
EXPERIENTIAL LEARNING IN MANAGEMENT EDUCATION

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Abstract. Management studies have been criticized for lagging behind the actual needs of organizations, ignoring experiential dimensions. We address this issue by applying experiential learning theory using an accountability-oriented board game designed to help participants learn about cost management. The game was played in a pricing course with an enrolment of 104 accountancy students. We examined the impact levels of game entertainment and comprehensibility on the course material comprehension as well as the game's impact on the final grade in the course. Results show that game participants had significantly higher grades than students that did not participate in the game, and that entertainment and comprehensibility of the game predict the understanding of course material. We also found that managerial employment capability can be predicted by level of challenge participants derive from the game. This study addresses the gap between traditional management education and practice. It provides empirical evidence of the value of hands-on gameplay experience for assimilation of course concepts and strategies. The results confirmed the importance of exposing players through an entertaining game simulation to challenges that arise in the business world. In addition, we lay the ground for future studies on the novel usage of the game as a tool to assess management skills.

Keywords: game, simulation, experiential learning, management, education, accounting.

JEL Classification: M10, M41, M53.

1. Introduction

Managers are being challenged with a greater range of problems than ever before (Szarucki 2013), however, management studies have been criticized for insufficiently preparing students for the realities of professional life (Pfeffer, Fong 2002). As such, they are the first to be blamed for failure or poor workplace performance (Taylor *et al.* 2002). Business schools can fall short of providing adequate real-world skills for graduates to compete in the marketplace (Bennis, O'Toole 2005). Of course, classroom management education bears little resemblance to actual organizational life (Quillien 1993). While experiential pedagogies are generally preferred by managers (Gold, Holman

2001), ultimately, business schools have ignored this experiential dimension (Mello 2006). Therefore, this study addresses this issue by applying experiential learning (EL) theory (1984) to accountancy management studies.

According to Kolb (1984: 38), “*Learning is the process whereby knowledge is created through the transformation of experience.*” This concept is now embedded in the literature (Ord, Leather 2011). It has generated considerable recent interest (Penger *et al.* 2011) and is a fixture in higher education today (Gerlach, Reinagel 2016). The EL approach conceives of the learner as actively involved in the learning process (Bencke, Bezuidenhout 2011). In contrast, more traditional teaching methods (Karlłowicz 2009) view the student as a passive recipient of information (Lopez *et al.* 2006). EL is an increasingly common college curricular alternative (Cline, Kroth 2008), merging different learning styles and enhancing the ability to apply lessons to new situations (McCleery *et al.* 2005) often through simulation, games, and role playing (Hale *et al.* 2002). Business simulations employed in management education (*cf.* Fawcett 1995; Granitz, Hugstad 2004) such as board games can be valuable pedagogical tools (*cf.* Wyss-Flamm, Zandee 2001). However, research on the effectiveness of board games in management classroom scenarios is lacking in empirical evidence, especially when applied to accountancy studies.

Consistent with the goals of EL, our research is based on evaluating students attempting to play the hitherto untested Jacket Factory (JF) board game (Estrin *et al.* 1995). This game is designed to expose participants to concepts and strategies of cost management, using a simulation revolving around the manufacture of a line of goods.

Accordingly, this study makes several contributions. First, it addresses the gap between traditional management education and management practice. Using the game simulation, we model a hands-on scenario that assimilates concepts and strategies discussed in class. Second, we provide empirical evidence that the game may improve student understanding of course material, serving as a valuable tool for academic educators. Third, we argue that it may prove useful to Human Resource Management (HRM) assessment of management candidates, as well as providing a starting point for future studies in the field.

2. Review

2.1. EL and management

Management education is a skill that can be learned (Lisinski, Szarucki 2011). EL has been described as one of the most effective instruments of management development (Holman, Mumford 2001), and is particularly powerful when linked to management education (Bevan, Kipka 2012; Reynolds 2009). Examples include disaster management (Rijumol *et al.* 2010) and lean management (De Zan *et al.* 2015). It has been compellingly argued that business education programs must include an experiential learning component (*cf.* Clark, White 2010). Gruver and Miller (2011) argue that EL works

especially well in management curricula, since organization and management require wisdom that can be acquired through experience.

