Research Article

Gamification in Management Education: A Systematic Literature Review

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Abstract

Quality of teaching is increasingly important for the success of educational institutions. In this context, gamification is a tool often used to improve the teaching-learning process by helping both teachers and students reach their goals in the short, medium and long term. Given the importance of the topic both in academia and society, this article presents a systematic review of the literature on the use of gamification as a tool to enhance the quality of the teaching process in general, and, in particular, the teaching of management. The study searches the most relevant literature on the application of gamification to educational contexts and describes gamification's main themes and constructs based on a systematic literature review of scholarly articles available in ISI Web of Science and Scopus databases. One of the main results of this study is to describe theoretical approaches to gamification and provide a conceptual model that gathers the contribution of various studies and paves the way for future research.

Keywords: gamification; game-based learning; education; management.

Introduction

Like any organization that wants to improve the quality of its services and products, educational institutions have the responsibility to ensure that their students get quality education at all levels (Yildiz, 2014). Educational institutions as well as instructors are expected to fulfill their obligations with the utmost quality so that future generations can be well prepared to go into the labor market (Hill, 1995). It is generally accepted that the quality of teaching is essential for the success of an institution and of its students; therefore, it is important to assess and monitor the quality of teachers' work (C.-Y. Chen, Chen, & Chen, 2014). Experts on education and, more specifically, on the quality of education, have been working hard to improve the quality of the teaching-learning process at all levels and in various aspects of the curriculum (Langstrand, Cronemyr, & Poksinska, 2015).

It is vital that teachers motivate their students, making them aware of the fact that what seems difficult is not always necessarily so. At the same time, instructors have to know that traditionally established methods are not always the ones that attract students the most. In fact, although many instructors favor the use of innovative methodologies, there is a broad and empirically verified consensus that student motivation and interest for traditional teaching methods are scant because they are deemed ineffective (Lee & Hammer, 2011).

The use of educational games as learning tools constitutes an approach that can strengthen not only student knowledge but also their ability to communicate and cooperate with schoolmates in what concerns the understanding of learning content (Hamari, Koivisto, & Sarsa, 2014). The use of games in the classroom may help students acquire new study methods, making them feel more motivated than when they are exposed to more traditional teaching-learning processes (Kapp, 2012b). Yet, only recently have instructors begun to explore the possibility of turning the classroom into a place where educational games are not only possible but also feasible, effective and academically enticing (Glover, 2013).

Although several studies have tested gamification in general, and, in particular, the use of educational games in the classroom, from primary education to higher education (Deterding, 2012; Hamari et al., 2014; Hamari & Koivisto, 2015), more empirical studies are necessary to actually demonstrate the effectiveness of such approach. Studies should be based on well-designed methodologies, robust comparison groups, longitudinal treatments and empirically validated assessments (Hamari et al., 2014). In the field of management, studies that show how game-based learning may have a positive influence in education are still scarce. Moreover, despite its motivating power in making students get involved, gamification faces serious problems that have to do with designing and applying games to teaching (Conway, 2014). As a matter of fact, it is both difficult and expensive to use games in the classroom, since it implies having suitable technical infrastructures and pedagogic integration at one's disposal.

This article presents a number of results about game-based learning in order to highlight more adequate and effective trends and practices. As this is a recently developed subject, there is still the possibility to expand already available knowledge through literature reviews (Hamari et al.,

2014; Martí-Parreño, Méndez-Ibáñez, & Alonso-Arroyo, 2016; Nah, Zeng, Telaprolu, Ayyappa, & Eschenbrenner, 2014; Surendeleg, Murwa, Yun, & Kim, 2014). The main goal of this article is to develop a conceptual research model of applying games to management education based on a systematic literature review that focuses on the most relevant literature regarding the application of gamification to educational contexts in order to grasp gamification's main themes and constructs.

As the use of games in the teaching-learning process is a promising tool to effectively motivate students and get them involved, and as most of the research conducted so far has failed to provide a compelling literature review on the subject and a conceptual research model, the present article may help researchers have a better understanding of how research pertaining to this field has been evolving. The analysis herein made it possible to identify and show how games are used in an educational context, as well as what their contribution is to increase motivation, flow, and attitude, besides proving its effectiveness in terms of the learning process. The scholarly literature on the use of games in the teaching-learning process was organized, and the most relevant constructs were identified along with how they relate to and interact with each other, thus allowing future research to use this study as a starting point.

The present article contributes to the advancement of the literature about the application of gamification to the teaching of the various areas of Management. We did a systematic review of the literature based on rigorous criteria presented in the methodology section, followed by a review of the literature of the main topics in this area, such as gamification in general, gamification applied to general education and in teaching of Management. There is also a section addressing the main constructs of gamification. We conclude that motivation, flow, attitudes and perceived learning are the most relevant constructs, and we verify the type of causal relations between them. Finally, we discuss the conceptual research model resulting from the literature review.

Research Methodology

Research applied to game-based learning in management education is a very interesting area that motivated systematic literature reviews (e.g., Connolly, Boyle, MacArthur, Hainey, & Boyle, 2012; Darejeh & Salim, 2016; Johnson et al., 2016; Sardi, Idri, & Fernández-Alemán, 2017). Thus, the present study and the methodology underlying it are based in other studies that ensured systematizing the literature (Armitage, Webb, & Glynn, 2016; Kitchenham et al., 2009; Patel et al., 2008; Tranfield, Denyer, & Smart, 2003). Only articles in journals indexed by ISI Web of Science (WOS) and SCOPUS databases were used, since they are the most acknowledged and used for such purposes (Podsakoff, Mackenzie, Bachrach, & Podsakoff, 2005).

