*Technology*

**Good practices to boost women's interest in the technology sector**

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In Mexico, women represent 39.28% of the mass media information sector, which is part of the Telecommunications subsector. Integrating more women into the ICT workforce is essential for women to benefit from technological advances. Women’s underrepresentation in STEM education limits their access to technological jobs. This in why, in Mexico some programs have been implemented to awaken the interest of girls to become interested in STEM.

1. **Women in STEM, Future Leaders**

In Mexico, the *women in STEM, Future Leaders* (2016) is a program designed by Rebeca Vargas president of The U.S. Mexico Foundation for the Ministry of Communications and Transportation. It is a mentoring program in Science, Technology, Engineering and Mathematics for 180 Mexican high school young girls in public schools members of the *Puntos México Conectado* (PMC) Network (Secretaría de Comunicaciones y Transportes, 2018). The goal of this program is to expand the horizons of girls, empowering them and bringing them closer to the world of science to guide them to study a degree related to one of these fields (INAOEP, 2017) . This program, was designed by the U.S. Mexico Foundation, especially for the Ministry of Communications and Transportation, carried out at the facilities of the *Puntos México Conectado* network.

This program was carried out to implement and take advantage of the remote connection technology (telephony and internet) at the *Punto Mexico Conectado* (Mexico Connected Point, PMC) that it is a national network of training centers and digital education driven by former president Enrique Peña Nieto that consists of 32 innovation centers located in downtown areas, one in each state of the Mexican Republic, in which anyone can connect with new information technologies, learn to use them, develop their creativity and undertake innovative projects (PMC, 2018). The participating digital training centers are those located in La Paz, Monterrey, Oaxaca, Puebla, Queretaro, Hermosillo, Matamoros and Mexico city (Secretaría de Comunicaciones y Transportes, 2018).

Each of the beneficiary students is assigned to a mentor to promote the trade of opinions. Mentors are a key component of the program. Professional women or students of master's or doctorate, participate as mentors and vocational guidance of young students, while being part of a unique network of Latina professional women in the areas of Science, Technology, Engineering or Mathematics. During 10 months, from September 2017 to July 2018, the young students received personalized vocational guidance, training and online seminars, interacted with other students in the country, attended to training sessions, participated in guided tours to museums, companies and universities, worked on individual tasks and projects in team and at the end of the course, they attended to an educational summer camp abroad (gob.mx, 2017). All the girls who successfully completed the program, homework, group activities and attendance to Saturday classes have the opportunity to attend an educational summer camp abroad  held in New York City (US Mexico Foundation, 2019).

During their summer educational camp, students have the opportunity to attend events with successful women who work in the STEM sector to listen about their life stories and good advices on how to achieve their goals. It is a pretty inspiring summer educational camp for young students to reinforce what they have learned throughout the program and to boost their interest in science (usmexicofound, 2018). It is said that “*The girl that left is not the same as the girl who came back”* (US Mexico Foundation, 2019)because young girls, when they go back to their communities they are transformative agents and become an example to other girls.

The *women in STEM, Future Leaders* program is contributing in increasing the number of women in STEM but also as a transformative procedure for the young students where they discover themselves as a future leader. It is a life-changing initiative, not only for the young students, but also it’s helping to change our society, empowering women through the ICT education.

However, according to a survey conducted by Microsoft in Europe (2016), young girls are becoming interested in STEM at age 11-and-a-half and then lose it again by age 15. This is a major issue for personal development of girls and women. Therefore, the interval between ages 11 and 15 is crucial for the future professional of young girls.

1. **Technovation**

Technovation (2013) is a technology entrepreneurship online program for girls from ages 10 to 18. This American program offers girls around the world the opportunity to learn the skills they need to emerge as tech entrepreneurs and leaders during 12 weeks. “Every year, Technovation challenges girls all over the world to build mobile applications that address community problems related to the areas of the United Nations Sustainable Development Goals. Since 2010, over 5,000 girls from 40+ countries have submitted over 1000 app prototypes to Technovation, thanks to support from dedicated volunteers around the world” (Technovation, 2016). The purpose of technovation is to teach the young girls how to apply technology to solve problems in their communities.

To participate as a technovation student, girls must be between ages 10 to 18, apply online and join a team. Teams can range in size from 1-5 girls. Depending on the age of all members, the students are divided into divisions. The Junior Divisionis a team whose members are between 10-14 years old and the senior division is a team whose members are between 15-18 years old. “The Technovation curriculum takes, on average, between 4 – 6 hours a week to complete, including 2 – 4 mentor-guided hours a week” (Iridescent, 2018).

