LEARNING BUSINESS PROCESS IMPROVEMENT BY USING A GAME

Juan Sebastián Zapata-Tamayo
Universidad EAFIT
jzapat60@eafit.edu.co

Carlos Mario Zapata-Jaramillo
Universidad Nacional de Colombia
cmzapata@unal.edu.co

Miguel Esteban Betín-Montes
Universidad Nacional de Colombia
mebetinm@unal.edu.co

ABSTRACT

Business process improvement is the systematic analysis of processes in order to measure and improve process performance. Some games have been created for teaching several aspects of management, but process improvement is still outside the focus of such work. Also, the ABSEL community has some effort in teaching and understanding business management, the broader area that covers business improvement. In this paper we propose a game for practicing the main steps of business process improvement. The game was played by several students and real-world practitioners with promising results.

INTRODUCTION

Companies face several challenges related to competitors and other external factors. The way to deal with such challenges start from the knowledge about internal processes and strategies for improving them. Business process improvement (BPI) is the final phase of business management, and it is intended to let business analysts establish the foundation, map processes, assess cost, and improve business processes.

Games have been strategies commonly used by some authors for teaching managerial skills. They advocate some advantages of games for learning, since games promote motivation and real-world simulations. Some of the skills taught by using games are: communication, decision making, and teamwork. However, business process management and business process improvement are topics commonly excluded as game topics.

ABSEL community has been working on several aspects related to business management teaching, like business concepts, simulations, and design. Based on such work, we can emphasize on the importance of business process improvement inside the business management area, and we can use games for teaching such a topic.

The aforementioned reasons lead us to propose a game for practicing a 10-step, cyclical method for business process improvement. This game is based on Monopoly™ and it is intended to replicate the common work products we develop when we try to improve a business process. The game was played both by undergraduate students and real-world practitioners, who provide some feedback for improving the game and graded the diversion and the realism of the game. The

results are promising, since most of the people expressed satisfaction with the game.

The structure of this paper is the following: first, we present some theoretical framework about business process improvement and games; then, we design the BPI game; after that, we discuss the feedback provided by practitioners of the game; finally, we discuss conclusions and state future work.

THEORETICAL FRAMEWORK

BUSINESS PROCESS IMPROVEMENT

According to Jeston and Nelis (2006), strategic organizational goals can be achieved by driving factors like productivity and quality. Process improvement is the way to address such factors. No matter which strategic option the organization selects—and they distinguish between customer intimacy, operational excellence, and product leadership—the way to achieve such goals is business process improvement. Kotter (1996) proposes an eight-step change model: (i) Establish a sense of urgency; (ii) Create the guiding coalition; (iii) Develop a vision and strategy; (iv) Communicate the change vision; (v) Empower broad-based action; (vi) Generate short-term wins; (vii) Consolidate gains and produce more change; and (viii) Anchor new approaches in the culture. Page (2010) encapsulates the Kotter's model and summarizes the path to BPI in the following ten steps: (i) Develop the process inventory; (ii) Establish the foundation; (iii) Draw the Process Map; (iv) Estimate Time and Cost; (v) Verify the Process Map; (vi) Apply Improvement Techniques; (vii) Create Internal Controls, Tools, and Metrics; (viii) Test and Rework; (ix) Implement the Change; and (x) Drive Continuous Improvement. She also says all these 10 steps are based on several quality and reengineering philosophies, since the customer and the product are on the focus, but improved processes are the means to achieve the goals.

GAMES FOR TEACHING

Huizinga (1955) was probably the first researcher advocating the importance of games for the teaching/learning process. He says men are naturally prone to gaming and we can take advantage of such situation for teaching. Klassen and Willoughby (2003) reinforce such statement by recognizing: (i) obvious knowledge is revealed when you participate in a game;

(ii) the more you play a game, the more the knowledge you gain; (iii) stress is minimized by using games instead of tests in the classroom; and (iv) simple materials can be used for creating a fun, educational game.

MANAGERIAL SKILLS TAUGHT BY USING GAMES

Management is one of the preferred topics to teach by using games. From the computerized version of the prisoner's dilemma (Axelrod, 1980), a good strategy for teaching decision making and cooperation by using rationality, some other games have been used for teaching. The trust game (Berg *et al.*, 1995), for example, has been used for teaching the importance of trust in decision making under rational self-interest and the negotiation game (Roman, 2009), for practicing cooperation under repeated bargaining interactions.