Data gathering took place in December 2017, without any chronological filter, and it resorted to Web of Science TM Core Collection (WOS) and Scopus (SCO) databases. The keywords used for the three separate searches were Gamification, Gamification and Education, Gamification and Management. The reason was to gather as many articles as possible on the field and sub-areas of management, making sure the articles that were selected covered the topic as extensively as possible. The outputs were successively filtered, until we had only peer-reviewed articles. Books, proceedings and non-scholarly documents were excluded.

In terms of areas covered by the databases, they are organized in different ways, with WOS having Management, Economics and Business, and SCO having two large groups: Economics, Econometrics and Finance, and Business, Management and Accounting. In the first methodological stage, the present study focused on gamification in general (Gamification), cross-referencing it with game-based learning (Gamification and Education) and management (Gamification and Management). The result were 565 articles in WOS and 701 in SCO. The outputs of the two databases were then cross-referenced, and duplicates were excluded, resulting in 841 articles. Then, the following inclusion criteria were established: (a) articles on game-based learning, and (b) review articles and literature roadmaps on the use of gamification. After perusing abstracts and/or complete articles, 597 of the latter were excluded and 244 included. The 244 articles that were selected in WOS and SCOPUS were published between 2012 and 2017. We then proceed to content analysis in three stages.

In the first stage, all abstracts, literature review, and final considerations were read and a document was created to contain the most relevant information extracted from those sections of each article. Subsequently, a chart was developed to present all subjects approached and the main conclusions (Beelmann, 2006). Finally, the contents were divided according to the main constructs in order to create a text that could provide an explanation of the main theoretical approaches for each subject related to gamification applied to the teaching-learning process, and the conclusions that had been drawn. Figure 1 presents the research layout that led to the final set of articles.
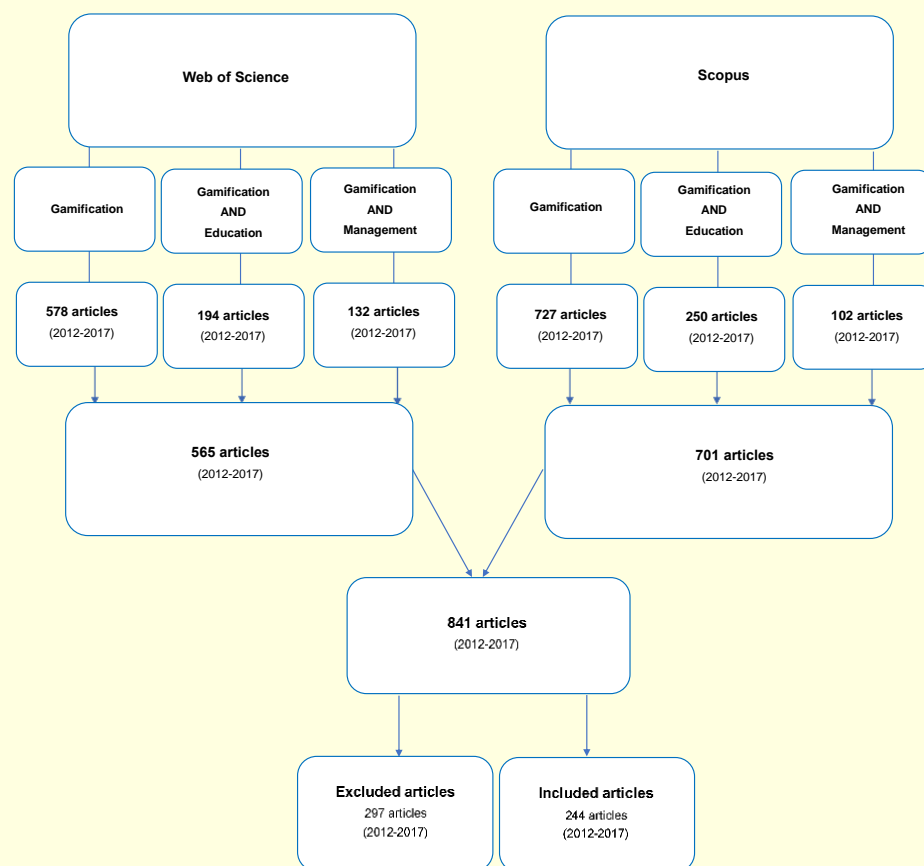

Figure 1. Review design

Systematic Literature Review

Gamification

Since 2010, gamification has arisen to increase an individual's involvement, motivation and attitude by using games in non-game contexts (Deterding, Sicart, Nacke, O'Hara, & Dixon, 2011). Gamification was first used in marketing and later implemented in other areas like health (Schoech, Boyas, Black, & Elias-Lambert, 2013), environment (Filsecker & Hickey, 2014), sports (Koivisto & Hamari, 2014), engineering (Huotari & Hamari, 2017), mathematics (Attali & Arieli-Attali, 2015), computer science (Domínguez et al., 2013), biology (Su & Cheng, 2015), communication (Hanus & Fox, 2015), and psychology (Landers & Landers, 2014). Gamification is typically described as the use of elements of game design in non-game contexts (Deterding, Dixon, Khaled, & Nacke, 2011; Koivisto & Hamari, 2014; Werbach & Hunter, 2012). Still, research must continue to happen on the theoretical bases, broader goals and more consistent empirical practices on the subject (Deterding, Dixon, et al., 2011), as well as on the impact of application on other areas (Zichermann & Cunningham, 2011).

