

Gamification in the Social Environment:

a tool for Motivation and Engagement

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ABSTRACT

Gamification can be defined as the use of game components in non-ludic contexts, and has become a crucial element in the field of behavioral learning. The present work aims to make a systematic review of the main components and its application of gamification in the social environment. To obtain the results, two of the most important scientific databases were consulted: Scopus and Web of Science. 136 articles published between 2011 and mid-2016 under the title Gamification were extracted and reviewed. The results of this study demonstrate how gamification has been gaining importance in the social field and that the use of game components increase motivation and commitment. It shows how gamification uses individual and/or group rewards to achieve proposed objectives; being successfully implemented in education, health, services, and social learning. Finally, it suggests that the success of the gamification system is directly related to the context, the framework selected, and the interaction of the participants.

CCS CONCEPTS

CCS → Social and professional topics → Professional topics → Computing education → Student assessment

Keywords

Gamification motivation, social environment, learning through active methodologies

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1. INTRODUCTION

The new information society is integrating digital tools for both leisure and educational contexts (Çağlar & Arkün Kocadere, 2016). For this reason, many of the challenges confronted in society require innovative and highly useful solutions

(Morford, Witts, Killingsworth, & Alavosius, 2014). Nowadays technologies are needed to address social problems (Deterding, Khaled, Nacke, & Dixon, 2011) since most people spend a lot of hours playing on consoles, portable devices, and mobile devices. Many of these players are digital natives, inclined towards the use of games (Simões, Redondo, & Vilas, 2013) as well as social networks, in order to find a state of FLOW that allows them a source of motivation and commitment focused on learning (Hamari & Koivisto, 2015).

In general terms, gamification can be defined as the use of game components in non-ludic contexts (Bíró, 2014; Deterding, Dixon, Sicart, Nacke, & O'Hara, 2011; Deterding, Khaled, et al., 2011; Gatautis, Banyte, Piligrimiene, Vitkauskaitė, & Tarute, 2016; Hamari & Koivisto, 2015; Marache-francisco & Brangier, 2012; Simões et al., 2013; Urh, Vukovic, Jereb, & Pintar, 2015) and Kapp (Kapp, 2012) define it as the use of game dynamics and mechanics, adding a convincing narrative with the purpose of solving social problems. Thus, gamification takes advantage of the inherent characteristics of the game to apply them in situations with a lack of motivation and commitment (Dicheva, Angelova, & Agre, 2014).

These publications demonstrate that gamification increases player's learning and participation. In the social context, there is a high incidence of these components, which persuade behavior through both intrinsic and extrinsic motivation. Similarly, these components can be implemented in non-ludic contexts in order to shape behavior. Due to the influence of games in the new generations in education, it is established as a theory of learning, like the Behaviorist, Cognitivist, Constructivist and Connectivist (Bíró, 2014). That is why teaching and learning are innate conditions of any gamification system. In the field of health, gamification extends its use to train doctors in the treatment of certain diseases and trains patients to healthier lifestyles (Pesare, Roselli, Corriero, & Rossano, 2016; Schoech et al., 2013). In the field of services, it is implemented as a tool for customer loyalty (Levy, 2012) and to improve the experience and participation of users in

predetermined applications (Korn & Schmidt, 2015; Sarangi & Shah, 2015). From the point of view of social learning, it is conceived as a tool to involve people in socially sustainable actions through the promotion of new ways of collaboration (Koivisto & Hamari, 2014).

The present work aims to systematically review the main components and their application of gamification in the social environment in order to improve the achievement of proposed objectives and the acquisition of habits in activities that are tedious or difficult to perform. The purpose of this research is to analyze which components of gamification are investigated in a sample of studies in the disciplines of Education, Health, Services and Social Learning.

2. METHODOLOGY

The literature review was carried out by the end of July 2016. The selection of the scientific articles was conducted by the following methodological steps applied by Caponetto et al. (Caponetto et al., 2014) and Rickinson & May (Rickinson & May, 2009): scope, search, selection, analysis, and presentation of results (see figure 1).

2.1 Scope

a) Application of the sampling strategy: Title "Gamification"; b) Latitude: Scope of research: Social (Social Sciences). The sample for these documents are the articles and reviews (in all languages); and c) the time lapse of interest includes each article and review published from the year 2011 to mid-2016.

