

Virtual Conference on Understanding the causes of gender disparities in STEM-related TVET

From 23 to 27 November 2020, on the UNEVOC TVeT Forum

UNESCO-UNEVOC will launch the report of its study on **'Boosting gender equality in science and technology. A challenge for TVET programmes and careers'** during the virtual conference.

Topic at a glance

Science, technology, engineering and mathematics (STEM)-related technical and vocational education and training (TVET) has a potentially significant role to play in providing the skills and competencies required to support innovation, productivity and international competitiveness as well as areas of social development including health and education. It is thus an important driver for achieving a range of the United Nations' Sustainable Development Goals (SDGs) and contributing to inclusive and sustainable societies. STEM skills and knowledge can be required for both 'traditional' and 'emerging' occupations; STEM-related careers are often referred to as the 'jobs of the future', driving innovation, inclusive growth and sustainable development. Moreover, for individuals, these careers offer good job opportunities with increasing labour demand and relatively high wage levels.

Even as STEM subjects and skills are becoming more essential in today's world, gender disparities are prevalent in these fields. In recent years, much has been done to help inspire girls and women to study and work in technical fields. Yet long-standing biases and gender stereotypes are steering girls and women away from STEM-related fields, which means that a large pool of potential skills that could contribute to economic development remains untapped. It can put major constraints on the individual lives of women and contribute to transmitting gender inequalities across generations.

UNESCO is giving particular attention to this issue as part of its efforts to promote women and girls' empowerment through education in line with SDG 4. Recent reports such as [Cracking the Code: Girls' and Women's Education in Science, Technology, Engineering and Mathematics](#) (UNESCO, 2017) and [A Complex Formula: Girls and Women in Science, Technology, Engineering and Mathematics in Asia](#) (UNESCO, 2015) are examples of UNESCO's commitment. While much of the focus to date has been on the participation of girls and women in general education and university STEM education, there has been relatively little documentation on the participation of girls and women in STEM-related TVET despite the significance of this sector.

Recognizing this gap in TVET-specific data and literature, UNESCO-UNEVOC conducted a study on **'Boosting gender equality in science and technology. A challenge for TVET programmes and careers'** from 2019-2020. In collaboration with members of UNESCO's global network of TVET institutions, the UNEVOC Network, ten case countries are highlighted in the study.¹ This virtual conference is organized at the occasion of the launching of this newly completed study report that reviews available evidence of the situation faced by girls and women in STEM-related TVET.

Against this background, the virtual conference aims to:

- Share findings from the UNESCO-UNEVOC study on **'Boosting gender equality in science and technology. A challenge for TVET programmes and careers'**
- Explore the individual, parental/peer, school-level and societal influences on girls' and women's enrolment, learning achievement and progression to STEM-related occupations
- Collect insights from TVET stakeholders and policymakers on the barriers for girls and women within STEM-related TVET and the change-maker role that TVET institutions and teachers can play
- Identify areas of successful practice in increasing the participation and performance of girls and women in STEM-related TVET, and initiatives to improve the participation of women in STEM-related occupations

¹ Australia, Chile, Costa Rica, Germany, Ghana, Jamaica, Lebanon, The Netherlands, The Philippines, South Africa

Format and agenda

The virtual conference will take place from 23 to 27 November 2020. Virtual conferences are **asynchronous discussions** that take place on the TVeT Forum. The moderator will open threads around specific topics and questions, and all participants are encouraged to contribute to the discussion by posting messages.