The aim of gamification is to support and motivate users to perform a given task (Deterding, Sicart, et al., 2011; Domínguez et al., 2013; Huotari & Hamari, 2012), engaging them in the activities (Csikszentmihalyi, 1990; Deci & Ryan, 1985; Deterding, Sicart, et al., 2011; Hamari, 2013; Ryan, Rigby, & Przybylski, 2006), and to foster their interest in a certain area that may enhance learning (Huotari & Hamari, 2012). In an educational context, gamification has a great potential to motivate students, making the school environment more attractive (Lee & Hammer, 2011), since it is a process aimed at improving educational activities (Gibson, Ostashewski, Flintoff, Grant, & Knight, 2015; Lee & Hammer, 2011; Werbach & Hunter, 2012). As such, the idea that game-based learning only involves playing makes is a limited one; learning should not be a dull experience, but a motivating and pleasant one (Wu, 2011). Several authors agree on the benefits of gamification to a target audience (Stott & Neustaedter, 2013), because games allow users to err and try again, facing learning without fear, and consequently becoming more involved in the learning process (Lee & Hammer, 2011).

The feedback students get from their teachers is very important to help them progress and move to the next level (Kapp, 2012a), thus mastering due contents. Gamification promotes student motivation and engagement (Clark & Rossiter, 2008), as well as interest and improvement (Camilleri, Busuttil, & Montebello, 2011; Kapp, 2012a). It is possible to say that the number of people who use a certain game-based resource may have a positive impact on the users' motivation, who are more likely to continue using it (Lin & Bhattacherjee, 2008). In general, findings on the impact of gamification take on several forms that can be positive, negative, mixed or even null. This is due to gamification not influencing all participants alike. Nevertheless, it has been considered beneficial by several authors (Brunsell & Horejsi, 2011; González & Area, 2013; Hellwege & Robertson, 2012; McGonigal, 2011; Muntean, 2011).

When one looks into the studies that are most frequently cited in the literature, it is possible, according to Domínguez et al. (2013), to find examples of motivation increase, at an early stage, but also of bad performance, as well as of an increase of interest shown by users of a marketing game (Downes-Le Guin, Baker, Mechling, & Ruyle, 2012), or the various effects of using game-based resources (Gäsland,2011; Witt, 2011). Other studies have drawn attention to the fact that there are demographic differences regarding gamification impacts and effectiveness. Bagley (2012) concluded that age and familiarity with games increase users' interest in such resources, while McDaniel and Fanfarelli (2016) claim there is no gender-related difference in the impact of gamification. Demographic differences are relevant indeed when one looks into the use of game-based technology (Venkatesh, Morris, & Ackerman, 2000), as some of the differences regarding perception and motivation to use technology have shown that the intent to use may change, or not, according to demographic factors (Venkatesh et al., 2000). Researchers have not paid much attention to age and gender as variables that may influence the use of such resources as games, but they may account for differences in the use and motivation to use (Greenberg, Sherry, Lachlan, Lucas, & Holmstrom, 2010; Griffiths, Davies, & Chappell, 2003; Williams, Yee, & Caplan, 2008). Other studies have shown that feedback on progress has improved learning and has reduced failure rates (Bellotti et al., 2013).

Charles, Charles, McNeill, Bustard, and Black (2011) applied gamification to an entrepreneurship course, using incentives that were proportional to each player's success. It allowed students to get a better learning and achieve higher levels of motivation, although they participated less in classes that followed a traditional model. Hamari and Koivisto (2014) concluded that gamification involves an aspect of novelty that tends to wear off over time. And, according to Deci, Koestner and Ryan (2001), rewarding the effort and success, as it happens with games, increases motivation; on the other hand, others think that performing a task that is in itself interesting and being rewarded for it may hinder motivation (Lepper, Greene, & Nisbett, 1973; Ryan & Deci, 2000a). Also, gamification in the classroom helps increase intrinsic motivation (McGonigal, 2011), thus it should be used and promoted. However, the use of rewards, which usually recognize one's skills and knowledge, does not always motivate students (Abramovich, Schunn, & Higashi, 2013; Hickey & Rehak, 2013; Landers & Callan, 2011; Muntean, 2011).

Hamari, Koivisto and Sarsa (2014) think there are not enough studies that provide information on the differences between using gamification and not using it (such as in a control group), so that it is possible to understand what happens within each group. Although the applications of gamification are promising, there is the need for more empirical evidence of its usefulness and ability to increase the interest of those who use it in an educational context. Gamification is then a concept that is still being developed and one that shows there is room for improvement concerning its real effects (Kapp, 2012a).

Gamification in education

Over the years, there have been attempts to apply game-based learning to education in order to stimulate students to behave well towards education (Denny, 2013). The goal is to make students

participate in all activities that have to do with the various learning areas, encouraging them to use teaching aids that appeal to them (Denny, 2013; Domínguez et al., 2013; Moccozet, Tardy, Opprecht, & Léonard, 2013; Simões, Redondo, & Vilas, 2013).

The game-based structures that have been applied to education resort to badges and rewards to recognize student improvement based on a classification system that assesses the skills and levels of knowledge evidenced by players during the game. The classification system uses competitiveness as the force behind the game's dynamics in the form of charts and ranking lists that rank students in ascending order (C. Li, Dong, Untch, & Chasteen, 2013). Although rewards promote competitiveness, interest and motivation among students, the rivalry they are likely to cause can also produce negative results (Zichermann & Cunningham, 2011). That is why game-based education has to deal with some important challenges, of which the most important one is to get students accept this kind of learning environment before it can be said to be successful. Therefore, the goals, the type of feedback and the rewards must be clearly defined, keeping the students immersed in a flow of positive and individually involving learning (Csikszentmihalyi, 1990). This is essential if students are to be always kept engaged and informed of the progress they have made and that has contributed to their satisfaction and academic achievement (Trowler, 2010).

