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GAMIFICATION IN LMS COURSES

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ABSTRACT

This paper attempts to respond to the use of the elements of gamification in education. With the help of research papers, we have chosen three different systems in which the elements of gamification are included and we have focused on their use in education.

KEYWORDS

Gamification, ClassDojo, Edmodo and Classbadges

1 INTRODUCTION

Gamification in education is not a new topic; it has been the focus of a number of studies. The overview study "A Systematic Mapping on Gamification Applied to Education" describes the positive impact of gamification on the student's willingness to participate in the education process, their learning outcomes, learning habits and socialization skills (Borges et al., 2014). Virtual badges also improve students' motivation to complete an assignment. (Denny, 2013) This paper focuses on analyzing gamification elements in open web systems and their incorporation into a general LMS (Learning Management System). Gamification is used in many different areas, not only in education. There are loyalty programs (used not only in online shopping) designed by merchants to encourage customers to shop by offering reward points which they then can exchange for discounts on future purchases, gift certificates, etc. And even though it is the merchant who benefits from this strategy in the end, the customer feels good about having saved money. Gamification is also used in a work environment (the authors focus on pedagogical employees at school). Employers try to motivate their employees by providing various bonuses, which can be divided into three categories: behavioral (related to an individual's behavior and mental state); feedback (feedback aimed at providing measurable results and evaluation); promotional (appreciating professional growth and progress). (Neeli, 2012)

2 LEARNING PLATFORMS WITH GAMIFICATION ELEMENTS

There are open web systems which are widely used and which contain some gamification elements. When designing our own LMS, we analyzed them in order to determine how they could be used in the education process, either in instruction or during both the pre-interaction and post-interaction stages of the education process. We only analyzed social-based applications, not LMS-like systems. Following the research of scientific papers, we selected three systems: ClassDojo, Edmodo and Classbadges. However, since the last system proved unstable and unavailable during testing, we decided to exclude it.

2.1 ClassDojo

ClassDojo is a web platform which enables better classroom organization and administration. The platform is primarily used by the teacher, with the students being passive users who only follow their statistics, grades and gamification elements such as badges. The teacher can choose whether they want to register as a teacher, principal, student, parent or guest. When registered, the teacher creates a virtual classroom and adds students. When added to the classroom, students do not need to register. After students are added to the classroom, a PDF file with instructions for parents is generated, containing information about the classroom and how the students can access it. The main gamification elements of this platform are badges which students acquire for good behavior or when they complete an assignment. However, there are both positive and negative badges. The badges are similar to grades at school. However, they are not expressed by a number, but rather verbally: helps his/her peers, works hard, participates in class, did not complete an assignment, etc. The teacher can either create their badges or use badges created by other users. Moreover, the teacher can also divide students into workgroups (Desk 1, Desk 2, etc.).

Each student has their own avatar. All the activities are displayed on the taskbar where the teacher can find the classroom work sheet (the number of positive/negative badges), can see which parent is online or can record students' attendance (present, late, absent). There is also a bulletin board (which is similar to the wall on Facebook) where classroom members can post comments, pictures or videos which the others can respond to or simply "Like" them.

2.2 Edmodo

Edmodo is a web platform aimed at communication and organization of a classroom. The user can log into Edmodo as a teacher, student or parent, with each role being clearly defined. A teacher can create virtual classrooms and then invite students by sending them a link, email, text message or special code. Its design and color make Edmodo look like Facebook. As Facebook, it also has a "wall". On the wall both teachers and students can post their comments, view others' comments and respond to them (as well as like, share or forward them). Teachers can also create tasks, quizzes or surveys. They can also choose whether an activity will be for all or only some students. Students have allocated time to complete the activity. Their answers are displayed so the teacher can see them. Apart from comments, one can also add files and attachments and then sort them into folders. One can log into Edmodo with one's Microsoft and Google account, respectively, and thus can use one's Google Drive/OneDrive. This feature makes it easier for the user to manage their files. Edmodo's main gamification elements are badges, progress tracking and also tasks and projects. Murar (2015) argues that even though Edmodo was not designed as a gamification tool, its elements make it possible to use it as such.