The following threads will be opened for discussion on the days specified and will remain open through the virtual conference period:

Monday 23 November 2020	Thread 1	Context: Current state of gender equality in STEM-related TVET
Tuesday 24 November 2020	Thread 2	TVET institutions: TVET institutional level factors affecting gender equality in STEM-related TVET
Wednesday 25 November 2020	Thread 3	Labour market: Women in STEM-related labour market sectors – the leaky-pipeline phenomenon
Thursday 26 November 2020	Thread 4	Societal and personal factors: Societal and personal factors (including families and peers) affecting gender equality in STEM-related TVET
Friday 27 November 2020	Thread 5	Policies: Government strategies for promoting gender equality in STEM-related TVET

Threads, leading questions and learning materials

Thread 1: Current state of gender equality in STEM-related TVET

Opens on 23 November 2020

Background

Taking the significant role of STEM into account as ‘jobs of the future’, it is essential to promote gender equality in these fields. However, in all countries that were analysed in the UNESCO-UNEVOC report, an underrepresentation of girls and women in STEM-related TVET can be witnessed with only a very modest increase in participation rates over the last years. This overall conclusion can be drawn, despite the difficulty in comparing country-level data related to the differences in STEM and TVET definitions. In Germany for example, only pure technology-related STEM subjects are considered as STEM areas, whereas in Lebanon also health- and commercial-related subjects are added to STEM. On the other hand, an important trend is the increasing participation of women and girls in TVET programmes that are not considered as pure STEM fields such as the Natural, Health and Physical Sciences.

Leading questions

- How is STEM-related TVET defined or understood in your country?
- Why is it important to promote the participation of girls and women in STEM-related TVET?
- What are the current trends in girls’ and women’s participation in STEM-related TVET?

References

UNESCO-UNEVOC (2020). *Boosting gender equality in science and technology. A challenge for TVET programmes and careers*. Bonn, Germany.

Thread 2: TVET institutional level factors affecting gender equality in STEM-related TVET

Opens on 24 November 2020

Background

At the TVET institutional level, factors that regularly influence girls' participation and achievement include teaching quality addressing specific needs, the presence of female teachers acting as role models, teachers' perceptions, the nature of curricula and learning materials, and the nature of assessment practices and their strong effect on the perceptions about ability. The country case study of the Netherlands for example shows that teachers and career advisors have the tendency to advise boys to choose STEM careers more often than girls. (Educational) career advice provided to girls and women by educational staff – such as teachers and career advisers- has a strong influence on the choices of girls and women. In the case of STEM subjects, this influence is negative in the sense that advice for girls and women does not often include STEM subjects or goes even against the choice for STEM.

Leading questions

- What do you see as barriers girls and women experience in participating and performing in STEM-related TVET?
- What kind of policies, practices or initiatives does your institute have in place to stimulate participation and/or performance of girls and women in STEM-related TVET? What makes them effective?
- Does your institution structurally monitor the participation rates of girls and women in STEM-related programmes at your TVET institution? If so, how is the monitoring data used?

Thread 3: Women in STEM related labour market sectors – How this affects gender issues in STEM-related TVET and school to work transition

Opens on 25 November 2020

Background

Evidence shows that, in addition to low STEM participation rates of female students, there is a 'leaky pipeline' between STEM-related TVET and STEM-related occupations. For example, from the Australian STEM graduates in TVET, 40% of male graduates remain in a STEM career, while for female graduates, only 20% remain in a STEM career at age 25. The latest data for 2020 shows that only 8% of the TVET-level STEM-qualified Australian labour force is female.² There is the widely held belief that girls and women are unsuitable for some STEM-related occupations, especially those linked to TVET programmes because of the physical demands involved. It is not clear, however, whether girls and women really do struggle to cope with the physical demands involved in some STEM-related occupations or whether this is an example of a gender stereotype that is used to prevent girls and women from entering male-dominated professions. In general, focusing on gender equality in STEM-related TVET should go hand in hand with striving towards equal opportunities for women and girls accessing the STEM-related labour market.

Leading questions

- What are examples of policies, practices or initiatives in place in the world of work to attract and retain female employees? Are they successful and what makes them successful?
- How could labour market organizations work together with TVET institutes to promote the transfer of girls and women to STEM-related jobs?
- Do you see evidence of a 'leaky pipeline' between female participation in TVET and their transfer to the labour market in your own environment? If so, which stakeholders need to work together to diminish this 'leaky pipeline'?