For Kahu (2013), student engagement in activities may be divided into three major components, called behavioral, cognitive, and affective. Behavioral involvement is the positive behavior shown by students who take part in learning activities demonstrating effort, persistence and attention and no sign of a negative, deviant behavior (Finn, Pannozzo, & Voelkl, 1995). Cognitive involvement refers to students' investment in mastering a certain subject (Fredricks, Blumenfeld, & Paris, 2004).

As for affective involvement, it has to do with students' willingness to perform the tasks that have been assigned to them, showing their interest through positive attitudes (Appleton, Christenson, & Furlong, 2008). It is possible to use game-based resources in a formal or informal school context, provided that there is some level of involvement for, according to Denny (2013), this type of resources contributing to raising participation in learning activities.

Many authors have created and tested tools in an educational context. Domínguez et al. (2013) created a game-based service that rewarded the best players by giving them badges and prizes, according to their ranking in the classification charts. This idea, however, caused some discomfort among the students. Unlike what happened with a group of college students during an electro-mechanics class, the students who used game-based resources behaved in a more confident way and were prouder to publicly show their achievements than those who chose not to use them (Foster, Sheridan, Irish, & Frost, 2012). But one should bear in mind that students need their instructor' help to feel motivated in the classroom (extrinsic motivation), and that prizes and rewards are but a way to stimulate the competitive spirit among students (McDaniel, Lindgren, & Friskics, 2012).

Another teaching aid based on the principles of gamification designed to help students prepare for finals was considered useful and easy to use. However, the game-based elements did not reach the intended goals due to the nature of the task (studying), the way the task was presented to the students (without any prospect of fun), and the fact that the aims of using such tool were not properly explained (Gåsland, 2011). Goehle (2013) created an electronic application that included several game-based elements, whose purpose was to assist home teaching. In spite of students believing that the system made them feel more appreciated for their effort, it was not possible to prove how using the tool impacted their performance. W. Li, Grossman and Fitzmaurice (2012) developed a tutorial system to help students access AutoCAD using several strategies like assignments, scoring (both numerical and visual through stars), various game levels, time pressure for problem-solving and rewards or bonuses. The authors were able to ascertain the strategy has increased the students' engagement, entertainment and performance.

According to Klopfer, Osterweil and Salen (2009), all educational games should rely on certain mechanics and dynamics. Game mechanics are constructs of rules and rewards, whereas dynamics consists of the wishes and emotions the game awakens in the players. Some authors (e.g., Lee & Hammer, 2011; Linehan, Kirman, Lawson, & Chan, 2011) have drawn attention to a number of rules that must necessarily be part of a game: allowing the repetition of experiences so that a goal may be attained, including immediate feedback on performance during the game, allowing different opportunities for success, and awarding good performance.

It is critical that one realizes the importance of using games in an educational context, but bearing in mind that it must satisfy both students and instructors. The use of games should give instructors the opportunity to create challenges that are suitable for the students' level of knowledge, raising the level of difficulty as new skills are acquired (Kuh, Kinzie, Schuh, & Whitt, 2011); create new ways to enable students to reach intermediary goals during the learning process (Biggs, 1999); provide students with feedback on learning by designing new tasks with higher levels of difficulty (Huang & Soman, 2013); use failure as part of learning; use the trial–and-error method for the successful completion of tasks, and not resorting to penalties (Hattie & Timperley, 2007); allow students to take on new identities and play different roles that let them explore different aspects of their personality (Banks, 2008); and use competitiveness among students as a means to promote learning (Schuler & Jackson, 1987).

As previously stated, education and learning have been the stage of many gamification experiences, and some positive results stemming from the application of game-based strategies have been identified, concerning the students' interest and motivation. In fact, authors like Hamari et al. (2014) claim learning and flow are guaranteed in such cases, although they also recognize the need for more studies regarding effective learning in various fields of knowledge. It is clear that the mere use of game-based mechanisms, no matter the area of expertise, does not assure that learning goals will be achieved (Dicheva, Dichev, Agre, & Angelova, 2015).

Gamification in management education

Monopoly was the first board game used in higher education in the area of Management. It soon became popular to play it at home as a cooperative game (Whitehill, 1999). In the mid-1950s, under the influence of what happened during World War II and the appearance of mainframe computers, the American Management Association came up with a simulation called Top Management (Cohen & Rhenman, 1961), followed by a game whose purpose was to become a backup tool for a Business Studies and Politics course (Albrecht, 1995). By that time, many were the management decision games being used at the universities of Michigan, California, Pennsylvania and Indiana (Cohen & Rhenman, 1961). Several adaptations of the games emerged focusing on decision-making in specific business areas, such as Operations Research, General Administration, Marketing Strategies, and Management Accounting.