2.2. EL and accounting

EL theory was previously applied to accounting education, even by Kolb himself between 1971 and 1999 as a means of examining learning styles (McCarthy 2010). Other examples include Young and Warren (2011), who used an EL approach based on exercises that require analyzing data to encourage developments of critical thinking in accountancy students. Eljido-Ten and Kloot (2015) describe the positive aspects of EL opportunities in the form of work-integrated learning, provided by small-to-medium enterprises (SME). Chiuichi (2013) employed the EL cycle in order to measure intellectual capital. Fuglister, Stegmoyer, and Castrigano (2010) used EL by analyzing bank accounting and international accounting cases. Dellaportas and Hassall (2013) conducted prison visits to former professional accountants, so as to bring students face-to-face with a better understanding of ethical conflicts and practice. Cornell, Johnson, and Schwartz (2013) applied EL by having accountancy students administer structured-interviews with the goal of enhancing student confidence and reducing anxiety. Laing (2009) examined the use of an experiential learning outdoor simulation activity through role-play, based on a manufacturing production line process designed to improve student comprehension of management accounting concepts. Laing's study, however, did not find any differences between the experiment and the control group.

2.3. Board games and management education

Gaming can be an effective learning tool to drive students to maximize their learning (Sprenkel 1994; Kelliher *et al.* 1996). Game playing can help students develop tactical awareness and decision making skills (Martin, Gaskin 2004). Board games are used in both business and academia to improve education and training (Coakley *et al.* 1998), and were previously applied in management education (*cf.* Moratis *et al.* 2006; Marques *et al.* 2013). However, board games designed specifically for accounting management are not so common, and most related research has yet to show empirical evidence of their efficacy in facilitating understanding of course material. For instance, Fouché and Visser (2008) employed a board game in an introductory accounting course, although no statistically significant results on its effectiveness were found and they neglected to provide a detailed description of the game. Fridman (2010) used the Cashflow board game in the classroom as a vehicle for learning the basics of investing and enhancing financial skills, although no statistical analysis was ever carried out.

2.4. Game assessment

One of the most basic aspects of game playing is entertainment (Day 1981; Jak *et al.* 2013; Gibson 2003; Kurt 2013; Hsi-Peng, Wang 2008). People play games for

enjoyment (Tirakoat, Lata 2011) and simply for the fun of it (Kirk, Harris 2011). Therefore, the more entertainment provided in gameplay, the more participants will be encouraged to play, and thus achieve its goal to better assimilate the course material.

However, understanding the game and wanting to improve as a player are also strong motivators (Chandler 1996). The first requires full comprehension of its rules and goals (Procee 2006). If a player lacks understanding of game rules, meaningful play may be impossible (Ang *et al.* 2008). The JF game includes concepts and strategies applicable to financial accounting, and its rules are correspondingly complex. Therefore, understanding the game and its informing concepts may be linked, which may determine level of student comprehension of course material.

As noted, the main purpose of this study is to assess its value as a management education tool. We also propose that the JF game may assist in the evaluation of managers, and, therefore, we prepare the ground for future studies in this domain by assessing how challenging participants found the game. The need for challenge is a motivator for driving business (Kakabadse *et al.* 1996), job satisfaction (Singh *et al.* 2006), and is often found in entrepreneurs (Caird 1993). This reflects the need for growth (At-Twaijri *et al.* 1995) and can serve as an entrepreneurship success factor (Sullivan *et al.* 2007). Managers who express a need for challenge are viewed better in their environment (Raelin 1993). The need for challenge may also affect managerial competencies (Raelin 1997), impacting career move decisions (O’Callaghan, Fahy 2002; Sullivan *et al.* 2007). However, this imperative does not disappear even when individuals shift their focus to family (Sullivan, Mainiero 2007). In the JF game, participants must continuously make strategic decisions, pivoting in new directions in order to attain ultimate goals. Since challenge occurs through exposures to paradox, dilemma, and decisions (Murthy *et al.* 2011), the complexity of player decision-making and dilemma-solving in game play may be translated into a means of predicting managerial capabilities.

In the achievement of a challenging goal, some errors may occur on the way. Managers need to identify their mistakes (Melewar *et al.* 2004) and learn from them (Pfeffer, Sutton 2006) in order to overcome challenges and reach objectives. An important element of learning is to use self-monitoring and to deal with failure (Magdalena Mo Ching, Cheng 2001).

3. The Jacket Factory game

Jacket Factory (JF) is played on a game board made up of three leaves arranged in the form of a trillium (Fig. 1). A tool for learning about cost management, the objective of the game is to earn as much money as possible by managing the manufacture of goods – in this case, jackets. All finished goods are sold at fixed wholesale prices so that the focus of the game is on cost management, not selling. The winner is the team which amasses the most money over the course of the game. However, all teams not forced to leave the game due to bankruptcy may be said to end the game successfully.

