Potential of gamification as a pedagogical strategy:

Incentive to participate based on the Moodle application

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Abstract: Gamification consists in the use of gaming devices in non-gaming contexts. This exploratory study aims to analyze the benefits that gamification can bring through pedagogical and technological objects mediated by the Moodle platform. The aim of this study is to present some of the potential that gamification may have, in terms of student motivation, for an increasingly active participation in the Moodle platform.

In this study it is necessary to highlight important factors to take into account, one of them being the change of the profile of the student being certainly important, to be able to integrate in this methodology different approaches that allow to capture the evolution of the student in order to increase their attention, motivation and commitment in the subjects to study. The game strategy then brings to the context a stimulating experience, seeking to extract from each one its competitiveness and commitment, in order to make the experience challenging and exciting.

Considering the exploratory nature of the study, questionnaires were presented to students who use online education and from individuals with little or no access to this type of education. Attempts were made to gauge the degree of acceptance of a game strategy for the same, as well as motivations and perceived barriers to the use of games in distance learning.

The results suggest that, for the most part, the preferred style of play is adventure, notably puzzle solving, it has also been found that the strategy-based style of play is among the favorites. It should also be noted that the results show that it is highly valued by the users of social networks the constant possibility of interaction and the possibility of constant updating of information.

The potentialities of game strategies that take into account the shared opinions were then delineated, so as to be able to reconcile the interests that motivate most of those involved in this study.

Key words: gamification, information systems, education, virtual learning environment.
1. Introduction

The main purpose of this paper is to find ways to motivate and increase the participation of higher education students in the Moodle platform. This study focuses on the application of the concept of "gamification", using the Moodle application linked to the Open University e-learning platform.

The concept of "gamification" refers to the application of elements present in video games in other activities outside the usual contexts and with potential in education and training (Deterding, Dixon, Khaled, and Nack, 2011; Kapp, 2012), meaning "elements of games" such as complying with rules, establishing clear goals and rewarding achievements through scoring systems or trophies (reward and return system) and launching challenges, developing the action according to difficulty levels in order to stimulate performances. It is also common in gamification to promote the creation of entanglements and avatars, here understood as the personification of the person's own imaginary alter-ego (physical and emotional) in the form of a character. These factors are of such importance that only when all are present, acting in a cooperative way, one can speak with the property of "gamification" (Kapp, 2012), being possible to obtain positive effects in terms of commitment of the individuals in the proposed tasks. Recently, there has been growing interest in the applications of gamification in the teaching / learning process at all levels (Domínguez, Saenz-de-Navarrete, Marcos, and Fernández-Sanz, 2013).

Given that gamification is a phenomenon that consists of the application of elements of game in situations that do not constitute like game, aiming that its users reach their goals. Taking into account and paying attention to the stated characteristics that the games fix the attention of their players increasing their performances, it is plausible to affirm that a strategy of gamification can decisively influence its users, leading to a change of behaviors and to enhance learning. In today's world, the widespread availability of broadband connections is increasingly present. Banking, buying food and clothing products makes the digital revolution ever more exciting. The internet has become the means of choice for a generation of consumers, the first generation with instant access to digital information.

On the other hand, the technological evolution that has been occurring in recent decades throughout the world, until nowadays has enabled the emergence of games in supports other than the traditional, video games. The epistemological principles underlying the construction of the study object led to the delimitation of the thematic area in which the research work would be located, focusing essentially on the implementation of potential gamification strategies using devices using the Moodle platform.

According to the aforementioned assumption, the research plan underwent some changes, as the object of study was known and, as it was getting to know better the subject under study. The plan was modified and the strategies were also selected according to decisions, in terms of specific aspects, context and the authors under analysis.
In the present investigation, the work of constructing the object of study was based on theoretical foundations resulting from the revision of the state of the art through previous readings made on the subject matter, by the reflection of the practices in terms of the use of devices using the Moodle platform.

2. Literature Review

The authors Alves & Maciel (2014) in the article gamification in education: an overview of the phenomenon in virtual learning environments, have developed a study that has as "... objective to delimit a scope of study of gamification within education, especially in Virtual Environments of learning, and to differentiate the uses of video game design elements from digital game-based learning approaches." For this, concepts were reviewed through the bibliographic review. Some of the conclusions reached by the authors: a good use of the elements of video games in virtual education environments depends on the design established by the educators; for the process to have a positive outcome a well-planned pedagogical strategy is needed.

