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How to gamify the classroom?

A proposal for teachers training

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Abstract
Gamification can be challenging to implement, because it is not just to use game mechanics in non-game context. The first results reveal that it is necessary to focus attention on the design process, where some of the main problems were detected. The setback that occurred in the early years was due to the lack of knowledge and tools to enable it to be accomplished. Currently it is possible to find digital tools that help on the design of gamification. Also the knowledge available allows teachers to find creative solutions to successful experiences. It is in this context that a teacher training program has been developed that will enable them to structure and implement gamification in their classrooms. From the Octalysis framework, teachers will be able to decide about what emotions they want to provide to their students, and then structure what tools to use and which game mechanics to apply.

Keywords: Gamification; Engagement; Training; Gamification design; Octalysis framework.

1 Introduction

Gamification is a recent concept but its application is old. A good example is education itself that is organized by sequential levels, with feedback and progression. Only with mobile devices and the internet available now this concept appears and gain projection [1]. However the initial promise faded because of the difficulties they faced: on one hand, knowledge was poorly consolidated and on the other, the lack of specific tools [2]. In the last two years books have been published, digital tools have appeared and research has been made. So it is possible to be more close to uncovering how to gamify classrooms.

In this paper will be described the concept of gamification and the Octalysis framework. Based on that, a teacher's course was developed and is being implemented. For that reason it only be described what is programed to be implemented. The first results would be presented at the conference.

adfa, p. 1, 2011.

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2 What is gamification?

The new generations spend most of their free time playing on the most varied mobile devices available [3]–[6]. The technological development associated with the technical development of videogames and digital games created an environment advantageous to the emergence of gamification [1], [7], [8].

For this contributed the work of Jane McGonigal [4], a designer who saw in the games great possibilities to change behaviors or even the society. It is in the area of marketing and human resources management that this concept has been more applied, with Gardner, Inc. (consulting firm) forecasting its use by most companies by 2014 [1].

Deterding, Dixon, Khaled and Nacke [7] presented the first general definition: "Gamification is the use of game design elements in non-game contexts" (p.10). One of the authors in the area of gamification that has focused on its use in the area of education is Karl Kapp [1] who argues that "gamification is using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problems" (p.12). Kapp distinguishes two types of gamification: (1^{st}) the structural that corresponds to the application of game mechanisms to existing content and (2^{nd}) the content where information, dynamics and content itself are changed through game design methods [9]. However, applying gaming mechanisms to any context does not mean that the desired effect is achieved. For example, the widespread use of badges we currently see is developing what Burke [2] calls a "badge fatigue" (p. 7), pushing away many of the users. It is important to direct the gamification to what the user will feel, because only then can we create engagement and achieve the desired effects [2], [10], [11].

According to Hamari, Koivisto and Sarsa [12], who evaluated the studies published in international journals, the education and learning are the most frequent context identified, and in these were pointed out positive results like increased motivation and engagement in activities, as well as fun. Points that need improvement were also pointed out, like the increase of competitiveness, the difficult to evaluate the activities and planning them.

At the Portugal national level, several projects have been developed; in the educational area, we find the application of methodologies in computer science [13], associating simulation games [14], implementation of the Openbadges mechanism in the SAPO Campus platform [15], a digital literacy project [16]. They are mainly situations of evaluation of the effects of platforms or digital tools that have characteristics of gamification in specific contexts, being based mainly on the use of badges, points and leaderboards. More recently, a proposal for a social stratification model for education, GET7, has been published, which outlines phases for the elaboration of a gamefull activity applied to education [17].

But most of these projects include development teams to create what teachers have planned. Unfortunately these conditions are difficult to provide in normal educational context because of the costs that are involved. This was why the idea to begin this project occurred. It is our aim to empower teachers to implement gamification with the tools already available under the schools conditions.

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3 How to apply Gamification on classroom?

According to Zichermann & Linder [8, p. 216] there are three reasons for gamification to be the future: (1st) "Gamification is the language of this new generation", (2nd) "The benefits of game apply equally well to older stakeholders", and (3rd) "Game delivers affordable, measurable, and scalable behavior change" (p.216).

Gamification is taking its first steps in the educational area, however that it is the context where more studies are published according to Hamari [12]. Most studies are based on projects where game mechanisms have been implemented in learning contexts [7], [12]. But Gamification is much more than that [1], its success depends on the interests of the recipients [2], [8], [10], [11]. One of the problems that has already been identified is the planning stage of gamification activities [12], which leads to poor design experiences that may have novelty effects, but without great relevance in long-term behavior change.

