

MOOC accomplishment through gamification

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Abstract:

This article approaches the concept of gamification in teaching and learning contexts, mainly in Massive Open Online Courses (MOOC), to increase the motivation and commitment of students in the perseverance to complete the course. The use of game elements and concepts prompts an important factor in the way methodologies move toward for the development of student-directed courses.

Keywords: Gamification, MOOC, Motivation, Engagement, game-based learning.

I. Introduction

The learning paradigm has been changing in the last decades, with technology being one of the great drivers. With the appearance of faster computer systems (hardware and software) and the massification of the internet, the distance that used to separate people has become more tenuous. Humanity lives in constant turmoil with technology. Recent data indicate that internet access is more prevalent in the young age group [Figure.1] and that the use of mobile phones in the classroom (e.g. in social networks) contrasts with the willingness to learn (from the teacher's perspective). A question that needs to be asked is "Can the use of these devices in the classroom learning context bring more engagement in learning activities by students? The use of new technologies may be a way for students to interact with each other and with the pedagogical content adapted to each concept that is to be defined. The "old" role of the

teacher as "owner of the knowledge", now becomes someone who mediates the use of technology and its contextualisation for the school environment. In this sense, it becomes necessary to address the challenge of turning the contemporary classroom into a tripartite relationship - knowledge, technology and teaching-learning [1].

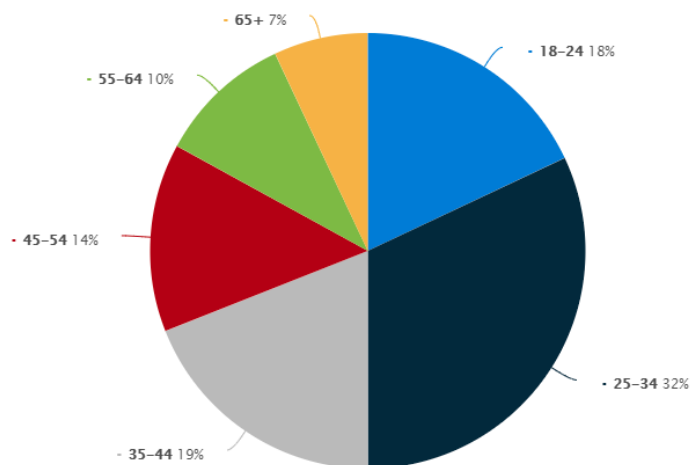


Figure 1 - Internet access by age group [2]

II. Massive Open Online Courses

In 2008, the term Massive Open Online Courses (MOOC), initially coined by Dave Cormier emerged, this kind of courses resulted from a course entitled "Connectivism and Connective Knowledge" developed by George Siemens and Stephen Downes [3]. Since then, the growth in popularity of MOOCs has

increased exponentially. Several MOOC platforms appeared, such as Udacity, Coursera and edX, which became pioneers in this new way of approaching web-based learning, as well as new platforms, in several countries [4], in Portugal, recently, the NAU platform also emerged, developed by FCT in line with the INCoDe.2030 initiative.

Just as they attract thousands of new students, MOOCs also suffer from the dilemma of thousands of dropouts in their courses. Thus, despite the enthusiasm and success in this form of distance learning, often acclaimed by academics, in the way they manage to attract millions, it is also in contrast, in its most expressive form, the percentage of dropouts [5].

It becomes clear, therefore, that we need to know and understand the reasons why there are so many cases of dropouts, as well as to try to counteract these numbers. The approach that this article seeks to emphasize is the concept of gamification applied to learning in the development of a MOOC. Gamification, in its simplest form, is understood as "the use of game elements and game design techniques in non-game contexts". [6].

III. MOOC Dropouts

With the massification of the internet, the opportunities for learning - usually called traditional means (e.g. classroom, etc.) - have been complemented by other so-called "innovative" methods. This has led to a new paradigm and a new approach to teaching and learning issues, with a free and open learning perspective for anyone, as long as they have access to the internet. Thus, many studies show, the benefits that MOOCs had - and have - at the time they first appeared, being an innovative idea to make distance and open learning a reality [7] [8] [9]. For this reason, the European Commission defines a MOOC as an online course open to all, without restrictions [9].

