



Knowledge hub - Collection of best practices

Summary of the best practice

1. Title of the best practice (e.g. name of policy, programme, project, etc.) *

Technovation Girls

2. Country or countries where the practice is implemented *

120

3. Please select the **most relevant** Action Track(s) the best practice applies to *

- Action Track 1. Inclusive, equitable, safe, and healthy schools
- Action Track 2. Learning and skills for life, work, and sustainable development
- Action Track 3. Teachers, teaching and the teaching profession
- Action Track 4. Digital learning and transformation
- Action Track 5. Financing of education

4. Implementation lead/partner organization(s) *

Technovation

5. Key words (5-15 words): Please add key descriptive words around aims, modalities, target groups etc. *

girls, AI, entrepreneurship, digital skills, climate education, parental engagement, mentorship, peer mentors, evidence-based, low-income countries, coding

6. What makes it a best practice? *

Worldwide there is a persistent gender inequality in technology, entrepreneurship and leadership positions. Technovation is the world's largest and longest running technology-entrepreneurship program for girls ages 8-18, with strong evidence to show that its model is effective in reducing the gender gap in technology. Through Technovation, girls partner with mentors from industry and together they identify a problem in their community that aligns with the SDGs, and develop a mobile or AI-based solution that they then prototype and implement in their communities. Technovation has rigorously tested its model at global scale for more than 15 years, reaching more than 370,000 participants over 120+ countries. It has a strong base of evidence that its model is effective in increasing the number of girls and women going into technology, and more broadly, increasing their access to resources, agency and achievement. What makes Technovation effective is in how we connect self-efficacy & adolescent brain development research to practice - at global scale. 76% of alumnae are pursuing STEM degrees. 60% of alumnae are working in STEM careers. 60% of alumnae credit Technovation for their career choice & increasing their self-efficacy. 50% of alumnae are leading change in their communities & being honored.

Description of the best practice

7. Introduction (350-400 words)

This section should ideally provide the context of, and justification for, the practice and address the following issues:

- i) Which population was affected?
- ii) What was the problem that needed to be addressed?
- iii) Which approach was taken and what objectives were achieved? *

TARGET POPULATION: Our target is girls ages 8-18, specially those from low-income communities. We also engage parents, educators, industry professionals (as mentors), as well as alumnae (18+). We have implemented the Technovation program with girls across 120+ countries.

PROBLEM: Last year the UN Secretary-General said that the world "is tremendously off track" to achieve the Sustainable Development Goals by 2030. COVID-19 has made things worse and highlighted the linkages between inequality, poverty, food and disease.

The most well-researched strategy that we know to address these immense global challenges is educating girls. Giving girls a basic education strengthens economies, creates jobs, adding ~35% to GDP for some countries. Educated girls are healthier citizens who raise healthier families. When girls are educated their communities are more stable and recover faster after conflict. And finally, we know that educating girls is the 5th most effective strategy for reducing carbon dioxide emissions (electric vehicles is #27).

Educating girls is at the heart of sustainable development. But we cannot just stop at basic literacy, especially when no country in the world has achieved gender equality, and when women are missing from the areas that have the most power and influence in today's times - technology, climate and leadership.

Globally, men pursue degrees in engineering and ICT at around three times the rate of women (World Bank, 2020). Women are particularly underrepresented in technical jobs with high employment growth rates: in the 20 leading economies, women account for just 26% of workers in data and artificial intelligence, 15% of workers in engineering, and 12% of workers in cloud computing (WEF, 2020).

To achieve sustainable development for our people and our planet, we must empower girls, not just with basic literacy skills, but build their skills to use AND develop technology, while also increasing their sense of self-efficacy as leaders.

APPROACH: Technovation's approach to the above problem is to engage girls in a 12-week competition through which they work in teams, and supported by a mentor, they learn to identify a meaningful problem in their community (aligned with the SDGs), and to develop cutting-edge technology solutions for it.

OBJECTIVES: The program has been successful in increasing technical skills, access to social capital (peers and mentors), agency (voice, influence and participation in different spheres of a girl's life), as well as tangible achievements such as increased education and earning capabilities as a result of pursuing STEM careers.

8. Implementation (350-450 words)

Please describe the implementation modalities or processes, where possible in relation to:

- i) What are the main activities carried out?
- ii) When and where the activities were carried out (including the start date and whether it is ongoing)?
- iii) Who were the key implementation actors and collaborators? (civil society organizations, private sector, foundations, coalitions, networks etc.)?
- iv) What were the resources needed (budget and sources) for the implementation?

