SYNCHRONOUS AND ASYNCHRONOUS DISCUSSIONS. A WAY TO IMPROVE CREATIVE IDEAS IN ENGINEERING EDUCATION

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INTRODUCTION

• Many courses have increased the number of online classes or using online tools to improve the efficiency of the educational activities. However, many instructors and lectures doubt about the capability that online sessions have to prepare students to succeed.

• It is important to determine whether online activities can provide the students the necessary skills to be successful in their future work. On the other hand, one of the main skills that are necessary to introduce in the courses is creativity.

• Many works have been presented in the literature where creativity has been introduced in face-to-face classes. Unfortunately, little work has been done in this topic to be introduced in online activities. A typical methodological strategy used in online educational activities is asynchronous discussions.

• Asynchronous discussions enable students to participate with each other to discuss about one topic proposed by the instructor. This interaction is possible due to the existence of virtual educational platforms where forums of discussion can be created.
METHODOLOGY

• It is important to determine whether the use of virtual tools help the student to develop creativity. To solve this problem, it is necessary to find the answer to two questions which are:
  1. How should be the instructor-student interaction during the asynchronous discussions?
  2. How should be the student-student interaction?
• The answers to these questions should be present during the design of the educational activity. In this work, an educational activity has been designed to incorporate synchronous and asynchronous discussions during the performance of PBL in class and online.
The methodology was structured in different face-to-face classes and online discussions.

1. Two different groups of students were formed and separated.
2. The first group (Group A) did not use asynchronous discussion. Only synchronous discussion was allowed.
3. The second group (Group B) included asynchronous sessions for discussion.
METHODOLOGY (Cont. II)

• These sessions were always carried out separately for Group A and Group B.

• In the first session the activity was explained to the students including the number of classes, the goals and the assessment of the work.

• The second session was a training in creative thinking. In this seminar the concept related to creativity were explained.

• In the third session, different engineering projects were presented to each group. The groups had to work to solve one engineering problem using creative thinking.

• In the next session, divergent thinking was used to generate the largest number of ideas. Students were allowed to use different ideation methods.

• The previous sessions were identical for Group A and Group B. However, the differences began at this point. In fact, synchronous discussion was the only tool allowed for Group A.
RESULTS

• General assessment of the results
• Assessment of the results using asynchronous/synchronous discussion.
CONCLUSIONS

• In this paper, the use of synchronous and asynchronous discussion in activities fostering creativity has been investigated.

• The main goal has been to study if the use of asynchronous methodologies could maintain, deteriorate or improve the results.

• The outcome shows that the results has a significant improvement. Indeed, the work has found the positive influence of using this type of communication between students. This fact allows introducing online discussion throughout the forums available in the educational virtual platform provided by the universities.

• Thus, the student can use these virtual tools to generate and propose ideas at any time and from anywhere. It is not necessary to schedule meetings at the university or at home. In this way, they can organize their time and chose the best moment to do the work.