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From a Girls' Camp to a Girls' World: Applying Lessons Learned from APOGEE (Anything is POssible for Girls in Electrical Engineering) to Global Implementation

Introduction

According to Project Drawdown, educating girls is a highly significant way to combat climate change. Many individuals also consider 'access to an education' a human right. Despite this, there are millions of girls across the world that still do not have this access. Beyond this issue, in the STEM (Science, Technology, Engineering, and Mathematics) fields of engineering, computer science, and physics, girls continue to be underrepresented at multiple levels of education and professional life.

This research assesses and summarizes current information regarding the relationships between climate change, the education of women and girls, current educational opportunities in STEM, and STEM camps. We discover that STEM camps may play an important role in the process of more girls entering STEM. At the same time, we put this idea into action through the APOGEE girls' camp.

Educating girls and climate change: What's the connection?

One, climate change makes educating girls more difficult:

- girls are often taken out of school first when disasters strike
- girls are at an increased risk of early marriage and gender-based violence in such situations as well

Two, educating girls is an extremely effective way of tackling climate change:

- girls learn how to use natural resources in responsible ways for them and their families
- Education increases women's, their families', and their countries' resilience to climate change effects

Why focus on educating girls in STEM?

Women and girls pursue education and careers in certain STEM fields to a lesser degree than men in many countries across the world.

- Men outnumber women approximately 4-to-1 in the STEM fields of physics, engineering, and computer science
- Women of color in particular represent the lowest percentages of STEM bachelor's graduates
- In the field of Engineering, women make up a little over 20% of all bachelor's graduates in the U.S.

These fields need women's presence and diverse perspectives.

For a full list of references, please scan here:

Why is having more women in STEM beneficial?

- The intrinsic, **social worth** of having equal access to STEM opportunities for all
- The positive **economic worth** of more women in STEM, projected at least in the U.S.
- The **growing demand for STEM professionals** that can in part be met with an increased number of women entering STEM
- The **value of women's unique perspectives** – there is research that suggests gender diversity is beneficial in multiple ways

3 main difficulties of getting more girls to enter and stay in STEM fields

What role do STEM camps play in the process of getting more girls into STEM fields?

There is initial evidence that suggests that informal STEM experiences have multiple effects on girls:

- Memories of these experiences that endure
- Increased presence of a positive viewpoint of STEM
- Stronger knowledge of STEM and STEM fields
- Increased future engagement with others in STEM, such as through formal education or careers
- Some individuals experienced a greater identification with STEM

However, more research is needed that is quantitatively focused on STEM camps in particular.

APOGEE is a girls' summer camp, created in 2018, whose goal is to introduce middle school and high school girls to STEM fields such as Electrical Engineering.

This camp embraces the core notion that the entire world benefits when more girls enter STEM fields, especially ones in which they are underrepresented.

This camp represents an example case of educating girls, particularly in STEM, and hence a way of combating climate change.

APOGEE 2019

This summer, the APOGEE 2020 camp is being implemented in a virtual format because of COVID-19.

However, this change to an online approach offers us an invaluable opportunity to experiment with working virtually. Virtual work capabilities would enable us to be more flexible in expanding APOGEE. Because of this, we will take lessons learned from this iteration to apply to future versions of the camp.

Moving forward: Global outreach

STEM camps similar APOGEE, if they are created and continued within our international community, can potentially help girls enter and stay in STEM.

As such, both our current (and future) actions are aimed at expanding APOGEE into other places throughout the globe.

It is our goal to do this through:

- Contacting potential partners to support each other in our mutual goals of increasing girls' access to an education
- Supporting increased visibility of the need for more opportunities for girls in STEM, so as to inspire others into action
- Reaching out, in the future, to those in need of an educational opportunity such as APOGEE in our international community

Selected References:

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