ABSEL COMMUNITY
AND BUSINESS MANAGEMENT GAMES

Business management has been one of the topics the ABSEL community has worked. However, BPI—one of the main topics of business management—has not been covered by ABSEL papers. Business simulation is used by de Klerk (2015) for teaching business concepts. Similarly, Papenhausen and Parayitam (2015) use business management simulations for improving system dynamics thinking. Business simulations are also discussed by Hall (2015) in order to promote reality and real-world improvement in such simulations, a subject also discussed by Ruszkowska and Wardaszko (2016). Karl (2016) discusses the design of project management games. Finally,

Zapata-Tamayo and Zapata-Jaramillo (2015) propose a game for promoting communication and cooperation in building social communities.

BPI TAUGHT BY USING A GAME

As a way to overcome the aforementioned problems about teaching BPI, we propose in this paper a strategy based on the Monopoly™ game. The main board of the BPI game is depicted in Exhibit 1, while the detailed description of the game is included in Table 1. Such a description is based on the template proposed by Gómez (2010) for designing the so-called "experience-based games."

RESULTS

The game was played by two independent groups: a 28-practitioner group (M.Sc. students employed by companies) and a 26-undergraduate-student group belonging to the Universidad Nacional de Colombia. The age ranges vary between 21 and 40 years summarized in Exhibit 2. The years studied by the undergraduate students are depicted in Exhibit 3.

Feedback from the participants was obtained by conducting a 6-question survey: (i) Is the game close to reality?; (ii) Is the game fun?; (iii) How difficult to play the game is?; (iv) What did you learn from the game?; (v) What do you think you need to win the game?; (vi) What do you suggest in order to improve the game?

Related to the first three questions, 57% of the players believe the game is close to reality, while only 11% believe is

EXHIBIT 1
MAIN BOARD OF THE GAME
(SOURCE: THE AUTHORS)

TABLE 1
DESIGN OF THE GAME
(SOURCE: THE AUTHORS)

DESCRIPTION OF THE GAME

I. SPECIFICATIONS	
Name	BPI game
Goal of the game	Players must analyze, measure, and improve a business process by following a 10-step method.
Amount of players	Minimum 2. Maximum 6.

II. MATERIALS		
Name	**Quantity**	**Description**
BPI plan	1	Excel™-based rectangular board with BPI method steps in cells, as depicted in Exhibit 1. 6 out of 10 steps are represented by cells, 1 out of 10 is represented by a button (apply improvement techniques), and the remaining 3 steps are implicit in the game functioning. The implicit steps are: "develop the process inventory," represented by the list of processes, "create internal controls, tools, and metrics," implicitly followed by pressing the "apply improvement techniques" button, and "drive continuous improvement," represented by the cycle for improving the measurement of the process.
Business analysts	2–6	Colored squares for indicating the steps followed in the analysis.

III. RULES	
N°	**Description**
1	Players have several improvement opportunities to advance (by clicking the "advance BPI plan steps" button). Some restrictions are applied to each advance: In Step 2, Analysts can select context, goals, or problems. In Step 3/5, Analysts can select process map, only if the context is determined. In Step 4, Analysts can select cost and time, only if all the previous elements (context, goals, problems, and process map) are determined. In "apply improvement techniques," Analysts are allowed to click on the button "step 6. Apply improvement technique," which generates a random number between 0 and 100% for assessing the key performance indicator. If a number is previously assigned to the KPI, then the new number should be higher in order to change it. Otherwise, it remains the same number. In Step 8, Analysts can select tests, only if KPI is greater than 0. In Step 9, Analysts can select implementation, only if the tests are determined.
2	When the advance is set on "select step," Analysts are allowed to go to the position they prefer in the BPI plan and act according to the step selected.

IV. WINNER SELECTION
The winner of the game will be determined by the degree of advance in the BPI plan. An analyst with a process improvement implemented is close to win. Ties are solved by comparing the value of the KPI.