When they emerged in 2008, the MOOCs were not expressive in global terms. It was as of 2012 [Figura 2] that the presence of this type of courses began to be felt, with the emergence of several platforms - associated with universities. The growth of MOOCs, both in number of courses and

students worldwide, had an exponential growth. Nevertheless, the number of enrolments in the thousands of courses available also relates to the high dropout rate [10].

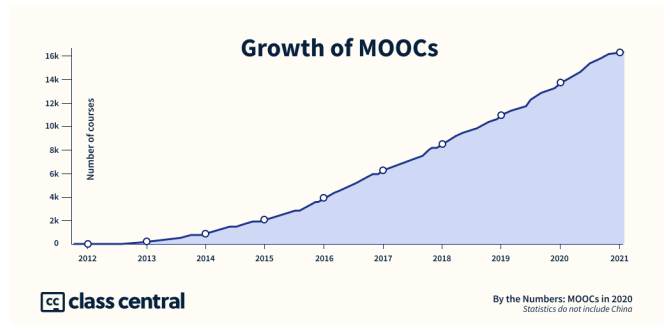


Figure II - Evolution of the number of MOOCs over the last decade [11]

There are several reasons why there are so many dropouts from MOOCs, some of them being [5] [10] [12]:

- A. Many students register for courses even before the syllabus is available and end up never accessing that course again.
- B. When they enrol on the course, they have no interest in completing the course. They only do it out of curiosity.
- C. Lack of time. Many students, when they enroll in the courses, have no notion of the time they need to complete the course. MOOCs, the way they are structured, namely the didactic resources (e.g. PDFs, videos), are not individualised for each student. If one student takes two weeks to finish a course, another may take a month.
- D. The difficulty in the course itself and the lack of support from the teacher who is teaching. Often the students' doubts are not answered, especially in more difficult syllabuses.
- E. The expectation of the course being different from that idealised.
- F. Lack of motivation to complete the chosen course.

- G. The student is only interested in a part of the course, rather than the whole course itself.

The reasons listed are only some of the factors that several authors refer as a cause for dropping out of courses, which may also be related to poor pedagogical quality. This generates an increase in enrolments in courses, in a passive way, and a low prevalence in the level of conclusion of those courses [12].

The use of gamification methodologies in MOOCs, could encourage student engagement using game mechanics and concepts and thus increase motivation, participation and engagement [13].

IV. Gamification

Games have been part of our lives since the beginning of human civilization. Many hours are spent playing per day, where age group, gender or location are not relevant factors, however, there is a higher prevalence of this activity in younger generations [6]. In this way, games have come to influence our lives, whether it is how we plan holidays or how we articulate how to orientate financial management. The way we used to think of the word "play" has become the everyday one of "learning responsibly through play" and the way of visualising this new concept of learning has been given the name of gamification [14].

Applying gamification methodology is not an easy thing to do, since its implementation complexity is influenced by many factors, such as user experience, user interface, game science and design, and psychology. Gamification can therefore be explained as "the application of a set of elements belonging to games, applied to a context other than a game, with the aim of solving problems or trying to modify the behaviour of participants". [15]. It is important to stress that each case is unique and gamification cannot be conceived as a rigid design, but rather should be flexible and variable, to adapt to each context and problem that needs to be solved. Thus, a single gamification approach, for any type of situation, will not be the best solution [15].

According to Cunningham [16], we can use gamification concepts, that is, employing game mechanics, aesthetics and game thinking, to captivate people and solve problems. The use of game mechanics, helps in learning and motivation, whether in formal or informal context. In this way, Cunningham [16] highlights some important characteristics of gamification usage:

- A. Users are all participants (in our context, the students);
- B. All challenges and tasks performed by the students have well-defined objectives;
- C. Points - are accumulated as tasks are completed;
- D. Levels - are dependent on the accumulated points;
- E. Badges¹ – will serve as a reward for completing a particular action;
- F. Leaderboards - Ranking of students according to their results.

Learner motivation is the central core of gamification, without it, it can almost be said that there is no gamification and every associated system has no chance to be built and scaled [14]. Motivations can be intrinsic or extrinsic. Intrinsic motivation belongs to the commitment to an activity because of the satisfaction or pleasure it provides, without there being any kind of reward. Extrinsic motivation, on the other hand, is characterised by activities which will have as an end goal, recognition or an associated reward [17]. Based on this context, we can delineate three (3) components inherent to games, which, in a way, are also crucial to learner behaviour - pleasure, rewards and time [14].

