How gender inclusive are your science education activities?
Questions to consider!

THE INDIVIDUAL LEARNERS

When girls and boys encounter science education activities in out-of-school programmes, they already have individual, well-established gender identities. These identities may mean that they feel science is for certain kinds of learners, and not for others. As an educator, you can help counteract such feelings by considering these questions...

What relevant knowledge do learners already have?

Does your activity consider what learners might already know about the subject? Remember: different learners have different kinds of knowledge.

For example, the topic 'bacteria' may be relevant to some learners due to their prior knowledge about diseases and health, while it might be relatable for others due to their interest in living organisms.

What scientific interests do learners have?

Does your activity allow for several different lines of inquiry that correspond to different ways of being interested in the subject?

For example, an activity may have a technological line of inquiry, a socio-scientific line, and an ethical line.

Does your activity give equal consideration to specific details of the activity and the bigger picture?

For example, some learners may be interested in the broad uses of science; others may be interested in the technological details of science.

What previous experience do learners have with science?

Do you avoid presenting learners with strongly gendered activities that may contribute to the internalisation of 'female' or 'male' identities?

Remember to present learners with science activities that include its various aspects, for example interpreting and discussing data, having diverging points of view, arguing one's perspective, reaching agreement (or not), etc.

Does your activity include the diversity of science as much as possible?

Every instance of doing science has its own individual line of inquiry; it is important to include this variation in the activities you do with the learners.

What experience do learners have with visits to companies or industry?

Could students have had including or excluding experiences on previous visits to companies or industrial facilities?

Previous experiences in settings similar to yours may affect learners' willingness to participate in the education activity. It is important to be sensitive to hints of such experiences.

Do you encourage all learners to participate equally, and set high expectations for all learners?

For example, some learners may hesitate while others may speak before they think. It is important for educators to encompass these differences.

How does learner's sense of self or identity relate to activity?

Can your activity encompass a variety of different ways of engaging?

For example, some learners might be more comfortable with group discussions, others with group work.

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THE INTERACTIONS BETWEEN LEARNERS

It is important to consider how interactions between learners may create and reproduce inequality. These ways may include 'othering' (for instance, having lower expectations for certain learners) or taking/giving a subordinate role (for example, when a student takes the role as the 'secretary' of a group in order to be a part of that group). You can counteract such interactions by considering the following...

Does your activity require different capabilities in a balanced way?

Does your activity or lesson have a balanced approach to participants' learning preferences? Does your activity include thinking tasks, motor skill tasks, and value-related tasks?

For example, carrying out a laboratory experiment might require primarily motor skills while assessing the ethical implications of a scientific finding might require primarily the ability to assess value arguments.

What kind of interaction does your activity require?

Does your activity or lesson involve a variety of different interaction forms?

For example, think about including individual work, group work, and pairwise interactions.

Do the different roles of the students in your activity or lesson have equal status, or do the roles rotate between participants (to counteract instances of 'othering' or subordination)?

For example, if the activity requires students to take on experimenter, managerial, or recording tasks, ensure that learners take turns carrying out these tasks.

What scientific role models do students encounter?

Do you yourself serve as a scientific role model?

Professionals are often role models for students. Consider the ways in which you are modeling gender behaviour for the learners.

Does your activity or lesson involve encounters with scientists? If so, remember that girls and boys are most inspired by role models they feel similar to. Otherwise, the standards set by the other person become a contrast that girls and boys may react against.

It is important to present the learners with a variety of personalities, genders, and career pathways, not just 'star scientists' or 'nerds'. Remember, women can be role models for boys, and men can be role models for girls.

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AT THE LEVEL OF YOUR ORGANISATION

Organisations and companies often build gender meanings into their practices. These meanings may become logics that are difficult for you, as an individual educator, to change. However, if you are aware of any potential gendering effects of these practices you can counteract or work around them. Consider the following questions...

How does your company's core aim shape your education activity?

Are you explicit about the role of your organisation in society (e.g. providing digital services or developing cures for diseases) when addressing learners, and about how this shapes your science activities?

For example, a mission statement of 'Developing medication to heal the person, not the disease' sets the scene for particular understandings of science that may include some kinds of learners and exclude others.

Have you considered how best to align the institution's stated aim with your activity's opportunities for gender inclusion?

For example, are there ways to nuance the stated aims of your organisation to set the tone for activities that include a greater diversity of learners.

How does your organisation approach science, and is this reflected in your pedagogy?

Have you considered how your institution's approach to science appeals to different learners in different ways?

For example, the empirical, lab-based approach of some companies may appeal to extrovert personalities who enjoy experimentation and risk-taking, whereas the more theoretical, logic-based approach taken by others may appeal to more introvert personalities who enjoy observing and reflecting.

Does your organisation deal with a specific scientific discipline, and is it represented in specific ways in the institution?

Have you considered how to take a balanced approach to your organisation's discipline in your activity?

For example, it is easy to classify physics as 'hard' and biology as 'soft'; yet all scientific disciplines have built-in dualisms such as hard vs. soft. Science education activities that encompass these dualisms, rather than embracing one extreme, are inclusive to a broader range of learners.

Does your activity ensure that the variety of ways of conducting scientific research are represented in the activity?

For example, biology requires both descriptive activities (drawing or classifying) and experimental activities (laboratory testing).

What kind of engagement does the learning space support?

How does the physical learning environment support the planned activities?

If you have spaces dedicated to school programmes, consider how they support different types of activity, e.g. group work, individual study work, presentations, etc.

Hypatia PROJECT

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AT THE LEVEL OF YOUR CULTURE AND SOCIETY

Gender identity is shaped and influenced by the culture and society which organisations, companies, educators, and learners are immersed in. These cultural and societal conditions are impossible for you, as an educator, to change, but by being aware of them, you may help offset or counteract their effects. Consider the following questions...

How do public interest and ideas set the scene for your activity?

If you carry out an education activity that takes a point of departure in public representations (e.g. to spark interest in your activity), you should consider how to support multiple ways of participating in the activity beyond those publicly recognized.

For example, do you use well-known public figures or television programmes to create the background for your activity? And if so, are you aware of possible inclusion and exclusion effects of this background?

What are the stakeholders' interests and how does that interact with your activity?

Have you considered how gender is implicitly or explicitly conceived and discussed by stakeholders (ministries, politicians, interest groups etc.) and the potential effects of this on your education activity?

For example, the EU campaign Science: It's a girl thing! *reflects a certain view of gender and science – do such views affect your science education activities indirectly?*

What are the cultural constraints for your activity?

Have you considered what is included in the definition of science in your national context, and what is excluded? You should consider whether employing a broader conception of 'science' in your activity could support the inclusion of a broader range of learners.

For example, does your organisation employ a broader range of science disciplines than those commonly considered to be science in your culture? If so, have you considered how to include this breadth in your activity?