

How to address stereotypes and practices limiting access to STEM-related education for women and girls

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Summary of text:

Paradoxically, contemporary research has identified that in more egalitarian countries, such as Norway or Finland, fewer women participate in STEM fields. Conversely, in countries where gender equality policies are less advanced, such as India, better levels of female participation in STEM fields can be observed. In the world's most developed countries, individuals tend to use self-expressive value systems of their occupational decisions in terms of motivation and interest. On the contrary, in countries with lower rates of equality, women justify their choice of STEM studies based on its ability to grant them economic autonomy.

The afore-mentioned pattern of underrepresentation in STEM has several implications, including the risk that technological products and services do not meet the needs and demands of women. There is also a tendency to make the contributions of women in scientific and technological fields invisible, while the contributions of men in these areas are highlighted. This impacts the way in which these contributions are taught in school and university contexts and the way women's contributions to an idea, or specific project, are valued in the workplace.

A complex array of factors (at different levels, i.e. environmental, social, school, and personal) shape women's underrepresentation in STEM fields. Societal stereotypes about the type of person who is expected to succeed in STEM career pathways, namely middle-class white males, discourage many young people who do not meet these attributes from studying STEM subjects. The belief that women are more competent in reading and languages, whereas men are more competent in science and technology seems to be endorsed by parents and teachers, who then shape children's perceptions of their own ability. Adolescents themselves assume these social beliefs in such a manner that they end up making these beliefs a reality. Gender bias in learning materials is also thought to sustain gender differences in attainment, as well as the kind of classroom dynamics and teaching styles at play.

Key recommendations:

- Present interventions which seek to address stereotypes limiting girls' access to STEM education focus only on girls. Instead, girls' broader environment must be considered, including parents and teachers. It is also crucial to include boys and attempt to change their mindset.
- Schools must make unconscious bias training mandatory and train teachers to be able to actively work with students so that they can deploy positive and active coping strategies against sexist beliefs. Textbooks and didactic materials must be designed to help teachers make more visible women's contributions to STEM.
- Meetings should be facilitated between school-age girls and women in STEM with whom they can identify based on shared social and personal characteristics, such as a similar cultural background or ethnic group. Female teachers of STEM subjects should be made visible, especially for those students who are not in direct contact with female role models in STEM.
- Pre-conceptions about the lack of synergies between STEM and non-STEM disciplines should be challenged, and the social utility of STEM subjects should be emphasized, including its value in the fight against climate change, social injustice, and other current and future

societal challenges. Innovative pedagogies in the teaching of STEM subjects must be promoted.

- Long-term, sustainable programs and initiatives should be promoted to raise girls' interest and participation in STEM.