Robson [18] presents a framework of gamification named Mechanics, Dynamics, and Emotions (MDE). This framework was adapted from Hunicke, Leblanc and Zubek original game design: Mechanics, Dynamics, and Aesthetics (MDA). Aesthetics on the game design "describes the desirable emotional responses (…) evoked in players when they interact with the game" [21, p.413]. On his framework, Robson [18] replace 'aesthetics' by 'emotions' since it is a close term to engagement outcomes. MDE framework includes four components, namely:

- People involved -Designers, players, spectators, and observers.
- Mechanics - Decisions made by designers ("the goals, the rules, the setting, the context, the types of interactions, and the boundaries of the situation to be gamified" [18, p. 414]).
- Dynamics - behavior that emerges in players due to a gamified experience.
- Emotions - the emotional state and reactions that the experience provokes in the players - from this depends the extension of the player in the experience.

It is important to understand how these components can be organized to accomplish a successful gamification experience. What mechanics should be used? What is the relationship between Mechanics and Emotions? What can we expect from a set of mechanics? To understand how we can design and apply gamification it will be presented the Octalysis framework developed by Chou [11].

3.1 Octalysis Framework description

The Octalysis framework is based on the concept of Human-Focused Design that prompts that people have feelings, motivations, insecurities and reasons why they want to do something and optimize it to achieve that aim. All human actions have behind it a Core Drive that motives them. Octalysis [11] is an octagonal analysis of what drives anyone to do something, it describes eight core drives that explain the motivation that is stimulated by game mechanics (Table 1).

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Table 1. – Core Drive description on the Octalysis framework [11].

Core Drive	Description	Example of mechanics
1 - Epic meaning and calling	- it "is the Core Drive that is in play when a person believes they are doing something greater than themselves and/or were "chosen" to take that action" (p.25).	- Narrative - Elitism - Destiny child - CoCreator
2 - Development and accomplishment	- it "is our internal drive for making progress, developing skills, achieving mastery, and eventually overcoming challenges" (p.25).	- Points - Badges - Progress bar - Leaderboard
3 - Empowerment of creativity and feedback	- it "is expressed when users are engaged in a creative process where they repeatedly figure new things out and try different combinations" (p.26).	- Mission unlock - Instant feedback - Boosters - Choice perception
4 - Ownership and possession	- it "is where users are motivated because they feel like they own or control something" (p.26)	- Collection set - Avatar - Virtual goods
5 - Social influence and relatedness	- "incorporates all the social elements that motivate people, including: mentorship, social acceptance, social feedback, companionship, and even competition and envy" (p.27)	- Social treasure - Group quest - Bragging - Mentorship
6 - Scarcity and impatience	- it "is the Core Drive of wanting something simply because it is extremely rare, exclusive, or immediately unattainable" (p.27)	- Appointment dynamics - Fixed intervals - Count down - Patient feedback
7 - Unpredictability and curiosity	- it "is the Core Drive of constantly being engaged because you don't know what is going to happen next" (p.27)	- Mini quests - Easter eggs - Random rewards
8 - Loss and avoidance	"This Core Drive should come as no surprise - it's the motivation to avoid something negative from happening" (p.28).	- Progress lost - Evanescence opportunity -Fear of missing out

This entire Core Drives are organized in an octagonal shape being the 1 at the top corner and the 8 at the bottom, the even numbers are distributed on the left side and odd numbers on the right side. The Core Drives on the left side of the shape are more extrinsic motivation (logic brain side) and the ones on the right side are more intrinsic motivation (creative brain side), being the 1 and 8 core drives with the two sides. This octagonal shape also has positive (White hat) and negative (Black hat) drives. The top shape has the positive ones: they give us joy, and is possible to control them. The core

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drives in the bottom are the negative ones: they are urgent, addictive and we cannot control them. Chou [11] in his book presents more than a hundred mechanics that we can find in games and we can use them on gamification design. However, we must start by establishing what emotions we want the players/learners to feel on the gamification experience and after is possible to define the mechanics to use to achieve it.

The Octalysis framework explains how each mechanic affects players, allowing us to understand the motives behind their reactions. For this reason it was chosen to help teachers on the gamification design of classroom activities during the training.

3.2 A proposal to teachers training

"Taking quizzes and exams became 'defeating monsters', writing papers became 'crafting' and class presentation became 'quests'" [19, p. 424] is a way of easily explaining how teachers could apply gamification to their classrooms. But is necessary more than a change of words, we need digital tools easy to use and available to teachers and students. It is also necessary that all components (mechanics, dynamics and emotion) make sense to people involved [2], [11], [18].

Gamification requires digital tools to provide the full scope of a game and teachers can take advantage of the vast number of resources available through the Internet to achieve this. Thousands of digital tools and apps for mobile devices are available to be used, but it is difficult for teachers to keep up with developments and new releases.

These digital tools, if used properly, enable teachers to create engaging environments in their classrooms. An extensive list of digital tools has been collected and can be useful guide to teachers, but it is the context and how the tools are used that makes the experience engaging. Octalysis framework can lead teachers to choose which tools to use, how and at what time.

