

Problem-Based Learning (PBL) Approach in Geology Course for Civil Engineering (Poster)

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יישום למידה מבוססת בעיות (PBL) בקורס גיאולוגיה להנדסה אזרחית

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Abstract

Lecture-based instruction, a traditional teaching method which still dominates the teaching of engineering in academia, has proven to be ineffective (Mills and Treagust, 2003), especially for equipping students with 21st century skills such as teamwork, communication and lifelong learning (Miranda et al., 2020). Problem Based Learning (PBL) is an established pedagogy that involves learning through activity. PBL has been shown to produce deeper understanding of lecture materials while promoting problem-solving and collaboration skills (Beagon et al., 2019). However, some studies have found that students feel that their time would be better spent in a traditional-lecture setting (Ahern, 2010; Iborra et al. 2014).

Against this background, a theoretical lecture-based sophomore course taught at Shamoon College of Engineering, "Geology for Civil Engineering", was transformed to PBL, with the aim of offering students the benefits of this form of pedagogy while avoiding the downsides indicated in the literature. The students' main objective in the course was to design physical models for an exhibition illustrating topics in geology for civil engineering.

The course is structured as follows. After two weeks of traditional lectures presenting basic concepts, a topic list is created together with the students, who are asked to form work-teams and choose a topic that interests them. Student teams meet with the teaching staff for guidance. Later, each group presents its topic to the class

*Proceedings of the 16th Chais Conference for the Study of Innovation and Learning Technologies:
Learning in the Digital Era*

I. Blau, A. Caspi, Y. Eshet-Alkalai, N. Geri, Y. Kalman, T. Lauterman (Eds.), Ra'anana, Israel: The Open University of Israel

and explains its goals for the final exhibition. Students receive feedback from the lecturer and from their classmates. The exhibition is held in the final week, with the general public invited to increase student motivation. Additional motivation is generated by a competition, with the three models judged to be best showcased in the city's science park (Carasso Science Park).

A survey was composed to explore student perceptions of the course. Specifically, students were asked about this form of pedagogy's contribution to their learning and skills (both academic and soft skills), to the emotional experience, and to their attitude towards the subject and the project. The questionnaire was completed by 166 students, with a response rate of 76.9%. The results indicate a high degree of satisfaction with the pedagogy and the experience it generated for students (average response between 3.41 and 4.25 on a five-point Likert scale), and even higher for the minority group whose perception of the pedagogy was significantly statistically different from the majority groups in 27 of the 32 questionnaire statements.

Keywords: Problem based learning, civil engineering, student perceptions.

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