10YPBL - Ten years of PBL in one degree of industrial engineering and management at the University of Minho

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18th March, 2015

Abstract:
Higher education institutions have been responding to challenges that have led to a transformation of educational practices, particularly towards the implementation of active learning methodologies, with learning processes more meaningful, with students increasingly more autonomous, cooperative and motivated. In the particular case of Engineering, graduates should be able to develop their professional activities, dealing with a wide range of different types of problems that require the mobilization of technical and transversal competences. Aiming to increase the relevance of the teaching-learning methodologies, the integrated Master of Industrial Engineering and Management (MIEGI), from the School of Engineering of the University of Minho, an engineering program of 5 years, developed over the past few years much work on curriculum innovation. This work was fundamentally focused on teaching-learning processes based on Interdisciplinary Projects (PBL - "Project based Learning") mainly inspired in the work of Powell and Weenk - PLE, "Project Led education". These processes have started as experiments in preparation for the appropriateness of the course to the Bologna Process and today, take a formal space in the curriculum of the MIEGI. Since 2005, the projects developed in MIEGI boost the development of technical and transversal competences, engaging student teams throughout the semester in search of a possible solution to a problem. In these projects, teams of 7 to 9 students will integrate the course units (CUs) of the semester, exploring, researching, being creative, and making decisions. The proposals made by the teams will be mainly related to the articulation of the contents of these CUs, thereby contributing to the development of the required competencies. The teams will have technical guidance from teachers of all UCs and further support from a mentor teacher, whom contributes to the development of transversal competences of project management, teamwork, and communication. The PBL of the first semester begins on the first day of classes for the 1st year and intends to integrate the contents of the CUs of this semester. That way involves initial CUs of engineering and basic sciences, in a project that addresses the issue of sustainability. So far, there have been 11 editions of these projects, involving 62 teams and 432 students. In the implementation of PBL in semester 7, teams of students aim to develop a project in an industrial environment that, in general terms, involves two phases: (i) analysis and diagnosis of the production system of the company and (ii) development of proposals improvement. The fact that dealing directly with companies, and their real problems, causes a strong motivation on the part not only of students but also of teachers. So far, nine editions of PBL were carried out in interactions with 17 companies, involving 35 teams of 249 students. In these contexts, longitudinal studies have been conducted based on two PhD projects identifying the positive results of this learning methodology. The purpose of this communication is to describe the model, the results and the impact of 10 years of Project-Based Learning in a degree course of Industrial Engineering and Management at the University of Minho, Portugal.

Video Link

Acknowledgments:
Aalborg Centre expresses its gratitude to all presenters, who prepared and presented in this webinar sessions making it possible. Aalborg Centre also expresses its gratitude to all registered participants which engagement and active participation contributed to rich discussions and reflections.
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