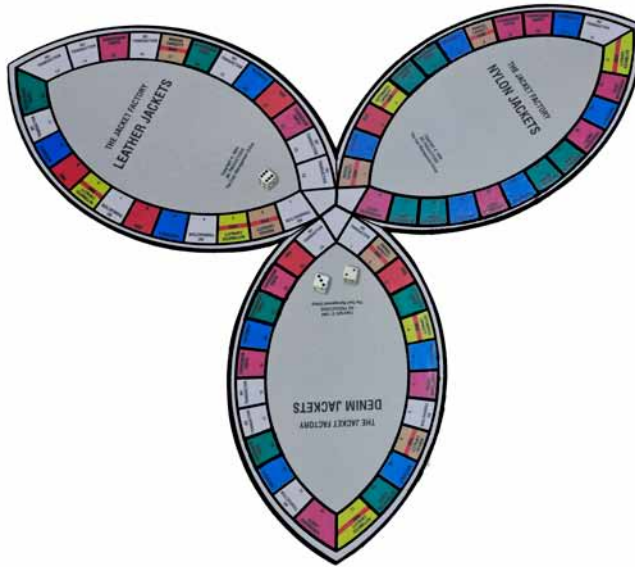


Fig. 1. Game Board

Game description

The game is played by two to four teams of players. Each team can be composed of two to four members. Each member may be assigned a role: for instance, team leader, audit controller, and strategy planner, etc.

There are three types of Jackets: Leather, Denim, and Nylon. Nylon jackets are the most easily manufactured, made from the cheapest materials. More nylon jackets, although not a lot more, can be produced in a shorter time period than other kinds of jackets. However, selling prices and profits are relatively low. Denim jackets are a little more difficult to manufacture, with material that is more expensive and fewer that can be made in a given period of time. Selling prices and profits are a little better, but it takes longer to reach a profit position. Leather jackets are the most expensive to manufacture, are made from the costliest materials, and are the most time-consuming to produce. It takes longer to make a profit manufacturing leather jackets, but selling prices and profits are the highest. For all kinds of jackets, period costs have to be paid. Furthermore, the longer it takes to manufacture and sell a product, the higher the costs will be and therefore the lower the profits.

Figure 2 illustrates the building block levels to sell a final product, for each of the three materials.

Teams must also decide which manufacturing procedure they wish to adopt: Regular manual production, fully automated production, or outsourcing; that is, subcontracting the manufacturing process. Outsourcing translates into lower costs and faster turnover, but less

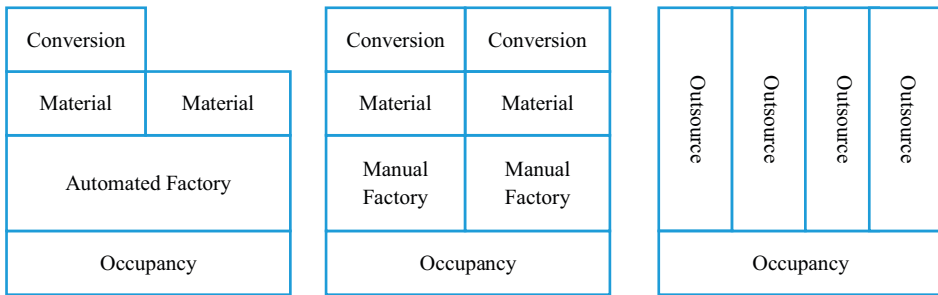


Fig. 2. The building block levels to sell a final product, for each of the three materials

volume. As in the real world, decisions as to which mode of manufacture is most appropriate are limited by opportunities presented. In the game these are determined by rolls of the dice. Again, as with real conditions, teams do not have unlimited financial resources. Teams begin with initial capital of \$2,000,000, and may borrow up to \$3,000,000 with interest payments of 1% per turn. If a team declares bankruptcy, a further \$1,000,000 may be borrowed at double the rate of interest.

In addition to player decisions, risk is represented in the game both by the throw of the dice and by 45 Risk Cards. Period costs must be paid every time the dice are picked up, so that teams are aware of the passage of game time. Time management is also a factor because game time is ultimately limited. Strategies requiring many turns to generate a profit may thus prove unsuccessful.

Calculators are useful in keeping game accounts, although cost management sheets are essential. Each team must keep a running record and balance of all transactions. Once a team has accumulated a stack of Capacity, Direct Material, and Conversion Costs blocks on an Occupancy block, all of which now represent finished goods, they may be sold on the next turn after payment of period costs. As for game endings, a number of different scenarios exist. For example, players can mutually agree on a game time limit or a given number of player turns. The game can also end when all the Risk Cards are used up or when one team possesses all the resources. In any event, the team with the most money at game's end is declared the winner.

