

InspirHerTech: A comprehensive model of mentorship, science communication, and STEM competency building for girls and women in Peru.

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Resumen

En el Perú, solo el 14.11% de los investigadores registrados en ingeniería y tecnología son mujeres, una cifra que refleja barreras estructurales, culturales y de acceso que persisten incluso cuando el talento existe. Este trabajo busca documentar y analizar el modelo de InspirHerTech, una organización peruana fundada en 2024 que opera desde tres ejes: mentoría entre pares, divulgación científica accesible y desarrollo de competencias de liderazgo mediante voluntariado. Se empleó un diseño de estudio de caso descriptivo basado en registros internos de nueve eventos realizados durante el primer año de operación, complementado con una encuesta de satisfacción aplicada a los participantes de uno de los programas. La organización alcanzó una participación acumulada de 467 personas en modalidades virtual, presencial e híbrida, con una puntuación media de satisfacción de 4.61 sobre 5. Estos resultados sugieren que iniciativas lideradas desde la experiencia directa de sus fundadoras, ágiles y construidas fuera de los circuitos institucionales formales, pueden reducir de manera concreta la distancia entre el talento femenino existente y las oportunidades que no siempre son visibles, con un modelo replicable en otros contextos latinoamericanos.

Descriptores: *Peru, Women in STEM, Peer Mentorship, Science Communication*

Abstract

In Peru, only 14.11% of registered researchers in engineering and technology are women, a figure that reflects structural, cultural, and access-related barriers that persist even when talent is not the issue. This paper aims to document and analyze the model of InspirHerTech, a Peruvian organization founded in 2024 that operates across three axes: peer mentorship, accessible science communication, and leadership competency development through volunteering. A descriptive case study design was used, drawing on internal records from nine events held during the organization's first year of operation, complemented by a satisfaction survey administered to participants of one of the programs. The organization reached a cumulative total of 467 participants across virtual, in-person, and hybrid formats, with a mean satisfaction score of 4.61 out of 5. These results suggest that initiatives built from the direct experience of their founders, agile and operating outside formal institutional structures, can concretely reduce the gap between existing female talent and opportunities that are not always visible, offering a model that is adaptable to other Latin American contexts.

Keywords: *Peru, Women in STEM, Peer Mentorship, Science Communication*

1. Introduction

1.1 Problem statement

The gender gap in STEM is a persistent challenge driven by multifactorial causes around the world [1]. Over the last decades in Peru, significant progress has been documented regarding educational access for women, driven by inclusion policies in vulnerable

rural communities [2], though this increase in female educational attainment presents a paradox: while overall university admission for women has expanded, their representation in core engineering and digital technology disciplines remains heavily constrained [3], and women are still underrepresented in science, technology, engineering and mathematics education. According to the Review of the National Scientific, Technological and Innovation Registry (Renacyt), only 14.11% of the total researchers in the field of engineering and technology are female [4], and it's not that talent is missing, but rather that the path isn't always clear and role models aren't easy to find either.

What tends to be lacking isn't exactly motivation, but orientation. Many high school students or students in their first university years don't have anyone to ask what studying engineering is actually like, how to apply for a scholarship, what IEEE is, or what doing research really means. That information exists, but it's scattered and mostly reaches those who already have access to the right networks.

1.2 The gender gap in Peru

This isn't a new problem, though it's far from a solved one either. Across Latin America, women's participation in STEM careers has grown slowly over recent decades, but it tends to concentrate in fields like biology or chemistry, while engineering, computing, and physics remain predominantly male spaces, and Peru's no exception to this pattern [2][3].

Beyond the numbers, there's something statistics don't always capture: the non-monetary cost of navigating those spaces without support networks. Students who do manage to enter engineering programs often do so without nearby female role models, without clear information about international academic opportunities, and without spaces where they feel they're part of a community that understands their specific challenges [4][5]. Institutional initiatives do exist, including government programs, university projects, and isolated efforts, but their reach is limited and their continuity isn't always guaranteed, and what's often missing is something lighter and more sustainable: peer-led initiatives built from the ground up that can move with the kind of agility formal structures simply don't have.