In Accounting, several concepts were approached, and instructors were encouraged to use creative methodologies and adopt technology-based teaching (Fratto, 2012). Several adaptations of Monopoly were then made available (M. M. Tanner & Lindquist, 1998), and spreadsheets and word processors were used to create quiz-type games (Moncada & Moncada, 2014). Game-based activities, focusing on improving learning in Financing Accounting courses became usual, adapting other games and turning them into tools that, in spite of having not been specifically designed for teaching Management in general and, in particular, Accounting, they were nevertheless effective. Adaptations of Jeopardy (Cook, 1997) with the help of PowerPoint (Murphy, 2005) and Excel (Bee & Hayes, 2011) led to the creation of teaching aids that, even if being quite simple, helped improve practices and revise concepts in accounting (Moncada & Moncada, 2014). More recently, several game-based resources have been applied to various other areas of Management (Avramenko, 2012; Ceschi, Dorofeeva, & Sartori, 2014; Dias, 2017; Fitó-Bertran, Hernández-Lara, & Serradell-López, 2014), such as Marketing (J. R. Tanner, Stewart, Totaro, & Hargrave, 2012), Entrepreneurship (Antonaci et al., 2015; Arias Aranda, Bustinza Sanchez, & Djundubaev, 2016), Industrial Production (Müller, Reise, & Seliger, 2015), Tourism (Adukaite, Zyl, Er, & Cantoni, 2017; F. Xu, Buhalis, & Weber, 2017), Innovation (Yalabik, Howard, & Roden, 2012) and General Administration (Kumari, 2019).

Also, several authors have tested different business simulation platforms in trying to see how they influence learning in Management and Accounting. They concluded that the business simulations were instrumental in preparing Accounting students to manage a business, helping them be prepared to take on the role of future business leaders and refining their decision-making skills (Carenys, Moya, & Perramon, 2017; Riley, Cadotte, Bonney, & MacGuire, 2013).

Yet, there are also studies that point to the opposite conclusion as regards this type of educational resource, highlighting that, in Accounting, they do not improve learning (Krom, 2012; Tao, Cheng, & Sun, 2009), and stressing the need for more research that can test their usefulness beyond doubt (Carenys et al., 2017). We also mention studies on Management education, where the application of gamification is very rare and still lacks significant empirical evidence (Moncada & Moncada, 2014). As regards the application of gamification to Management, there is scarcity of scholarly studies and lack in both robust conclusions and scope, resulting only from very

limited studies. Also, there is scarcity of tools suitable to making broader and more effective approaches. After the present literature review of gamification in Management education, we confirm that such studies remain rare (Dichev & Dicheva, 2017). We also verify that, contrary to the other previously mentioned fields, there is still a long path to follow in Management as regards the scientific evidence resulting from applying gamification (Dale, 2014).

Gamification Constructs

Gamification includes constructs that explain how one can apply gamification tools to educational interests, while promoting motivation, attitudes, flow, and learning. Several theories have been used in gamification studies, namely Landers' theory of gamified learning (2014), Ryan's and Deci's self-determination theory (SDT) (2000b), Csikszentmihalyi's (1990) flow theory and Ajzen's (1991) theory of planned behavior; the aim is to try and to understand how motivation (MOT), flow (FLO) and attitudes (ATT), which emerged in the application of game-based resources to the teaching of Management, can influence perceived learning (PLE).

Motivation

Most studies that have been looked into in this literature review focused on the impact of gamification, in general, and, in particular, on the influence of games-based learning (GBL) on the teaching-learning process. In all studies, the common denominator is the application of a game to an area of knowledge with the purpose of understanding its motivational impacts on flow, attitudes and perceived learning. The research goals regarding the use of gamification are clear: verifying a game's impact on students' motivation, analyzing students' knowledge flow after becoming familiar with the game-based resource, studying the students' attitude to continue using the resource after having used it for the first time, and knowing the impacts on perceived learning of using this type of resource (Hamari et al., 2014).

Motivation is a construct used to explain the direction, intensity, persistence and quality of a given human behavior (Maehr & Meyer, 1997). In the literature, it is described as varying in magnitude and orientation. Motivation, whether intrinsic or extrinsic, is used as a mediating variable that accounts for several types of behavior in different contexts and environments (Ryan & Deci, 2000a). In education, it is considered a key element in learning and used to explain the effort and attention invested by students in activities in which they are involved (Brophy, 2013). In this context, it is up to the instructors to manage student motivation and raising it when possible, so that the learning process has positive results (Harlen & Crick, 2003).

Flow

Educational games are developed to educate and train, integrating serious work elements into a game context, what may make emerge the state of flow (Csikszentmihalyi, 1990). Flow is a mental state characterized by high concentration and focus on tasks that cause high pleasure and intrinsic motivation (Shernoff, Kratochwill, & Stoiber, 2003). Studies on flow concluded that challenging

tasks lead to high concentration, absorption and immersion. Flow has been associated with learning, development of talent, academic performance and creative achievement, regardless of the task or job (Csikszentmihalyi, 1996; Csikszentmihalyi, Rathunde, & Whalen, 1997). In their studies, Hamari and Koivisto (2014) and Procci, Singer, Levy and Bowers (2012) found that game-based technologies promote and conjure up flow experiences capable of having a positive effect on the quality of learning and academic performance (Barzilai & Blau, 2014; Brom et al., 2014; Chang, Wu, Weng, & Sung, 2012; Hung, Sun, & Yu, 2015; Sabourin & Lester, 2014).

Attitudes

Attitudes remains one of the main interests of research in the social sciences, as it is widely accepted that attitudes are relevant for understanding and foreseeing social behavior (Ajzen, 2001). An attitude is a behavioral pattern that shows an individual's predisposition to adjust to designated social situations, a conditioned response to certain stimuli that lead to social experiences (LaPiere, 1934). Because it is a cross-cutting concept within the human and social sciences, it has been the subject of diversified and even competing approaches (Fredricks et al., 2004; Libbey, 2004; Poskitt & Gibbs, 2010). In several studies, a behavioral component is usually mentioned (Beer, Clark, & Jones, 2010; Fredricks et al., 2004), while, in others, students' attitudes towards education are discussed (Fredricks et al., 2004).

