

Women's Empowerment Through a **HOLISTIC** Approach to **Education**

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4 W 43rd Street, Blue Room

EMPOWERING WOMEN AND GIRLS THROUGH A HOLISTIC APPROACH TO ICT EDUCATION

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Introduction

Two hundred and fifty years ago, Wang Zheny, a famous female scientist from the Qing dynasty said “When talking about learning and sciences, people thought of no women” (Bennett, 2015). Nowadays, the situation did not change that much. In 2019, the scarcity of women in ICT world is a fact. Men dominate in the fields of science, technology, engineering and math (STEM) not only in the creation of technology but also in the access and use of Internet.

In 2018, worldwide, 45.7% of the population uses the Internet (World Bank, 2018). The Internet usage rate worldwide in 2017 by gender and region shows that female and male users do not make the same use of the Internet (Statista, 2019). Moreover, Worldwide in 2017, only 35% of students enrolled in degrees related to science, technology, engineering and mathematics are women and only 28% of the world's researchers are women. (UNESCO, 2017). Thus, even if the highest paying jobs tend to be high-skilled, heavily concentrated in technology, professional services and engineering sectors, women are less likely to choose the ICT sector for their professional development.

The aim of this presentation is not to find the reasons for women's under-representation in the ICT world but rather to explore the best practices that allow the empowerment of women through technology. Below are two programs, one Mexican and one American, that seek to awaken the interest of girls to become interested in STEM.

- **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

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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,

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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.

○ **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 Division is 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

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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:

- **“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.
- **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.
- **Community** **Severall** 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+.
- **Counseling** In all three years, most apps developed focused on providing support for women or young girls and students who are victims of bullying.
- **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:

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- 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.

Conclusion

Education can become truly transformative for girls and women with the right resources. We must shift our gaze to achieve gender equality. Beyond thinking about the barriers that limit the empowerment of women and girls, it is time to change the paradigm and move from the paradigm of exclusion to the paradigm of inclusion. Digital inclusion of women with gender-responsive is essential to ensure young women are set up for success in a world where STEM skills are increasingly important (Microsoft, 2017) but also to promote the full and equal participation of women in non-traditional sectors. Breaking down the barriers that limit women’s access to a holistic approach to ICT is crucial to achieve gender equality and empower all women and girls.

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