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ACTIVE METHODOLOGY IN MECHANICAL TECHNOLOGY

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Abstract

The course unit of Mechanical Technology II, which is taught in the 1st semester of the 3rd year, is integrated in the course structure of the Degree in Mechanical Engineering from the School of Technology and Management of the Polytechnic Institute of Bragança. The course contents are organized in fifteen themes that cover different manufacturing processes and which can be classified into two main groups: machining processes and metal joint processes (welding and structural adhesives). The classes of the course unit are divided into theoretical and practical (2 hours each). Usually in the theoretical classes prevail the exposition of contents by the teacher, while the practical classes have an experimental component of design and experimental work that is implemented in laboratory where the students conceive and manufacture real metal components.

Considering the analysis of students' performance based on the approval of the course unit, it can be observed that in the academic years prior to 2016/2017 the approval rate was relatively high, for example in the three previous years this rate varied between 78% and 90%. However, if the theoretical component is separated from the practical component is verified that the students in theoretical part have a much lower classification, the percentage of approved classifications ranged from 19% to 42% for the same period. Thus, it is the practical component that essentially contributes to the observed approval rate, and there is doubt if the difficulties of theoretical concepts are overcome at the end of the whole process.

In this context, there was a need to rethink new ways of approaching the theoretical component of the course unit that contribute to a greater involvement of the students in the classes and, consequently, to a more meaningful learning of the contents. To reach this objective, in the academic years 2016/2017 and 2017/2018, in the theoretical classes of the course unit the exposition of the themes was carried out by the students instead of traditional mode. In this way, the students were in charge of presenting the theoretical subjects. At the end of each presentation there was a large group discussion in the class, involved the discussion about the application of theoretical contents to practical cases. In order to encourage the student involvement in the debate and the previous study of content, at the end of each class, was proposed a "lesson question", which consisted of a written answer to one or two questions on the topic presented.

The main goal of this work is to compare the results of this methodology for two different conditions. In academic year 2016/2017 the class has 15 students while the academic year 2017/2018 the class has 50 students. The analysis of the impact of the described methodology was carried out by the teacher, reflecting on the practice and confronting his experience of teaching the course unit in previous years, based on the students' performance. Was purposed a questionnaire to analyse the student' opinion about the contribution of the applied methodology to their learning.

Keywords: Mechanical technology, presentation of themes, bibliographic research, active participation.