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First Experiences with a Gamified Course in the Higher Education System in Hungary

Áron TÓTH, Emma LÓGÓ

Budapest University of Technology and Economics, Department of Ergonomics and Psychology, Budapest, Hungary

totharon@erg.bme.hu, emma@erg.bme.hu

Paper introduces the experiences and the possibilities of future work on how to implement game elements into a university course. Several attempts had been done to motivate and engage students in schools for different age groups, however the research on the university courses faced multiple difficulties. Thus, this paper shows the methods to use gamification elements to boost the overall engagement at the bachelor level university course, with participating over 100 students.

The education system is not suited for the needs of the Y Generation, since the school system is lacking all the elements of the modern, digital and highly paced world. These digital natives, as coined by Prensky, crave interactive content, and learn poorly from lectures and exams, because they find them to be boring and disengaging. In the same time computer games are progressively taking part in everyday life, foremost among the young generation. Since the gamification term was invented in 2011 it had been rapidly expanded and being used effectively in several fields. Gamification is about implementing game elements to alter the behavior of the user to the positive in a non-game context, which is now a university course.

Detailed information was given on how to plan a gamified course, then continue how to execute it on a weekly basis. Later, the gained knowledge and thoughts will be concluded. In addition, a conclusion on what was planned well and the parts which needs revision for the next course. Moreover, ideas and suggestions for future implementations of gamified elements into university courses will be given.

Introduction

The education system has been following the same methods and patterns since the public education system was created in 1948 (Csapó, Molnár & Kinyó, 2009). However, the Y generation, the spread of the personal computing (e.g.: smartphones, tablets and laptops) and the daily usage of

the videogames created new needs among the education. Everyday life, video games and mobile phone gaming has become basic daily to-do, to which compared to the schooling system is slow. These digital natives, as coined by Prensky, crave interactive content, and learn poorly from lectures and exams, because they find them to be boring and disengaging (Prensky, 2011). In addition the 2013 New Student Survey at Holland College (completed by 1196 students) indicated that 50% of first-year students anticipated access of 50% or more of their course materials through the Internet, with an additional 14% expecting to access 40 – 50% of their course materials via the Internet (Lister, 2015).

Educators recognize the impact of entertainment software and utilize games as a teaching device in a growing number of classrooms and SRI International and the Bill & Melinda Gates Foundation found that game-based classroom tools can boost cognitive learning among average-performing students by 12 percent (Colvin & Ross, 2014). Possible solution to catch the student's attention, could be to implement game like elements on top of an ordinary university course curriculum. Gamification takes advantage of students' natural tendency to compete with their peers, and utilizes the same strategies and tactics that game designers have relied on for decades to engage their audiences (de Freitas & de Freitas, 2013).

The course should be viewed as a pilot test on how is possible to apply elements from gamification. The aim was to learn on how to create a better system to boost student's engagement. incorporation of games into the learning process did result in higher levels of student engagement, motivation, and satisfaction (de Freitas & de Freitas, 2013). The course on which the research was done, was the first semester of a brand new elective course called Product Experience and Design. The participants were mostly second / third year bachelor students with background of management, economics and basic psychology. All together 118 students signed up for the class.

Key factor was that the base structure of the course, the weekly classes and it was mandatory to pass 2 exams could not been changed. Thus, gamification could only be implemented on top of the curriculum.

The implementation of the game elements in this course were based on the work of Yu-Kai Chou who created the Octalysis model (Chou, 2016), the user types from Andrzej Marczewski (Andrzej, 2015) and Rajat Paharia who wrote about Loyalty 3.0 (Rajat, 2013).

The rest of the paper is organized as following. Section 2 introduces the term gamification and focuses on the prospect of education. In section 3 the methods and materials are going to be described to build a gamified course. Section 4 presents the results of the carried research. Section 5 draws conclusions about the possibility of gamifying a university course and outlines future works.

Gamification

The birth of gamification started by finding the solution for a motivational crisis, because the previously used motivational mechanics were loosed their power. On the other hand, there is a strong force based on the Y generation (Admin, 2017).

In my opinion, the first generation of Gamification, the Gamification 1.0 was about to create a competitive environment. Right now, the trends are showing that Gamification 2.0 is in the early stages of spreading, in which the psychological factors are becoming important, mostly in order to activate the intrinsic motivation (Hakulinen, Auvinen, & Korhonen, 2013). If the player is relying on extrinsic rewards, then if they are offered incorrectly, can result demotivation (El-khuffash, 2013). In the second generation, the idea to implement the concept of flow by Csíkszentmihályi, the optimal experience as a mental state of extremely rewarding concentration that emerges in the space between frustration and boredom (Pilke, 2004). As a result, the idea of exploration, the experience and the joy of play came to the center of focus, not the rivalry.

