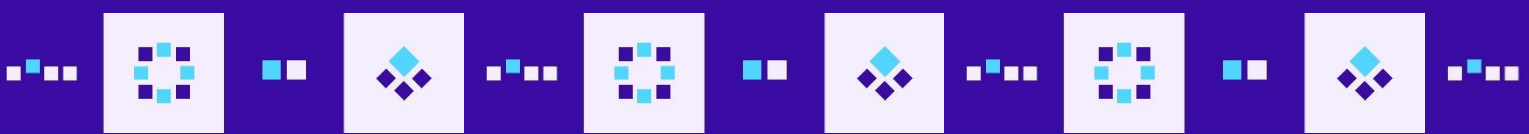




Basic Guide for Activity Facilitation



Aim

This guide aims to provide basic guidelines for **including the gender perspective in all STEM outreach activities** and early STEM talent development activities.

We understand “STEM outreach activities” as initiatives and actions designed to **encourage and increase the interest of students**, especially in secondary education, in the areas of Science, Technology, Engineering and Mathematics (STEM). These activities seek not only **to inform** about academic and professional opportunities in these fields, but also **to inspire** students to consider careers in STEM through outreach.

These activities may include:

- 1. Educational Talks and Workshops:** Presentations in schools or educational centers where STEM careers, their applications and opportunities are explained.
- 2. Science and Technology Fair:** Events where universities and organizations showcase innovative projects, experiments, and interactive demonstrations to capture the attention of future students.
- 3. University and Laboratory Visits:** Field trips that allow students to experience first-hand the academic and research environments of universities.
- 4. STEM Competitions and Olympiads:** Academic competitions in areas such as mathematics, physics, programming, and robotics that motivate students to explore beyond the traditional curriculum.
- 5. Mentoring and Guidance Programs:** Initiatives where STEM professionals and advanced students offer advice and guidance to interested students.

On the other hand, we also have initiatives that go beyond the informational and educational, beyond the “promotional”, providing tools for the development of academic and **hands-on skills and abilities of underrepresented groups**, for example, through training or mentoring programs. These activities may involve segregated enrollment (offering them only to girls and/or adolescent women), or they may impose participation quotas based on sex and/or gender.

These activities may include:

- 1. Camps and Vacation Programs (winter/summer):** Immersive activities that combine the teaching of STEM concepts with practical and experimental activities.
- 2. Segregated or mixed, semester or annual educational programs:** Courses and/or workshops that deliver basic competencies or competencies in STEM topics.
- 3. Jam-type days:** Training sessions, hackathons or marathons that involve the acquisition of knowledge and tools to face STEM challenges.

Including a gender perspective means paying attention to the similarities and differences in the experiences, interests, expectations, attitudes and behaviours of women and men, and identifying the causes and consequences of gender inequality in order to combat it (AQU Catalunya, 2018). This implies a transformation of stereotypes, that is, a long-term task that must affect people at an early age. In schools, this transformation implies ceasing to transmit gender biases (the so-called hidden curriculum), educating boys and girls in the same values, without assuming that girls should be oriented towards more humanistic and social areas, and boys towards more technological and leadership areas. The university can collaborate in this transformation work through the promotion and development activities mentioned above.

The guide is designed for people who will implement the activities, that is, the **people who will facilitate change**. This change consists of: (1) breaking gender stereotypes, and (2) transforming the image that society, and specifically pre-university students, have of STEM studies. STEM professions can contribute great value to society, providing knowledge and solutions to help solve current problems not only technological, but also environmental and social. But current STEM stereotypes do not allow us to see this contribution, or to enhance it. Changing stereotypes about the profession can awaken new vocations and promote an increase in the number of girls enrolled, leading to a medium- to long-term transformation not only of studies, but of the solutions proposed by future professionals, benefiting the whole of society.

The main objective of including the gender perspective in these promotional activities is to encourage the transformation of gender stereotypes and improve girls' self-efficiency in STEM contexts, promoting gender diversity in STEM careers at the university level.

An international initiative

The principle that men and women are effectively equal has been established internationally and is overseen by the Commission on the Status of Women (CSW), a commission of the United Nations Economic and Social Council (ECOSOC). The CSW is the principal intergovernmental body concerned with promoting gender equality, building on the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW, 1979). Article 10 of CEDAW highlights the importance of education in promoting equality between men and women: "States Parties shall take all appropriate measures to eliminate discrimination against women in order to ensure to them equal rights with men in the field of education."

Since then, various actions have been taken to promote equality between men and women. Most of them have focused on women, their empowerment and their support through the introduction of quotas. Laws have also been developed to achieve equality, both at national and transnational levels, in education, research, work or social aspects. But change cannot be fully achieved until the whole of society is involved, both men and women (Sandys, 2008). Men and young boys must also be involved in this transformation. This means accepting other male roles (the so-called new masculinities) and seeking male allies to help promote change.