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MAIN ACTIVITIES:

Participant Recruitment: Technovation collaborates with community organizations and local leaders around the world who want to empower girls in their communities with technology entrepreneurship skills. These partners recruit girls and volunteers (educators, parents and industry professionals) who mentor the girls. Since inception, over 80,000 educators and industry professionals have volunteered their time to support Technovation's programming.

Competition launch & season: The Technovation challenge opens in October each year (usually on the International Day of the Girl). Girls form teams of up to five to participate in the beginner (8-12), junior (13-15), or senior (16-18) division. Over a period of 12 weeks, girls engage with Technovation's online curriculum (and online classes), supported by mentors. They learn about mobile app development, artificial intelligence, real-world problem-solving, and entrepreneurship.

Community Celebration: Technovation chapters hold regional pitch events where learners pitch their technology solutions to judges. Seeing girls from their own communities encourages other young girls to explore STEM learning/careers. Parents and community members are likewise exposed to the potential and promise of empowering girls to grow their technology skills. These events are an important way to strengthen the community, while also changing social norms.

Judging and Awards: Technovation works with thousands of volunteer judges to score pitch videos and prototypes based on a standardized rubric of criteria. 45 finalists are chosen to pitch during our World Summit celebration event in August. Each member of the 45 teams receives an educational stipend. One team from each division is chosen as the grand prize winner, in addition to other prizes that address timely global problems.

WHERE & WHEN: The season starts in October each year, and culminates in August. Participants around the world follow a free, online, curriculum - either virtually, or meeting in person.

KEY IMPLEMENTATION PARTNERS

We partner with ~220 community organizations, afterschool programs and local leaders who want to empower girls in their communities. Global partners include UNICEF, UNOOSA and industry partners who provide funding, mentors and judges.

RESOURCES NEEDED: Each team needs at least one laptop and access to the internet to be able to go through the program. We typically provide stipends to community partners ranging from \$1000-\$5000 (and many times more). The cost of providing the full 12-week Technovation program to a girl, and capacity building support to her community is \$170. Most of our funding comes from industry partners, and the remaining from foundations and individuals.

9. Results – outputs and outcomes (250-350 words)

To the extent possible, please reply to the questions below:

- i) How was the practice identified as transformative? (e.g., impact on policies, impact on management processes, impact on delivery arrangements or education monitoring, impact on teachers, learners and beneficiary communities etc.);
- ii) What were the concrete results achieved with regard to outputs and outcomes?
- iii) Has an assessment of the practice been carried out? If yes, what were the results? *

FORMAL ASSESSMENT RESULTS

Technovation's transformational impact on participants was determined through an external long-term impact evaluation conducted by WestEd in 2020 that showed 76% of Technovation alumnae pursue STEM degrees and 60% of Technovation alumnae work in STEM-related careers - directly addressing the lack of women in technology careers.

TRANSFORMATIVE PRACTICE

Technovation's model is transformative, because it is the only global, research-based, large scale program with proven longitudinal impact data showing that its alumna are successfully pursuing STEM careers as a result of Technovation. No other program has the same long-term impact data or proven ability to scale globally.

Additional ways in which Technovation's model is unique, innovative and transformative:

It builds capacity for the parents, educators and mentors in the girl's community, ensuring that she has a base of continued support.

It is the only large-scale, global program that teaches youth to tackle real-world, complex problems using cutting-edge technologies.

It is the world's longest running and largest, evidence-based AI-education program that teaches youth about the basics of AI, and how to apply AI-based tools to real-world problems.

CONCRETE OUTPUTS & OUTCOMES

Technovation has been successfully delivering on its mission to close the gender gap in technology. To date, Technovation has engaged and supported 370,000 participants across 120+ countries. It has empowered girls around the world to develop more than 12,000 mobile and AI applications to tackle problems in their communities, like this team from Ukraine who developed this app to support refugee children (<https://www.youtube.com/watch?v=n57f9Z9ccFQ>). Other impact metrics include:

- * 75% of girls reported learning how to code.
- * 67% of girls reported learning how to start a business.
- * 75% of girls reported learning how to solve problems.
- * 87% of parents indicated greater capability to support STEM learning at home
- * 100% of educators learned better ways to stimulate a student's interest in STEM
- * 98% of industry volunteers reported an increased sense of purpose
- * 99% of mentors say they use Technovation skills at work
- * 96% of mentors would recommend this program to a colleague

10. Lessons learnt (300 words)

To the extent possible, please reply to the following questions:

- i) What were the key triggers for transformation?
- ii) What worked really well – what facilitated this?
- iii) What did not work – why did it not work? *

KEY TRIGGERS FOR TRANSFORMATION have been:

Building, testing and improving a research-based program model based on Bandura's self-efficacy theory as well adolescent brain development theory. After rigorous field testing of 14 program models, the current Technovation program has demonstrated that it can scale and have lasting impact on girls from different cultures and socio-economic backgrounds.

