Educational gamification as a motivational strategy for teaching in primary education

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Abstract---Currently, the teaching-learning process must be sufficiently stimulating and motivating, so that primary school students attract their interest in learning the different program content, so teachers must employ different techniques that succeed in stimulating and attracting them to the achievement of learning results, one of them being educational gamification. The objective of this work is to carry out a characterization of the educational Gamification strategy and its application as a tool for the motivation of primary education students. Use Desk Research methodology, which allowed for a systematic review of previous research on the subject. Finding that the Gamification strategy allows, through the incorporation of new technologies, the use of the underlying culture in digital natives, promoting motivation in them, being attractive at early ages at the level of primary education, the planned dynamics, They allow the transforming involvement of the student, creating an increase in motivation for the role that they have to play in the educational activity.

Keywords---primary students, educational environment, active participation, motivation

I.   Introduction

Currently, students do not have the same motivations that students had 30 years ago, mainly due to technological and cultural factors (Pérez, Rodríguez, Rodríguez, & Villacreces, 2020). For this reason, in the teaching-learning process, techniques and strategies must be available to maintain the motivation of the students towards the content of the courses taught in primary school. This implies that teachers must know and apply new techniques and resources in their classes, seeking high motivation and creating conditions for quality learning to exist (Ortiz-Colón, Jordán, & Agredal, 2018).

Education in our days is guided by principles that promote autonomous and meaningful learning, from this a set of emerging techniques are derived, which aim to keep the student motivated to inquire about the contents of their courses (Hamari, Koivisto, & Sarsa, 2014), among which can be mentioned: technology-based strategies such as Maker Spaces or playful and Gamification strategies, the latter the central reason for this article (Fernández, Olmos, & Alegre, 2016; Pérez et al., 2020).

The technique Gamification was first introduced by Nick Pelling, a computer game programmer, in 2002, but it was not until 2010, when it became relevant in the educational area (Rojas-López & Rincón-Flores, 2018). The Gamification proposes that, in the educational process, elements of the games can be involved, where the students (participants) are involved in the process of receiving and giving feedback, having as their main element, the fun that

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the participants get in the games. interactions to develop in the learning process (Area & González, 2015; Martín & Vílchez, 2017)

Educational gamification, includes concepts and dynamics of games to encourage student interaction in the teaching-learning process (Espinosa, 2017), using the prospecting that we humans have, competition and attraction to games (Valda & Arteaga, 2015), generating a higher level of motivation to achieve the expected academic results (González Alonso, 2017; Martín & Vílchez, 2017)

The stimulus for learning arises from the application of different dynamics, in which students must actively participate (Rodriguez, Perez, Lituma, & Perez, 2020), through educational sessions, in which they are immersed in challenges and entertaining activities, which allow to achieve During the training process is experiencing a continuous desire to learn (Perez, Rodriguez, Vazquez, & Bowen,2020),achieving individually and group new knowledge(Oliva,2016; Ortiz, Jordan & AgredaI,2018);Ortiz; 2015).

When applying Gamification techniques to elementary students, it is necessary to take into account the objectives, rules and challenges, always paying special attention to their order, rights and responsibilities (Espinosa, 2017). This must be in a context where the participant must face problems, to which they must give a solution, in this way they understand that the methodology is part of the process, and the teacher must foster at all times an environment of active participation (Salinas & Alejandra , 2017).

It is evident that Gamification can be a powerful technique to motivate students, so the teacher must know its characteristics, and how they can positively impact the student, in addition to using creativity to generate new strategies based on this technique. In this sense, the objective of this work is to characterize the educational Gamification strategy and its application as a tool for the motivation of primary education students.

II.   Materials and Methods

In carrying out this research, the so-called Desk Research (was identified as the methodology to be followed, (Gandhi, Sucahyo, & Ruldeviyani, 2018; Guerin, Janta, & van Gorp, 2018)was carried out a review system for research previous on methodologies used in the teaching-learning processes of primary education and particularly the strategy Gamification, proceeding then to carry out an analysis to determine the valid conclusions to the problem raised. This type of selected research technique allows creating knowledge, based on previous studies (Revelo-Sánchez, Collazos-Ordóñez, & Jiménez-Toledo, 2018).