EXHIBIT 2
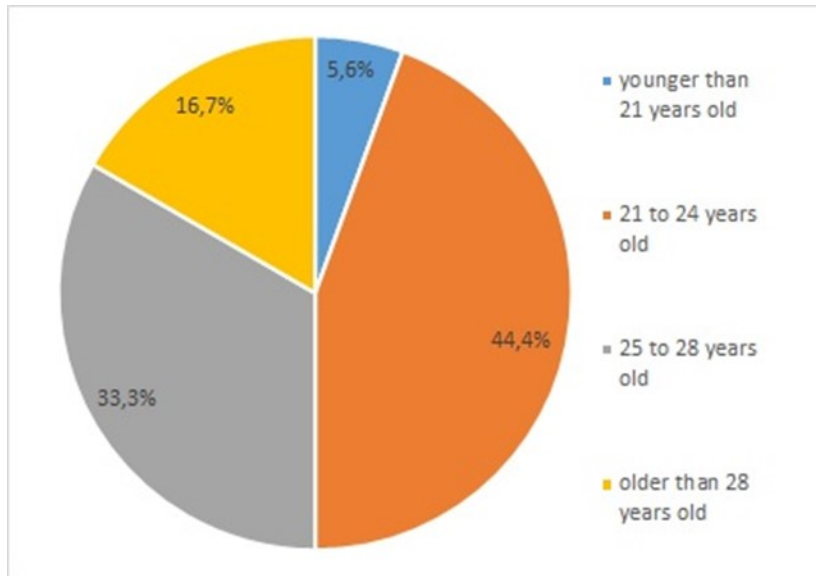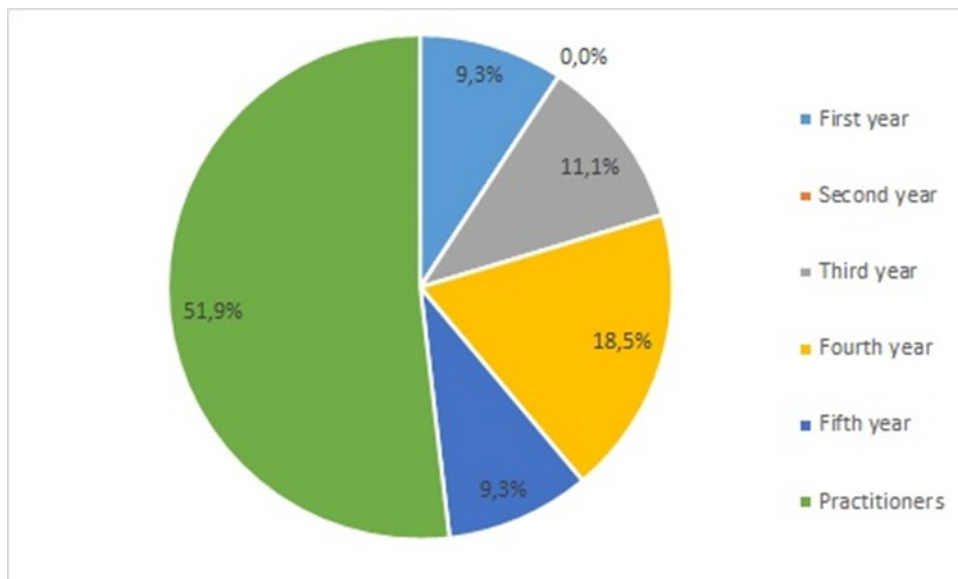**AGE RANGE OF THE PLAYERS**
(SOURCE: THE AUTHORS)

EXHIBIT 3
AMOUNT OF SEMESTERS STUDIED BY UNDERGRADUATE STUDENTS
(SOURCE: THE AUTHORS)

far away to reality; 65% believe the game is fun, while only 17% believe is not; 75% believe is easy to play, while 9% believe is difficult. Answers to these questions are summarized in Exhibits 4 to 6. The final questions are summarized in Exhibits 7 to 9.

CONCLUSIONS AND FUTURE WORK

Business process improvement (the final phase of business process management) is important for giving companies the chance to survive in a competitive environment. BPI can be taught by using strategies common to other management activities like games. The ABSEL community has gained some interest in business management, but improvement is still not

the focus of such interest. For these reasons, in this paper we proposed a game for practicing a 10-step BPI method. The game was played by two different groups: students from the Universidad Nacional de Colombia and practitioners belonging to several companies in Medellín.

