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Team-based learning in business courses: The application of case studies and simulation games

María-Teresa Bolívar-Ramos, Andrea Martínez-Salgueiro

//Abstract

INTRODUCTION. A command of action-oriented disciplines such as business is not directly determined by knowledge level, but by the capacity to apply management and economic theories to the real world. This action-oriented nature has highlighted the insufficiency of traditional educational techniques for teaching purposes, based on readings and lectures, and has given rise to the appearance of alternative instructional methods such as those based on team-based learning (TBL). METHOD. The use of two key instruments is becoming increasingly widespread in business training: case studies and simulation games. RESULTS. As part of this study, both tools are subjected to an in-depth analysis in order to determine whether their use at the TBL application stage is an appropriate alternative, given the practical nature of this phase. DISCUSSION. Based on the evaluation of these techniques, our research suggests that their joint implementation can be particularly beneficial and may lead to better learning outcomes and skills acquisition, given that each produces different but equally valuable results.

//Keywords

Team-based learning; Simulation games; Case method; Business education; Strategic management.

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//Títol

Aprenentatge basat en equips en cursos de gestió d'empreses: l'aplicació d'estudis de casos i simulacions

//Resum

INTRODUCCIÓ. El domini en disciplines amb una gran orientació pràctica, com la gestió d'empreses, no està determinat directament pel grau de coneixement, sinó per la capacitat d'aplicar teories econòmiques i de gestió al món real. Aquesta naturalesa pràctica posa en relleu la insuficiència de les tècniques educatives tradicionals per a l'ensenyament, consistents en lectures i classes magistrals, i condueix a l'aparició de mètodes instructius alternatius, com els fonamentats en l'aprenentatge basat en equips (ABE). MÈTODE. Concretament, hi ha dos instruments l'ús dels quals s'ha anat incrementant en educació empresarial: els estudis de casos i les simulacions. RESULTATS. En aquesta investigació, els dos instruments són analitzats detalladament amb l'objectiu de determinar si el seu ús en la fase d'aplicació de l'ABE és una alternativa apropiada, atesa la naturalesa pràctica d'aquesta fase. DISCUSSIÓ. Basada en l'avaluació d'aquestes tècniques, la nostra investigació suggereix que la implementació conjunta d'ambdós instruments pot resultar especialment beneficiosa i desembocar en millors resultats d'aprenentatge i d'adquisició de capacitats, atès que cada un produeix efectes diferents i, al seu torn, valuosos.

//Paraules clau

Aprenentatge basat en equips; Simulacions; Mètode de casos; Educació en gestió d'empreses; Gestió estratègica.

//Título

Aprendizaje Basado en Equipos en cursos de gestión de empresas: La aplicación de estudios de casos y simulaciones

//Resumen

INTRODUCCIÓN. El dominio en disciplinas con una gran orientación práctica, como la gestión de empresas, no está determinado directamente por el nivel de conocimiento, sino por la capacidad de aplicar teorías económicas y de gestión al mundo real. Dicha naturaleza práctica puso de relieve la insuficiencia de las técnicas educativas tradicionales para la enseñanza, consistentes en lecturas y clases magistrales, y condujo a la aparición de métodos instructivos alternativos, como los fundamentados en el Aprendizaje Basado en Equipos (ABE). MÉTODO. Concretamente, existen dos instrumentos cuyo uso en educación empresarial se ha ido incrementando: los estudios de casos y las simulaciones. RESULTADOS. En esta investigación, ambos instrumentos son analizados en detalle con el objetivo de determinar si su uso en la fase de aplicación de ABE es una alternativa apropiada, dada la naturaleza práctica de esta etapa. DISCUSIÓN. Basada en la evaluación de estas técnicas, nuestra investigación sugiere que la implementación conjunta de ambos instrumentos puede resultar especialmente beneficiosa y desembocar en mejores resultados de aprendizaje y de adquisición de capacidades, dado que cada uno de ellos produce efectos diferentes y, a su vez, valiosos.

