GAMIFICATION OF THE TEACHING-LEARNING PROCESS AT THE OFFICIAL MASTER IN ECONOMICS / GAMIFICACIÓN DEL PROCESO DE ENSEÑANZA APRENDIZAJE DEL MASTER OFICIAL DE ECONOMICS

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Abstract

The modern educational challenge involves tasks of engaging students, stimulating their interests, retaining their attention, and maintaining a positive attitude in educational environment. The clue to achieve this result is tryout to maintain a fruitful communications environment that encourages feedback and reinforcement, not only between the professors and students, but also among the students themselves. In this paper, we introduce the gamified pilot project of the teaching learning process at the double official master in economics of the University of Granada and SRH Hochschule Berlin. We have implemented gamification to different courses in operations management and supply chain management exploiting gamification strategy, including story line, experience points, leveling, leaderboards, rewards and achievements. A pilot study involves 115 participants from both universities. The primary obtained results showed that gamification positively affected on engagement, motivation and competitiveness of participated students. Therefore, the aim of this pilot project is to bring a maximum to perfection the further project avoiding technical problems as smartphone applications and online platform failure.

Keywords: Gamification, Motivation, Behavior Change

1. INTRODUCTION

Today digitized life creates different destructions for students that can cause lack of time management and provoke poor academic performance. Implementing gamification will
benefit from this disadvantage; moreover, using an opportunity to utilize digitized products students will be engaged to study process. Today gamification has already become a popular tactic at some educational institutions to encourage specific behaviors and the results of case studies in researching of gamification in education showed a positive affection on students’ behavior (Domínguez et al, 2013). Gamification is commonly called the use of game thinking and game design elements in non-game contexts to engage users in solving problems and increase users' self-contributions. Nick Pelling in 2002 was the first who coined the term “Gamification”, but it gained the popularity only in 2010, when several industrial players and international conferences started the campaign of its widespread adoption (Marczewski, 2013).

Nowadays, gamification has already been implemented in education, business, training, social networking, health and wellness. For example, kindergartens and primary schools have adopted gamification in the classes (Simões et al, 2013; Domínguez et al, 2013). Facebook serves as online platform for campaigns of companies, which implemented gamified applications to increase program participation of their products by building up communities (Xu, 2011). Nike in conjunction with Apple provided a gamified service to motivate people to run (Ramaswamy, 2008). Business companies implemented gamification to improve experiences of their employees (Schacht and Schacht, 2012).

2. THEORETICAL BACKGROUND

2.1 The game

Lately McGonigal (2011, p.21) combined definitions of game and offered four traits that games include: goal, rules, feedback system and voluntary participation. The goal is the specific outcome of the players that has to be achieved by following the rules (limitations of goal achieving process) which unleash creativity of the player and foster strategic thinking. The feedback system is performed as a form of points, levels, score, or a progress bar which provides information in real time to the player how close s(he) is about to achieve the goal. Voluntary participation claims that goal, rules, and feedback are consciously accepted by the player. Thus, gaming and games in counter of playing and toys, characterized by rule systems and the competition of players towards outcomes (Deterding et al, 2011b). So far, as video games are designed to entertain and motivate users of their retention, game elements could make enjoyable and engaging other non-game products and services (Deterding et al, 2011a).

2.2 Game design elements

Game design elements are acting as tools in the creation of gamification scenarios and can be divided into three categories in a form of pyramid: dynamics, mechanics and components that are connected in decreasing order; each mechanic binds with one or several dynamics and each component is tied up with one or several mechanics or dynamics (Werbach and Hunter 2012). One of the most important components of gamification with the highest level of abstraction is Dynamics. Mechanics are at the basic level of the gamification process and Components are specific forms of elements, which
emerge from the mechanics or dynamics. For instance, Points (components) give the player rewards (mechanics) and create a sense of progression (dynamics). We have to denote that Gamification is to not only take out game elements from videogame and implement them into non-game context. A good game design involves thinking about problems in a certain way. For example, several innovative car companies as Nissan, Ford, and Toyota gamified driving experience to promote new electric car that foster influence on the behavior of drivers by making them drive more efficiently affecting in both in an environmental and a material way (Sato et al, 2011; Diewald et al, 2015; Nicholson, 2012).