On the other hand, we must think systemically about this social problem, going beyond quotas. It is about creating spaces in which power, understood as the capacity for agency and access to results or benefits, is distributed equitably. And where social recognition systems also value the contribution of invisible groups. For example, within universities, are prizes and awards given equitably to all actors? Are the spaces where new generations are trained named after women in the same proportion as men? Are the names of Prizes and Scholarships also named after women in STEM areas? In short, proposing representation in terms of quotas is a first step, but it is no guarantee that the mentality of those who are being trained considers STEM careers as a space to develop a career, if it is not accompanied by social recognition, with providing greater agency to all actors in an equitable manner.

General aspects to take into account

Gender is a social category and a constitutive element of social relations and structures based on hierarchies imposed by discourses and ideologies that define social norms, stereotypes and roles associated with femininity and masculinity, which produce different structural forms of inequality and injustice, both in terms of recognition and status and in access to socioeconomic resources (AQU Catalunya, 2018).

It is essential to consider as a starting point that all the people involved in promotional activities, from the facilitators to the students, their families and the teachers of these students, are not free from these traditional gender stereotypes, with all the biases and injustices that they entail.

Both activities to promote university studies in the STEM field and actions to develop academic talent and applied STEM skills are a very good opportunity to promote change and ensure that students who enter the university system do so with a renewed point of view in relation to gender equality and the contribution of STEM to society.

The following are the measures to consider to incorporate the gender perspective in STEM outreach activities.

Extent	Description
<i>In the facilitation team</i>	
1	<p>Use gender-inclusive, non-androgenous, and non-sexist language</p> <p>Language (written and oral) used in activities should not discriminate against any particular sex, social gender or gender identity and should not perpetuate gender stereotypes. According to the United Nations, the use of gender-inclusive language is an effective way to promote gender equality and eradicate gender bias. The United Nations guide is recommended in English and Spanish (United Nations, n.d.).</p> <p>It is important to be aware that a change in the way of speaking is not immediate and, therefore, it is expected that facilitators make some mistakes. It is key to show the effort, talk about it during the activity to be carried out and allow yourself some imperfections that will be reduced with time and practice.</p>
2	<p>Use materials with images and text without gender stereotypes</p> <p>Images included in the material we distribute to schools, pupils or on the networks can reinforce or counter gender stereotypes. We have the opportunity to change these stereotypes by looking for images where gender roles are not perpetuated. On the website of the European Institute for Gender Equality (European Institute for Gender Equality, n.d.) Some examples are shown of how to avoid the use of stereotypical images.</p>
3	<p>Provide female role models</p> <p>Contact between pre-university female students and a role model in the STEM field helps motivate them to follow in their footsteps, especially if the contact demonstrates the usefulness of science, technology, engineering and mathematics studies, without overemphasizing the lack of women in the sector (Breda et al., 2023; Sevilla et al., 2023). Therefore, it is highly recommended that one of the facilitators can act as a role model, explaining the profession, recommending strategies for a healthy professional career and demonstrating the contribution to society, directly or indirectly. In the case that no role model in</p>

		<p>the STEM field can be found within the team of facilitators, it is recommended to introduce some role models, perhaps former students of the institution itself or national/international female role models working on cutting-edge topics.</p> <p>Within the group of facilitators, it would be convenient to have cultural and social diversity, to ensure that all participants feel represented and valued.</p>
4	Taking care of gender roles in the facilitation team	<p>Often there will not be a single person facilitating an activity, it may be a combination of teachers, professionals and students. It is essential to act as role models in gender equality.</p> <p>Despite the existence of a hierarchy within the team, the treatment between men and women must be equal, respectful and the perpetuation of traditional gender roles must be avoided. For example, leadership should not always fall on men and tasks of emotional support should not fall on women. This is the time to show by example that relationships between men and women can be different.</p>
5	Present women within the content.	<p>Both in the bibliography and in the visual and audiovisual material (films, documentaries) female authors must be included in a proportion equal to or greater than 30%.</p>
<i>In the participants</i>		
6	Create work teams considering that, if there are women, they are not alone and have at least one peer within the group.	<p>When girls or adolescent women participate in teams, they feel more encouraged and confident when there are more women like them within their own groups. This is because the presence of other women on the team reduces anxiety and improves the perception of belonging and self-efficacy, which are crucial for them to feel valued and safe in their environment.</p> <p>A study reviewed by Amanda L. Irvin (Irvin, 2017) shows that women tend to underestimate their abilities while men tend to overestimate them; having female role models and teammates can counteract this phenomenon and strengthen girls' confidence in their own abilities within collaborative environments.</p>
7	Taking care of gender roles in students	<p>Traditional gender roles are present at all levels of society. It is therefore not surprising that these roles appear in activities where students have interactive participation among equals.</p> <p>The facilitating team must detect them and promote a change towards a more equitable distribution of roles. This can be done at different levels, depending on the activity and experience. For example, it may be enough</p>

