How Exciting Computer Engineering Can Be for You?

Extended Abstrat

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ABSTRACT

This paper presents a novel initiative to promote engineering vocations in Information Science and Computer Engineering among school children, specially among girls. Women working in this field visit schools to run a workshop that shows different computers related jobs. This activity provides the kids with relevant women references from the history of Information Science and Computer Engineering, and the participants share their own personal experience as role models in order to encourage girls to work on these topics.

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In December 2015, a group of female faculty members from the School of Engineering and Architecture of the University of Zaragoza, all of them members of AMIT-Aragón, devised the project entitled "A women engineer at every school". This initiative's main goal is fostering female participation in college and careers in STEM (Science, Technology, Engineering and Mathematics).

Figure 1 shows how the number of female students in Computer Engineering studies has been decreasing in the last years at the University of Zaragoza. Furthermore, the percentage in the last 10 years has never reached 15%.

As a result, several actions for High School students have been performed to attract women to these degrees: Girls' Day [4] and Wikinformatica [2]. However, these two actions have low impact on female students because at that age, students had already declined STEM studies. In fact, the gender gap concerning technological studies appears at the early age of 6 [3].

For these reasons, we decided to organize workshops in primary schools to show what engineering is, how useful and fun it is. The first edition, in 2016, involved 40 women engineers, 20 schools and 1000 pupils. Half of the activities were about computing, including a brief review of relevant female figures such as Ada Byron or ENIAC programmers and different applications of computing engineering such as robotics, video gaming or computer networks to name a few. Then, in a workshop entitled "How computers store information"

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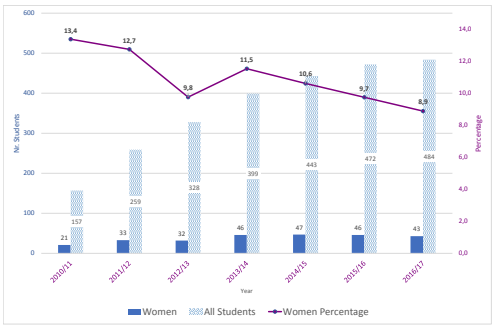

Figure 1: Evolution of students in the Bachelor's Degree in Computer Engineering at University of Zaragoza

[1], the children became makers to learn how computers store information. In the workshop, an image is split into big squared colored pixels[1]. The image is coded line by line. At any line, the color of the pixel is followed by the number of consecutive pixels of that color. The children's work on image codification was twofold. First, instructions with the codification of a sample image were given to every group (4 or 5 kids) and they had to build the image. Next, the groups designed and built their own image with the pixels and then wrote its codification. As this activity involves simple mathematics concepts, it can be done by children up 6 years old adapted to each age.

Thanks to this activity, we realized that many primary teachers do not realize that there is a problem of lack of women in computer science studies. As they do not notice it, there are no actions to change this situation. Second, the use of technology is quite different from developing technology. It is important to make the community think about it. And finally, we all had a great experience together and many students found engineering exciting as many families reported later to the educational centers.

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[1] Materials courtesy of Retroacción Association (http://www.retroaccion.org/)