The methodology Desk Research contemplates a series of steps including: a) planning of the inclusion, extraction and synthesis criteria of the documents found, considering the quality of the databases to be selected, b) search using the key words as criteria defined in the research and in some cases research guiding questions, c) initial selection of the appropriate articles according to established criteria, d) evaluation of the quality of the article according to the context and search criteria, in this case the last 5 years, d) synthesis of the most relevant data found and metadata, and subsequently the statement of conclusions (Revelo-Sánchez et al., 2018).

III.   Analysis and Discussion of Results

The results achieved from this research are the product of the proposed objective, which is based on characterizing the educational Gamification strategy and its application as a tool for motivating primary education students. In this sense, a review of different databases was carried out, in which Redalyc, ScienceDirect (Scopus), Google Scholar were considered, finding a distribution in the number of publications arising from the topic, since 2002 (year in which it is coined the term) to 2019, as shown in figure 1, it shows the increase in articles published in reference to the term "Gamification", both locally and globally, showing a growing increase in publications on the subject , from the year 2010, where the relevance that it acquires in the educational area is observed, evidencing an increasing interest throughout the following years.
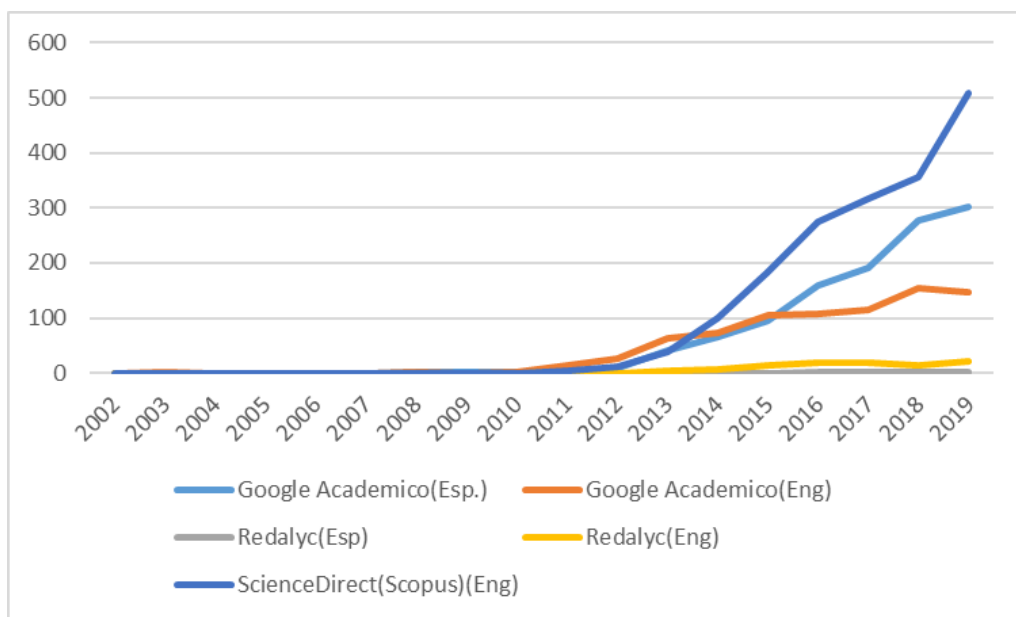

Figure 1. Publications with the term Gamification

The term Gamification, has been developed in the educational field in the last 10 years or so, its purpose is to increase student motivation using game features, in non-playful situations. By using these elements, the student is located at the center of the teaching-learning process, where the process uses the rules of the games, motivating the student to get the rewards or prizes, and in this way he acquires knowledge, abilities and skills (Carrillo & García, 2018).

Gamification has become relevant with the advent of new technologies, but for its application very common things are necessary, from pencil and paper or other elements, the fundamental thing is to look for motivation, based on elements that are a normal part of games, however it is necessary to be careful to understand that its application, in cases that are not games, is to exploit the advantages due to the great motivation that playful elements produce in human beings (Kim, 2015).

