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CHALLENGES FOR THE THIRD MILLENNIUM

Engagement of Civil Engineer students in the first academic year

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ABSTRACT

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Stronger student engagement or improved student engagement are common instructional objectives expressed by Higher Educational Institutions. They aim, in particular, at reducing the early dropouts of Science, technology, engineering, and mathematics (STEM) studies and to involve students in their own learning process.

This paper presents training resources and materials recently incorporated to the Calculus course of the first year of the Civil Engineering Bachelor at the Escola Tècnica Superior d'Enginyers de Camins Canals i Ports de Barcelona, in order to motivate and encourage students towards independent learning in mathematical topics.

One of these tools is a series of specific thematic math videos. They have different aims and scopes. On the one hand, they connect basic concepts of the Calculus course with relevant topics of Civil Engineering. On the other hand, they propose and state contextualized problems (pertaining to Civil Engineering) which are solved stepwise using Calculus tools and procedures. Moreover, there are different kinds of videos, namely: motivational, audiovisual workshops and audiovisual laboratories.

Producing and editing workshop videos required the cooperation of professors and also last year students in Civil Engineering. Being the speakers actual students, these videos convey to the target audience (first year students) a sensation of proximity and a potential easiness. Much more than if they were presented by a lecturer.

Initially, all of these videos were only accessible through the Civil Engineering School web portal, CaminsOpenCourseWare. Currently, the three collections of videos are already displayed on the YouTube channel, which provides more flexibility for access and allows controlling displays. They are also integrated into the web platform of the Calculus course, which allows students being immediately updated.