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Peter Hotchkiss <peter.hotchkiss@opcw.org> is the science policy adviser at the Organisation for the Prohibition of Chemical Weapons and secretary to the OPCW's Scientific Advisor Board. ORCID 0000-0002-1229-1090.
Hemda Garelick, Prof of Environmental Science and Public Health Education at Middlesex University, London, UK. Past President of IUPAC Div VI 'Chemistry and the Environment'. ORCID 0000-0003-4568-2300
Russell Boyd is the Alexander McLeod Professor Emeritus in computational chemistry at Dalhousie University. ORCID 0000-0001-6802-2976.
Jonathan Forman is a Science and Technology Advisor at Pacific Northwest National Laboratory in the USA. He formerly served as the OPCW Science Policy Adviser from 2013-2019. ORCID 0000-0002-5379-812X
www.opcw.org/resources/science-and-technology

Malta X, Women in Science

by Rachel Mamlok-Naaman

The Malta X conference, Frontiers of Science: Innovation, Research and Education in the Middle East—A Bridge to Peace, took place in November 2022 in Malta. The president of the Malta Conferences Foundation is Professor Zafra Lerman, who initiated the conferences. One of the goals of these conferences is to ensure inclusive and quality education for all (Zajdela and Lerman, 2021). An important activity in these conferences is establishing a women forum in science. Thus, during Malta X, a three-hour workshop on Women in Science was conducted. The coordinators and co-chairs of the workshop were Rachel Mamlok-Naaman, Rana Raddawi, and Noha Taymour. In addition, two posters on the topic of women education were presented in the poster session at that afternoon. The women who participated in the workshop came from different countries in the Middle East. They were asked to refer to three questions:

1. What kind of challenges did you face during your career?
2. How did you cope with the different challenges?
3. What are your recommendations for coping with challenges and problems that women face during their careers?

The women's stories were exciting and sometimes heart breaking. The discussions revealed that women still need to cope with discrimination, with an unconscious bias, as well as with family demands. Below you may find one of the most touching stories that one of the young chemistry researchers told:

> I was born in the West Bank. My parents are not familiar with reading or writing. The main goal for daughters in our society is to raise and take care about the family.
>
> I am the first born to my family, and despite the atmosphere in our community, my mother encouraged me to study. My curiosity and interest in science stimulated me to study chemistry in the university. There was no person happier than my mother was when she attended the ceremony in which I received my PhD in chemistry. She said that I accomplished her dream, becoming a scholar and an independent woman. She did not care about getting married or having children, but rather prayed that I will get my PhD, and become a scientist. My mother's attitude made me very happy! I started believing that there might be a change in the Palestinian society towards women's role in society.

Their experiences in both educational and employment settings are consistently less positive than those

Professor Zafra Lerman (right) and Dr. Rachel Mamlok-Naaman

Women workshop at Malta X conference

that men experience, and in scientific fields they might encounter a "glass ceiling" in academia as well as in industry. Women with a PhD struggle in sharing their time between their family and a career (Mamlok-Naaman, 2021). Therefore, they often compromise their career, and they are not enough represented in the science, technology, engineering, and mathematics (STEM) disciplines in most countries around the world, despite their advancements in these areas. The same situation was reported in studies conducted all over the world, aimed at investigating gender gap in STEM disciplines from different angles, globally and across disciplines. The following will serve as an example (Messer Yaron, 2003).

