Gamification and educational games in emergency remote biology teaching

Preliminary results

Marina Lantzouni†
ΓΑΒ LAB – Knowledge and Uncertainty Research Laboratory, University of Peloponnese, Sparta, Greece
m.lantzouni@go.uop.gr

Aikaterini Dimopoulou
2nd Senior High School of Mikra, Thessaloniki
cdimopou@sch.gr

Manolis Wallace
ΓΑΒ LAB – Knowledge and Uncertainty Research Laboratory, University of Peloponnese, Sparta, Greece
wallace@uop.gr

Vassilis Poulopoulos
ΓΑΒ LAB – Knowledge and Uncertainty Research Laboratory, University of Peloponnese, Sparta, Greece
vacilos@uop.gr

ABSTRACT

COVID 19 outbreak imposed an unprepared transition from traditional teaching to emergency remote teaching. One of the tools to help motivate students through this journey is Gamification and games. At the same time, in the middle of this health crisis due to the pandemic, the need for biological literacy is becoming even more imperative. In this paper the attitude of high school students towards games and gamification tools during the teaching of biology is investigated. More precisely the focus is on the way students react to gamificational tools such as Edmodo, Grifobot, Kahoot! and others. The results are promising, therefore further research on educational games, and their tracing, classification and evaluation is necessary.

KEYWORDS

Games, gamification, biology teaching, emergency remote teaching, student's attitudes

Introduction

Gamification can play an important role in emergency remote teaching. It's a tool that upgrades the educational process and motivates students to further engagement [1],[2], and a new field for scientific research. [3],[4] New gamification tools and applications are emerging, indicatively: Kahoot, Edmodo, quizizz, Wordwall, helpfulgames, learning Apps, grifobot .

The lack of biological literacy is obvious, especially during the pandemic "era", with all the conspiracy theories and the pseudoscience emerging. However, biology as a subject in greek high schools has been degraded to a one hour per week course. Thus, gamification tools can offer the possibility for further engagement to students. [5],[6]

Many different kinds of games have been developed for biology. There are commercial boardgames like Cytosis, Photosynthesis, Wingspan etc, while others have been developed by research institutions and teachers. Most of them are available online to download, print and play by everyone (Genetisist Trumps, ImmunoScenarios etc).

Materials and Methods

This study is a preliminary part of a broader research on the use of games and gamification in biology teaching. For this part, 259 students of junior high schools and 118 students of senior high schools participated throughout the school year 2020-2021, using Edmodo, grifobot, Kahoot, bioman.bio and wordwall. Students were asked to fill in questionaires regarding their learning experience at the beginning and towards the end of the emergency remote teaching.

Results and Discussion

All students participating in the study acknowledged the need to study biology, and responded in an enthusiastic way in all the games and tasks assigned. The vast majority of the students (77%) replied that they think they can learn biology through games. Similarly, 83% for junior and 76% for senior high school students, answered that they want to participate in Edmodo tasks and quizzes for the next year. Activities in Grifobot were characterized "very interesting" by 77% of the students, with none negative view. Of all the games used, Kahoot had the most controversial results, possibly due to the element of time. Some students enjoyed the competition arising from the ticking clock; others found it stress inducing. Despite that, more than 88% of the students said they had fun playing kahoot, and that it helped them.

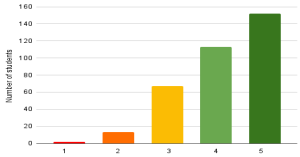

Figure 1: Student's response in question: Do you think you can LEARN biology through games? Grade from 1 to 5.

Conclusion

Students respond positively to gamification and are motivated to study. We believe it can augment student's engagement in biology courses and lead them to start filling the gap in biological literacy.

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