an account. The use of analytical cashbooks was taught by getting students to maintain a cashbook to record their personal cash expenses. Students were recommended textbooks and other reading material (including web sources), but these were not used as part of the classroom teaching. Instead teaching within the

TABLE 1

CRITERIA	TREATMENT GROUP	CONTROL GROUP
Total number of students in group:	31	46
Number of student responding to questionnaire:	27 (87%)	41 (89%)
Number of accounting majors	5	41
Number of business majors	22	NIL
Age group:	18 to 21 = 19 22 to 25 = 7 26 to 30 = 1	18 to 21 = 32 22 to 25 = 6 26 to 30 = 3
Have you studied some accounting?	YES: 24 NO: 3	YES: 41 NO: nil
Have you taken accounting as major before?	YES: 8 NO: 19	YES: 39 NO: 2
Of the subjects you expect to study in the first year would you say that you expect bookkeeping and financial accounting to be the most enjoyable?	YES: 6 NO: 21	YES: 41 NO: nil
Do you aspire to be an accountant or have a career that requires you to mainly deal with accounting and finance?	YES: 5 NO: 22	YES: 41 NO: NIL

classroom took place during the game session where the tutor assisted students with recording financial transactions incurred during the game. Tutor support was made available outside session hours too. Students were seen in teams and were required to make an appointment in advance.

In addition to the questionnaire at the beginning of the course (see table 1), three other research evaluations were carried out. The first of these was held in the ninth week using a focus group of 18 students (67%) from the treatment group. In addition to serving the research needs of this study, it also served to gather evidence for a conference workshop Gamlath & Mortimer (2006) and to validate the ethical considerations of the project. The second evaluation took place in the twelfth week, after some coursework had been submitted and graded but before the written exam. It took the form of a questionnaire administered to both groups (see table 2). The third formal evaluation administered the second questionnaire to the treatment group but at a later date (see table 3).

OBSERVATIONS

The research was largely exploratory. The results of questionnaire surveys were quantified to facilitate a degree of scientific scrutiny. However, it is the qualitative observations that proved the most interesting. The profiles identified in the first evaluation led the researcher to expect that students in the control group to benefit more from the financial accounting course than students in the treatment group. The focus group study consisted of only a small

sample of the treatment group. However, it confirmed that students recognized the game as making a positive contribution to their learning. Students took the game rules (such as submitting financial statements on time, passing the audit etc.) seriously, mainly because it entailed financial consequences. The majority of students claimed to be willing to put in extra hours to meet a deadline imposed by the game (as they would any other coursework). Students found teamwork to be the most difficult aspect of game. The novel teaching approach that eliminated constant reliance on text books in the classroom was not seen by students to hamper their learning. They found the recommended sources easy to use and complementary to the classroom activities.

Responses to the questionnaire administered in the twelfth week revealed a noticeable deviation in responses between the two groups in respect of their ‘enjoyment’ of the course.

Both groups identified grades as their main performance indicator. In both groups, students were individualistic in their work habits. Researchers on the other hand expected the treatment group to recognize the importance of teamwork. The treatment group was able to associate a significant degree of personal emotion with outcomes of the game. All respondents in the treatment group found the financial accounting course enjoyable, although at the beginning only 22% expected to enjoy the course. In the control group, despite the entire group expecting to enjoy the course only 55% actually did. The treatment group also found that the course boosted their confidence in financial

TABLE 2

CRITERIA	TREATMENT GROUP	CONTROL GROUP
Total number of students in group:	31	46
Number of student responding to questionnaire:	31 (100%)	40 (87%)
Fill in the blank: "I know I have done well when ..."	96% of responses related to course GRADE. 4% of responses were related to success in the GAME.	98% of responses related to course GRADE. 2% (one respondent) identified a successful accounting career.
Do you agree: "In comparison to my tutor, and my individual diligence, fellow students are equally important to my success"?	YES: NIL NO: 31	YES: NIL NO: 40
What aspect of the course teaching did you find most useful?	GAME SESSIONS: 25 TUTOR CONSULTATIONS: 31 WORKSHOPS: 8	TUTORIALS: 36 LECTURES: 40 PERSONAL TUTORING: 6
Which instances made you feel most satisfied?	COURSEWORK GRADE: 29 GAME SUCCESS: 29 UNDECIDED: 2	COURSEWORK GRADE: 40 HAND-IN COURSEWORK ON TIME: 18
Which instances made you feel dissatisfied?	COURSEWORK GRADE: 29 GAME LOSSES: 31	COURSEWORK GRADE: 40 MISSED LECTURE / TUTORIAL: 15
Consider the subject matter of the course. What percentage of the course would you say represented knowledge you have not learnt before?	51 to 75 percent = 25 More than 75% = 6	25 to 50 percent = 9 51 to 75 percent = 28 More than 75% = 3
Compared to what you expected at the beginning of the course did you find the study of financial accounting <u>more</u> enjoyable?	YES: 31 (100%) NO: NIL	YES: 22 (55%) NO: 14 NO RESPONSE: 4
Compared to your level of confidence in financial accounting at the beginning of the course do you find your confidence has <u>increased</u> as a result of the course?	YES: 31 NO: NIL	YES: 34 NO: 6