Attitudes shape one's behavior through a deliberate or spontaneous process; strong motivations can influence behaviors, attitudes, the subjective rules, and the perceived behavioral control (Albarracin & Vargas, 2010; Banji & Heiphetz, 2010). Regardless of the rules concerning public opinion on changing educational procedures, one cannot expect to find homogeneous attitudes among individuals, due to people having different personalities (Eaves & Eysenck, 1974).

Attitudes towards education can be either positive or negative. The latter usually occurs when students are not involved in the teaching process of which they are part. This is usually an indicator of school dropout, because, when students are involved in school activities, they tend to persevere in fulfilling their goals, despite the challenges and obstacles they may face (Saeed & Zyngier, 2012).

Perceived learning

As important agents of the teaching-learning process, instructors play an important role in their students' education, identity acquisition and development as members of a society and future professionals (Willemse, Lunenberg, & Korthagen, 2005). Students' positive thinking about which of the methods used by instructors are the most experiential and interactive (Brown & Lee, 1994; Frontczak, 1998; Mayer, 2003) is a precious indicator of a pedagogy of affection that helps students understand theoretical and practical knowledge they depend on to improve their learning (C. H. C. Hsu, 1999; Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013; Rust, Price, & O'Donovan, 2003; Tynjälä, 1999). The use of teaching methods that are aligned with the students' preferences and needs thus helps them develop more favorable attitudes to

acquiring knowledge, feel more fulfilled, and reach higher levels of performance (Paswan & Young, 2002; Sendaug & Odabacsi, 2009; Young, Klemz, & Murphy, 2003). This way, higher education institutions that possess a clear and innovating view of education and well-defined learning goals are better equipped to help their students become more productive and increase their interest, effectiveness and learning (Kolb & Kolb, 2005; Pritchard, 2013; Silins & Mulford, 2004; Young et al., 2003). That is why perceived learning analysis is so important, in so far as it has a positive impact on how students value what they are learning – although one can never be too careful when interpreting their opinions about the quality and usefulness of the teaching they have been offered (Frenzel, Pekrun, & Goetz, 2007; Marks, 2000).

Relationships among Constructs

Of the 244 articles included in the current study, the ones entailing an empirical analysis were selected (n=104) and results of empirical models were looked into in order to understand their relationship. The 104 empirical articles revealed statistically significant relationships among gamification's four main constructs. Some were obtained individually in one construct (n=25), some in two constructs (n=57), and some in three (n=20) and in four (n=2) constructs simultaneously (Table 1). The analysis showed the existence of cause-effect relationships among various constructs, most of which were statistically significant.

Table 1

Relationships among gamification's construct

Authors	Constructs			
	MOT	FLO	ATT	PLE
(Ding, Kim, & Orey, 2017; Zamora & Aranda, 2017)	X	X	X	X
(Browne, Anand, & Gosse, 2014)	X	X	X	
(Ahmed & Sutton, 2017; Betts, Bal, & Betts, 2013; Hamari et al., 2016)	X	X		X
(Adukaite et al., 2017; Birch & Woodruff, 2017; Borras-Gene, Martinez-Nunez, & Fidalgo-Blanco, 2016; de-Marcos, Garcia-Cabot, & Garcia-Lopez, 2017; Domínguez et al., 2013; Hakulinen, Auvinen, & Korhonen, 2015; Hew, Huang, Chu, & Chiu, 2016; Kirillov, Vinichenko, Melnichuk, Melnichuk, & Vinogradova, 2016; Landers & Armstrong, 2017; Landers & Landers, 2014; Seixas, Gomes, & de Melo Filho, 2016; Su & Cheng, 2015)	X		X	X
(Cózar-Gutiérrez & Sáez-Lopéz, 2016)	X	X		
(Armstrong & Landers, 2017; Galbis-Córdova, Martí-Parreño, & Currás-Pérez, 2017)			X	X
(Codish & Ravid, 2015; de-Marcos, Domínguez, Saenz-de-Navarrete, & Pagés, 2014; Hanson-Smith, 2016; Koivisto & Hamari, 2014; Kuo & Chuang, 2016; Mekler, Brithlmann, Tuch, & Opwis, 2017; Schoech et al., 2013)	X		X	

Table 1 (continued)