At this point, Direct Material blocks may be cashed in at a 50% discount, and Outsourced blocks at an 80% discount, but all other blocks are worthless.

4. Methodology

Based on the literature above, the hypotheses of study are as follows.

H1. Entertainment and comprehensibility of the JF game predict the understanding of course material.

Grade point average (GPA) was often used as a performance criteria vs. the game results in terms of earnings in the game (Faria 2001). Therefore, we hypothesize:

H2. There will be a difference in course grades between students who won in the game, those who lost, and those who did not attend at all.

H2a. Students who won in the game will have a higher mean course grade than students who did not participate.

H2b. Students who lost in the game will have a higher mean course grade than students who did not participate.

H2c. Taken as a single group, students who won and students who lost in the game will have a higher mean course grade than students who did not participate.

H3. The level of challenge derived from the game, along with the ability to handle failure, predict managerial capabilities.

There were 104 accountancy students enrolled in the pricing course, out of which 79 participated in the game, while 25 did not. All participants were between the ages of 20 and 30 years. Of them, 15 students were employed in managerial positions. Players were divided into three groups of three players. Rules were taught to players prior to the start of the game.

4.1. Measurement of key variables

In order to show a relationship between the game play and its value as a pedagogical tool, based on the review of the literature above we first needed to measure the motivation to play the game. Second, the game relies on financial accounting strategies, which make its rules more complex. Therefore, it was needed to measure the level of comprehensibility of the players, in order to validate the game's contribution to the understanding of the course materials. Third, in order to measure the level of the challenge that the game offers, as a key to growth and management development, we measured the level of the challenge the game offers. The fourth construct is needed for the ability to measure the game's success in terms of its educational value. The fifth construct is meant to measure the ability to self-monitor and to deal with failure, as an important element of learning and a key for successful management. Therefore, the five constructs measured in this study: Entertainment (*ENT*), entertainment associated with playing the board game; Comprehensibility (*COM*), understanding of game complexity; Challenge (*CHL*), positive impact on player excitation; Course Material (*CMT*), understanding of the course material due to the game; and Failure (*FAL*), ability to self-monitor errors. The first three variables were taken from d'Astous & Gagnon (2007), which examined factors that impact appreciation of board games. The latter two were added by the authors. Participants were also asked if they work in a managerial position. The items in the questionnaire were measured using five-point scales anchored from "strongly disagree" to "strongly agree."

A reliability test of the items that measure the key variables using Cronbach’s alpha yielded a standard item alpha score of 0.87 for *CMT*, 0.90 for *ENT*, 0.73 for *COM*, 0.77 for *CHL*, 0.88 for *FAL*. Descriptive statistics for the ten variables and their correlations to game participants are provided in Table 1. No single observation was removed from the set.

Statistical Procedure: Data was analysed using a multiple regression analysis, one-way Anova analysis, Kruskal-Wallis test, t-test, and univariate analysis. We used SPSS v23.

Table 1. Correlation matrix of the variables, the means, standard deviations, and reliability

	ENT	COM	CHL	CMT	FAL
<i>ENT</i>	–				
<i>COM</i>	.23	–			
<i>CHL</i>	.09	.01	–		
<i>CMT</i>	.37**	.33**	–.02	–	
<i>FAL</i>	.22	.99***	.39**	.71	–
N	69	72	72	71	52
Mean	12.83	6	5.64	13.90	20.56
SD	3.51	1.63	1.58	3.01	39.51
Cronbach’s α	.90	.73	.77	.87	.88

*significant at $p < .05$

**significant at $p < .01$

***significant at $p < .001$

5. Results

As mentioned, H1 claims Entertainment and Comprehensibility of the JF game predict the understanding of course material. This hypothesis was supported by the data, while a multiple regression analysis was carried out, in which *ENT* and *COM* were the independent variables and *CMT* was the dependent variable (Table 2). From Table 2, we observe that $R^2 = 0.16$, where *ENT* and *COM* positively affect *CMT*.