//Palabras clave

Aprendizaje Basado en Equipos; Simulaciones; Método de Casos; Educación en Gestión de Empresas; Gestión Estratégica.

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1. Introduction

The use of active learning methodologies in higher education as a way of enhancing student skills and involvement in the education process is continuously increasing. We are currently witnessing a shift from instructive methods, typically based on lectures, to techniques that foster students' active participation. As part of this approach, the instructor no longer acts as an expert, but instead plays the role of facilitator.

This study focuses on cooperative learning, specifically team-based learning (TBL), which can be defined as a large-group, peer-teaching strategy in which the student applies the course content to specific questions by working in small groups (McMahon, 2016). This technique consists of three stages (Abdalla, 2014): self-study, the readiness assurance process (RAP) and application. The most important of these is the application phase, which involves each group completing assignments on the topics covered in the two previous phases and ends with a large-group discussion (McMahon, 2016). The choice of this methodology is underpinned by the fact that teamwork is one of the most sought-after skills in the job market. Furthermore, it also leads to highly valued outcomes such as increased student engagement and performance.

After an introduction to the TBL methodology and a discussion of its pros and cons, this study specifically analyzes the application of TBL to business subjects such as strategic management. The study focuses on two activities that may be implemented during the application phase: case studies and computer and non-computer based simulation games. Both methods are considered mechanisms that can boost the potential benefits of TBL in a business context, and further research is thus required in order to understand the dynamics that lead to increased individual and team performance (Bernardo et al., 2016; Karagozoglu, 2017). Our study contributes to the literature that highlights the huge potential of TBL in business education. It proposes the use of novel methodologies during the application stage and demonstrates their usefulness for a successful instructive process.

The following sections will examine the abovementioned topics. Section 2 provides an overview of the TBL methodology. Sections 3 to 5 discuss the use of case studies and computer/non-computer games as TBL techniques. Finally, the study's key conclusions and limitations and future research lines are presented.

2. The team-based learning (TBL) methodology

TBL overview: origins, concept and stages of the process

For a long time, it was common to teach courses in different fields of expertise through lectures alone; these involved the instructor delivering information to students through passive learning as a means of promoting knowledge acquisition (Wolff, Wagner, Poznanski, Schiller & Santen, 2015). Although this method is especially valuable for explaining the basic theories and fundamentals of a given course, its effectiveness in fostering student learning may be limited. As many studies have shown, students learn little when they simply listen to lectures, and much more when they are engaged, discuss ideas and apply learning principles (Huang & Lin, 2017).

Instructors have considered various teaching methods to help students learn through working together in groups (Sisk, 2011). Remarkably, as Chickering and Gamson anticipated in the 1980s: "learning is enhanced when it is more like a team effort than a solo race. Good learning, like good work, is collaborative and social, not competitive and isolated. Working with others often increases involvement in learning. Sharing one's own ideas and responding to others' reactions sharpens thinking and deepens understanding." (Chickering & Gamson, 1987, p.3).

TBL was first implemented in the 1970s by Larry Michaelsen, in the context of a business school (Gullo, Ha & Cook, 2015; McMahon, 2010). Later, its popularity increased and its use became widespread in other fields such as medicine, engineering, natural sciences, nursing, IT, mathematics and humanities (Sisk, 2011).

TBL is an instructor-directed methodology that entails active collaborative learning, which favors the application of knowledge through discussions in small groups (Abdalla, 2014). In particular, TBL is a methodology designed to support the development and improvement of high-performance teams and to provide opportunities for teams to participate and engage in a sequence of learning tasks (Michaelsen, Knight & Fink, 2002).

This collaborative learning strategy is typically designed around modules, or units of instruction, which are taught through a process that involves three key stages (Abdalla, 2014; Team-Based Learning Collaborative, 2017):

1. *Preparation / Self-study*. Students read and prepare materials that have been carefully selected, prepared and proposed by the instructor and are related to a specific topic. This phase is frequently conducted outside the classroom.