Training course for teachers is underway. It aims to uncovering the emotions that motivate students to learn and thought Octalysis framework, teachers will design and implement of a gamified activity in real context.

To design gamification experience for their students, teachers are invited to

1. Identify the goal they want to achieve (i.e.: change a behavior; engage students in a part of the subject;…)
2. Identify the emotions that can guide students to achieve that goal (i.e.: curiosity; item collection; peer appreciation; …)
3. Identify digital tools that could be used to reproduce these emotions (i.e.: online space to interact with students; different tools to create more interactive support materials)

Based on these choices, teachers will be supported by the project team to prepare and implement a gamification design they planned. The possibilities of combining the different tools are gigantic. This allows teachers to choose the options that best suit the technical conditions available in schools, the technical mastery they have over the tools and the interests of the students. Of course, it is not an easy task to do. We expect that the discussion of ideas between teachers and the sharing of experiences could have a great effect here. Also, the creativity of each teacher to think outside the box could have a big contribution to the success of each design.

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Presently this training is happening, for that reason is not possible to identify results. However, is possible to identify different type of digital tools that can be used. Table 2 is not exhaustive, but presents some of tools collected that appealed more teachers.

Table 2. Digital tools that can be used to design a gamifyed experience.

Type of tool	Description	Examples of digital tools
Platform to social interaction trough students and teachers	Online platform that allows exchanges between students, teachers and parents, where is possible to schedule tasks and give feedback.	Edmodo https://www.edmodo.com/ SAPO Campus http://campus.sapo.pt/
Gamification platform	Online platform that have gamification features ready to be used, like avatar, rewards, progress and achievements.	Class Dojo https://www.classdojo.com/ Class Craft https://www.classcraft.com/ LiveSchool http://whyliveschool.com Habitica https://habitica.com Blue Rabbit http://bluerabbit.io/
Collaboration tools	Tools that allow collaboration work between student and teacher. Facilitating the track and rapid feedback.	Drive (Google)
Exhibition tools	Tools that allow the creation of presentation more interactive to show in class. It can be used by students and teachers.	Amaze http://www.emaze.com/ Slidebean https://slidebean.com/ Prezy https://prezi.com
Exhibition tools with collaboration features	Allow to create a presentation and share it with students' thought their mobile devices and they can interact with it.	Nearpod http://www.nearpod.com/ ClassFlow https://classflow.com/ Pear Deck https://www.peardeck.com/
Quizzes	A set of questions to be answered, it can be used to assess students' knowledge or to help them to study.	Quizalize https://www.quizalize.com/ Quizizz https://quizizz.com/ Kahoot https://kahoot.it/ Plickers https://plickers.com/ Quizz Center http://quiz.center/en/
Quizz on text, image or video	Tools that allows integrated questions during the visualization of a video, in a PDF file or on an image.	ActivelyLearn http://www.activelylearn.com/ EDpuzzle https://edpuzzle.com/ Playposit https://www.playposit.com/ Thinglink http://www.thinglink.com/

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Video development	Tools that allow to create animated videos that can be used by teachers and/or students.	easelly http://www.easel.ly/ ToonDoo http://www.toondoo.com/ Screencast o Matic http://www.screencast-o-matic.com/ Go Animate http://goanimate.com/ My simple show https://mysimpleshow.com
Game tools	Tools that allow editing content in games, like crosswords, random picker, puzzle.	Jigsaw Planet http://www.jigsawplanet.com/ Educaplay https://en.educaplay.com/ Classtools http://www.classtools.net/

These tools will be useful to teachers to reproduce the mechanics necessary to increase the desired dynamics and observe the desired emotions happening. The important is to correctly combine all these tools. It takes a context that gives meaning to everything that is accomplished, either by the narrative that accompanies the unleashing of the tasks or by the challenge that was proposed to the class. It is up to the teacher to define the path that he considers most suitable for his students. This prevents possible technical limitations and technical competence that some tools may require.

4 Final Consideration

Who applies gamification has in common "the belief that human behavior can be changed through good, engaging design"[8, p. 220]. Also “Understanding the individuals that are involved in a gamified experience is fundamental to understanding gamification” [18, p. 414].

There is always a clear goal when gamification is implemented (examples: behavior change, understanding a subject, motivation for learning, etc...) however, must be adapted to the requirements that arise: technical conditions, mastery on the use of the tools chosen and the motivations that drive the ones involved in. Many variables can influence the execution of gamification projects; however, so far we observed that the sharing of experiences and cooperation between teachers are factors that have a positive influence in the execution of these projects.

It is our intention to present in the future the results obtained through the training of the first group of teachers and later improve it, so it would be possible to teacher to gamify their classrooms with success.

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