

# Gathering inputs for the development of a gamified experience

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## Introduction

Gamification is becoming very popular in the field of education (Alsawaier, 2018) as a tool to encourage student's motivation (Deci & Ryan, 2020) and engagement (Groccia, 2018). A gamified experience was designed and implemented in a High School Mathematics course during the whole academic year to promote mathematical skills, such as critical thinking, problem-solving and mathematical communication. This paper describes the main game's elements incorporated into the course and the first findings of the qualitative study. We outline students' perceptions about their behavioural changes caused by gamification regarding engagement, motivation and mathematical learning outcomes. The value of immediate feedback was brought up by the students. We also underline the benefits of digital technologies in developing this kind of experience.

## Description of the experience

In 2021, a gamified experience was implemented with a group of 17-year-old students in Montevideo, Uruguay, integrated into a 28-week Precalculus course—three 80-minute sessions per week.

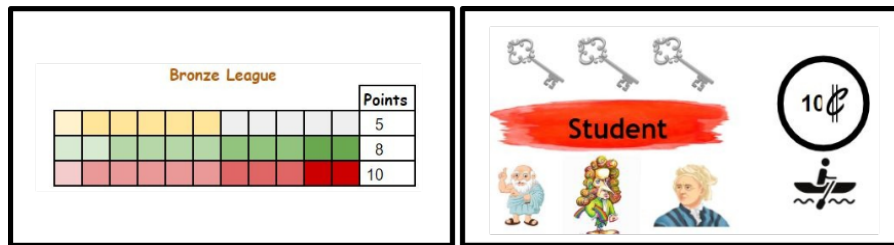
The course's units were introduced as “chapters”. Students were awarded using three types of “points”, according to their performance: academic achievements, engagement and positive behaviour. Each student was assigned to a “league”, and formal marks were determined by the leagues. Extra “medals” could be obtained by carrying out special tasks. Students had both a private and a public dashboard (Figure 1), showing off their achievements. “Jockers”, among other goods, were offered at the “shops”; those goods could be bought using “coins” they earned by different activities.

This experience was developed according to an action research approach (Cohen et al., 2018), primarily carried out by the teacher. The main aims were to enhance the evaluative procedures, foster positive attitudes towards scholar tasks, and improve various aspects of class management.

## Report and analysis

To investigate students' perceptions of how their learning, motivation and engagement had been affected by gamification, semi-structured in-depth interviews were conducted within the experience. First findings show that students perceive an improvement in their behaviour. They highlight that game's elements forced them to become more active and, therefore, to a better learning.

Regarding engagement, students express a tight link between game's elements and studying, working and focusing. They say that “raising your hand, studying constantly and doing homework” are key to earning points. As a student said, “if homework was assigned and I'm tired, I do it anyway because I know the points are behind it”.



**Figure 1. Student's private and public dashboards**

Finally, about motivation in general, students explicitly mention that they felt more motivated to study and get involved in the course. They acknowledged that even though they knew that game's elements were not an important part of the course, they found motivation and they wanted to be more involved. Despite this can be considered an extrinsic motivation, student's attitudes such as ego involvement and conscious valuing of the activity suggest that the internalization process to intrinsic motivation is ongoing (Deci & Ryan, 2020).

Two unexpected results emerged from the analysis. Students repeatedly said that immediate feedback would be an important improvement, and they also expressed that oral participation was fundamental.

From the teacher's perspective, it was clear that carrying this experience out required hard work, both when designing and managing it. Findings were interesting and promising, and deeper research on motivation, engagement and learning outcomes in gamified environments would be enlightening. Likewise, it would be convenient to help teachers to overcome the issues we found, providing them with an easier and faster way to integrate and manage every game element. For this reason, as part of this research, a digital platform for structural gamification is under development taking care of the main issues we found during this experience. A newer gamifying course using the beta version of this platform will also be developed.

## References

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