2. *In-class readiness assurance test (RAT)*. There are ready assurance tests at the individual and team level (usually based on multiple-choice questions). This approach, which is taken into consideration for assessments, provides students with an incentive to arrive at sessions prepared, attend classes and participate in group discussions.

3. *Application-based exercise*. The rest of the session focuses on the team discussion of exercises or case studies that involve the direct application of the content reviewed during the previous two stages. Students face a challenge and, based on a consensus, are required to choose and provide the most appropriate solution from a selection of alternatives. Finally, the instructor leads a classroom discussion to analyze the topic and any additional issues that may arise. This is the most critical phase, as students genuinely acquire and consolidate new knowledge by considering a specific problem posed to them, first in teams and then through a large-group discussion (McMahon, 2010).

In addition to the stages involved in the implementation of this methodology, some basic notes regarding the underlying dynamics of the process are also worth mentioning. First, students are usually grouped into teams of five to seven learners (Sisk, 2011). Second, the role of the instructor as facilitator is key, especially during the application stage, when it is

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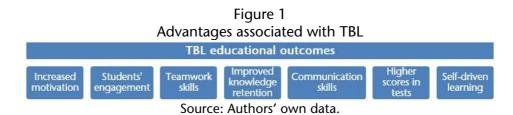
essential to create a dynamic discussion to help learners understand key concepts related to the problems to be solved (Gullo et al., 2015). Third, the rules of the "four S's" should be followed: the assignment must be "*significant* to the student, the *same* for all students, designed to make a *specific* choice, and reported *simultaneously* to the teams" (McMahon, 2010, p. 58). Thus, it is easier to create a stimulating learning environment that favors a high degree of participation and student engagement during the application stage (Gullo et al., 2015). Finally, it is important to note that the implementation of TBL takes place in accordance with the following principles: team formation and maintenance, student accountability and incentive, feedback, and team development and peer teaching (McMahon, 2010).

Advantages of TBL

In the field of higher education, emphasis is currently being placed on adopting teaching methodologies that foster abilities such as knowledge sharing, analytical skills, collaborative work and communication skills, among others, to prepare students for today's complex changing environment (Huang & Lin, 2017). In such contexts, multiple studies have highlighted the fact that the TBL methodology can have numerous beneficial effects for students' educational outcomes, including increased motivation and improved skills, learning and performance (Abdalla, 2014; Michaelsen et al., 2002), as discussed below.

Haidet, Kubitz and McCormack (2014) reviewed 40 articles in the TBL literature and provided evidence that TBL has positive effects on educational outcomes related to knowledge acquisition, engagement, participation and overall team performance. In another systematic research review on TBL that included experimental, descriptive and explanatory research from 2003 to 2011 in the fields of medicine, business and education, Sisk (2011) concluded that TBL is usually perceived as a satisfactory active learning method by most students, compared to passive learning through lectures. In addition, TBL improves student engagement and examination scores. Nevertheless, the author stresses the need to carry out further experimental studies to verify that TBL positively influences test scores and other learning outcomes.

In an explorative analysis, Huggins and Stamatel (2016) indicated that, although students performed almost the same in TBL and traditional lectures, those engaged in TBL perceived a higher attainment of creative thinking and oral communication skills. In another recent study, Huang and Lin (2017) used qualitative and quantitative data from two human resource management classes in Taiwan to corroborate that, when TBL is implemented, there is a positive relationship between the students' motivation, enjoyment, perceived value of group members' contributions, and learning outcomes. Figure 1 summarizes the findings established in the previous literature.

Figure 1
Advantages associated with TBL

Source: Authors' own data.