According to Kapp et al. [18], there are two (2) types of gamification - structured gamification and content gamification. The two are not self-excluding, on the contrary, they may coexist in the same course and when this happens the impact is greater. Structured gamification adds game elements to the content that will not change during the course. In this way, the aim of this approach,

¹ *Badge* - uma medalha/distintivo de compleção de um requisito ou objetivo.

is to provide learning by creating, for example, rewards when each task is completed, until the student reaches the end of the course. Content gamification, consists of applying elements of games and game thinking, to alter the content and make the course more like a game. By using narrative elements at the beginning of the course, or starting the course with a challenge rather than simply a list of objectives, it provides greater engagement and context, without turning the course into a game.

The most widely used *framework*² in game designs and which, in turn, also accepted in gamification is the MDA³ [14] [15], which represents the mechanics, dynamics and aesthetics. It consists of three (3) concepts that relate to those who develop the game and the players who play it. Thus, this *framework* [Figure 3] will be an asset to describe the interaction of elements in a game and apply that concept outside it [19].

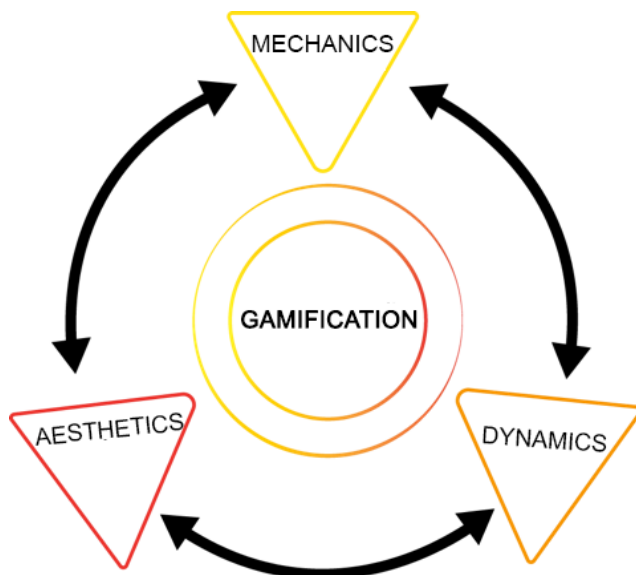


Figure III - Framework Mechanics, Dynamics and Aesthetics (authors source)

The Mechanics constitutes the functional components of a game, being related to the game system (e.g. scoring, levels, badges, etc.). Dynamics is related between the interconnection of the player and the game mechanics, but they are totally distinct. Dynamics, in this way, determines what each player is doing in response to the game mechanics. Aesthetics is the way the player feels

during interaction with the game system and can be seen as the result of the interactions of the system mechanics and dynamics. The whole system works as a whole, with each element being important in the chain as they are interconnected [14] [15].

According to Kyriakova et al. [16], to develop a strategy to implement gamification in a learning environment - in our case, through a MOOC - it is necessary to take into account several aspects:

- Characteristics of the students.
- Definition of course objectives.
- Creation of educational content and activities for gamification.
- Adding game elements and mechanisms
- Software.

IX. Conclusion

Gamification is different from a game - a game is independent. In gamification, although game elements are used (e.g. points, medals, challenges), the intention is not to create something independent, as in a game. Rather, the aim is to use these game elements, to provide an experience and engagement for those who are going to learn. Therefore, an in-depth and specific approach is needed to decide which (key) elements will be used in the course, as well as the context - according to the intended course objective - in which these elements will be used [18].

By using gamification in the design of learning, considering the various aspects mentioned throughout this article, it is possible to achieve various objectives in this field. Gamification is obviously not the solution to all learning-related problems, but it can be effective in combating student disinterest, increasing motivation and influencing behaviour and thus increasing the level of success in learning. Thus, gamification should be planned with the aim of involving students, where intrinsic and extrinsic motivations should be balanced, because if there are too many rewards or if the difficulty is too high (or

² Estrutura

³ MDA – Mechanics, Dynamics, Aesthetics

low), there may be no interest in completing the course.

X. References

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