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How gamification can boost student success

In a perfect world, students would be self-motivated to focus during lectures and practice or stu the material. Unfortunately, this is often not the case for many reasons. Recognising that engagement is one of the key elements for student success is what leads many of us, as professors and teachers, to develop and adopt techniques to foster it.

By Aaron Langille 15 Sep 2017

A staff-wielding Arcstrider character takes on foes in Destiny 2. The video game by Bungie studio, published by Activision, makes use of badges and other achievements to spur on players — a technique that can be applied to education. Handout

As an educator teaching undergraduate students, I have been exploring an approach that I was already familiar with in a non-academic context: Gamification.

In its simplest form, gamification is the application of game design elements to non-game tasks. Some of the richer but more complex gamification techniques include quests, "levelling-up" and role-playing while tl simpler and more common elements include points, badges, achievements and instant feedback.

Of course, I use more conventional tools as well. The ones I tend to call on most include applied example analogy, humour and a healthy dose of pop culture references. I also use group discussions, elements of "flipped classrooms" and various digital platforms to provide some variety in the delivery methods. I inherited some of these techniques from my own past professors who managed to engage my interest ev when the course material seemed of little personal value to me.

Students need additional motivation

While these methods have proven useful in increasing engagement during in-class lectures, they don't hel motivate students to complete homework assignments, study for tests or maximise effort in projects.

As in-class engagement increased for my students, a disconnect between interaction in lectures and over academic performance became apparent. Through conversations with many of them, it seemed that although they enjoyed and understood the lecture topics, they simply lacked the motivation to work for mo than a minimally acceptable grade.

Lack of motivation was a particular problem for students taking courses as electives to satisfy another degree program. In order to increase the level of engagement with these students — and hopefully all of r students — I began looking for ways to offer extrinsic motivation.

I drew inspiration from video games.

Video games structure motivation

In video games, badges and "achievements" — recognition for completing minor, secondary or non-essential tasks or goals that do not inherently affect the game's outcome — are a staple tool to reward players for accomplishments. For example, the highly cooperative Overcooked rewards players who work together to complete a level using the same controller.

Another game, the story-driven Ori and the Blind Forest, offers 57 achievements ranging from progress tracking such as "Complete the prologue" to skill-highlighting, including "Finish the game in under three hours" and "Find all secrets."

Examples abound in all types of games, from puzzle and adventure games like the ones I mentioned, to fast-paced, action-oriented games that test one's hand-eye co-ordination and reflexes. Whatever the genr achievements are an established means of motivating players to keep playing and to push their skills furth They are also a motivational technique that many students are familiar with given the rates at which they are playing video games.

In the game Ori and the Blind Forest, title character Ori (centre) braves obstacles and foes to earn recognition or achievements, which help to motivate players.Handout

Non-game software and mobile phone app developers frequently use badges and achievements to prom sales and increased use. These offer the same core benefits as in games: a sense of accomplishment, a concrete goal to strive for and ways to foster commitment to achieve that goal.

