



Item	1 <sup>st</sup> Case Study
<b>Introduction</b>	Space Race is an interdisciplinary teaching experience based on Game-based Learning as an educational methodology complementary to the Flipped Classroom pedagogical approach in higher education. The tool used was the Space Race application integrated into the free Socrative software. A more active and meaningful learning has been promoted in the student with its implementation. Likewise, it has allowed the face-to-face classes to be energized, creating a relaxed atmosphere. The reflective and critical use of technological applications and mobile devices in the classroom has also been encouraged. The use of the Space Race has increased the participation of students in the classroom, their motivation and interest, collaborating in the development of skills and abilities. This tool has been very useful to obtain bidirectional teacher-student feedback in real time. As a result, a more cooperative, reflective and meaningful learning has been obtained.
<b>Type of institution involved</b>	Higher Education
<b>Title of the methodology used</b>	Game-based Learning as an educational methodology: Space Race
<b>Type of educator</b>	Academic Lecturers and Industry Professionals
<b>Tool/tools used</b>	The Space Race resource used in the classroom is available within the Socrative digital teaching application. Socrative is an intelligent response system where the teacher can perform questions, contests and games, to which students can respond in real time from their mobile devices. Student responses are projected instantaneously on our device. Students can leave feedback on the activity by using the Exit Ticket resource [5,6]. The Space Race option allows incorporating gamification in the classroom, see Figure 1. This activity shows a diagram with the synchronized progress of an icon (rocket, spacecraft, bear, bicycle, etc.). For each correct answer the icon advances a position. In this way the students can verify their progress.

**Main Challenges,  
Key Success and  
Enabling Factors**

In order to obtain a plural information, we have approached the study of its use from an interdisciplinary perspective by teachers belonging to different areas of knowledge; specifically Engineering and Biomedicine from the academic year 2015–16 to the present at the University of Zaragoza. In both cases, Space Race has been used according to different methodological approaches. Sometimes students have participated individually and other times in groups. It has been tried to use to encourage the use of this tool in the classroom with a critical, reflective and ludic spirit. The proposal in this experience has been the use of the Space Race resource to support the implementation of the Game-based Learning (Gamification) strategy complementary to the pedagogical approach Flipped Classroom.



As a disadvantage we can point out that:

- The free version of the application does not allow to configure punctuation options or the time assigned to each question. You can only observe the relative position of the participants with the rest of the adversaries (Figure 1), so it is not suitable as an assessment system in real time.
- The tool allows students/groups to choose a specific color for their own equipment or it can be randomly assigned. This last option can falsify the results
- Mobile devices or the network itself can affect its effectiveness as assessment system.
- The free version only allows to compete between 20 students/groups, which is a limitation.



<b>Lessons Learnt and Recommendations</b>	<p>The analysis of the use of Space Race resource reveals that:</p> <ul style="list-style-type: none"><li>• Facilitates the resolution of doubts about the assigned tasks that have been developed independently by the students outside the classroom according to the Flipped Classroom model.</li><li>• Allows monitoring the subject (student feedback), as well as the evolution of the teaching learning process. Reveals those more difficult aspects for students. We can highlight concepts.</li><li>• Facilitates the continuous assessment and the verification of the progress of the students with respect to the subject.</li><li>• Gives fast and immediate information transmission through a game of competition. A lot of time is saved in the transmission of information in favor of personalized attention of the students.</li><li>• The dynamics generated in class invites the debate. In this way the face-to-face class goes from passive reception to active participation.</li></ul>
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