A Contribution to Educational Strategy.

Gamification within the Current

Educational Space

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Introduction

It´s necessary to maintain a constant teacher training adapted to the new times in the new educational scenario. Today's students are experiencing new ways of communicating and establishing social relationships. In this context, Information and Communication Technologies (ICT) play an essential role in the development of these and in the dissemination of knowledge. The inclusion of this didactic-technological resource finds its justification in the new socio-educational needs that the school of the 21st century must assume. Evidently, the use of ICTs implies, among many other changes, methodological innovations, encouraging student participation and offering them an active, participatory and social role. The more traditional pedagogies are being surpassed and replaced by new digital trends within the framework of the information and knowledge society [16,3].

As a consequence of these socio-educational needs, the Gamification technique is framed, a learning technique that transfers the mechanics of games to the educational-professional environment, in order to achieve better results, can produce an additional incentive to students in different educational centers, from basic education to higher education.

In an educational environment, the benefits of incorporating game elements provide extra motivation for students [1]. In this environment, students are allowed to progress at their own pace through personal and timely feedback, in addition to developing skills such as problem solving, collaboration and communication. Currently, students are satisfied with the use of technological tools to support their teaching and learning process, but we must activate new processes and establish

which typology of Gamification tools improve results in each specific case. As for the methodology of rewards when recognizing the efforts of each student or group, there is a wide debate as to whether they should be physical prizes, qualities obtained, educational bonuses or access to virtual games/platforms.

This is perhaps the most critical point of a methodology in which constant learning is highly valued and which is beginning to be implemented in many educational centers.

The idea of Gamification is not to create a game, but to use the tools we have to get used to the system: Pursuit of an Objective - Goal - Achievement – Reward [4,5].

Likewise, the different characteristics that this new resource can offer as a support material during the contemporary teaching-learning processes are presented. It also incorporates the approaches of different activities that can be used as orientation for its later application in the Primary Education stage. The aim is to show the potential of ICT in the educational field, focused on gamification, as a didactic strategy in the teaching-learning processes [2].

2. Where it Comes from and what Gamification is

In most studies, the birth of the 'gamification' concept is located in the business sector, however, its evolution and development diverted to other areas. The leap to the world of Education is due to Professor Malone, who developed a study/workshop on the application of the motivation of network games using the concepts of gamification in learning. However, there are other figures who stand out in the study of gamification in the educational environment such as (i) Gee, who tried to show the adaptability of video games in the classroom; and (ii) Sawyer and Smith, who were the architects of the famous taxonomy of serious games (video games specifically designed for purposes other than pure entertainment). They succeeded in involving different sectors (education, health, training, coaching, simulation) in the use of serious games (JS).

The modern or current concept of gamification dates back to 2003. It is a derivative of 'gamification', a term devised by the British Nick Pelling, a business software developer and programmer, who spread this term to give a name to a reality he had observed, according to which the "game culture" was a kind of revolution that was reprogramming society. Thus, gamification is understood as a paradigm on how existing things, whether products, social or educational aspects, can be transformed into a game to obtain specific objectives, leading to a process of transformation of reality to achieve set objectives, whether they be business, educational, academic, health, etc [6]. It appears as a term that has a place in any sphere of society, as a link between these and more or less achievable objectives.

Since 2003 the term has been adopted in different fields, but it was in 2010 and 2011 when some famous video game designers conveyed the idea of gamification through congresses, seminars and conferences, stressing that this term also highlighted the "importance of the gaming experience", i.e. the need to transfer the con-

centration, fun and emotions experienced by the player to the real world. Game developers Cunningham and Zicher-mann defined gamification as the "use of playful thinking and game mechanics to encourage user participation and solve problems. On the other hand [7], contributed an aca-demic definition: "use of game design elements in non-game contexts".

Currently, gamification, already introduced in the educational sector, is initiating a maturation process in which a huge amount of critical mass is being generated in publications and scientific journals, many of them based on the adaptation of gamification to mobile formats and cutting-edge technologies [9].
Gamification appears nowadays as a learning technique that transfers the mechanics of games to the educational-professional field in order to achieve better results, either to:
- Better absorb some knowledge
- Strengthen a value
- Improve a skill, or
- Change an attitude
- Reward specific actions and behaviors
It should be kept in mind that a game is a system composed of a set of rules, obstacles and choices, in which the player needs to learn from his mistakes in order to succeed. Since the game can manifest itself in an environment of encounter, which favors both social and cultural factors, the adoption of game structures in different environments can make a tedious activity more attractive. This article deals with the history of the use of games in the teaching environment, focusing on the "origin of educational gamification".

