INFLUENCE OF THE EDUCATIONAL ACTIVITIES IN THE PERCEPTION OF CREATIVITY IN ENGINEERING STUDENTS

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INTRODUCTION

• Nowadays, the challenges that the education has to confront with (e.g. cultural, economic, and environmental) have made to change the role of our Universities.

• No doubt, incorporating creativity and innovation into the courses as general skills in students is essential to confront with the modern world, because students can create original designs, products and systems.

• Perception of creativity in engineering among students and lecturers are often subjective.

• Creativity should be taught creatively, as this makes students more open to the perception of this concept. How the instructors organize and present their lessons has a huge effect on students learning.

• It must be the instructor concern to develop effective classes and inspire students to think creatively. When this goal is reached, the students can develop both engineering design and the skills to create original ideas with self-confidence.
METHODOLOGY

• In this work specific activities are designed, scheduled and included in class. When this task is carried out properly, the students can develop creative designs with confidence.

• However, it is not easy to design effective lessons and activities. In the methodology proposed the students are divided into groups and each group has to work on a very simple design task.

• PBL is used to this aim. The activity has five stages, which are:
  1. Training in creativity and innovation.
  2. Comprehension of the design problem.
  3. Generation of ideas.
  4. Reduction of ideas.
  5. Refinement.
QUESTIONNAIRE I

• Initial perception of creativity in engineering.
  1. Do you consider yourself a good student?
  2. Do you consider yourself a creative person?
  3. Do you think that creativity in a person is an innate feature (not learned)?
  4. Do you think that a smarter person is more creative?
  5. Do you think that creativity can be learned?
  6. Do you know an effective method for improving creativity?
  7. Is creativity an important factor in engineering?
  8. Do you think that working in groups improve creativity?
  9. In your opinion, is creativity more important than technical knowledge?
 10. Does creativity have enough importance and is well considered in engineering education?
 11. In the degree that you are studying, are creative ideas well considered?
QUESTIONNAIRE II

• Initial perception of creativity in engineering.
  1. Do you consider yourself an observant and curious person?
  2. Are you an imaginative person?
  3. In your personal live, do you make decisions (you are not a passive person)?
  4. In your daily life, do you have many ideas that you would like to carry out?
  5. Are you conformist with the opinions or criteria of others?
  6. Do you think you have leadership skills?
  7. Do you spend a lot of time thinking before making decisions?
  8. In your personal life, are you reluctant to change?
  9. When you propose an idea, does fear of failure condition you?
QUESTIONNAIRE III

• Conclusions about the educational activity.
  1. This educational activity has changed my perception of creativity.
  2. I think I have understood the importance of creativity in engineering.
  3. I am satisfied with the work done in this educational activity.
  4. These matters should have more importance in the subjects of the degree.
RESULTS

• Results obtained from Questionnaire I.
RESULTS (Cont. I)

- Results obtained from Questionnaire II.
RESULTS (Cont. II)

• Results obtained from Questionnaire III.
CONCLUSIONS

• The present study confirms that, in general, the engineering students do not understand the concept and the importance of creativity.

• The first step should be to introduce this concept and to explain the importance that this topic has in engineering. After that, the instructors should introduce examples in class using PBL in order to teach how to think creatively.

• In the educational activity presented in this work, we are successful in changing the perception of the students about creativity.

• Students indicated that the creative perspective is beneficial for them and it would be helpful to incorporate more examples throughout the year in different subjects.

• By encouraging students to generate creative ideas, instructors promote critical thinking and it helps students to understand concepts that would be more difficult to learn using traditional methodologies.