accounting. The research assumed that other differences in the educational environment (i.e. apart from the use of gaming) had only a negligible effect. However, the responses of control group subjects (esp. regarding their enjoyment of the course) in table 2 may have resulted from their existing knowledge of financial accounting, which may have rendered parts of the course boring. The study does not find evidence to suggest that the game was superior in

developing students' cognitive learning. The average test score for the control group was 61% while that for the treatment group was 46%. The coursework grade average placed the control and treatment group at 65% and 67% respectively.

The most significant observation was made towards the end of the first semester. Students in the treatment group unanimously petitioned that tutors continue using the game

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in the second semester. After some redesigning the game was adopted for use on a second semester course called External Influences on Business Organizations (EIBO). The course was a basic economics course that aimed to teach students the application of PESTLE analysis. However, under game rules, students were required to continue maintaining books of accounts and producing financial statements as a team effort, even though grades would no longer be awarded for doing so. To alleviate the tutor's workload, students were also asked to audit each other's final accounts. Students continued to maintain accounting systems they set up in the first semester and to audit each other's final accounts. Students also took greater responsibility for the day-to-day running of the game. Students also amended the game's normal procedures to better serve their business needs.

Three such occurrences were of interest to researchers. First, some businesses (with surplus cash) made short-term loans to others that were cash-strapped. To do so they undercut the bank's lending arm – the bank made short-term loans at an interest rate of 4.5%, these businesses offered to

lend at less than 3% thus undercutting the bank. Second, when two of the borrower businesses could not pay back their loans, the lender who had made the largest amount of loans to both these businesses brought insolvency proceedings against them. As there were no such provisions in the game rules, the administrator had to negotiate the process as he went along. The final agreement reached enabled the business to create a financial subsidiary for the explicit purpose of administering the two insolvent businesses. This subsidiary was not awarded the right to liquidate the two insolvent businesses (although they would have liked to). The subsidiary guaranteed the debts owed by the insolvent businesses to other creditors including the bank. Accordingly a schedule was drawn up for the repayment of the debts owed to third parties by the subsidiary. In return it was exempt from paying corporation tax. The game also witnessed two mergers. The first was a survival strategy, between two less profitable businesses. The second was between relatively successful businesses to increase market share. In each case students were required to justify mergers against antitrust rules.

TABLE 3

CRITERIA	TREATMENT GROUP Results from 3 rd Evaluation	Treatment Group results from 2 nd Evaluation reproduced here for purpose of comparison.
Total number of students in group:	31	31
Number of students responding to questionnaire:	29 (94%)	31 (100%)
Fill in the blank: "I know I have done well when ..."	54% of responses were related to GRADES. 47% of responses were related to outcome of the GAME. 7% of responses related other outcomes such as successful career and "better knowledge".	96% of responses related to course GRADE. 4% of responses were related to success in the GAME.
Do you agree: "In comparison to my tutor, and my individual diligence, fellow students are equally important to my success"?	YES: 23 NO: 6	YES: NIL NO: 31
What aspect of the course teaching did you find most useful?	GAME SESSIONS: 27	GAME SESSIONS: 25 TUTOR CONSULTATIONS: 31 WORKSHOPS: 8
Which instances made you feel most satisfied?	GAME SUCCESS: 27 COURSE GRADE: 29	COURSEWORK GRADE: 29 GAME SUCCESS: 29 UNDECIDED: 2
Which instances made you feel dissatisfied?	GAME LOSSES: 28 UNDECIDED: 1	COURSEWORK GRADE: 29 GAME LOSSES: 31

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A slightly modified version of the questionnaire used in table 2 was re-administered towards the end of the academic year. The responses of the treatment group were noticeably different from that of the earlier questionnaire.

A greater proportion of students identified the game outcome as the main performance indicator – 47% compared to 4% in the earlier survey. A significant number still attached emotional value to game outcomes. A markedly greater number now recognized the importance of teamwork. While none of the thirty-one respondents recognized the importance of peer-support in the previous survey, 79% of the respondents did in the later survey.

CONCLUSION

This paper concludes with two main findings. First, students taught using a simulation game have a greater chance of enjoying their course than students taught using standard approaches. Secondly, prolonged exposure to a game-based learning environment resulted in noticeable shifts in attitude and behavior. The observations also suggest that the significant learning that occurred through the game were non-cognitive (mainly motivational) in nature.

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