

Peer-to-peer medical student education: design, experience and evaluation of the impact in learning of 2nd year medical students from the University of Malaga

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It is well-known that gamification is a rising educational technique, implemented in many settings by teachers, especially in primary education. Escape rooms have been trending in the past years among young adults, as teamwork, ingenuity and knowledge merge in a both distended but competitive environment. Inspired by it, a physiology escape room was designed for second year medical students of the Faculty of Medicine in Malaga on a peer-to-peer teaching basis. Indeed, physiology intern students from higher courses structured a practical escape room that covered the topics of the first human physiology course, focusing on cardiovascular and respiratory physiology. As a result, these students replaced regular teachers in this activity, taking control of the design, promotion, preparation, execution, evaluation and follow-up of the event. The escape room was done in mid-December, when all practical and theoretical content of the subject had already been delivered. It was divided in four stages, two for each topic, adding a final case, connected to the beginning of the activity. Participants were asked to team up freely in groups of 4-6 students. This activity was done during three years, readapting the structure to evaluate impact on students' learning and exam results. Our statistical analysis showed an increase in final exam grade of students that participated in escape room with a magnitude of 1.03 ± 0.65 points ($p < 0.005$) compared with those who did not, as well as an increase in global final grade with a magnitude of 1.34 ± 0.83 points ($p < 0.005$). Additionally, the students that participated showed a significantly higher performance in the final exam regarding cardiovascular ($p < 10^{-4}$) and respiratory-related questions ($p < 0.005$). Furthermore, positive feedback was given by participants on how they found the activity, independently on the impact in grade (as this was done prior to the exam). We conclude this teaching tool should be furtherly assessed in following years in order to implement a peer-to peer teaching structure that can maximize its utility to medical students.

Keywords: teaching, escape room, peer-to-peer education, physiology

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