2.2 Search

To achieve greater efficiency, two databases with the highest incidence of published scientific articles (Web of Science and Scopus) were consulted. The search was carried out in both databases and 136 works were selected, most of them published in the Journals; Computers in Human Behavior (n = 15); Computers in Education (n = 5); Procedia- Social and Behavioral Sciences (n = 5); IEEE Intelligent Transportation Systems Magazine (n = 4); International Journal of Engineering Education (n = 4); International journal of Game-based learning (n = 3); and Journal of eLearning and Knowledge Society (n = 3).

2.3 Selection

After analyzing each article and scientific review, the duplicates (n = 100) and those articles that did not have an abstract (n = 28) were eliminated, giving rise to the final sample (n = 136).

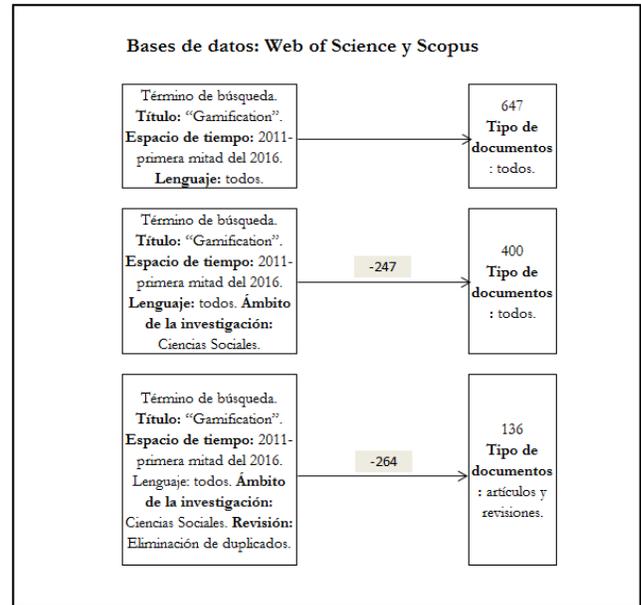


Figure 1. Sample selection process (adapted from the Miller & Campbell scheme, 2006)

2.4 Analysis and Presentation of Results

For a better analysis and presentation of results, the articles were classified into content sections; organized and processed in the Mendeley 1.12, Excel 2007, and Nvivo 10 programs. All the keywords were selected for the elaboration of the sections (see table 1), then processed in the Nvivo 10 program.

Palabras clave (Keywords)	Conteo
Learning	10
Education	8
Engagement	8
Game Mechanics	7
Motivation	7
Game-based learning	5
Games	4
Persuasive Technology	4
User Experience	4
Badges	3
Customer Engagement	3
Ehealth	3
Game Design	3
Gaming	3
Mechanics	3
Physicalactivity	3
Serious Games	3
Social Networking	3
Video Games	3

Table 1. Keywords of the articles published in the Web of Science and Scopus databases: Social Scope (n = 136), in the period (2011-mid 2016)

3. RESULTS

The objective of the investigation is to analyze the elements of gamification that are present in the research accomplished in the fields of Education, Health, Services, and Social Learning in the last decade.

It seems that not all the components are studied equally in the disciplines mentioned above (see table 2). In addition, table 2 makes a relationship between the Gamification elements most used by the aforementioned disciplines, divided into present or not present. At the same time, the components of extrinsic motivation have more presence in the Services and in Education field than those of intrinsic motivation in Health and in Social Learning field.

3.1 Education:

In the educational field, modern applications use gamification mechanics to motivate participation and knowledge acquisition, allowing students to form their own goals and failures. Adjusting the feedback (positive or negative), depending on the circumstance (Dichev et al., 2014), as a way of learning by playing. Although, in the education field, gamification does not feel like a game, it is perceived as something innate of learning. After reviewing the components, we note that the most common are points (exams), levels (grades), achievements (grades), and comparison tables. Points and badges are used as external symbolic award elements (Su & Cheng, 2015), influencing students' classroom behaviors. Challenges and competitions serve to create a competitive atmosphere where the ego and reputation come together to develop a more self-determined behavior.

