The importance of project-based work in fostering student learning of Basic Sciences in engineering programs: a case study

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Abstract

Maths and Physics are basic curriculum units that are part of first years of an engineering program. An analysis of existing data reveals that many students drop out the first year of the engineering program, amongst other reasons, due to the lack of motivation for learning the contents of those curriculum units. For many students, Maths and Physics are far away from what engineering is all about and for their future work as engineers. The purpose of this study is to look at the role of basic sciences in engineering curriculum from the perspective of students, university teachers and professionals. It also addresses the contribution of project-based learning as a strategy to engage students in learning the contents of the so-called basic sciences such as Maths and Physics. Data were collected through focus group with students (1st to 4th year of study) and university teachers mainly from basic sciences (Maths, Physics and Chemistry). The paper also draws upon data collected from interviews to professionals. Findings point to the relevance of project-based learning in the first year of engineering programs in terms of students' engagement and motivation in their learning. In addition, the results also indicate that the participants recognize the connection between Maths, Physics and Chemistry and their contribution to their training as future engineers in the field of Industrial Engineering and Management.

Keywords: Engineering Curriculum; Basic Sciences; Project-Based Learning.