1.3 Origins and purpose of InspirHerTech

InspirHerTech didn't emerge from a strategic plan, but rather from a fairly simple observation: that many students don't have enough guidance at the moment they need it most. The founder, a student at Universidad Nacional Mayor de San Marcos, had been through that moment herself: she'd secured scholarships, participated in international conferences, reached leadership positions within IEEE, and along the way she realized that much of what she learned wasn't in any syllabus, since it lived in conversations, in connections, in knowing who to ask, and that's exactly what InspirHerTech tries to make accessible.

InspirHerTech was created to work precisely in that space, not as a substitute for formal education, but as something formal education can rarely be: a close, flexible environment built from the direct experience of those who've already walked part of that road. Since its founding, the organization's focused on three axes that in practice constantly intersect: personalized mentorship, accessible science communication, and leadership competency development.

2. Methodology

2.1. Conceptual framework

InspirHerTech's model isn't built around a single strategy. It's organized around three axes that, in practice, are hard to separate: mentorship, science communication, and STEM competency building through leadership and volunteering. The decision to work on all three at once wasn't arbitrary; it came from recognizing that the barriers women face in STEM aren't just informational, they're also about belonging, visibility, and having someone who's already been through it tell you it's possible. Rather than replacing formal education, InspirHerTech operates in the spaces formal education leaves open.

2.2 Research design

This paper documents InspirHerTech's model through a descriptive case study of its first year of operation. The data comes from three sources: internal event registration records, participation logs across all nine events organized during the period, and a satisfaction survey administered after one of the events. The quantitative side of the analysis relies on absolute and relative frequency distributions by modality and participation volume. The qualitative observations draw on the direct experience of the founding team and the

organizational learning built up across the initiative's first cycle.

2.3 Mentorship and vocational guidance

2.3.1 IniCIENCIA: Structures One-on-one mentorship

The clearest expression of the mentorship axis is IniCienia, a program where each participant is matched with a mentor who accompanies her throughout the process. What makes this format different from a talk or a workshop is precisely that continuity: the guidance adapts to where each participant actually is, whether she's still figuring out what to study or already trying to take her first steps in research, and IniCienia ran entirely in a virtual format reaching 26 participants.

2.3.2 Vocational Guidance and opportunity access

Not all mentorship within InspirHerTech takes the form of an ongoing relationship, since the organization also runs events specifically designed to open up awareness of opportunities that tend to stay invisible without the right networks. Más Allá de las Fronteras: Trayectorias, Proyectos y Becas sin Temores brought together 50 participants virtually around a topic that rarely gets covered in a classroom: international scholarships, exchange programs, and what doing research abroad actually looks like.

2.4 Science communication

2.4.1 Science communication as a core strategy

Science communication within InspirHerTech isn't a side activity, but one of the three axes the model is built on, and it serves two purposes at once: making scientific knowledge genuinely accessible, and putting women in STEM in front of an audience that might not have seen many of them before. That second function matters more than it might seem, since visibility is part of what makes a path feel possible [2].

2.4.2 Key programs

The Pasaporte al Mundo STEM: El Cáncer de Mama cycle combined specialized speakers, accessible content, and free certification, all in a virtual format that reached 45 participants, while SISTEM 8M, the International STEM Symposium for Women, took a similar approach in a hybrid format

and brought together 47 participants around International Women's Day, embedding science communication within a broader conversation about gender equity in STEM.

2.5 STEM competency building through Leadership and Volunteering

2.5.1 Volunteering as a learning experience

The third axis works differently from the other two, in that rather than delivering a program to participants, it invites them to help build one. Volunteers within InspirHerTech take on real responsibilities across areas like communications, project management, alliance development, and technology support, and in doing so they develop competencies that engineering curricula rarely touch, with entry being through open calls with a formal application process that makes the experience accessible to students from different universities and backgrounds.

2.5.2 Events oriented toward leadership and empowerment

This axis also shows up in specific events, as STEMpreneurs, held in person with 24 participants, focused on entrepreneurship and leadership in STEM contexts, and BIOMECH, an in-person university encounter centered on STEM empowerment, reached 80 participants. Together, these events show that competency building within InspirHerTech's model isn't limited to those who join as volunteers, but extends to the broader participant community as well.

2.6 Strategic alliances and community partnership

InspirHerTech's reach wouldn't be what it is without its alliance network, since partnerships with organizations like IEEE EMBS, ECOSstem, SENAJU, and Women in Action aren't just institutional endorsements but functional channels that open up access to speakers, resources, and audiences the organization couldn't reach on its own.