Table 2. *ENT* and *COM* effect on *CMT*

	Coefficients (<i>B</i>)	Statistical error (<i>SE</i>)	Weight (β)	R^2	ΔR^2
<i>ENT</i>	.22	.10	.26*	.20	.18**
<i>COM</i>	.28	.10	.31**		

*significant at $p < .05$

**significant at $p < .01$

H2, claiming that a difference between the three groups of students (game winners, losers, and non-participants) on the final course grade, was supported. We first performed a one-way Anova test. The homogeneity of variances test showed significance, implying a difference in population variance. Therefore, an a-parametric test should instead be performed. We performed the Kruskal-Wallis test, which showed a statistically significant difference between the three groups of students ($\chi^2(2) = 14.71, p < .01$). The highest mean rank of the grade belonged to students who won in the game (58.12), followed by students who participated in the game and lost (55.27), and finally the students who did not participated in the game at all (30.56).

In order to confirm that students who won in the game will have a higher mean course grade than students who did not participate (H2a), a t-test was performed. The t-test showed a significant difference between the two groups of students ($t(47) = 3.43, p < 0.01$) (Table 3). Indeed, the mean of the students who won ($M = 78.92, SD = 16.80$) was higher than the mean grade of the students who did not participate in the game ($M = 58.33, SD = 24.65$).

Table 3. Difference between students who won and students who did not participate

	N	Mean	Std.Div.
Won	25	78.92	16.80**
Didn't attend	24	58.33	24.65

** $P < .01$

In order to confirm that students who lost in the game will have a higher mean course grade than students who did not participate (H2b), a t-test was performed. The t-test showed a significant difference between the two groups of students ($t(27.38) = 3.60, p < 0.01$) (Table 4). Indeed, the mean of the students who lost ($M = 77.26, SD = 10.87$) was higher than the mean grade of the students who did not participate in the game ($M = 58.33, SD = 24.65$).

Table 4. Difference between students who won and students who did not participate

	N	Mean	Std.Div.
Lost	50	77.26	10.87**
Didn't attend	24	58.33	24.65

** $P < .01$

Finally, in order to confirm that students who won and lost in the game, taken together as a group, will have a higher mean course grade than students who did not participate (H2c), a univariate analysis was performed with Duncan's multiple comparison test. Indeed, the test indicated statistical significance between the two groups ($p < .001$), as observed in Figure 3.

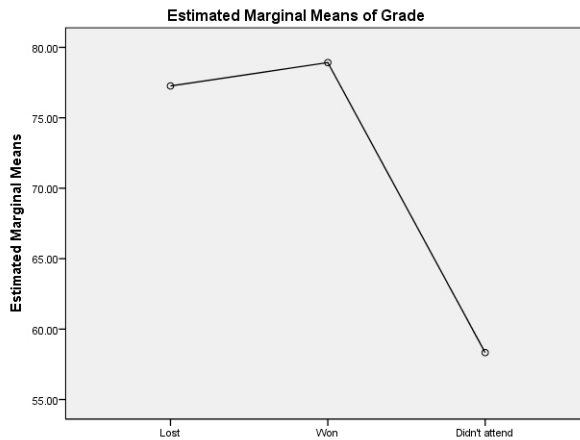


Fig. 3. Difference between game participants and those who did not participate

H3, it should be recalled, posited that the level of challenge derived from the game along with the ability to self-check causes of failure in the game predict managerial capabilities. The data supported this hypothesis as well. A binary regression analysis was used, where the independent variable is *CHL* and the dependent variable is *Manager* (if the respondent is employed in a managerial position). The regression was statistically significant ($\chi^2 = 7.10$, $p = 0.03$), with R^2 (Nagelkerke) = .23, and *CHL* was statistically significant ($p < .05$). However, *FAL* was not significant.

6. Conclusions

Board games employed in management education can be valuable educational tools. However, research on their effectiveness in management teaching is lacking in empirical evidence, especially when applied to accountancy studies. We propose an EL technique based on the JF board game, which offers hands-on experience using relevant strategies and techniques, challenging questions native to the business world, and an entertaining simulation.

The hypotheses asserting that the game provides valuable educational experience translatable into higher GPA scores were all supported. Students who participated in the games have shown a higher GPA than the ones that did not participate. Furthermore, the game's level of entertainment, along with its comprehensibility, was found to positively impact the understanding of the course material.

It was also proposed that the JF game may also serve as a tool to identify management skills, laying the ground for future studies to examine how gameplay can predict management capabilities. *Challenge* was found to be statistically significant, although

the ability to handle failure was not significant. This may be due to the fact that not all players were ready to learn from failure, and that personal background may be a dependent factor (Huovinen, Tihula 2008). Relatedly, a limitation of this study is that the sample consisted of a small number of participants employed in management positions. Future studies should use a larger sample of players in management positions, exploring a range of parameters such as strategies used during gameplay and teamwork.

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