3.2 Health:

In the field of health (exergames), as in education, the use of video games with gamification elements has driven initiatives in healthy lifestyles (Koivisto & Hamari, 2014). Many health systems recognize the potential of games to prevent illness and help patients recovering from illness by making positive adjustments in their lifestyles. Most external motivators help to reinforce intrinsic motivation by using points and badges as primary rewards. These points and badges are rewarded after achieving certain health benchmarks or maintaining healthy levels, and help the state and insurers reduce costs on healthcare (Levy, 2012). Table 2 shows the application of gamification, used in the area of health in the articles of the sample.

	R e w a r d s : P o i n t s b a d g e s	L e v e l s	S t a g e s	L e a r n i n g o b j e c t i v e s	A c h i e v e m e n t s a n d c o m p e t i t i o n s	O b j e c t i v e s	F e e d b a c k	C h a l l e n g e s	D u e l l s	A v a t a r s	C o m p a r i s o n	S o c i a l r e c o g n i t i o n	S o c i a l n e t w o r k
E d u c a t i o n	v	v	x	v	v	x	x	x	x	x	x	x	x
H e a l t h	v	x	v	x	x	v	v	v	x	x	x	x	x
S e r v i c e s	v	v		v	x	x	x	x	v	v	x	x	x
S o c i a l l e a r n i n g	v	x	x	x	x	x	x	x	x	x	x	V	v

Table 2. Components of the gamification that have been studied in the sample of selected studies (2011-mind 2016). Note: x = not present; v = present

3.3 Services:

In the service field, gamification is commonly used as a management-by-objectives approach. Under this approach, the purpose is to maximize the loyalty and motivation of the customers and employees. Customers' motivation is assessed by a series of external rewards, serving as marketing entities of the product, by receiving a good service. Since consumers focus more on rewards than on the quality of the product itself, gamification helps to increase brand loyalty. Therefore, when incentives are eliminated or changed, there is a strong decrease in motivation (Freudmann & Bakamitsos, 2014; Korn & Schmidt, 2015)). Employees are linked through the "challenge-reward" cycle, which uses comparison tables and action groups to direct and reward workers in specific tasks through positive and constant feedback.

3.4 Social Learning:

Game components are used in social learning through the promotion of interactive and collaborative situations (Simões et al., 2013). Their persuasiveness is determined by social recognition and rewards (Morris, Croker, Zimmerman, Gill, & Romig, 2013). In other words, using the mechanics and dynamics of the game, being influenced by the objectives of the community to which it belongs. For its part, social influence provides the context to develop social interaction, taking into

account how the participant reacts to a group and how the group can help establish an influential relationship (Marache-francisco & Brangier, 2012). That is to say, stimulating the necessary environment for participants to learn from the observation and behavior of other members, from knowledge to action. In line with the theory of network externalities, where the benefits of social repercussion depend on the number of influential participants in the community (Hamari & Koivisto, 2015).

4. CONCLUSIONS

The review of the literature on gamification in the fields of education, health, and social learning research lead us to the following considerations.

First of all, it is worth noting that gamified systems in the studies reviewed show better results than traditional systems (Di Bartolomeo, Stahl, & Elias, 2015), considerably increasing the participation of users. Although, adding gamification components to an application is not sufficient to fully motivate: we need to choose an attractive design framework, accompanied by a catching narrative and an appropriate context can help. In short, the entire gamification process should be considered as a framework subject to modifications (González et al., 2016).

Secondly, one of the challenges of using gamification is how to influence behaviors through the use of rewards, acquiring knowledge, and learning operating skills. That is the reason why good gamification systems try to create the basis for the development of self-determined behavior. In other words, to move from the game components that increase extrinsic motivation to those that really provide an intrinsic motivation.

Third, it is important to note that the components of gamification with more presence in the areas mentioned above are the rewards (points, badges), levels, and classification tables, mainly, because they influence extrinsic motivation quickly, but less effective than intrinsic motivation. On the other hand, social recognition and social networks do not have the same repercussions, because they are less used in the framework of the chosen sample.

An additional consideration is that gamification has been proven to be an effective strategy to increase motivation and commitment. Participants remain immersed in the experience and often return to share content and influence the community, developing the collaboration and socialization of the members.

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