Technovation's curriculum takes students through 4 stages of launching a mobile app startup, inspired by the principles of design thinking:

1. Ideation   
   Identify a problem in the community
2. Technology   
   Develop a mobile app solution
3. Entrepreneurship   
   Build a business plan to launch the app
4. Pitch  
   Bring the business to market

“Technovation participants build apps that address a wide variety of issues that they identify within their communities” (Technovation, 2016). The top themes that emerged from 2013 to 2015 are:

1. **“Education/Learning**: This was a popular theme for both US and international groups. However, there were some noticeable differences in the target groups for the apps. US-based teams created solutions to help students connect with their teachers and seek help with their studies online through tutors and peers. International apps, on the other hand, tended to engage marginalized groups in basic education.
2. **Health/Fitness** This theme covers range of topics from allergies and dietary restrictions to more serious issues such as maternal health and malaria. One of the Kenyan winners, Quit Mosquito, was featured in several news outlets like CIO East Africa and UN Women’s Empower Women website.
3. **Community Several** apps connect citizens to resources that give them information on local events or public concerns such as announcements from the government. However, the most interesting apps are the ones that use the model of social networking to create a sense of community among users. An example is Spectrum, a social media network for LGBTQIA+.
4. **Counseling** In all three years, most apps developed focused on providing support for women or young girls and students who are victims of bullying.
5. **Nonprofit/Volunteerism** The main functions of nonprofit/volunteering apps are to aggregate data on nonprofits and create a database where users can view volunteering opportunities or give donations.” (Technovation, 2016)

The best apps aren’t necessary those with the best coding skills members, but those who had a potential social impact, exceptional creativity, and great presentation. The teams with the best apps are invited to the Technovation World Pitch Summit, at Mountain View site in Silicon Valley in Northern California to present their mobile applications.

Some examples of a technovation app:

* Gold in Garbage by WOTE
* Category: Environment
* Mombasa has a long standing garbage problem. Gold in Garbage is designed to give people a chance to recycle materials they would ordinarily throw away.
* eFlow by Little Monsters
* Category: Environment
* Helps users manage their electricity bills and provides information on how they can save electricity and be eco-friendly.
* Swap It by Lycee Francais Technovation Team
* Category: Community
* Promotes lending within a community. Users are allowed to borrow items posted in the app from other people in the neighborhood.
* Tag It! by EPA Chica\_Squad
* Category: Community
* Primary purpose is for city beautification. Users can take a photo of areas they feel need attention, post it in the app where other members of the community can plan clean-ups or join existing initiatives.

Technovation is a program where “every girls can be a technology entrepreneur with the right resources” (Technovation, 2019). Moreover, a five year look-back survey of alumni showed that while most students had little or no experience with computer science before Technovation, their experience with Technovation had a powerful effect, most of the participants were interested in STEM fields. This program, had also an impact in the mentor’s lives because in most of the cases, it increase their technical skills and entrepreneurship knowledge.

1. **NASA Internships**

The Ministry of Communications and Transportation and the Mexican Space Agency published a call for Mexican students to conduct immersive research stays at NASA in the fall of 2019. The objective of this program is to encourage the linking of Mexican students with researchers and students from different countries on topics of space science and technology. The program is aimed at undergraduate and graduate students. This initiative encourages Mexican men and women, interested in the aerospace field, to make a stay at NASA (Gobierno de México, 2019).

1. **STEM Movement Mexico**

STEM Movement a nonprofit association that seeks to promote in Mexico and Latin America, education in STEM, future jobs and innovation, with a social and inclusive vision.It is a program that aims to promote STEM education without distinction of gender. Through this program, the STEM movement is sought to be promoted in public institutions, companies and different social actors (Movimiento STEM México, 2019).

Through a training courses, conferences and mentoring, the STEM Movement Mexico seeks to be an interlocutor and concentrator of efforts to integrate the STEM Ecosystem in the country, adding to its cause the private initiative, sector chambers, Civil Society Organizations, government, academy, entrepreneurial community and national and international non-governmental organizations.

**Conclusions**

Recently, various programs have been generated to arouse the interest of young people in science. The programs are focused mainly on young students of all levels. Some initiatives are aimed only at women, however, government programs such as NASA Internships and the non-profit organization STEM Movement Mexico are open to the general public. More government programs are needed throughout the country and there is also a need to disseminate programs to arouse the interest of girls in the technology sector.

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