Players believe the game is close to reality, fun, and easy to play. They also recognize the implementation issues and the BPI process as the main lines of knowledge acquired from the game. Also, they believe they needed some strategies for increasing the KPIs and take risks for selecting the KPIs in order to win the game. Finally, they suggest some ideas to improve the game like: (i) the possibility to decrease the KPIs and avoid randomness; and (ii) the establishment of some constraints to the process—*e.g.,* time to play and limit of

EXHIBIT 4.
ANSWERS TO THE FIRST QUESTION: IS THE GAME CLOSE TO REALITY?
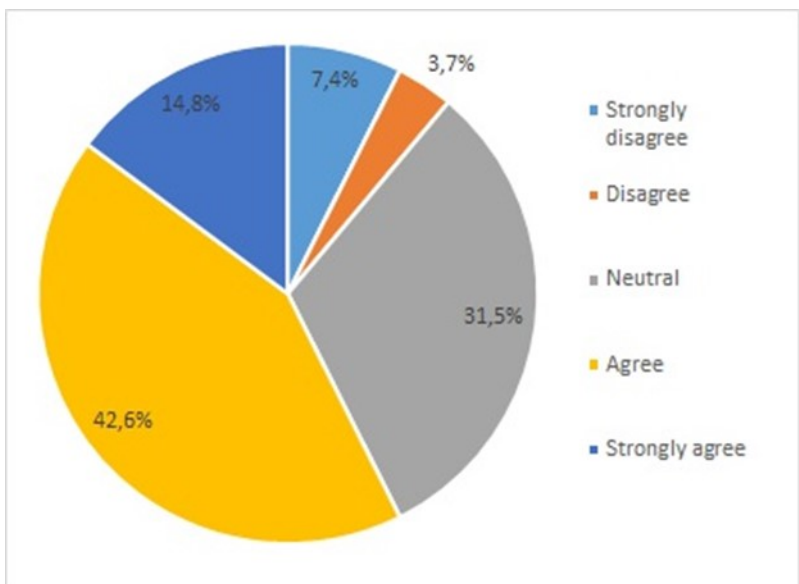**(SOURCE: THE AUTHORS)**

EXHIBIT 5
ANSWERS TO THE SECOND QUESTION: IS THE GAME FUN?
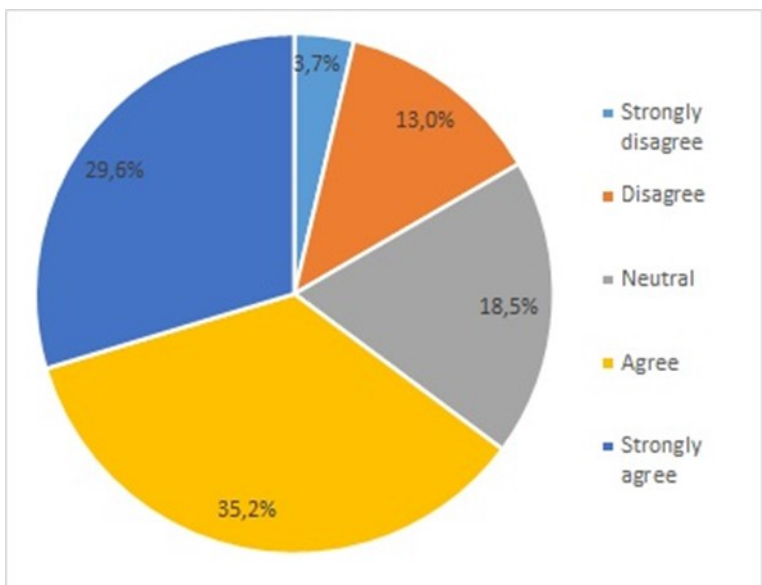**(SOURCE: THE AUTHORS)**

EXHIBIT 6
ANSWERS TO THE THIRD QUESTION: HOW DIFFICULT TO PLAY THE GAME IS?
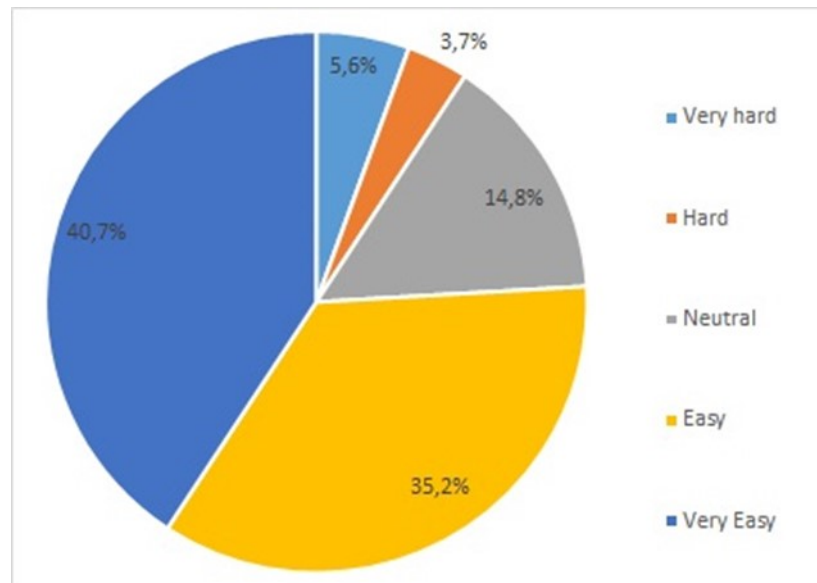**SOURCE: THE AUTHORS)**