		<p>to comment on how, in an apparently natural way, the roles have been distributed within a work group and ask the students the reason for this distribution. A step further will involve a rotating distribution of roles, for example, or even one imposed by the facilitator. But it is essential that any action carried out with the students is justified and commented on, giving the students space to reflect and give their opinions in a respectful manner.</p>
8	Encouraging female students' participation	<p>The space where the activity takes place must be a safe, inclusive and equitable space. But the STEM field, and especially technology and engineering, is seen as a very masculinised field where girls are not welcome. Therefore, their involvement must be encouraged and valued.</p> <p>It is important to be aware of the different forms of communication that are still differentiated according to gender, where women tend to use more cautious and apparently insecure language (“maybe, I think that, ...”) while men are more confident and direct in their statements (Merchant, 2012). Both forms are correct and the apparent confidence in a statement should not be automatically related to the veracity of the answer.</p> <p>Girls may need more time to answer a question because they have to break through many stereotypes and internal resistances and insecurities. A good practice is to let them answer in pairs, for example.</p>
9	Promoting change in male students	<p>It has already been said that without the complicity of men (and male students) real change will not be achieved.</p> <p>It is important to highlight the benefits that a more egalitarian society can bring to the male students who participate in our activities (Cartier Philanthropy et al., 2019). For example, if we manage to break away from the traditional male role, boys will be able to perform tasks that are more in line with their personality, prioritize more humanitarian values, and enjoy a different way of carrying out the tasks or activities that are proposed to them.</p> <p>Positive masculinity should be promoted, that is, the ability to express emotions and relate in a non-violent way.</p>
10	Taking care of gender roles in the teaching staff of the secondary school institution	<p>Often, groups of students are accompanied by teachers from their respective schools. They may or may not be actively involved, but, possibly without being aware of it, they will be transmitting gender roles to their students. It is important to pay attention to possible scenarios that go against the values of</p>

		<p>equality and, as far as possible, with education and humor, try to, if not redirect them, at least make them explicit. It can even be a good starting point for the analysis of gender roles among students.</p> <p>In certain activities, it may be appropriate to define in advance the level of participation expected from the accompanying teachers and, if high participation is expected, to transmit to them some basic rules of gender equality.</p>
<i>As representatives of the institution</i>		
11	Mention the scholarships available for the underrepresented gender	<p>It is likely that if a field of study is highly masculinized or highly feminized, the university institution has scholarships and grants aimed solely at the less represented gender in order to reverse the situation and achieve gender parity among enrolled students. If this is the case, any promotional activity is a good context to publicize these grants and, if necessary, use it as a starting point for a brief debate on the still existing gender gap.</p>
12	Describe the work carried out at the university regarding gender equality and diversity	<p>Many STEM institutions have student associations that fight for equality (feminist associations, for example) and institutional actions such as International Women's Day or the International Day of Women and Girls in Science. In this case, you may want to publicize these events throughout the promotional action so that girls see that they are more than welcome at the institution.</p>
<i>The institution</i>		
13	Provide training to facilitators	<p>As mentioned above, all facilitators have their own gender stereotypes and prejudices. In order to act as agents of change, it is essential to be aware of this and have tools and examples for their gradual transformation. In addition, the ability to identify everyday situations where gender biases and prejudices appear in third parties is trained over time and with experience. Training, applied and open to debate and reflection, is key to accompanying facilitators in this process and accelerating it. To encourage participation in this training, it is recommended that the training be accompanied by enabling internal certifications or recognition.</p>
14	Facilitate the creation of communities of practice among facilitators	<p>Since the process of awareness-raising and learning is often slow, the possibility of sharing experiences with others can speed up the process. The institution should promote the formation of communities of practice among advocacy facilitators.</p>

15	Recognize participation to promote the academic career of facilitators	It is common for many promotional activities, with or without a gender perspective, to be carried out by female university teachers and researchers. It is part of the academic domestic work (Heijstra et al., 2017; Macfarlane & Burg, 2019) and is not usually well recognized within the institution, penalizing the academic career of these women compared to people who focus on the merits currently considered to be excellent, that is, publications and participation in public call projects. It is crucial that the institution values each of the tasks carried out by teachers, without penalizing those that are oriented to the good functioning of the institution itself.
16	Monitor participation on a gender-segregated basis	Monitor participation and, to the extent possible, the quality of participation in promotional activities on a gender-segregated basis over the years. This will allow needs to be identified and activities to be redesigned to motivate a more diverse group.
17	Monitor the follow-up of enrolled students in a gender-segregated manner	Monitor the follow-up of enrolled students in a gender-segregated manner, especially in the case of scholarships related to girls' STEM vocations. This will allow us to identify needs and design support or accompaniment actions.

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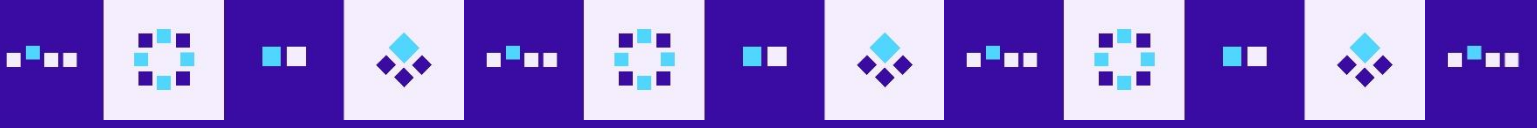
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