Based on Deterding (Deterding, Sicart, Nacke, O'Hara & Dixon, 2011), gamification by definition is the act of creating a game like environment by game elements (points, badges, rewards, challenges, etc.) to alter the behavior of the user / player possibly to the positive. With the combination of the tools of gamification and the idea of the human centered design, it is possible to create engagement towards a product or a service. Implementing game elements and game designs through gamification, access the people's drives it become a widely-used tool in the field of marketing, sales, human resources, education, and much more.

Gamification has been used in a variety of settings, including healthcare, business, education, and productivity (Lister, 2015; Muntean, 2011; Pereira, Duarte, Rebelo, & Noriega, 2014). For example, Khan Academy rewards users for watching videos and solving math problems with points and badges (Hakulinen et al., 2013; Lister, 2015) and Fitocracy uses gamification to motivate users to be more physically active (Goehle, 2013; Lister, 2015).

In addition, there is the Hook model (Liu & Li, 2016), which is focusing on how to trigger and reward the users for their actions in order to make the user form a habit. Combining the gamification ideas and the hook model to find the best triggers could open a new way of creating engagement.

One of the most important take from the games into gamification, is the idea of the art of not being afraid of failing. This only can be done if the student is able to re-do the failed test of quiz until he/she masters it. This is what a main component of the gamified environments.

The basic gamification elements are called PBL elements, points, badges and leaderboards (Reiners & Wood, 2015). To create a more engaging and a more detailed experience to the user it is advised to use much more

elements such as levels, boss fights, quests, virtual goods, collections and much more. In the Octalysis these elements have been collected together based on motivation types (intrinsic and extrinsic) and white or black hat gamification elements (Chou, 2016).

After reviewing the general terms of gamification, it is time to focus on the benefits of gamification in education. There are currently several applications (web and mobile) to provide gamified environment to create a habit about learning (e.g. Duolingo, Codacademy, Kahoot!, Habitica). Also, there are applications to the K-12 learning and to the higher education. There are several differences between them, mostly in design, but the main concepts are the same, which is to create a habit to learn actively, daily. In education the most used game elements are the Points, Badges, Leaderboards and Levels (Lister, 2015).

It is important to discuss the difference between games and educational games. A game is a "rule-based environment that is responsive to the player's actions, offers an appropriate challenge to the player, and keeps a cumulative record of the player's actions" while an educational computer game is a technology-supported game that is intended to result in a desirable change in the player's knowledge (Lister, 2015).

From my perspective, the aim of a good gamified classroom is to the game elements induce the learners to freely decide to do the tasks in a proper way, following the intended learning behavior defined by the scripts (Challco, Andrade, Oliveira & Isotani, 2015). Thus, it is important to ensure that the introduction of competition through gamification does not encourage carelessness among students and is not demotivating for students (Lister, 2015).

Materials and methods

In the gamification industry there are some frameworks on the topic how to create a gamified system. The most accepted ones are; the Octalysis by You-kai Chou; the Hexad User Types analysis from Andrzej Marczewski; and the Loyalty 3.0 by the creator of the Bunchball gamified services. These different frameworks are focusing on various parts of a gamified system however there are common elements among them. Such as they all make it clear to find goals that are measurable through the system, to see progression. Also, common element is to find out the user's behavior that is supposed to be rewarded. In the course the idea of game thinking was used. Game based elements were added to the course from the basic level of gamification.

The creation of the gamified system started by forming an overall goal to be able to choose the gamified elements to be implemented. Since the course was first introduced, the goal was to have the students take part in the course. Thus, a glowing choice and a fixed action reward was put together to motivate students to participate in each class from week to week. Since this is a non-mandatory university course, it was important to

take those students into consideration, whom cannot attend in the classes. As a result, students could gain extra credits for working on a case study. Due to the fact, that the main goal was to motivate students to take part in the course in the class, greater number of points could be collected for visiting the classes, then doing the case study. This is important during the planning to create a ranking among the goals.