The work SMILE-BR: application of gamification concepts in a question-based learning environment, developed by França & Reategui (2013) aims to study the use of the concepts SMILE (Gamification in a Learning Environment based on Questioning) and the proposal for a new environment, called SMILE-BR. "It is an approach that fosters critical thinking, the development of research skills and the responsibilities for learning itself," this is how the authors describe Questionnaire-Based Learning. According to the authors, the "Results in several experiments with the use of the tool demonstrated the involvement and good performance of the students in the proposed activities". In the article Mobile devices and gamification: playful interfaces in new educational practices presented the proposal to use mobile technologies and gamification in order to "awaken the need to create together to young people and children a political sense ... "to the communicative practices that occur in the day to day from the use of mobile technologies. Giving the example of the crowd-sourcing campaign, the Volkswagen Group and that took place in china, and the Nike + application for mobile phones and Facebook.

The article, Gamification: an opportunity to involve students in learning, developed by Araújo & Carvalho (2014), intends to approach the concept of gamification and how it can be inserted in the most varied contexts, including education. The article itself presents elements of gamification (links), so that the reader can learn experiencing an experience. The authors begin by defining what gamification is, among the definitions it is concluded that they all emphasize the importance of creating effects similar to the gaming experience. The environment where the gamification will be applied should be careful with the aesthetic and design aspects, because
the available offer is not any experience that pleases a user. For these reasons, this way of motivating, requires great investment by the professionals, and the purpose is to motivate users to act in a specific way or promoting learning experiences and problem solving. In order for the learning experience in virtual environments does not become monotonous, it requires progress, constant updates, and creative ideas.

3. Methodological framework

3.1 Methodology
The research methodology developed below is as follows:

➢ Study of the state of the art:
Selection and study of diverse scientific bibliography in the areas of gamification, users of digital technology and game design. It should be mentioned that a consistent bibliographic review directs us to a better framework of the problematic under analysis.

➢ Gathering of requirements:
Questionnaires applied to students that use or have already used the online teaching modality, taking into account shared opinions to develop a solution that satisfies all the agents involved. According to Almeida and Pinto (1995), some advantages are considered in this type of data collection technique, such as: the possibility of reaching a large number of people, guaranteeing the anonymity of the answers, allowing people to respond at the moment more appropriate and does not expose the respondents under the influence of the questioner.

➢ Discussion and analysis of results:
Discussion and analysis of results from the qualitative point of view.

According to André and Lüdke (1986), Analyzing qualitative data means “working” all the material obtained during the research, that is, the reports of observations, transcripts of interviews, analysis of documents and other available information.

Establishing bridges between what has already been done in terms of gamification and what can be completed now with the new data obtained.

As André and Lüdke (1986) warn: Categorization, by itself, does not exhaust analysis. It is necessary that the researcher go beyond, beyond mere description, seeking to really add something to the already existing discussion on the focused subject. For this he will have to make an effort of abstraction, surpassing the data, trying to establish connections and relations that make possible the proposition of new explanations and interpretations.

➢ Potentialities of a gamification strategy:
Exploratory presentation of the potentialities of a gamification system in the Moodle platform.

3.2 Data collection

The methodology used included a questionnaire survey using "Google Forms", and the questionnaire was distributed by social network Facebook and by e-mail.

The main reason for choosing the distribution of the questionnaire through the mentioned routes is that the visas are or have been students of the online teaching. In this sense, we opted for a totally digital distribution of the same one, since, the familiarity of the respondents with both platforms was assumed. This same questionnaire was available to fill from 04/05/2017 until 05/20/2017.

The data collection was carried out so that the results obtained would reveal the preferences of the target audience, and the potentialities of gamification strategies were addressed on the basis of these same preferences, to indicate that the distributed questionnaire was attached.

3.3 Discussion of results

In this section of the chapter the main results of this investigation will be presented and discussed. Thus, considering what was addressed in the literature review and based on the data collected (surveys), we sought to analyze and reflect on possible gamification models to be implemented using the Moodle platform.

➢ Use of social networks:

As for the use of social networks, 91.1% of respondents are users of at least one social network, and Facebook is the most preferred one (Figure 14).

An important conclusion drawn from the literature review by the researcher Lazzaro (2004) is that people have different emotions when playing in a group or playing alone. The author argues that when playing in a group, players have emotions more often and more intensely than when playing alone. Nicole points out that group play allows for the emergence of new behaviors, rituals, and emotions that make games more exciting.

Given this and according to the data obtained in the questionnaire it is verified that the overwhelming majority of the sample uses a social network, so we can see that the sample in question is composed of elements that prefer social interaction will soon give primacy to strategies of games that involve the group to the detriment of games where they do not have any contact with the other elements.
➢ **Social networking features:**

As regards question no. 11 of the questionnaire "Which or what are the functionalities present in the network (s) of which you are a user, which motivate you to use the same (s)?"

In this free response question we find some of the essential elements in a gamification strategy that is immediate feedback, according to (Marczewski, 2013) one of the complaints about the real world is that the evaluation is often very slow, happens at the end of the year, bimonthly delivery of notes, interim examinations. In the game world, the assessment is constant and instantaneous.