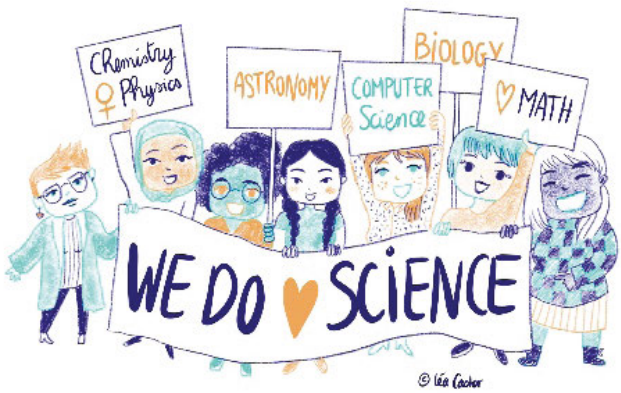
A three-year global project (2017-2019) referring to the gender gap in Mathematical, Computing, and Natural Sciences "How to measure it? How to reduce it?" was funded by the International Science Council (ISC), and was co-led by the International Union of Pure and Applied Chemistry (IUPAC) and the International Mathematical Union (IMU, Guillopé & Roy, 2020). It involved eleven scientific partner organizations. It was disseminated among 32,000 scientists, of which 50% were male and 50% female. Its main goal was to investigate how gender affected the millions of scientific gaps in the Mathematical, Computing, and Natural Sciences at various levels (Chiu & Cesa, 2020). The project included women workshops in different places over the world.

The findings were presented at the final meeting in Trieste, Italy, and show, that despite marked advances towards gender equality and the empowerment of women, progress has been slow and disparities persist around the world. Fewer than 30% researchers from all over the world are women (UNESCO Institute for Statistics, 2016). They continue to represent only a small proportion of faculty members in science and technology fields, especially at more prestigious research institutions. The results confirm that science is not immune

Final global project meeting in Trieste

to inequalities. The gender gap in science refers to all regions, disciplines, and development levels.

In summary, the findings led the researchers to declare that it is crucial to change this situation by acting at both the educational and the economic levels (Bystydzienski & Bird, 2006), as the gender gap is a problem of society as a whole (regarding both women and men), in developed as well as in developing countries. The recommendations refer to instructors and parents of girls in primary, secondary, and higher



https://gender-gap-in-science.org/2020/12/07/virtual-coordination-meeting-on-october-28-2020/

Charpentier and Doudna, Nobel prize 2020

education, educational organizations, scientific unions, and other worldwide organizations:

- Actively promote gender balance at every level of any organization, including its leadership, its committees, and institutional events.
- Raise awareness about the gender gap and include specific actions that aim at reducing it, in all outreach and educational programs and products:
  - To avoid books and social media that reinforce the gender gap in science;
  - To encourage the reading of books about successful women during history (Mamlok-Naaman, Blonder, & Dori., 2011).
  - To encourage the presence of women in editorial boards of journals in your discipline and publish reports on the proportion of papers published by women.
- Change the belief that having a family interferes with pursuing a career;
- Change the attitudes regarding the family members' responsibility;
- Begin at an early age in order to encourage women who decide to combine family life and a scientific career;
- Introduce role models: Women who succeed in this process, and who receive support from their families, e.g., Charpentier and Doudna, Nobel prize 2020 (CRISPR/Cas9 genetic scissors);
- Support young women scientists, both from men and women;
- Use examples of change, *e.g.,* The Nordic countries serve as prime examples of family policy;They aim at a gender-equal division of economic responsibility, and focus on the fathers' participation in childcare (Duvander, Lappegard & Johansson, 2020).

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Rachel Mamlok-Naaman <Rachel.mamlok@weizmann.ac.il> Weizmann Institute of Science

Teaching Chemistry for a Sustainable Future

by Farouk Fahmy, Nadia Kandile, and Ghada Bassioni

The **5th African Conference on Research in Chemical Education** (ACRICE-5) was held under the main theme Teaching Chemistry for a Sustainable Future, 7-9 Dec 2022. ACRICE-5 was hosted by Ain Shams University in Cairo, Egypt, and endorsed by Egyptian Academy of scientific Research and Technology (Egyptian Committee of pure and Applied Chemistry), the Federation of African Societies of Chemistry (FASC), and IUPAC. The four previous conferences were held in Ethiopia (Dec. 2013), South Africa (Nov. 2015), Algeria (Oct. 2017), and Nigeria (Sept. 2019).