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Overall, TBL represents a useful instrument for supporting good practice in high-level education, based on encouraging contact between students and instructors, developing collaboration and reciprocity among students, and providing useful feedback (Chickering & Gamson, 1987). As mentioned above, its positive effects on student test performance, motivation, engagement and teamwork skills make this method especially effective for developing the abilities and competencies required in the professional world (Huang & Lin, 2017). Moreover, the methodology also has some benefits for faculty members, since it promotes greater collaboration and interaction among instructors to prepare materials (Thompson et al., 2007). However, there are potential problems associated with the implementation of this method, as addressed below.

Challenges associated with TBL

Although TBL is a valuable methodology, it also has some drawbacks. Based on their experience, Michaelsen et al. (2002) highlighted some of the most common negative feelings presented by students involved in TBL: a) complaints about doing most of the work, when everyone in the team receives the same mark ("not fair"); b) some colleagues in the team just do not care about the work, which creates conflict for students engaged in the methodology; and c) no meetings outside the classroom to prepare the proposed tasks.

With respect to faculty members, instructors may also face some challenges when trying to adapt their courses to TBL due to the initial high workload associated with learning the method and preparing teaching materials (Haidet et al., 2014). In addition, sometimes they may perceive that there is insufficient administrative support (Thompson et al., 2007).

To counteract these negative effects and thus increase the acceptance and successful implementation of this method, it may therefore be important to offer quality training programs for teachers, continuously expose students and professors to this methodology, and ensure that there is sufficient investment (Abdalla, 2014). Moreover, future studies are recommended to provide greater clarity and verify the efficacy of TBL through the use of experimental studies, since previous research has given rise to contradictory results relating to some educational outcomes (Sisk, 2011).

Despite these potential downsides, TBL is still widely perceived as a methodology that enhances student performance, not only by transforming theoretical concepts into applied sessions, but also by reinforcing learning opportunities through interaction, cooperation and the accomplishment of team goals (Haidet et al., 2014; Huang & Lin, 2017). We will now analyze how the use of case studies and computer and non-computer games as TBL techniques can help improve student education in the context of business courses. To that end, we will first define and conceptualize such learning methodologies.

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3. Computer and non-computer based simulation games: concept and definition

There are two main types of simulation game: computer and non-computer based. The former can be classified into three different forms (Lean, Moizer, Towler & Abbey, 2006): gaming, which is the category examined in this study; training; and modeling simulations. With respect to non-computer based simulation games, there are two types: role play and educational games. Both are addressed in this research.

A business gaming simulation is defined as "a software that models and simplifies the reality, useful for the learning of certain concepts and abilities, which measures the quality of decisions based on the results derived from the competitive and dynamic interaction between its participants" (Blanco Callejo & García Muiña, 2007, p. 3). Gaming simulations present relatively realistic business situations and management functions. Players are then organized into teams and have to make decisions on one or more functional business areas. After that, they receive feedback on the results of the measures undertaken and continue making decisions and discovering how things work in the particular environment through experience (Jackson, 1959).

With respect to the two types of non-computer based simulation game, role play is defined as "an 'as-if' experiment in which the subject is asked to behave as if he [or she] were a particular person in a particular situation" (Aronson & Carlsmith, 1968, p. 26). For their part, educational games are described as instruments designed for both learning and entertainment. They are expected to boost all thought and decision-making processes that make a game engaging or not (Educational games, n.d.). Although there are four types of non-computer based simulation game, this study focuses on the specific formats of board and card games due to their extensive use in business training.

4. The case method: concept and definition

The case method is a teaching technique that consists of presenting students with cases in the form of narrative texts in order increase students' problem-solving skills. Its use is very popular in business education (Merrian, 1998). This methodology presents two main characteristics (Wassermann, 1999):

- *Team work*. Students work in small teams, which gives them the opportunity to exchange different opinions about the critical questions posed at the end of the case.

- *Active role of the instructor*. The instructor is responsible for conducting the discussion and helping students analyze problems correctly. Furthermore, given that cases increase motivation, additional information sources are often available.