EXHIBIT 7
ANSWERS TO THE FOURTH QUESTION: WHAT DID YOU LEARN FROM THE GAME?
(SOURCE: THE AUTHORS)

ANSWER	N°	%
The sequence for improving a business process	13	24%
The use of KPIs for improving processes	12	22%
The way to implement BPI	29	54%
	54	100%

EXHIBIT 8
ANSWERS TO THE FIFTH QUESTION: WHAT DO YOU THINK YOU NEED TO WIN THE GAME? (SOURCE: THE AUTHORS)

ANSWER	N°	%
Following the sequence: improve the KPIs, implement, and test	21	39%
Applying all possible techniques to improve the KPIs	14	26%
Maximizing the KPIs	4	7%
Taking risks for improving the KPIs	9	17%
Making good decisions about the foundation steps	6	11%
	54	100%

opportunities for improvement.

We recommend some future work for this game: (i) incorporating some changes in the randomly assigned KPI values according to the technique applied; (ii) incorporating some of the suggestions made by practitioners; (iii) giving some insights related to the kind of diagrams we can use for representing context, problems, goals, and process maps.

EXHIBIT 9
ANSWERS TO THE SIXTH QUESTION: WHAT DO YOU SUGGEST IN ORDER TO IMPROVE THE GAME? (SOURCE: THE AUTHORS)

ANSWER	N°	%
The game is highly dependant on randomness. Decision making should be improved in the game.	4	13%
KPIs can only increase in the game. In the real world, KPIs can also decrease.	5	17%
The game has no time restrictions, so the game can be very difficult to end.	7	23%
The current version of the game has no distinctions among the improvement techniques.	4	13%
Decision making should be limited by using a timer.	4	13%
Improvements of KPIs should be limited.	6	20%
	30	100%

REFERENCES

Axelrod, R. (1980). More Effective Choice in the Prisoner's Dilemma. *The Journal of Conflict Resolution*, 24(3), 379–403.

Berg, J., Dickaut, J. & McCabe, K. (1995). Trust, reciprocity and social history. *Games and Economic Behavior,* 10, 122–142.

de Klerk, J. (2015). Exploring the use of a business simulation to teach business concepts to emirati students. *Developments in Business Simulation and Experiential Learning*, 42, 51–51.

Hall, J. (2015). Business simulations: reality... and beyond! *Developments in Business Simulation and Experiential Learning*, 42, 84–90.

Huizinga, J. (1955). *Homo ludens.* Boston: Beacon Press.

Jeston, J. & Nelis, J. (2006). *Busines process management: practical guidelines to successful implementations*. Burlington: Elsevier.

Karl, Ch. (2016). Designing educational games for project management using the MyPMgame canvas©. *Developments in Business Simulation and Experiential Learning*, 43, 192–206.

Klassen, K. & Willoughby, K. (2003). In-Class Simulation Games: Assessing Student Learning. *Journal of Information Technology Education*, 2, 1–13.

Kotter, J. P. (1996). *Leading change.* Cambridge, MA: Harvard Business School Press.

Page, S. (2010). *The power of business process improvement*. New York: Amacon.

Papenhausen, Ch. & Parayitam, S. (2015). Business management simulations as a pedagogical tool to improve student's system dynamics thinking. *Developments in Business Simulation and Experiential Learning*, 42, 76–76.

Roman, M. (2009). Entreprises behavior in cooperative and punishment's repeated negotiations. *Journal of Applied Quantitative Methods,* (1)*,* 1–16.

Ruszkowska, A. & Wardaszko, M. (2016). Process-oriented research method for teamwork effectiveness assessment in business simulation games. *Developments in Business Simulation and Experiential Learning*, 43, 233–239.

Zapata-Tamayo, S. and Zapata-Jaramillo, C. M. (2015). Building social communities as a foundation for entrepreneurship: a game-based approach. *Developments in Business Simulation and Experiential Learning*, 42, 117–123.