The evolution of games and, above all, the way of playing, have changed radically with the emergence and consolidation of the video game industry since the 1980s. The marketing world quickly grasped the influence that the gaming experience had in modifying behavior, and soon adopted elements and dynamics of video games to attract and retain customers with notable success. In this sense, gamification can be related to the commercial strategy of offering gifts, accumulating coupons and points, etc., something commonly used by countless companies to sell their products.

3. Differences Between Gamification, Serious Games and Project-Based Learning

Gamification is the learning technique that transfers game dynamics and its resources to a non-game scenario. It uses resources such as rankings, rewards, badges, prizes or points systems.
Serious Games (JS) are generally computer-simulation programs, virtual reality or video games whose main objective is not fun or entertainment, but learning or practicing skills.

And finally, Game-Based Learning (GBL) is a method that uses games to learn. When the contents and skills that want to be taught are not presented in a pre-classroom, online class or in a book, but through games.

4. Characteristics of Gamification

The most important characteristics of gamification are the following: it uses game mechanics in non-game environments, such as an e-learning course, corporate training, formal and informal education, etc. (for example, awarding points and medals when different activities are passed, making a ranking where the progress of students is shown globally, organizing contests, etc.); its main purpose is to motivate people to perform certain tasks, achieve learning objectives, and ultimately, complete the course. In general, it is not applied to the whole, but to certain elements (evaluations, grades, course progress, etc.) with the purpose of improving the learning experience [19]. It is convenient not to apply gamification to all the elements of the course, i.e., not to turn every activity or resource into a tool to get compete, get medals.

5. Advantages and Disadvantages of Gamification

The most important advantages produced by the application of the didactic tool of gamification are the following [12, 14, 15]:

- It encourages teamwork (inside or outside the office) and improves the work environment. This is best achieved with small groups of three or four students.

- It improves communication in the company. Commitment to the achievement of joint objectives improves horizontal and vertical communication among participants (students, employers, etc.).

- Achievement of objectives. They always create a good working environment and encourage to continue in that line of improvement.

- Results can be quantified. They are always measurable and comparable to see where we are. They allow to set references to be able to undertake more important achievements.

- It makes the processes and therefore the work more fun. The student/worker feels more committed to his/her work and does it in a more dynamic way.

- It allows getting to know the team members better and better. The communication between the groups is a link of greater knowledge of the participants in the planning and achievement of the objectives at all levels.

Among the disadvantages of Gamification are:

- It is a distraction for the team if the activity is not done well, it is necessary to follow the student continuously.

- Misunderstood competition among colleagues. This could lead to leadership problems within the work group and generate that the group does not work at the right speed.

- Someone may cheat. Derived from the lack of attention on the part of the teachers in charge of carrying out the activity.

- Team members may see it as a waste of time. It may be that the activity is not sufficiently well explained or that the students do not relate it to the subject dealt with in the subject where the activity is to be carried out.

- Difficulty in coordinating a large team. With very large groups you can lose the perspective and intensity of the work in some part of the group that could lead to a lack of commitment of some students thus impairing the development and implementation of the objectives to be achieved [13].

6. Lines of Work to 'Gamify Education'.

A first line could be to use games in a controlled way (the teacher chooses the game and the moment) so that students acquire the competencies and skills that are supposed to appear in them. For example, making decisions, preparing a strategy, interacting with different elements, acquiring spatial vision, etc. [10,11]. Experiences can be found where the student plays, and afterwards, the teacher tries to identify their skills and use them in a formative process. It is very common to include games so that students can socialize better; for example, many communities and social networks include the possibility for users to have access to online games [29].

A second line would be to use the characteristic elements of games. Levels, points, medals, accumulated useful objects, scoreboards or the interface. In this case, it is a matter of taking advantage of the learner's predisposition to play in order to increase motivation for learning. In the 1990s, numerous programs were developed in which the assessment tests (formative and summative) had an interface similar to games such as Trivia, roulette or word search. Today, badges (badges or medals) are widely used in training. The student receives bagdes as he/she passes certain activities.

