Chapter 10

Value of Adaptation of Methodologies Between Different Knowledge Areas: As Applied in the Context of Project-Based Learning

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ABSTRACT

Project-based learning (PBL) is a powerful tool for teaching that helps students to get the best in terms of ratio effort/learning outcomes, especially in studies with a very practical basis, such as university degree studies in engineering. A way of getting even more out of this is by means of the adaptation of methodologies from different knowledge areas, because this allows the launch of innovative ways of working with certain guarantees of success from the very first moment, and at the same time to integrate skills from different fields within a shared context. Furthermore, it helps to put into practice some transversal competences, which are very useful for future professionals. The chapter also includes some case studies on the successful adaptation of different methodologies coming from different fields such as graphic design, biology, and social sciences in the context of a university engineering degree in industrial design and product development.

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INTRODUCTION

Since the launch of the European Higher Education Area (EHEA), Project Based Learning (PBL) methodologies have experienced a noticeable development in the context of university studies, increasingly replacing the traditional master class.

A more extended use of learning methodologies based on the principles of “learning by doing”, or “learning through experience”, together with an increase in scientific papers and publications dedicated to communicating the obtained results, (since Anzai & Simon, 1979; or Barron et al, 1998) is helping to expand the realization of different and innovative learning experiences. This not only contributes to the showcasing of these techniques, but at the same time expands their potential. Moreover, the results of the students in terms of the ratio effort/learning outcomes are steadily improving (Manchado et al, 2015). Consequently, the number of teachers who are enthusiastic about teaching innovation based on PBL is growing, and new experiences are proposed and developed every day.

Nevertheless, sometimes the degree of student success implied in the first-time application of a new methodology is affected by the need for adjustments, required to make some techniques fully develop their potential. Meanwhile, sometimes, only after several editions do these prove to be truly useful. For this reason, it seems convenient to show experiences where the development time has been reduced, and the speed of implementation increased, to sooner obtain the expected, good results.

These PBL experiences are particularly well exemplified when a series of teaching activities is organized via a modular coordination of selected subjects from different knowledge areas yet within the same degree. This modular approach can help the student to achieve a number of global learning objectives and competencies, through the acquisition of partial objectives for each subject in an overall context, allowing improved academic outcomes and reducing abandonment of subjects (Manchado & López, 2012).

By working with modules of subjects, the aim is to ensure learning outcomes, complementing other subjects without overlapping content, to make sense of all subjects within the same degree (regardless of their particular area of expertise), and to optimize the use of implied resources and efforts of the student. The achievement of these objectives is through a series of activities planned by the team of teachers involved in the module, in which the best practices are introduced. Some of these practices include continuous and group assessment, normally basing the learning experience on the development of a common project involving all areas of knowledge, (which at the same time prepares the student for the reality of professional work).

This strategy has been broadly developed in the context of the Engineering Degree in Industrial Design and Product Development, providing not only good results for students, but also other important achievements. One of these achievements has been
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