2.3 Differentiation of Players

Prensky (2001) believes that Digital Generation can think faster and be multitask exactly because of practicing in computer games and using mobiles and other gadgets. For this generation it is not just about be active online, connecting to social network services or using Information Technology (IT) in general, but commonly be engaged to all of these activities via games. Video games cover all demographic ages, starting from children and teenagers (Dahl et al, 2006; Radoff, 2011), continuing with average player of 37 years old (Ferrara, 2012) and comprising with more the 50 years old players (McGonigal, 2011). To categorize the users who play video games Richard Bartle (1996) introduced a theory of different types of players by studying Multi User Dungeon text-based game. He differentiated players by four aspects that people usually like while playing video games. The achievement within the game concept, when players set in-game goals for themselves and do everything possible to achieve them. Explore the game, when players try to learn as much as possible. Socialization with other players, when players use communication tools for role-play games through communication with other players. Imposition upon others, when players use the features of the game in order to cause distress or, in few cases, to help other players. According to four identified factors all these players can be divided by achievers, explorers, killers and socializers. Achievers learn systematically, the want to be recognized. For this type, following game mechanics can be used: levels, hierarchies, ranks, badges, rewards, progression, information, etc. Explorers learn on their own, they like to discover and freedom to fail. Game mechanics: discovering, ownership, random acts of kindness, etc. Killers can learn as individually as in groups by acting. Clearness, challenges and competition is very important for them. All they want to be a leader. Game mechanics would be points, ranks, collaboration, competition, points, badges, etc. Socializers learn in groups by collaboration. They need other people to network. They like to form ideas and need to be admired. Social standing is considerable for them. Collaboration, share, trade, random of acts of kindness, gifts and charity are game mechanics that could be applied for this type of players. Summarizing, Bartle’s approach is a basic understanding for students’ motivation and can be useful for designing gamification.

2.4 Motivation

Gamification strategy can be whether successful or ineffective. It is impossible to make students to do something what they do not want to do, just by giving them points and
rewards. Good gamification scenario requires an understanding of motivation. Generally, there are two types of motivation: extrinsic and intrinsic (Ryan and Deci, 2000). External, tangible rewards lead to extrinsic motivation. For example, a person is seeking for any job, interesting only on the amount of money he/she will receive. Intrinsic motivation, on the contrary, drives behaviors that result to internal rewards, as happiness and positive feelings. For instance, a person is seeking for a job he/she enjoys, material issues go by the wayside. In our case, student can be highly motivated at studying because he/she really enjoys the gamified process of education (intrinsic motivation) or he/she is interested in final reward of the project (extrinsic motivation). In the pilot project we propose to link extrinsic and intrinsic motivators together, hence gamification strategy can bring positive results and a state of flow. Csikszentmihalyi (1991) claimed that “flow” is a state of mental condition in which a person is fully integrated into what he/she does. In gamification values like motivation, participation, engagement, fun, and behavior provide improved productivity and retention. For instance, “Coursera” an educational company in cooperation with leading universities teaches online courses from Sciences and Engineering to Humanities and Business. All assignments and online tests are measured the progress with machine evaluating system and students receive immediately feedback by providing the results with implemented rewards system like badges, rankings, levelling up, etc.

3. IMPLEMENTATION OF PILOT PROJECT

The main objectives of our pilot project are to explore how gamification affects creation of value, distinguishing between additional, complementary, comprehensive, and distribution services respectively. To examine in depth the relationship between the process of studying and gamified mechanisms, determining their actual ability to generate value. To determine the importance of applying gamification for double Master in Economics program to configurate the effectiveness and development of new service. To study how innovations can change students’ behavior. To analyze in depth the relationship between the adoption and implementation of gamified approach as an important addition to study process.

What makes people change their behavior? According to Fogg’s Behavior Model (FBM), there are three factors of FBM which should coincide at the same time in order to occur the behavior change: motivation, ability and trigger (Fogg, 2009). Motivation has three core motivators: pleasure/pain, hope/fear, acceptance/rejection. Ability is driven by six simplicity factors: time, money, physical effort, brain cycles, social deviance and non-routing (Fogg, 2009). Spark, facilitator and signal are behavior triggers. For instance, Speed Camera Lottery in Sweden. The idea was to monitor speed-obeying drivers and reward them participating in a lottery. The money of the fines of the drivers who did not obey the speed limit were collected to form the prize of the lottery. This gamified experiment lasted during three days in a multi-lane street and resulted with average speed dropped from 32 km per hour to 25 km per hour. All three FBM factors were presented in Speed Camera Lottery: trigger as a lottery sign on camera fixture, ability as decreasing vehicle speed and motivation as a possibility win a lottery. (Zichermann and
To achieve all assigned objectives we have used FBM by implementing gamification in conjunction with persuasive technologies to the programme of double Master in Economics. It includes a story line, experience points, leveling, leader boards, rewards and achievements. The story line represents a virtual company with management hierarchy chart. During the academic year students obtain points by completing different gamified tasks that foster promotion, starting as employee up to chairman of company. To be promoted for a higher position students have to reach special amount of experienced points. The higher position costs the higher amount of experience points. Once student becomes a manager, he/she can choose among five types of manager, whether operation, financial, marketing, accounting or HR manager, according to their topic of final Master Thesis.