Authors	Constructs			
	MOT	FLO	ATT	PLE
(Alabbasi, 2017; Attali & Arieli-Attali, 2015; Buckley & Doyle, 2017; Bustillo, Rivera, Guzman, & Acosta, 2017; Cadavid & Montoya Gómez, 2015; Cakiroglu, Basibuyuk, Guler, Atabay, & Memis, 2017; Carenys et al., 2017; C.-H. Chen, Liu, & Hwang, 2016; Cheong, Filippou, & Cheong, 2014; Chubarkova, Sadchikov, Suslova, Tsaregorodtsev, & Milova, 2016; Chun, Youm, & Oh, 2015; de-Marcos et al., 2016; Dias, 2017; Evans, 2016; Fernandez-Mesa, Olmos-Penuela, & Alegre, 2016; Garcia Gaitero, Costa Roman, & Real Garcia, 2016; Geelan et al., 2015; Gennari et al., 2017; González, Toledo, & Muñoz, 2016; Hanus & Fox, 2015; Hernando, Arévalo, Mon, Batet, & Catasús, 2015; H. Xu, Song, Yu, & Tavares, 2017; Iwamoto, Hargis, Taitano, & Vuong, 2017; Kétyi, 2016; Khaleel, Ashaari, Wook, & Ismail, 2016; Laskowski & Wojdyga, 2014; Leaning, 2015; L. Gonzalez, Gomez, & Echeverri, 2017; Malas & Hamtini, 2016; Manrique-Losada, Gasca-Hurtado, & Álvarez, 2015; Mladenovic, Krpan, & Mladenovic, 2016; Morillas Barrio, Munoz-Organero, & Sanchez Soriano, 2016; Nebel, Beege, Schneider, & Rey, 2016; Pechenkina, Laurence, Oates, Eldridge, & Hunter, 2017; Perryer, Celestine, Scott-Ladd, & Leighton, 2016; Sousa-Vieira, Lopez-Ardao, Fernandez-Veiga, Rodriguez-Perez, & Lopez-Garcia, 2015; Strmečki, Bernik, & Radošević, 2015; Su & Cheng, 2016; van Rosmalen & Westera, 2014)	X			X
(Ašeriškis & Damaševičius, 2017; Bartel & Hagel, 2014; Buckley & Doyle, 2016; Davis & Singh, 2015; de Freitas & de Freitas, 2013; Gibson et al., 2015; Gopinath Bharathi, Singh, Tucker, & Nembhard, 2016; Hamzah, Ali, Saman, Yusoff, & Yacob, 2015; Hasegawa, Koshino, & Ban, 2015; Iaremenko, 2017; Kopcha, Ding, Neumann, & Choi, 2016; Müller, Reise, & Seliger, 2015; Osipov, Nikulchev, Volinsky, & Prasikova, 2015; Pedersen et al., 2016; Pe-Than, Goh, & Lee, 2015; Sailer, Hense, Mayr, & Mandl, 2017; Y. Chen, Burton, Mihaela, & Whittinghill, 2015)	X			
(Hamari & Koivisto, 2014)		X		
(C.-L. Hsu, Chen, Yang, & Lin, 2017)			X	
(Brull, Finlayson, Kostelec, MacDonald, & Krenzischeck, 2017; Christy & Fox, 2014; de-Marcos et al., 2016; Fan, Xiao, & Su, 2015; Gudoniene, Bartkute, Rutkauskiene, & Blazauskas, 2016; Palomo-Duarte et al., 2016)				X

The construct that stood out the most was motivation, tested in 94 of the 104 empirical articles, followed by perceived learning (76/104), attitudes (29/104) and, finally, flow (8/104). Motivation and perceived learning were more often flagged up (69/104), ahead of motivation with attitudes (27/104) and motivation with flow (7/104). Only in two articles was a relationship tested (attitudes with perceived learning) without motivation having been analyzed. It follows, then, that motivation is gamification's main construct, and that perceived learning, attitudes and flow come next.

As per the relationships among three constructs, the most researched triad is motivation-attitudes-learning (16/104), followed by motivation-flow-attitudes (4/104) and motivation-flow-learning (3/104). In only two articles, there is a relationship among the four constructs simultaneously.

Most of the relationships that were observed were statistically relevant, and most empirical articles show the following main relationships: motivation has a positive influence on perceived learning (Attali & Arieli-Attali, 2015; Buckley & Doyle, 2017; C.-H. Chen et al., 2016; de-Marcos et al., 2016; Filsecker & Hickey, 2014; Gennari et al., 2017; Hanus & Fox, 2015; Ibanez, Di-Serio, & Delgado-Kloos, 2014; Simões et al., 2013), attitudes (Codish & Ravid, 2015; Domínguez et al., 2014; Hanson-Smith, 2016; Koivisto & Hamari, 2014; Kuo & Chuang, 2016; Mekler et al., 2017; Schoech et al., 2013), and flow (Ahmed & Sutton, 2017; Betts et al., 2013; Browne et al., 2014;

Cózar-Gutiérrez & Sáez-López, 2016; Ding et al., 2017; Hamari et al., 2016). In turn, flow has a positive influence on perceived learning (Ahmed & Sutton, 2017; Betts et al., 2013; Hamari et al., 2016), attitudes (Browne et al., 2014; Ding et al., 2017; Zamora & Aranda, 2017), and motivation (Ahmed & Sutton, 2017; Betts et al., 2013; Browne et al., 2014; Hamari et al., 2016). Finally, attitudes have a positive influence on perceived learning (Adukaite et al., 2017; Armstrong & Landers, 2017; Birch & Woodruff, 2017; Borras-Gene et al., 2016; Cózar-Gutiérrez & Sáez-López, 2016; de-Marcos et al., 2017; Galbis-Córdova et al., 2017; Hew et al., 2016; Landers & Armstrong, 2017).

Conceptual Model

We developed a conceptual model to ground future studies in the field (Figure 2).