And finally, redesigning a learning process as if it were a game. This modality is the most complicated, the teacher must design his subject, or part of it, as a game. It is not enough to have an interface with the same elements of the games, but the student must also 'play', and thus acquire knowledge, skills and competencies, Currently, platforms are being designed to help teachers to 'gamify' their subject [21].
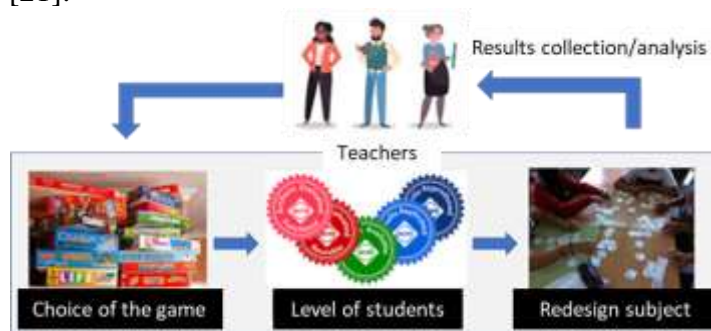

Figure 1. Lines of work for gamification

7. Conclusions

The introduction of gamification is important because it acquires the role of a motivational tool, since it can transform extrinsic motivation into intrinsic motivation, thus awakening the student's passion for learning and an enormous need to learn significantly, valuing that the development of a gamifying activity is for the benefit of the student himself [28].

Gamification in education carries with it an enormous responsibility for the objective to be achieved and for the addressee of the process. It should be taken into account that young students, many times in training, are easily malleable and will be motivated if the processes are developed properly; however, if the processes are not sufficiently clear, demotivation usually appears when they are not able to understand what is intended for them [17,18].

A gamified class survives with arguments centered on the game but implemented as learning experiences that use challenges in real situations and choices whose level of difficulty is increasing, so a gamified class should have an attractive story that allows converting the learning objectives into challenges to overcome [20]. The success of a gamified class in the higher education context should have a series of daily objectives in accordance with its methodological planning, which should have a system to measure their progress; this is because an educational system that uses gamification is guaranteed to reduce stress and anxiety levels, paying more attention to the involvement in the game. Gamification as a support for the university teaching strategy eliminates the uncertainty about why I learn and with what I learn, as well as the monotony of the expository model, since the implementation of a gamifying activity helps both the student and the teacher to objectively know the level of progress in the personal learning of each individual based on his or her own interests [22,24]. As a general consequence, it is determined that gamification positively affects the learning process by stimulating motivation in students, particularly through the positive interaction between teacher and students.

Young people are extremely binary and want things to happen as soon as possible in their thoughts and tastes, so a gamification process may face several problems of not quickly achieving the motivation and immersion of students in the programmed activities. Because of this, it is a tool that must be calibrated according to the competencies and skills of the users and the organization (schools, companies, etc.), as well as the indirect users of the process, such as friends and families, since they also represent a source of influence on the learner's perception of the gamification process. In order to achieve long-term success, it always has to be squared from the more general point of view of the center, otherwise, the objectives will be lost in the rest of the contents that have not been gamified [25,26].

It must also be said that the creation of a 'gamified system', for example, in a university subject, is not an easy task. There is a risk that the system may end up lowering the level that we want to demand from the students or, and this is even more worrying, that the students end up perceiving that the level of demand has been lowered. For this reason, it will be necessary to be very careful with all the

details of the development of the application of gamification, being very clear about the need to be covered and ensuring that all proposals always respond to these needs [27].

References

[1]   E.M. Avedon and B. Sutton-Smith, *The Study of Games*, New York, Wiley, 1971.

[2]   J.M. Berluhesht Seleygth, *Teknik Trender i utbildning*, Uppsala Sweden: Uppsala Universitet Upplagor, 2009.

[3]   J. Black, J. Castro and C. Lin, *Youth Practices in Digital Arts and New Media: Learning in Formal and Informal Settings*, Springer, New York, Palgrave, 2015. https://doi.org/10.1057/9781137475176

[4]   R. Caillois, *Man, Play, and Games*, Glencoe, New York, 1958.

[5]   R.S. Contreras Espinosa, Elementos de juego y motivación: reflexiones entorno a una experiencia que utiliza gamificación en una asignatura de grado para game designers, En: Contreras Espinosa, R. S. y Eguia, J. L. Eds., Gamificación en aulas Universitarias. pp. 56-67. Bellaterra: Institut de la Comunicació, Universitat Autònoma de Barcelona, (2016) Disponible en: http://incom.uab.cat/download/eBook_incomuab_gamificacion.pdf

[6]   M. Csíkszentmihályi, *Flow: The Psychology of Optimal Experience*, New York, Harper & Row, 1990.

