Advantages of a compulsory attempt to learn autonomously in preparation for traditional presential classes

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At our engineering colleges, we are often confronted with a deficient educational background in our freshmen. This situation matches the PISA results about the European school students. In Spain, there is a widespread opinion, also shared by many teaching colleagues, that one of the main reasons for this situation lies in a lack of demand for personal effort materialized as autonomous homework. In order to examine this situation from this point of view, we have carried out a pilot study in two classes of ‘Physics I’ (fundamentals of Mechanics, Wave Physics and Thermodynamics) and ‘Physics II’ (Electromagnetism and fundamentals of Optics), in which about 70 students have participated, including the final survey. In the Digital Campus (University Intranet), these students had access to (a) a calendar with the headings of the specific theory items scheduled for each specific (presential) class, and (b) references to sources in order to learn the corresponding item autonomously. For each item there were two sources referred to: texts in a traditional handbook, and web pages, generally in hipertextual format (including multimedia animations and applets). In a first part of the course, the students were asked to attempt to study the corresponding item autonomously and previously to the class as a compulsory homework, although not controlled by the lecturer or professor at first. So, in the following class, only doubts should be clarified and, at most, a summary of the item would be explained ‘at the blackboard’ in a rather traditional way. After that, the whole item would be considered as totally explained. From about the middle of the course onwards, the students were asked for the same compulsory homework, but now it was controlled by means of a handwritten summary that they had to deliver before the beginning of the corresponding class and that would be marked (they had to scan and send it by e-mail, if they could not attend the class). As a means to investigate the effectiveness of this compulsory attempt, by the end of the course, we asked the students to fill in a questionnaire. The students were also encouraged to add free comments on advantages and disadvantages of the activity described. The results drawn from their answers and comments are as follows: (a) Only the controlled compulsory homework is effective. (b) Although students often do not understand what they are attempting to learn in an autonomous way previously to the class, the compulsory requirement of a handwritten summary is very effective in preparation for getting a higher learning performance out of the rather traditional class, and (c), as a consequence of or a cause for this, it is also very effective to find the class less boring or more appealing. (d) The use of the web sources recommended was much more spread than the use of a traditional handbook. As a conclusion, we deem it very useful to ask for an attempt at an autonomous study in preparation for the presential class, after giving appropriate references to texts in a traditional handbook and, especially, to hypertextual web pages. But at least in our case, we deem it indispensable to control this activity effectively by means of a compulsory summary to be delivered previously to the class. In the end, students are grateful for the learning results, if we trust their free comments.

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