Adaptation of Problem-Based Learning to Online Teaching in the Graduate and Undergraduate Chemistry Courses at the University of Barcelona

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Abstract

Problem-based learning (PBL) is a teaching strategy in which students learn concepts by dealing with challenging problems, developing at the same time problem-solving skills and improving collaborative work. In the past years, we have applied this strategy to different subjects of the Graduate and Master degrees of Chemistry and Chemical Engineering at the University of Barcelona. With the advent of the COVID-19 pandemic, we were forced to adapt the PBL experience to online teaching. As a result, we have been able to compare the results obtained from face-to-face PBL implementation with those obtained using online PBL. Although the effectiveness of PBL learning is dependent on several factors (number of students in the group, maturity of the students, type of subject, etc.), in general, the online PBL implementation proved to be less effective in all of the cases considered. One of the main challenges that had to be overcome was the lack of a suitable platform for students and teachers to interact and discuss the problems under consideration. We will present the implementation of the online PBL strategy to different groups, with different characteristics, analyzing the results obtained and suggesting ways to improve them.

Keywords: online teaching; problem-based learning; chemistry; self-learning; collaborative learning