It is evident that Gamification is driven and empowered by digital advances, this has permeated significantly in the culture of digital natives (Delgado, 2020), observing in them, a natural inclination to manage devices and systems based on software, in addition to his clear motivation against these activities. Although the concept of Gamification

does not depend on technology (Quintanal, 2016), but the most significant sets of educational proposals are based on technological tools, such as the programs: Class craft, ClassDojo, Xbox, Kinect, Blokify, Wii console, Scratch , Arduino, among others

The games present as characteristic elements, 3 aspects, whose level of abstraction is variable, such as: the dynamics, mechanics and components. The dynamics conformed by the narrations, emotions, progressions and particular aspects that the person giving the instruction to carry out the activity imprints on it are not considered part of the Gamification strategy. In the case of educational models, an academic context or scenarios must be established, with a clear scientific tendency, in which mechanics and components are integrated (Cheong, Filippou, & Cheong, 2014).

The structure of the integrative categories of educational gamification are presented in figure 2. This structure has proven to have positive results, one of the most outstanding being the increase in motivation, as well as other benefits for teaching-learning (Andreu, 2020; Fuentes -Hurtado & González-Martínez, 2019).
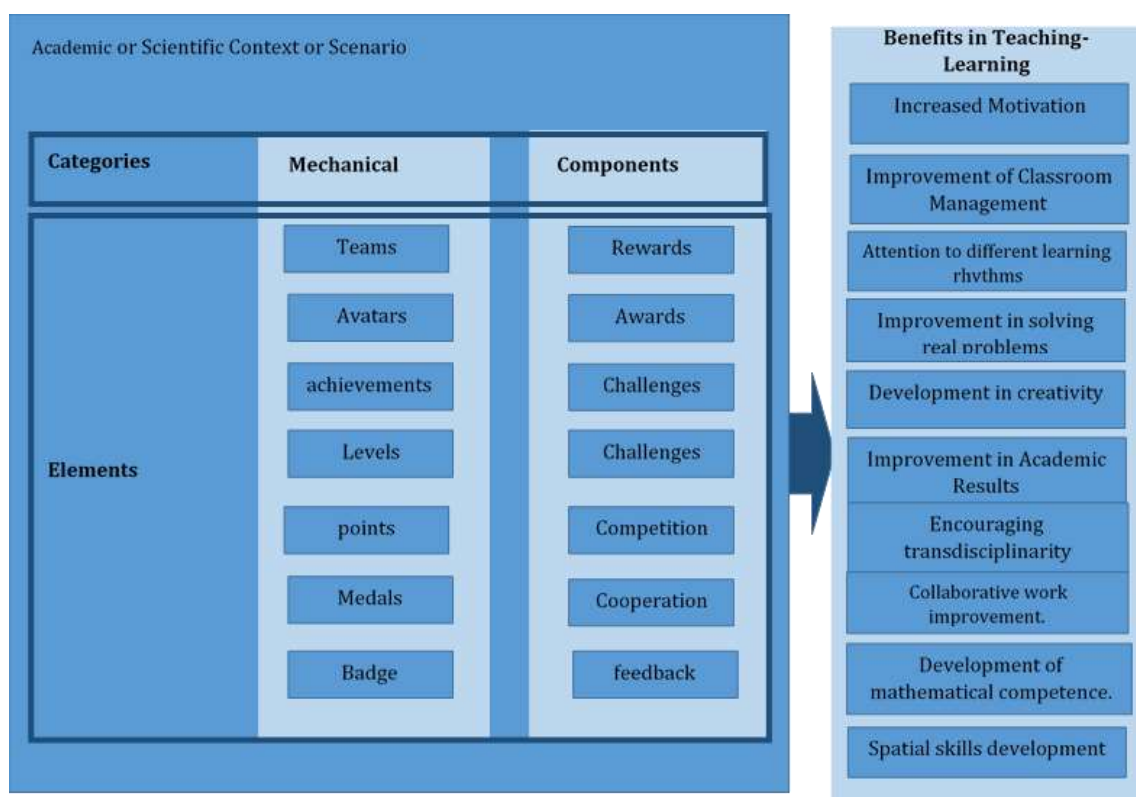