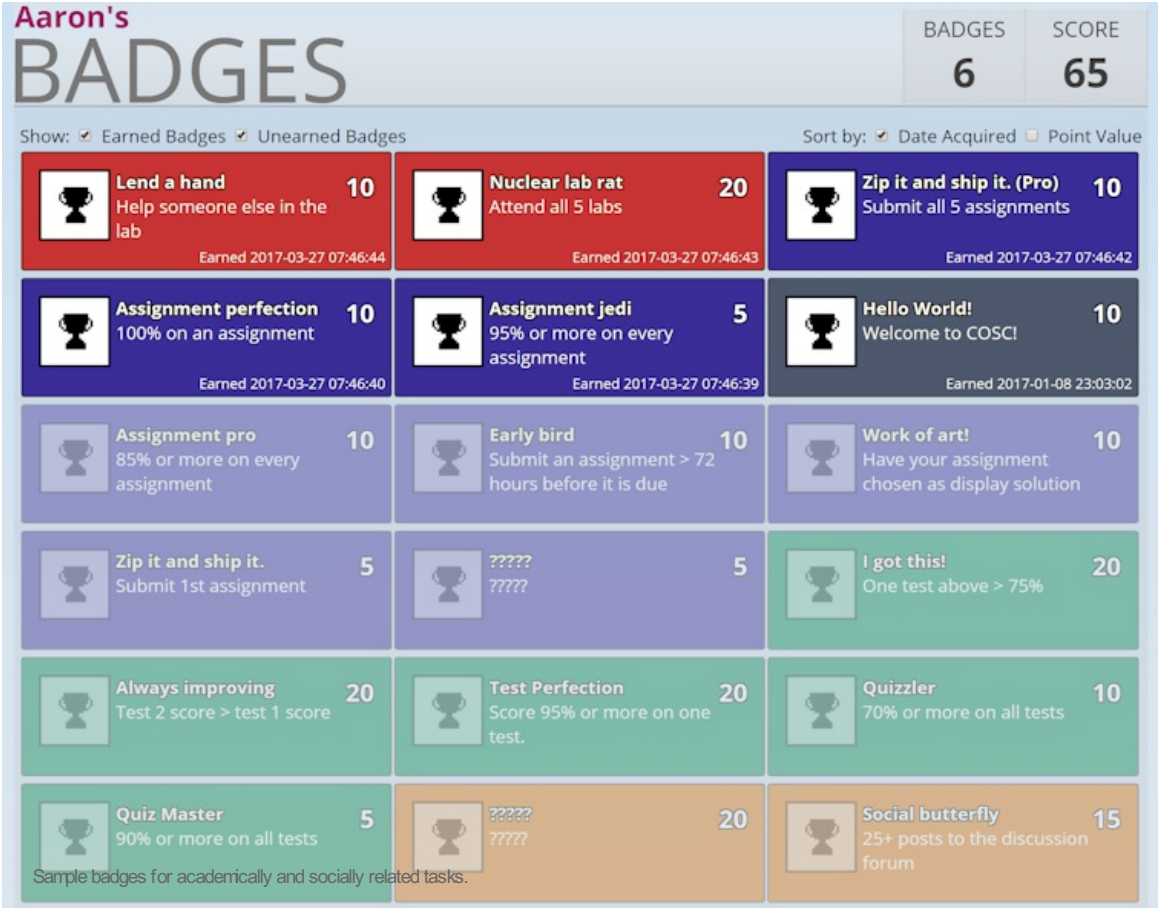
Use of badges, leaderboards and even quests to promote positive behavioural change is perhaps most evident in the fitness software market.

Gamifying the education experience

Based on these models, a Laurentian computer science student developed a custom website to support a trial of these simple gamification elements in my first-year computer science course. The website allowed creation of badges based on several categories: assignments, labs, tests, social interactions and miscellaneous (for badges that didn't fall into any the previous categories).

All of the badges were colour-coded so that students could easily identify and group them by category. Th specific criteria for each achievement was designed to reward positive academic or social behaviour, denoted by a title and brief description of the task required to earn the badge. Examples of badges are shown in the image below.

In addition, the site included a leaderboard to promote friendly competition between students. Badges we assigned a point value, based on the perceived difficulty of the required task. The sum of a student's badg points — rather than the number of badges collected — gave students a relative rank on the leaderboard.



To protect students' identities, they used a nickname and could opt out of the leaderboard altogether. Asic from the ranking and point sums on the voluntary leaderboard, all information on the site was private betwe users.

Tracking success

Perhaps the biggest success was the overwhelmingly positive student response to the system. In a brief survey at the end of the courses, over 75 per cent of the students who responded said the system was enjoyable, engaging, and that they would like to see it implemented in other courses. More importantly, students felt it helped motivate them to work harder on assignments, labs and test preparation.

Although a clear increase in academic performance cannot be quantified from the original trial, having students report a qualitative increase in motivation is an important step in the right direction.

Approximately 20 per cent of the initial badges had titles and descriptions that were hidden from the students. The goal of these "mystery" achievements was to provide an element of surprise, with details of the badge revealed only when the task was accomplished and the badge awarded.

It was my hope that the first students who uncovered these tasks would then discuss them with other students, thereby increasing the social aspect around the badge system. Instead, 68 per cent of students said in the exit survey that mystery badges were their least favourite feature.

Unexpected outcomes and the future

It appears as though students value the goal-setting nature of the badges over their potential as "fun" surprise elements. Though future implementations are likely to include mystery achievements, the number will be significantly reduced.

Perhaps the most discouraging result was a noticeable lack of enthusiasm when the badge site was used with a subset of the same students in the followup course. The motivational properties of simpler gamification systems — particularly badges and achievements — tend to diminish over time. This effect m be mitigated or perhaps even eliminated with further trials, data collection and improved integration of established positive behaviour modification techniques.

Despite some concerns, many professors, teachers and researchers believe that even this type of simple gamification remains a valuable engagement tool. It is not a standalone cure for low student engagement r poor academic performance. Instead, it capitalises on students' nearly universal experience with video games and their reward systems to provide a source of extrinsic motivation that supplements effective lecturing and solid pedagogy.

The survey results from the first trial clearly indicate that students enjoyed the experience and felt that it di have a positive impact as an extrinsic motivator.

We are continuing this work with badges and achievements, with more colleagues and their courses participating. This will be accompanied by a formal study to quantify changes in academic performance. O intention is to improve the current gamification system through iteration, expansion and student feedback.

ABOUT THE AUTHOR

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