Points were used to track the progress of the students and a weekly leaderboard was uploaded to the course's Moodle page. Students could earn points in different ways:

1. Exams: mandatory to all the students, each 50 points, sum 100 points
2. Class quiz: Kahoot! ("Kahoot!," n.d.) quiz, at the end of every class, 5 questions, in total 2.5 points per class, sum 20 points
3. Case study: writing a case study for 15 points
4. Presentation: present the case study for 5 points
5. Filling out a questionnaire: which helped the teachers to measure the student's player type (Andrzej, 2015), their consumer profile
6. +1 Creating exam questions: students could create exam questions and from those from every 10 questions, one would be picked into the exam.

The main feature was that the system was tailored to diverse types of students. (1) Firstly, if a students hadn't had time to participate in the classes and didn't have any motivation to do anything extra with the course, by passing the exams he/she would be able to successfully pass the course. (2) Secondly, those who were listening to the classes, they could receive rewards as their participation. (3) Thirdly, if for some reason students couldn't attend in all the classes, but they were hard working, then they had the opportunity to write a case. It was a goal to use several positive reward mechanisms to give the students the freedom of choice.

Results

The results of the usage of gamified elements in the university course are indicated in various ways. I will look over one by one the actions and their results and later following a comprehensive summary of the results.

Firstly, the attendance of the course was high in relative that the this was the first time ever to be announced. From the data, it is clear that from week to week it was lower and lower number of students attending in the class, however it was not viewed as a problem, because as it was mentioned before, there were alternative ways to pass the course. We know the number of students participating in the lecture, because of the end-class quiz in Kahoot!.

This is why using Kahoot ("Kahoot!," n.d.) during a class is beneficial for both the lecturer and the students. The reason is simple, from the teacher's side, he/she is informed about the knowledge of the students, to

see if they understood the topic and the context of the class. In addition, it is a good tool to see, who has been participating in the classes regularly. On the other hand, the students can earn plus credit by not just sitting through the class, but by the extra points are given for paying attention during the lecture, their motivation (partially intrinsic, partially extrinsic) to try to understand the topic.

Secondly, students were asked to fill out a survey to gain extra credits, since 2 classes could not been held, because of university holidays. The first questionnaire was on the first week, the second one, was after the results of the first exam and the third after the last class if the semester. The number of respondents were significantly higher after the first test and the lowest on the third questionnaire. This could mean, that when the students first understood the work behind a points and grades, they were highly motivated to gain as much extra credits as possible. Also another reason could be that based on the Hook model (Liu & Li, 2016), the students were triggered in the perfect time, when their motivation was highest to fill out a questionnaire.

Thirdly, the students did not live with the opportunity to create exam questions. It was the only booster that did not have a connection immediately to the point system. If the students would collaborate with each other, they would have known exact exam questions and answers, which would be cashed into points at the exams.

Moreover, about creating and managing the points system. Points are the basics of a gamified environment, as part of the PBL system (El-khuffash, 2013b). Points are beneficial to use, since it is easy to measure, track and compare results. Furthermore, when points are given to each student, for their work, it is possible to see the trends and the differences for each user and also to understand more about the differences of learning.

During the course points were assigned to students in a various ways, in order to promote good behavior. To balance the importance of the exam and the extra points, there was a limit, of 25 points out of 100 to be reached. However, the design of the point system still needs some fine tuning. We have faced a scenario, when a student collected the maximum amount of points before the semester ended, thus she lost the motivation to engaged in collecting more points. In consequence, it is suggested to first discuss the ratio for the different actions that worth rewards and then create the point system in reverse order. Find the maximum point that could be collected and then divide that to the different options to gain points.

Conclusion

The last part is about to conclude the experiences and the results from this pilot test on implementing gamification elements to a university course.

To begin gamifying the classroom, from our experiences the (1) first step is to find the desired actions to measure as metrics. Examples of the desired actions could be to make the students participate more at the classes, to get better grades, to be more active with the extra work etc. Then the (2) second step is to review the course events in the semester to place the triggers. The well-placed triggers are motivating the students to do extra work, since they are presented in a situation, when the students motivation level is high. The (3) third step is to create the environment where the different tasks and rewards are presented in a structured system. This will help to the teacher to keep track on the reward system and for the students to understand the system. The last (4) step is the simplest, to carry out the gamified course and follow the rules that were created in the third step. Important, to always review the system and the student's actions if they align with the main goal. If not, then it is suggested to consider the possibilities why it is not performing as it should be. If yes, then congratulations, keep up the excellent work. However, there is always room to improve.

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