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5. Application of computer-based simulation games and the case method in strategic management courses

Strategy/policy is one of the disciplines in which the use of gaming simulations (Faria & Wellington, 2004) and cases is most widespread. In fact, a wide variety of articles analyze different aspects of its application within this area of study. There are two specific investigation types that can be conducted to determine the effectiveness of both instructional tools: substantive evaluations, based on a comparison of the method under study against other available teaching techniques; and procedural evaluations, which focus on analyzing the practices and procedures of the specific technique that yields the best results (Wolfe, 1997). The following subsections address both types of investigation applied to strategic management courses.

Substantive evaluations in strategic management training

The synonymous terms "strategic management" and "business policy" usually refer to "capstone" courses, which are implemented in most business schools and provide a realistic overview of how businesses really operate (Wheelen & Hunger, 2011). This section focuses on this specialty.

Although evaluations based on student perceptions of the instructional techniques under analysis also exist, this investigation addresses exclusively the results derived from the application of objective measures. The evolution of this branch of research has been strongly affected by the different criteria used for measuring the effectiveness of the instructional techniques analyzed, which have evolved from general to more specific. The first appraisal criterion applied was knowledge and skills (Raia, 1966). Throughout the 1970s, several studies used three novel dimensions to evaluate performance: overall course knowledge and conceptual and fact mastery (Wolfe, 1973; Wolfe & Guth, 1975). A new criterion based on goal-setting skills was introduced by Wheatley, Hornaday & Hunt (1988) the following decade. More recently, Mitchell (2004) implemented four new dimensions for the assessment of the effectiveness of teaching: diagnosis, strategy formulation, strategy implementation and strategic thinking. And finally, Blackford & Shi (2015) suggested a novel measurement of outcome that consisted of a standardized assessment of all disciplines related to the business field.

Overall, despite the different criteria employed, most studies produced positive results for both gaming simulations and the case method, either to be used jointly or to complement the traditional methodology.

Procedural evaluation of strategic management training

Several studies on the practices and procedures of gaming simulations and the case method in strategic management training have been published in recent decades. One of the variables that have been subject to thorough research is game complexity. Raia (1966) and Wolfe (1978), among others, have researched this topic and obtained contradictory results. While the former observed no significant differences between two groups

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participating in gaming simulations with different complexity levels, the latter concluded that more complex games lead to greater knowledge gains. Cannon, Friesen, Lawrence & Feinstein (2009) recently proposed the simplicity paradox, which states that the simplifying mechanisms introduced by Cannon (1995) to decrease game complexity actually lead to higher levels of difficulty. They concluded that game designers need to adapt the complexity level of simulations to the specific needs of students.

Team performance is another critical factor that influences gaming simulations and the effectiveness of the case method. With respect to the former, Wolfe & Chacko (1982) evaluated the importance of the team size variable and reached the conclusion that the highest learning levels take place in teams with three or four members. Concerning the case method, Karagozoglu (2017) analyzed the factors involved in team performance and indicated that advance preparation is positively related and diversity negatively related to this measure.

6. Application of non-computer based simulation games in business subjects

Despite the shortage of literature on the application of both non-computer based instruments in strategic management training, the following subsections address some studies concerning their use in other business disciplines, whose generally positive results might be indicative of the feasibility of implementing such tools in other business courses, such as business policy. Most of the studies included are based on student perceptions, and some also analyze procedural factors.

Evaluations of role play

Brown (1994) was among the first to investigate the use of role play in the business discipline by applying this instrument to a financial management course with the objective of teaching financial principles and posing serious ethical questions. Indeed, the instructional method generated very positive perceptions among students. Some years later, Paul and Mukhopadhyay (2005) designed an international business course consisting of several experience-based activities, three of which included role play. Only one activity did not produce statistically significant results based on student perceptions. More recently, Barnabè et al. (2013) introduced a role-play game in supply chain management training. Despite its usefulness, the authors pointed out that the game should be used in conjunction with other traditional tools and educational approaches.