Developing a robust impact assessment and reporting mechanism that is the core backbone of the organization's operations.

Using technology to reach a large number of participants at lower costs (we have developed our own platform that allows students to connect with mentors, and for judges to review each students' submission)

Developing powerful partnerships at local and global levels to help increase scale

Developing a partnership model with the private sector that enabled us to connect students with mentors (social capital) in the short-term, and financial capital in the longer-term.

WHAT WORKED REALLY WELL & WHAT FACILITATED THIS?

In addition to research based elements that defined the program, we used the principle of spread instead of scale to implement the program globally (Cynthia Coburn, 2013). This principle encouraged us to develop a model that could be locally adapted to different situations, instead of adopting a top-down "franchise" type of model. This allowed our model to scale globally.

A standardized judging rubric used by external judges to evaluate each student's project was an effective method of maintaining quality, because participants wanted to make sure they did well in the global competition and adhered to the judging rubric criteria.

WHAT DID NOT WORK & WHY?

What hasn't worked so well for us has been to build a global brand and raise awareness about the effectiveness of this program. This has been because much of the organization's energy, resources and expertise was directed towards developing a high-impact program.

11. Conclusions (250 words)

Please describe why may this intervention be considered a “best practice”. What recommendations can be made for those intending to adopt the documented “best practice” or how can it help people working on the same issue(s)? *

What makes Technovation a “best practice” in closing the gender gap in STEM, is in how we connect research to practice and proven impact. 76% of alumnae are pursuing STEM degrees. 60% of alumnae are working in STEM careers and credit Technovation for their career choice & increased self-efficacy. We have demonstrated this impact at global scale - engaging 370,000 participants across 120+ countries.

Recommendations

We recommend the following elements to be included into programs that want to empower minorities and youth to become innovators and leaders:

- * Purpose-driven - Youth, especially teenagers, are looking for ways to build their sense of identity and projects that give them an opportunity to make a difference in the world, build new skills while helping them understand themselves better are popular - and impactful!
- * Team-work - Students cherish the opportunity to work with one another on meaningful projects, as this is one of our universal human drives as a social animal.
- * Mentorship - Youth, especially girls, and especially those from low-income communities need a thick layer of social support and social capital helping them learn about new opportunities and continue deepening their skills and aspirations.
- * Physiological effects in addition to cognitive - Embedding a learning program into a competition with a deadline and exciting prizes serves as a powerful motivator to participate and persist through challenging multi-week programs.
- * Choice - Giving students, especially teenagers, the choice to participate in an exciting program significantly increases their engagement, as opposed to forcing them to participate during formal school hours.

12. Further reading

Please provide a list and URLs of key reference documents for additional information on the “best practice” for those who may be interested in knowing how the results benefited the beneficiary group/s. *

* Technovation 2021 impact report - <https://www.technovation.org/impact/2021-annual-impact/>

* Impact of COVID on girls' learning (compared to previous years):

https://www.technovation.org/wp-content/uploads/2021/06/Impact-report-Digital_FULL-final.pdf

* Technovation's longitudinal study: https://www.technovation.org/wp-content/uploads/2020/09/WestEd_Technovation-Girls-Alumni-Survey-Report-2020_20200730.pdf

* Comparing 2 Years of Empowering Families to Solve Real-World Problems with AI -

[https://link.springer.com/article/10.1007/s13218-021-00738-2?](https://link.springer.com/article/10.1007/s13218-021-00738-2?wt_mc=Internal.Event.1.SEM.ArticleAuthorOnlineFirst&utm_source=ArticleAuthorOnlineFirst&utm_medium=email&utm_content=AA_en_06082018&ArticleAuthorOnlineFirst_20210723)

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* Other impact reports - <https://www.technovation.org/impact/impact-reports/>