



Promoting a new generation of people passionate about engineering through a spaghetti bridge building competition

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Abstract

Education plays a major role in promoting the transversal skills of collaboration and creativity and in building a more sensitive general public able to appreciate the virtues of engineering design. Therefore, an important effort should be put on the development of educational experiences that enhance collaboration, creativity, and an appreciation for what is a sound structural design.

Within this context, this paper presents an experience carried out at the Universitat Politècnica de València's Science Week to develop the above mentioned skills. The experience involved students of several secondary schools in the construction and load test of reduced scale models of bridges built with spaghetti. The experience was presented as a challenge where the goal was to cross a pre-defined span with the highest possible efficiency.

The paper provides the details of the design challenge (means required to carry out the competition, designs presented by the students, and results). It also shows how the experience was successful in terms of both, the skills developed by the students and the fostering of a passion for engineering.

Keywords: education; footbridge; spaghetti construction; STEAM; technology dissemination, active learning.

1 Introduction

The Science Week is a European celebration promoted in Spain by the *Fundación Española para la Ciencia y la Tecnología*. The Universitat Politècnica de València (UPV henceforth) contributes to this celebration every year by hosting workshops covering different types of knowledge. These workshops are aimed to disseminate science and technology in a funny way as well as to show some of the research and developments carried out at the UPV. Within this context, the author of this paper run a workshop

in November 2016 for secondary school students aimed to:

- Make the attendants become aware of the contributions of civil engineers to society.
- Develop an appreciation about the structural behavior of bridges.
- Develop an appreciation towards bridges as works of art. This point was intended to make the activity move from a STEM (Science, Technology, Engineering and Math) approach to a STEAM (Science,