Effective use of formative assessment requires the effective use of feedback, so that students have a clear view and understanding of learning goals or objectives, a way of relating their own performance to that goal, and then a way of objective, if there is any discrepancy between the state and its own performance objective (Delacruz, 2011). From this point of view and verifying the answers given, it is verified that the elements of the sample ambition the social contact from a constant interaction point of view and that same interaction aims at providing "quick response", "quick response and permanent contact".

➢ Regarding the last open-ended question, where each individual was asked to express their personal tastes in terms of what might be interesting in terms of game strategies. It can be concluded that the answers evaluated complement the style of strategy game, combining this quizzes, puzzles, solo learn, games of the type who wants to be a millionaire, and scored championships that stimulate competitiveness.

The goal of gamification is to stimulate learning and make it more interactive and interesting for students, and the characteristics that contribute to a greater commitment of these in systems based on gamification strategies are (Ed-Rom, 2017b):

**Feedback:** Frequent and immediate feedback is important so that students are aware of their progress and level of achievement, so that they can implement strategies to improve their performance, which is extremely important in e-learning, since it is about autonomous and distance learning;
Challenges: The challenges posed with a clear intention to the student, taking into account activities of learning to something of the "real world", motivate and encourage the students to act;

Competition: Through gamification, direct competition among students is stimulated. It is possible to choose the best student of the week or month, or even a healthier and passive competition, by publishing the top five grades of one test;

Rewards: Rewards (in the form of points, medals, collectibles or merit), associated with feedback, encourage the student to take good advantage of the tasks, motivating him to the following activities, promoting learning and school success

According to the literature review it is verified that four essential factors in a gamification strategy are 1) feedback; 2) challenges; 3) competition; 4) rewards. What is verified in the last question of open answer of the questionnaire is that the elements of the sample in question in their overwhelming majority refer to these four elements showing in our understanding that the challenges stimulated by a punctuated competition, having a reward for the same results reached appear in a classification table in which it is possible to measure and compare the performances performed by each one of the elements throughout the evaluations carried out.

4. Conclusion

4.1 Final considerations

With regard to the main objective of this master's thesis, the purpose was to propose a model of gamification, which met the expectations and preferences of those who are users of online education, and consequently increase their motivation and participation.

In the first phase, literature research and revision work was carried out. Followed by the collection of data through questionnaires addressed to users of this type of education. In this study, we sought to elucidate the potentialities that the Moodle platform has in terms of gamification, in order to allow the active involvement of the students. It was clear, given the preferences of the users surveyed, so that strategy as a form of game was predominantly present, having developed a general concept of gamification, in the form similar to a championship punctuated according to the performance of each one. But with a flexibility component regarding the presented challenges, since, making use of the activities and resources of the platform can be modified according to the intended, as well as according to the characteristics of each group involved. In a generic way, we can say that among the tools at our disposal, some of the advantages that give us more advantages for a gamification based on strategy as well as the competitive factor are:
The technology at our disposal today, exponentially increases the possibilities of teaching. It is now up to us to be able to innovate with the same technology so that the students begin to approach teaching in a less heavy, serious or stressful way. Although it was not possible to apply the proposed gamification model using the tools available in the moodle platform. Based on feedback from distributed questionnaires, we judge that users value peer competition a lot, in order to keep their participation at high levels. Therefore, what better evidence the competition between pairs is understood to be the punctuation of the performance of each one, this score that will reflect the final prizes.

With regard to risks and negative aspects to be taken into account, we can say that the lack of understanding of the rules by recipients is certainly the main aspect to be taken into account. It is therefore considered that the adoption of games with too complicated rules tends to alienate players from the game. Another of the risks involved in this type of project is the lack of immediate feedback, because all games must have a dynamic component that allows their players to remain participative and with their high level of interest. Having said that, it is vital that you get a constant response to your level of performance.

In short, gamification does not change the content to be taught in the classroom. It adds yes, greater attraction among other factors. Including rules and other elements taken from games, in order to change the participation of students and make it more enjoyable.

4.2 Future Research

There is still a long way to go in this area, since it is a relatively recent theme in education. In this context it would be opportune to test different game models in different classes, in order to arrive at a game model that maximizes the level of participation in the students. Namely through the use of mobile technologies and networked devices, which may include Augmented Reality and Mixed Reality.

It will also be important to understand the level and amount of rules that can be applied, taking into account the workload that will be the responsibility of each teacher, so that feedback, for example, is as immediate as possible, thus maintaining the interest of the participants.

Given the results obtained in the distributed questionnaire, it will be pertinent to include in future research the development of games based on adventure and strategy that foster competitiveness among the students involved. It is also considered important to involve IT
students in the development of gamification, opting of course for creating software that allows
greater freedom in the face of software limitations imposed by the moodle platform.

It would also be interesting to replicate the study across the various areas of education
in order to understand how the gamification proposals would vary according to the areas under
study.

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