The model shows the state of the art of gamification, its applicability, the main constructs, target audiences, and the type of organizations that use it. The main stakeholders using gamification in an educational context were identified, and the application of this tool to higher education was highlighted. Figure 2 presents the dimensions of education-applied gamification resulting from the literature review.
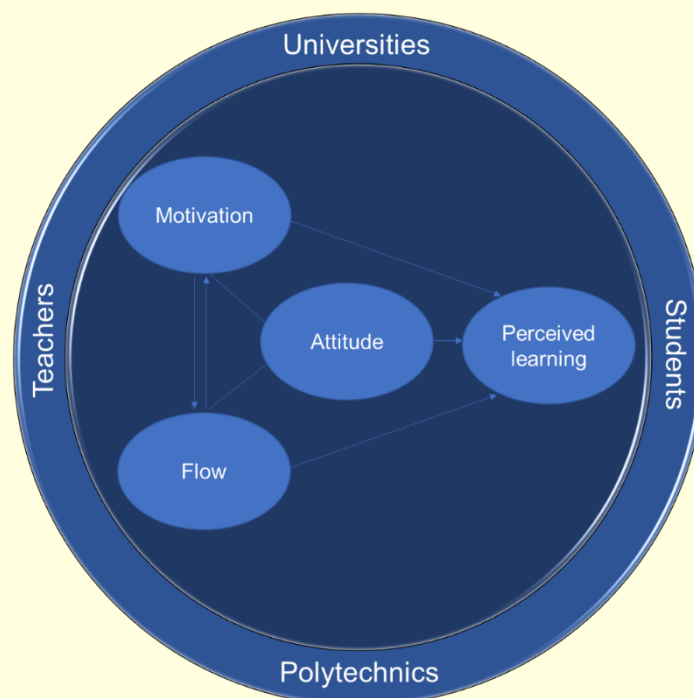

Figure 2. Conceptual model

From the systematic literature review, we verify that most relationships were statistically relevant, and most empirical studies show the following main relationships: motivation has a positive influence on perceived learning, on attitudes, and on flow. In turn, flow has a positive influence on perceived learning, on attitudes, and on motivation. Finally, attitudes have a positive influence

on perceived learning. The proposal of this conceptual model will be important for researchers studying the effect of game-based resources on education in general and, in particular, on Management education, as this is an area where such teaching methodologies are clearly beneficial.

Conclusions

The main purpose of the present study was to develop a research conceptual model of Management-applied gamification through a systematic literature review. An overview of the most relevant literature on the subject led to the identification of the topics more frequently approached by the authors, namely: GBL supporting theories, gamification; serious games and Game-based Learning, gamification's main constructs, gamification applied to education, and gamification applied to management education.

The systematic literature review points to gamification having become more and more an object of scientific research, besides being a field with huge potential, but in need of expanding, since the available studies have their limitations and many of them are not robust enough nor do they have the capacity to extrapolate to the surrounding reality. The present research is a contribution to the advancement of scientific knowledge on the field that may help future research. Furthermore, it has led to a holistic systematizing of studies already conducted, identifying the most relevant authors who have approached the subject and continue to be a reference in the area. Although other analysis methods might have been used, resorting to various types of analysis has proven to be extremely useful in describing, systematizing and relating contents, given the diversity of the topics under study.

The present study's main contribution is to systematize the literature on game-based learning, filling in a gap as regards summarizing gamification's main basic theories and proposing a conceptual model that will enable further research, resulting from several studies on this field of knowledge.

The present article provides the reader with information on relevant publications included in the main scholarly databases, as well as on how they have contributed to this field of knowledge, the dimensions they have addressed, and the theories they draw on. The conceptual model that we propose allows future researchers to test empirical relationships besides suggesting others that may contribute to the advancement of literature

Contributions

Previous studies have stated that gamification in education can help promote learning in several areas, although its application in management has not been extensively addressed. The present study does a general review of the literature on game-based education in general, but looking especially into the case of Management as part of the administrative studies. In fact, this is the

first study to extensively address this subject in a macro and micro dimension, contributing to advancing knowledge in this field and giving a detailed account of how the literature is organized.

The present systematic review provides an organized and structured starting point to the study of how the literature is sequenced, what has been done, what has been achieved, and the results and contributions of it for future research.

One of the major contributions is, no doubt, a systematic rigorous and complete review of the most relevant literature on gamification that made it possible to identify and look into how it has been generally applied, especially to education, its impact on learning, the type of teaching aids that have been used, how they have been used, and their contribution to the teaching-learning process in the various areas of management. In addition, the conceptual model that was created, stemming from the literature review, can help future researchers, providing them with a starting point that will lead the way of their research, by showing them which topics to approach and how to do it.

The extensive analysis of scientific articles also revealed the topics that still raise researchers' interest, namely those that can be controversial like the application of such theories as gamification, flow, self-determination, and planned behavior to show that gamification is not only a useful tool, but it can also actually help the learning process, regardless of the field in which it is applied.

Also important in this study is the way it refers to limitations that still persist when one tries to apply gamification to education. There is still much to do. Based on the present study, future research can expand in the study of applicability and effectiveness of game-based education, and, in particular, Management education. Finally, this has been a contribution to show gamification's increasingly important role in the evolution of education by way of the effect it has on students and instructors, distinguishing them in the traditional educational system.

Limitations and future research

This study has a limitation due to the fact that the systematic literature review is limited to ISI Web of Knowledge and Scopus databases, although these are also the two most well-recognized databases in scholarly fields. An additional limitation concerns the validation of findings, as it was limited do the authors' own analyses.

In terms of future research, we suggest that other empirical quantitative and qualitative studies be done on applying gamification to management education, as well as the impact of using game-based resources on students' motivation, flow, attitudes and learning. Also, new games with different mechanics and principles as compared to those previously tested should be created and analyzed in terms of impacts. Another line of inquiry is to study more instructors and students in different contexts, as well as research methodologies that include control groups and game-adopting groups for comparison.

As regards to advancing theory, it is vital that the existing theories continue to be tested and, if possible, improved so that the true impact of gamification on education may be explained. Longitudinal studies are, thus, welcome to establish medium- and long-term impacts of gamification, allowing researchers to make more viable conclusions about the robustness of this type of studies, while developing the existing gamification theories and, eventually, creating new ones that will provide a more complete explanation of the phenomenon.

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