[7]   S. Deterding, Gameful Design for Learning, *T+D*, **67** (2013), no. 7, 60-63.

[8]   S. Deterding, D. Dixon, R. Khaled and L. Nacke, From game design elements to gamefulness: Defining gamification, *Proceedings of the 15th International Academic MindTrek Conference*, Envisioning Future Media Environments, New York: ACM, (2011), 9–15. https://doi.org/10.1145/2181037.2181040

[9]   M.V. Diggelen, Principles of gamification, (2012), Disponible en https://www.youtube.com/watch?v=Peqh-EBm1Fk

[10]   M. Eraut, Schon shock: a case for reframing reflection-in-action?. *Teachers and Teaching Theory and Practice*, **1** (1995), 9–22. https://doi.org/10.1080/1354060950010102

[11] M. Eraut, Informal learning in the workplace, *Studies in Continuing Educa-tion*, **26** (2004), no. 2, 247-273.
      https://doi.org/10.1080/158037042000225245

[12] J. Hamari, J. Koivisto and H. Sarsa, Does Gamification Work? – A Litera-ture Revi ew of Empirical Studies on Gamification, *47th Hawaii Int. Con-ference on System Sciences*, Hawaii, USA, (2014), 3025-3034.
      https://doi.org/10.1109/hicss.2014.377

[13] J. Juul, The game, the player, the world: Looking for a heart of gameness, En: Copier, M. y Raessens J. Eds., Level-up: digital games research confer-ence proceedings (2003), 30–45. The Netherlands: Utrecht

[14] K.M. Kapp, *The Gamification Of Learning And Instruction: Game-Based Methods And Strategies For Training And Education*, 2012, John Wiley & Sons.

[15] E.A. Locke and G.P. Latham, What should we do about motivation theory? Six recommendations for the twenty-first century, *Academy of Management Review*, **29** (2004), no. 3, 388-403.
      https://doi.org/10.5465/amr.2004.13670974

[16] J.J. Lee, Gamification in Education: What, How, Why Bother? *Academic Exchange Quarterly*, **15** (2011), 1-5.

[17] S. Lei, Intrinsic and extrinsic motivation: Evaluating benefits and drawbacks from college instructors' perspectives, *Journal of Instructional Psychology*, **37** (2010).

[18] P.S. Loreto Vivar, *Fundamento Del Juego Serio En Contextos Educativos*, Lima, Peru: Universidad Federico Villareal EDICIONES, 2015.

[19] D. Maletz, Four Tricks to Improve Game Balance, Disponible en (2012), http://www.gamasutra.com/blogs/DavidMaletz/20120913/177683/Four_Tri cks_to_Improve_Game_ Balance.php

[20] C.I. Muntean, Raising engagement in e-learning through gamification, *Proc. 6th International Conference on Virtual Learning ICVL*, (2011).

[21] S. Nicholson, A user-centered theoretical framework for meaningful gamifi-cation, *Games+ Learning+ Society*, **8.1.** (2012), 223-230.

[22] H.A. Oliva, The gamification as a methodical strategy in the university educational context, *Journal Reality and Reflexion*, **44** (2016).

[23] A. Penenberg, *Play At Work. How Games Inspire Breakthrough Thinking*, Editorial Piatkus Londres, 2013.

[24] O. Picardo Joao, *Teoria Curricular*, San Salvador: UFG Editores, 2016.

[25] D. Pink, *La Sorprendente Verdad Sobre Qué Nos Motiva*, Editorial Gestión 2000. Barcelona, 2010.

[26] J. Radoff, *Game On: Energize Your Business With Social Media Games*, Wiley publishing. Indianapolis, 2011.

[27] A.S. Reber, *Implicit Learning And Tacit Knowledge: An Essay On The Cognitive Unconscious*, Oxford: Oxford University Press, 1993.

[28] K. Salen and E. Zimmerman, *Rules Of Play: Game Design Fundamentals*, MIT Press, 2004.

[29] G. Sanglier, J.C. Zuíl, C.B. Martínez, I. Serrano and A. Herrnández, The role of games through gamification in Higher Education, *Contemporary Engineering Sciences*, **14** (2021), no.1, 43-50.
https://doi.org/10.12988/ces.2021.91675