

# Attraction Campaigns to Increase the Participation of Women in Engineering Programs at Universidad Tecnológica de Bolívar

Sonia H. Contreras-Ortiz, Vilma V. Ojeda-Caicedo, Ericka Duncan, Cristina Osorio Del Valle, Jose Luis Villa  
 Universidad Tecnológica de Bolívar  
 Cartagena de Indias, Colombia

## Abstract

The low participation of women in STEM fields is considered a critical issue in our society. It limits women's career prospects and affects the quality of science and engineering projects. The Faculty of Engineering student population at Universidad Tecnológica de Bolívar is composed of only 29% female. In order to reduce the gender gap, the W-STEM team developed several activities in 2020 to attract women to the faculty of Engineering, and this poster presents the most important results of these activities.

## Introduction

Women are underrepresented in science, technology, engineering, and mathematics (STEM) around the world. Despite the progress made to increase female students' enrollment rate in higher education, the gender gap in STEM fields persists and worsens as the level of education increases [1]. Currently, only 35% of STEM students are women [1]. Reducing this gap has become a priority in the world for several reasons. STEM fields offer great career opportunities for women; gender parity can improve research and innovation quality and contribute to productivity and innovation in engineering projects [1,2,3].

The Faculty of Engineering of Universidad Tecnológica de Bolívar (UTB) has 11 engineering programs, and in 2018 there were 3773 students enrolled. Only 29% were female. The programs with fewer female students were mechanical engineering (10%), systems engineering (11%), mechatronic engineering (12%), and electronic engineering (14%). Based on this data, the W-STEM team at UTB developed several activities to attract women to the Faculty of Engineering, especially to the programs with higher gender gaps.

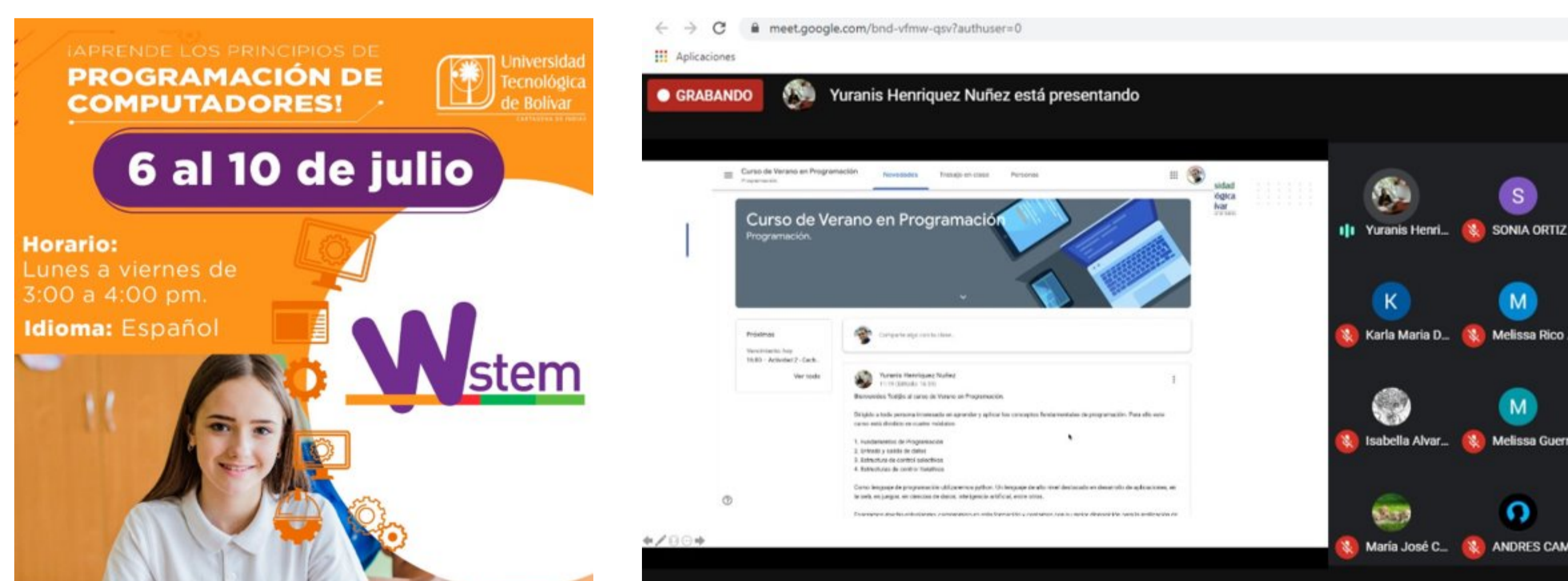
## Attraction campaigns

### 1. Circuits workshop



This activity was held on February 11, 2020, to commemorate the international day of women and girls in science. Twenty-nine girls from the Ondas program participated. This is a program from the government of Colombia that promotes research in school students. Students from the W-STEM UTB group were the tutors in the workshop. The most remarkable aspect of the activity was the number of girls that attended and the accompaniment of female engineering students.

### 2. Programming workshop



In this workshop, secondary students learned basic Python programming concepts using Google's Colab. Sixty-two students signed up, and 25 completed the activities (9 boys and 16 girls). The students gave positive feedback and asked for similar activities in the future.

### 3. Life experiences of women in engineering



We organized a round table with female engineers working in the industry in Colombia, Mexico, Ecuador, Spain, and the Dominican Republic. The discussion followed a methodology based on remembrance or evocation of the experience, thoughtful criticism, analysis, and social transformation.

### 4. Cine forum Hidden figures



The students reflected and discussed the challenges and hurdles that these outstanding women overcame to succeed in their careers. The students' participation was limited by their English skills, as the activity was developed in this language.

### 5. SUMA scholarship

It was created to contribute to the reduction of the gender gap in engineering programs. Open to women of academic excellence and leadership on the Colombian Caribbean coast. The scholarship is based on the idea that women contribute to (suman) new perspectives, diversity, social sensitivity, innovation, creativity, and collective intelligence in science and engineering.



## Results

The table below shows the number of participants in the activities. The circuits workshop and the programming course were the activities that allowed hands-on experience for the girls in engineering tasks. The students enjoyed the activities and provided positive comments in the evaluation forms.

Activity	Type	Participants
Circuit Workshop	Face to face	29
Programming Workshop	Online	25
Womens in Engineering	Online	147 views
Cineforum	Online	20
Suma Scholarship	-	46 Applications 2 Scholarship Winners

## References

- Chavatzia, Theophania. Cracking the code: Girls' and women's education in science, technology, engineering and mathematics (STEM). Vol. 253479. Paris: UNESCO Retrieved from [http://unesdoc.unesco.org/images/0025/002534\\_2017](http://unesdoc.unesco.org/images/0025/002534_2017).
- Lee, Heisook, and Elizabeth Pollitzer. Gender in science and innovation as component of inclusive socioeconomic growth. Portia Limited, 2016.
- Corbett, Christianne, and Catherine Hill. Solving the Equation: The Variables for Women's Success in Engineering and Computing. American Association of University Women. 1111 Sixteenth Street NW, Washington, DC 20036, 2015.