2.3 Google Classroom

Google Classroom is a web platform free for those who have a Google account, irrespective of an operating system. This application uses Goggle Documents, Gmail and Google Calendar for educational purposes. It saves the teacher's time by limiting the time they need to spend on the organization of instruction (e.g. assigning tasks to students and communication with students), thus making the classwork much easier. Again, the teacher can create and configure a classroom and then send students a special code with which they log into it. A virtual classroom enables students to keep track of their assignments, when they are due and of their timetable. When they submit their assignment, they obtain immediate feedback as the teacher

is notified of every student's activity. The platform does not contain any specified gamification elements. However, to a certain extent, the ability to monitor one's own progress and assignment evaluation can be viewed as such. However, of the three mentioned platforms, Google Classroom contains the least gamification elements – none.

3 LMS MODEL WITH GAMIFICATION ELEMENTS

Based on an analysis of the aforementioned systems and general requirements of LMS, we designed a system with the following game mechanics:

3.1 Badge acquisition

The user can obtain badges either knowingly or unknowingly. They can knowingly collect badges for completed courses, the number of added friends, the number of reviews written or their overall activity in the system. The user can also collect them unknowingly, e.g. for registration or when they are awarded a badge by the teacher.

3.2 Score

Every user's success is measured by score. The user can use score not only to measure their own success, but also to compare themselves either with their friends or with their peers in individual courses. There are various ways to acquire points.

3.3 Course completion

Course completion should be the main activity of each student in the system. The student increases their score by enrolling in individual courses and studying. For each course the student obtains a different amount of points – the amount of points for each course is calculated by the system based on the difficulty and length of the particular course.

3.4 Completing daily challenges

The user can acquire extra points for completing bonus content or the so-called daily challenges. Daily challenges are based on randomly selected questions which the student has already encountered during the course of their study and therefore should know the correct answer. Each day, the student can complete such a challenge by correctly answering ten random questions. They can earn as many as ten points – one point for each correctly answered question. The user who has not yet answered the minimum number of questions – and therefore cannot participate in the daily challenge – is asked to earn more points, i.e. to enroll in more courses.,

3.5 Levels

The user automatically advances to the next level when they have earned enough points. The user can learn the number of points required to advance to the next level either on their profile page or on the system's main page.

3.6 Leaderboards

There are two kinds of leaderboards – global leaderboards (realized only on the main page) and leaderboards visible on the pages of individual courses following the user's registration. The global leaderboards contain all the users in the system. However, for motivational reasons, only the first ten users are displayed. This way the users do not see who is the last. Since they can only see the "Top 10", it motivates them to try harder and break into the Top 10. Another global leaderboard is called "My Neighbors", which contains all the users who are at the similar level as the currently logged-in user.

The number of points determines the position in the leaderboard. The user with more points is ranked higher in the leaderboard. The course leaderboards display the number of points earned in the particular course.

3.7 Daily challenges

Daily challenges are based on motivation – the user needs to log into the system every day and answer ten questions. Daily challenges are based on randomly selected questions (selected by an algorithm) which the student has already encountered during the course of their study and therefore should know the correct answer. If the user wants to earn the points, they need to answer (either correctly or incorrectly) all ten questions. Each question can be answered only once. If the user answers correctly, the question will be marked "Correct". If they answer incorrectly, the question will be marked "Error". Therefore, the user knows which questions they answered correctly and which incorrectly. After answering the last question, the user is redirected to a final page on which their total number of points is displayed (providing them with feedback on how they did in the daily challenge).

For each correct answer, the user earns one point. They earn no point nor lose any point when they answer incorrectly. Therefore, the user is not penalized for an incorrect answer.

The user can earn as many as ten points and as little as zero points. The user can see the number of points on the final page for the remainder of the day.

The user can complete only one daily challenge per day. It is monitored whether the user has already completed their daily challenge or not. If, on any given day, the user fails to answer the ten questions, they earn no points and can complete the daily challenge the following day.

The user who has not yet answered the minimum number of questions cannot participate in the daily challenge. Such users are then redirected to an information page where they are presented with the daily challenge requirements and are asked to earn more points, i.e. to enroll in more courses. The list of courses is displayed on the very page.

4 CONCLUSION

Following an analysis of open educational applications with gamification elements and detailed research of scientific papers, the authors designed a gamification-based LMS model. Moreover, the authors also defined a list of game mechanisms which every course should contain. Some of those mechanisms were marked as automatic, i.e. they are part of every new course, which means that the author does not have to define them manually. The author can then add other elements. An LMS based on this paper will be created and tested in instruction.

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