² Australian Government. 2020. *Australia's STEM Workforce report*. Access via: https://www.chiefscientist.gov.au/sites/default/files/2020-07/stem_workforce_report_2020_-_vet_infographic.pdf

Thread 4: Societal and personal factors (including families and peers) affecting gender equality in STEM-related TVET

Opens on 26 November 2020

Background

Societal factors have a strong influence on female participation in STEM education programmes and occupations. A few societal-level factors that are flagged repeatedly in the country case studies of the UNESCO-UNEVOC study are the relationship between gender equality and wider societal and cultural norms, the effects of mass and social media, and the presence of policies and legislation.

Even though research shows that biological differences on the brain-level between boys and girls have no effects on ability or performance in STEM subjects, psychological factors do affect the behaviour of the individual learner. These factors are likely to reinforce gendered identities and have an effect on the differences between girls and boys in their interest and abilities in STEM subjects. This seems to be more evident in TVET, where in technology-related programmes there are fewer female role models than in other types of education. In addition, there is a general idea that the working conditions in STEM-related TVET careers are harsher and more female unfriendly, influencing the interest of girls in pursuing STEM-related TVET. Added to this, the lack of gender sensitive information about the value of STEM and the opportunities that it presents, as well as the general negative attitude towards TVET occupations, seem to impact the choices of students and drive them towards gender stereotypical specialties.

This thread also seeks to learn from girls and women through storytelling and gain insights on barriers and opportunities they experienced.

Leading questions

- What are societal and/or personal factors that can pose barriers for girls and women in your country to pursue a STEM-related TVET study or STEM career?
- How could TVET stakeholders (teachers, career guides, mentors) deal with societal and/or personal barriers and support young women to participate successfully in STEM-related TVET?
- What other stakeholders are needed to support young women in dealing with societal and/or personal barriers, so they are able to participate in STEM-related education and transfer to STEM-related jobs?

Thread 5: Government strategies for promoting gender equality in STEM-related TVET

Opens on 27 November 2020

Background

Worldwide, many countries have developed national policies promoting education and training in STEM-related fields. Some specifically address female participation, but very few pay attention to the TVET sector and careers. The few specific STEM-related TVET policies that focus on coping with gender challenges can be categorized into two main types, namely: (i) strategies aimed specifically at the education and training sector to address gender disparities in STEM subjects; and (ii) strategies aimed at redressing gender disparities in STEM-related occupations that have implications for the education and training system. A challenge in most cases is the level of implementation of the strategies and the specific measures as well as the monitoring and evaluation of the impact of those measures. In addition, in several middle- and low-income countries these strategies are donor driven and lack contextualization and ownership.

Leading questions

- What strategies and structures have been implemented at the national level to successfully promote gender equality in STEM-related TVET?
- How can the 'learnings' or 'best practices' be communicated among all relevant stakeholders?
- Is data on the participation and performance of girls and women in STEM-related TVET and their transition to the labour market collected in your country/context? Is data collection linked to a policy with specific gender participation in STEM related TVET indicators

About the moderators



Ms Epke Vogel is a Dutch TVET expert with over 25 years of experience in international socio-economic cooperation. She holds a Master's degree in European Studies at the University of Amsterdam and has worked for various national and international institutions that play a role in strengthening TVET systems, such as a Dutch sector skills institute and the European Training Foundation. As Senior Consultant for CINOP, Ms Vogel manages various international projects aiming to support training institutions and national authorities in improving the relevance and quality of education and training. Within these projects she provides specific expertise in the field of TVET system governance, quality assurance and institutional capacity, labour market engagement, curriculum development, didactical approaches, career guidance, and gender equality in education, training and employment.



Carmen Kurvers is a TVET consultant, working worldwide on strengthening inclusive and quality vocational education and training. She has an academic background in Cultural Anthropology and Development Sociology and obtained an Advanced Master's degree in International Development at the Radboud University. Working as a consultant at CINOP, Carmen coordinates various projects that aim to connect vocational education to labour market needs as to increase the (self-)employment opportunities for more and more youth, with a focus on equal opportunities for girls and women.