Several events were built directly through these relationships: Women in Action: Tecnología e Innovación: Comunidades STEM gathered approximately 75 participants in person, the collaboration with SENAJU in the framework of the Festival por el Día de la Niña y el Niño Peruano brought InspirHerTech's work into contact with around 40 children extending the model's reach well

beyond the university context, and IngeniaX23, developed virtually through the alliance network, reached 80 participants.

3. Resultados

The following tables and figures present the participation data collected across InspirHerTech's nine events during its first year of operation, as well as the results of the satisfaction survey administered following one of the programs.

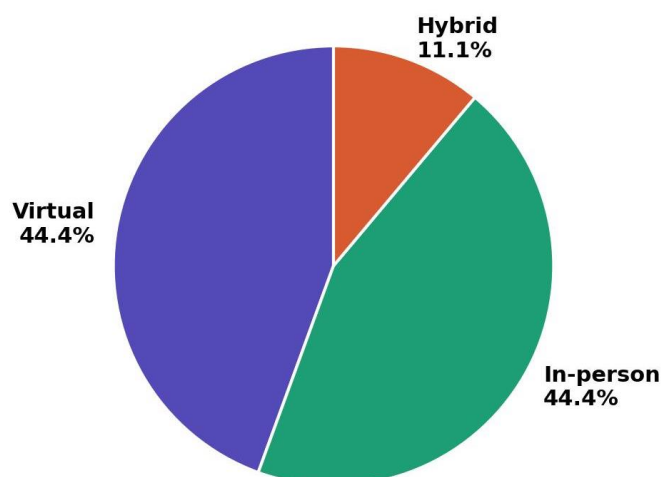


Figure 1: Distribution of InspirHerTech events by modality during its years of operation ($n = 9$). Virtual and in-person formats each account for 44.4% of total programs organized, while hybrid events represent the remaining 11.1%.

Table 1. Event summary by modality and participation

Event	Modality	Participants
Pasaporte al Mundo STEM: El Cáncer de Mama	Virtual	45
STEMpreneurs	In-person	24
SISTEM 8M	Hybrid	47
Women in Action: Comunidades STEM	In-person	75
Organización Juvenil en tu Barrio (SENAJU)	In-person	40
IngeniaX23	Virtual	80
IniCiencia	Virtual	26

Más Allá de las Fronteras	Virtual	50
BIOMECH	In-person	80
Total		467

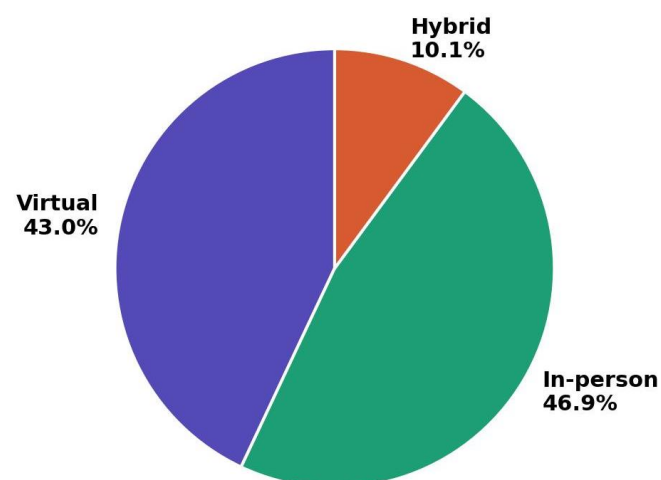


Figure 2: Distribution of total participants by event modality across InspirHerTech's first year of operation ($n = 467$). In-person events concentrated the largest share of participation at 46.9%, followed by virtual formats at 43.0% and hybrid at 10.1%.