Figure 2. Elements and results of the application of Gamification

Source: (Fuentes & González, 2019)

There is a set of experiences in the education sector, generated as of 2010, in which the benefits and potential of this strategy are evident , which allow to increase student performance and motivation in students, in addition to facilitating the understanding of the world around them, in a pleasant environment (Ortiz-Colón, Jordán, & Agredal, 2018), among the skills developed with this Strategy is: concentration, social awareness (Uribe, Cobos, & Ortega, 2017), self-confidence, self-esteem, social skills and personal competence (Calderón, Petri, Ruiz, & von Wangenheim, 2018).

Various authors have pointed out that the interesting element of the Gamification strategy used in education, particularly the set of characteristic psychological factors that students experience with these didactic strategies, such as: mastery, autonomy, knowledge of the process, immersion or suspense, but whose main objectives are to offer experiences through dynamics that support the creation of experiences, which give real value to the learning experienced by students (Contreras, 2017).

The desire to participate and the intrinsic motivation towards the game, in the planned dynamics of Gamification, generate a transformative involvement in the students, where the experience and interaction of which they are part, creates an increase in motivation for the educational content and their commitment. Player volunteer (Contreras, 2017), giving the possibility of being able to give a mechanic of interest, emotion and fun, to all the activities to be carried out within the learning tasks (Villalustre & Del Moral, 2015).

There is consensus of various authors in pointing out that the Gamification strategy is a fundamental factor to increase the motivation in the students, understanding by this, the passion, stimulation and enthusiasm that the students feel to contribute with their abilities and talents to a task (Ortiz-Colón et al., 2018). Motivation can be categorized as extrinsic motivation, that which arises from a stimulus or an external source, generating a desire to learn to achieve a goal, to achieve professional success, to beat your peers academically, or to stand out before your teacher. (lumsden, 1994). Intrinsic motivation comes from within the student, and makes the student want to learn for the satisfaction of doing it (lumsden, 1994).

As for intrinsic motivations, there are 3 main characteristics that must be covered to achieve this type of motivation, which are enhanced by Gamification, including: a) competence, as an ability to complete and perform external challenges, b) relationships, it is the universal desire to interact and bond in a way, c) autonomy, it is freedom to choose actions and to be able to make decisions (Borrás Gené, 2015).

Regarding the theory of behavior associated with motivation and gamification, developed by Mihaly Csikszentmihalyi, who points out that there is a zone that can be called flow, in which there is a mental state where the person is fully involved in the activity that performs, but that this ability is directly related to the perception that one has, of the degree of difficulty of the activity and of the skills that are available to carry out said activity, these are the barriers that the student precisely manages to break when engaging in the Gamification activities (Borrás Gené, 2015).

This motivating involvement that leads the student to learning the content, is presented from: activities that pose a challenge, tasks or activity with clear instructions and medium level of complication, clearly designed and achievable goals, participants to whom it is offered continuous feedback, all these elements present in the Gamification teaching strategy.

IV.   Conclusions

It is illustrated how the Gamification teaching strategy generates in students an active learning role, engaging in activities in the process of receiving and giving feedback, together with the psychological factors involved in the proposed academic context or scenarios, in which through dynamics that support the creation of experiences, which give real value to the learning experienced by the student.

Structurally, the Gamification strategy contains the same categories as games: mechanics, components and dynamics, the latter being the difference, where the dynamics of the context in the educational environment respond to academic or scientific circumstances, seeking the development of skills and dexterity, as well as the acquisition of knowledge. The use of the Gamification strategy is promoted by the incorporation of new technologies, taking advantage of the underlying culture in digital natives, promoting motivation in them, and their attractiveness is common at early ages at the level of primary education.

The intrinsic motivation that is capable of being generated in the planned dynamics of Gamification, allow the transformative involvement of the student, creating an increase in motivation for the role that he / she plays in the educational activity, generating a voluntary commitment as a participant, so the activities it executes are based on a mechanism of interest, emotion and fun within the learning tasks.

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