Evaluations of educational games

Accounting is one of the disciplines that have received most attention with respect to the use of board and card games, especially in recent years. There are two key findings of the research on this topic (Lázaro-Gutiérrez, Barainca-Vicinay & Bilbao-Goyoaga, 2017; Moncada & Moncada, 2014): 1) student perception of educational games in accounting courses are generally very positive; and 2) such games are very useful from an educational point of view.

However, educational games have been implemented in disciplines other than accounting. For instance, Bernardo et al. (2016) applied a board game to a quality management course, which was also perceived very positively by players.

7. Concluding remarks

This study has analyzed the effectiveness of computer-based simulation games and the case method as instructional methods that could be implemented during the TBL application stage of business courses, such as strategic management, given its practical nature. The literature seems to indicate that both techniques are more effective than the traditional method and several studies have concluded that gaming simulations are more effective than the case method. However, there is no clear consensus, and some authors argue that both techniques should be used in conjunction or as a teaching support for the traditional methodology, given that they produce different but equally valuable effects. It is therefore potentially beneficial to use both instructional tools during the TBL application stage[1], since this could lead to better learning outcomes and skills acquisition. Furthermore, the results of the different procedural evaluations included in this study highlight the importance of paying attention to the practices and procedures employed when applying both instructional tools to ensure optimal learning results.

Although more attention has been paid to the abovementioned methods, non-computer based simulation games have also been addressed in this study. The results of studies on either role play or board and card games have shown that their implementation is generally successful in other business disciplines. Therefore, the use of these methods should also be considered for the TBL application phase.

Regardless of the positive statements often found in the literature about the use of the tools under study in business subjects, the results actually depend to a great extent on a set of contextual factors, and the conclusions and outcomes reached are therefore sometimes not directly comparable. For instance, cultural aspects can play an important role in the success of a teaching style or educational instrument. The instructor's personality and support can also determine and influence the results attained. Therefore, this study should ideally be based on

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[1] Several studies have addressed the possibility of combining cases and simulation games in strategic management courses (Anderson & Woodhouse, 1984; Keys & Bell, 1977; Mitchell, 2004; Raia, 1966). Our proposed methodology is very similar to that proposed by Keys & Bell (1977), who, after dividing the class into small teams, applied a business policy game and three case studies in a business policy course. Concretely, game decisions were applied throughout the whole quarter and cases were interspersed over that period. We consider that this is an appropriate methodology, since a preliminary and final six-question business policy essay test, which assessed fact, principle mastery and overall learning, indicated that the groups improved in all three dimensions measured. However, our proposed teaching technique includes one important new feature, i.e., implementation of the TBL methodology based on the use of both the case method and business games during the application stage, as the main instructional tool in business subjects. First, the preparation phase starts with self-study of materials that have previously been prepared by the instructor. For instance, in a strategic management course, these materials could consist of information on industry analysis or corporate-level strategy. The in-class session then begins with the readiness assurance test, which deals with topics related to the previously distributed materials and is carried out on an individual basis and in small teams of three or four members. The application phase then takes place. Specifically, we suggest a combination of sessions in which the case method is applied with classes consisting of the use of business games. Ideally, the use of the two methods should be distributed in a balanced way, given that they produce different outcomes. In fact, as the study carried out by Anderson and Woodhouse (1984) reveals, the application of simulations is suitable for "accomplishing skill objectives related to direct implementation issues" while cases are seen as more effective "at improving communication skills." Consequently, the distribution of the different instruments should be designed with due regard for the outcome that needs to be fostered. Finally, the instructor conducts a large-group discussion, which focuses on the key concepts that students are required to learn.

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evaluations performed under very similar conditions. In fact, although all of the studies analyzed in this research fulfill similar requirements, there is always some degree of heterogeneity. Thus, although this study supports the use of simulation games and the case method in the TBL application stage, the actual implementation of these techniques does not necessarily lead to optimal learning results, and other aspects need to be considered.

Concerning future research, an empirical study in which the different instructional methods are implemented during the application stage of the TBL teaching technique would be useful in order to quantify their specific contribution.

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