Table 2. Absolute frequency by modality

Modality	No. of events	Total participants
Virtual	4	201
In-person	4	219
Hybrid	1	47
Total	9	467

Table 3. Relative frequency by modality

Modality	% of events	% of participants
Virtual	44.4%	43.0%
In-person	44.4%	46.9%
Hybrid	11.1%	10.1%
Total	100%	100%

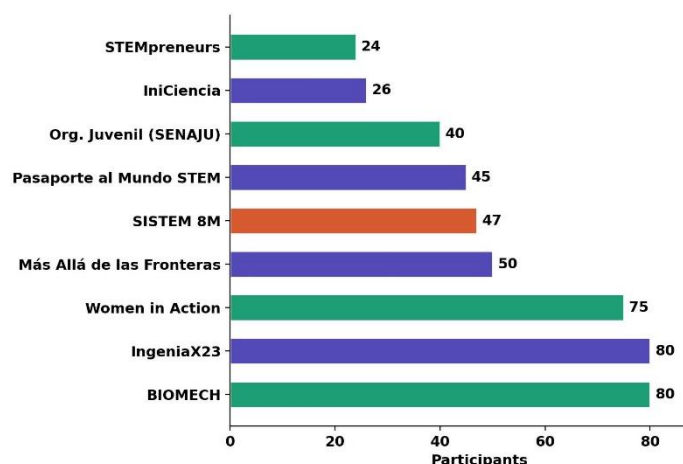


Figure 3: Participant count per event organized by InspirHerTech during its first year of operation. BIOMECH and IngeniaX23 recorded the highest attendance with 80 participants each, while STEMpreneurs and IniCiencia, both more focused in scope, reached 24 and 26 participants respectively.

Virtual and in-person events each account for 44.4% of the total programs organized, while hybrid represents the remaining 11.1%. In terms of participation, in-person events drew slightly more at 46.9%, though virtual formats were close behind at 43.0%, which suggests that format alone doesn't determine engagement and that both modalities are working effectively within InspirHerTech's target population. Across all nine events, the initiative reached a cumulative total of 467 participants in its first year.

Table 4. Satisfaction survey results — Pasaporte al Mundo STEM: El Cáncer de Mama

Rating	Frequency	Relative frequency
5	11	61.1%
4	7	38.9%
3	0	0.0%
2	0	0.0%
1	0	0.0%
Mean	4.61	
n	18	

The mean satisfaction rating across the 18 respondents came out at 4.61 out of 5, with 61.1% choosing the maximum score and the

remaining 38.9% rating the experience at 4, and no ratings below 4 recorded.

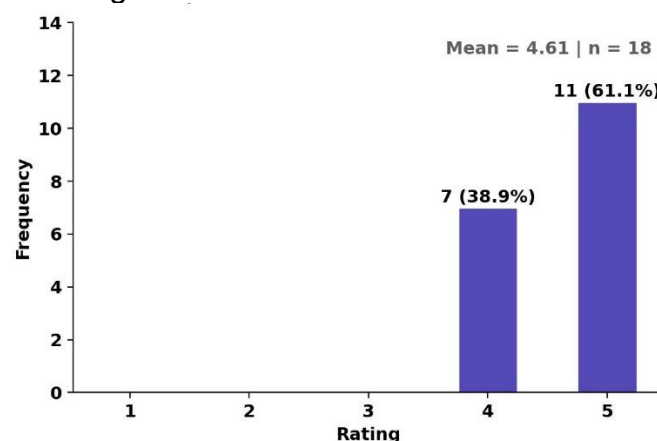


Figure 4: Satisfaction survey results following the Pasaporte al Mundo STEM: El Cáncer de Mama event, measured on a five-point Likert scale (n = 18). All respondents rated the experience at 4 or above, with a mean score of 4.61 out of 5.

While the limited sample size and single-event scope preclude generalization across the full program portfolio, these preliminary findings suggest a high level of participant satisfaction with the virtual format and content approach adopted by InspirHerTech, and the systematic application of this instrument across all future events is identified as a priority for subsequent iterations of the model.

4. Conclusions

InspirHerTech doesn't resolve the gender gap in STEM, since claiming that would be too ambitious for a one-year-old organization, but it does something concrete: it reduces the distance between talent that already exists and opportunities that aren't always visible.

What makes this model interesting isn't that it's entirely original, since similar initiatives exist elsewhere in the world, but rather that it was built from the inside, from the direct experience of a Peruvian student who navigated that path and decided to build something so others wouldn't have to do it alone. The InspirHerTech model, built around peer mentorship, accessible science communication, leadership development, and a network of alliances, is replicable: not necessarily in identical form across every context, but adaptable

nonetheless, and in a continent where the gender gap in STEM remains real, these kinds of ground-up initiatives carry a value that institutional policies can rarely replace on their own.

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