Mobile applications for Android and iOS platforms are implemented to the double Master programme. For instance, class and seminar check-ins. Every check-in is rewarded with points. Implemented online platform is also connected to mobile applications. Collaboration with the teaching staff and/or among the students facilitates obtaining more points to reach the highest position of the company. Furthermore, “Econopedia” which is equivalent to Wikipedia is applied to the double Master in Economics programme. We are still developing a free, open content online encyclopedia for economists that will be created through the collaborative effort of a community of users. Every enrolled student at double Master in Economics programme can write an article for publication in Econopedia. Professors and students are able to edit articles under the supervision of coordinator of the project. Once a year upon completion of the gamification project a special event so-called “GamiDay” is organized for those students who achieve top hierarchy position. During the “GamiDay”, best students are able to present their theses to several invited CEOs of Granada.

Gamified double Master in Economics programme intends to provide students with advanced professional training in analytical and research skills to achieve excellence in Economics, Entrepreneurship and Business Management. Specifically the Gamification that is provided in the field of double Master in Economics at Table 2, intends to motivate students to follow specific responsibilities:

Table 2. The general structure for gamification to motivate students in specific responsibilities is developed as follows:

<table>
<thead>
<tr>
<th>Core responsibilities</th>
<th>Enhance responsibilities</th>
<th>Gamification provider</th>
<th>Gamification tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class attendance</td>
<td>Check-ins</td>
<td>Android and iOS apps connected to online platform</td>
<td>Points + leveling + leaderboards</td>
</tr>
<tr>
<td>Class participation</td>
<td>Acquire bibliographic information about the current state of the economic</td>
<td>Online platform. Direct Interaction between</td>
<td>Points + leveling + leaderboards</td>
</tr>
<tr>
<td>Activity</td>
<td>Description</td>
<td>Platform</td>
<td>Interactions</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------------------------------------------------------</td>
<td>---------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Seminars</td>
<td>Check-inns and critical review</td>
<td>Android and iOS apps connected to online platform</td>
<td>Points + leveling+ leaderboards</td>
</tr>
<tr>
<td>Econopedia</td>
<td>Formulate and answer questions such strategies applicable to business</td>
<td>Online platform</td>
<td>Points + leveling+ leaderboards</td>
</tr>
<tr>
<td>Assist in research projects</td>
<td>Develop scientific articles</td>
<td>Online platform. Direct Interaction between professors and students</td>
<td>Points + leveling+ leaderboards</td>
</tr>
<tr>
<td>Presentation or Debate</td>
<td>Understand the theories, relevant existing trends and debates</td>
<td>Online platform. Direct Interaction between supervisor and students</td>
<td>Points + leveling+ leaderboards</td>
</tr>
<tr>
<td>Exams</td>
<td>Explore the theories and obtained knowledge</td>
<td>Direct Interaction between professors and students</td>
<td>Points + leveling+ leaderboards</td>
</tr>
<tr>
<td>Business simulation</td>
<td>Apply and extend existing theories to solve real problems</td>
<td>Online platform.</td>
<td>Points + leveling+ leaderboards</td>
</tr>
<tr>
<td>Internship</td>
<td>Solving technical and practical problems related to real work organization and analysis of data</td>
<td>Online platform. Direct interaction between firms and supervisor</td>
<td>Points + leveling+ leaderboards</td>
</tr>
</tbody>
</table>

4. Methodology

In terms of methodology, it will be covered by qualitative and quantitative techniques. In this case, complement the quantitative in the sense of explaining the reasons behind
certain behavior of the variables. Its character is interpretive, is based on the case study and grounded theory, and the main techniques used are questionnaires, participant observation and document analysis. In this case, the software package to be used is the Nvivo10.

Regarding quantitative techniques, will proceed to the use of multivariate techniques, considering if dependency relationships or dependencies between variables. The software used to perform quantitative techniques consists of three software packages, SPSS 20.0, MPlus EQS 6.2 and 7.0. The results will be contrasted with those of the same area that have been published by universities and research centers in competitive journals.

5. Results and Conclusions

The pilot project is still running and will be finished by the end of this academic year. Initial results prove a significant increase in the motivation of students to pursue higher grades in their subjects. Compared to previous years and non-participating students in the current project, near 80% of the students have improved their class assistance while more than 90% of them declare high satisfaction regarding the business simulation (see Arias-Aranda and Bustinza-Sánchez, 2009). In comparison with previous academic year the average marks of exams during winter session increased by 17% compared to the non-participant groups. According to professors’ reports, students are more active this academic year during the classes in comparison with previous academic year.

Still, these results need to be considered with caution as there could be a bias as most motivated and participative students tend to get involved in innovative experiences. The gamification process will be fully implemented in the next academic year in the Master in Economics and International Management (UGR-SRH Hochschule Berlin) as well as in the Double Master degree in Civil Engineering and Economics at the University of Granada. The combination of different activities that configure the gamification process reveals a multidimensional experience for students who can put their knowledge into practice with different tools.

Our future line of research will drive us towards analyzing the impact of the different activities in the gamification process as a whole in order to balance and improve the teaching-learning process of the students.

REFERENCES


