



Use of a teaching-learning experience to stimulate collaborative learning of metabolism based on selected problems/cases

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Backgrounds: Since 2015, we are implementing a teaching-learning experience to involve undergraduate students enrolled in a “Regulation of Metabolism” course in a collaborative learning experience based on guided selected problems/cases. **Aims:** 1) To improve the results of our students in terms of scores. 2) To increase their skills in: scientific information finding, scientific data management and understanding, science communication, and studying and working in small collaborative groups. **Methods:** Each year, a relevant part of the syllabus has been worked out using this approach. With a flipped-learning strategy, volunteer students signing a learning contract were challenged to collaboratively solve a selection of guided problems/cases (the PBL of the year) in groups of 3-4 students. Four progress sessions were programmed throughout the semester to stimulate groups to contrast and share their doubts and their responses to the problems/cases. At the end of the course, each group had to submit a final report. **Results:** This collaborative learning approach was monitored through comparisons between scores in pre- and post-tests of knowledge, perception and satisfaction questionnaires, evaluation of students’ final reports and final exam scores. Results show an overall high level of satisfaction and higher final exam scores by enrolled students, as compared to those of students that did not take part in these tasks. **Conclusion:** In our experience, this teaching-learning based on PBL, collaborative learning, learning contract and flipped-learning, not only contributes to improve the results of the enrolled students but also to increase their motivation and interest in metabolism, the engine of life.¹

Keywords: Metabolism, metabolic regulation, cours-based undergraduate research experience, problem-based learning, flipped-learning, learning contract.

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Reference: ¹ Medina MA. Metabolic reprogramming is a hallmark of metabolism itself. BioEssays 42, 2000058, 2020

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