Commission on the Status of Women

Fifty-eighth session

Review theme

"Access and participation of women and girls in education, training and science and technology, including for the promotion of women's equal access to full employment and decent work"

Tuesday, 18 March 2014

10:00am to 1:00pm and 3:00pm to 6:00pm

ISSUES PAPER

I. Introduction

In accordance with its multi-year programme of work, the Commission on the Status of Women at its 58th session will review progress in the implementation of the agreed conclusions of the 55th session in 2011 on 'Access and participation of women and girls in education, training and science and technology, including for the promotion of women's equal access to full employment and decent work'.

Two meetings will be held to critically examine measures, mechanisms and processes put in place to implement the agreed conclusions. Lessons learned and good practices, as well as remaining gaps and challenges will be highlighted. It is expected that the interactive dialogue will lead to strong recommendations for accelerating the implementation of the agreed conclusions, taking into account trends and opportunities that have emerged since 2011.

II. Background

The 2011 agreed conclusions include recommendations for action in six areas: (i) strengthening national legislation, policies and programmes; (ii) expanding access and participation in education; (iii) strengthening gender-sensitive quality education and training, including in the field of science and technology; (iv) supporting the transition from education to full employment and decent work; (v) increasing retention and progression of women in science and technology employment; and (vi) making science and technology responsive to women's needs.

These agreed conclusions build on, strengthen and expand previous intergovernmental commitments, including the Beijing Declaration and Platform for Action; the outcome documents of the twenty-third special session of the General Assembly; the Convention on the Elimination of All Forms of Discrimination against Women; the Convention on the Rights of the Child; the Convention on the Rights of Persons with Disabilities and the Optional Protocols thereto; as well as relevant conventions of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Labour Organization (ILO). These commitments constitute a global legal framework and a comprehensive set of measures to promote gender equality in education and employment.

The 2011 agreed conclusions also align with the United Nations Millennium Declaration, General Assembly resolution 65/1 on 'Keeping the promise: United to achieve the Millennium Development Goals', as well as the United Nations Economic and Social Council (ECOSOC) 2010 Ministerial Declaration on 'Implementing the internationally agreed goals and commitments in regard to gender equality and empowerment of women'.

Since the adoption of the 2011 agreed conclusions, these commitments have been further reiterated in a number of subsequent United Nations outcomes. These include the 2011 ECOSOC Ministerial Declaration on 'Implementing the internationally agreed goals and commitments in regard to education'; the 2012 ECOSOC Ministerial Declaration on 'Promoting productive capacity, employment and decent

work to eradicate poverty in the context of inclusive, sustainable and equitable economic growth at all levels for achieving the Millennium Development Goals'; the outcome document of the 2012 United Nations Conference on Sustainable Development, entitled 'The Future We Want'; and the 2013 ECOSOC Ministerial Declaration on 'Science, technology and innovation, and the potential of culture, for promoting sustainable development and achieving the MDGs'. In the 2013 Santo Domingo Consensus, members of the Economic Commission for Latin America and the Caribbean committed to advance gender equality and the empowerment of women in the context of information and communications technologies, and to promote women's economic empowerment.

III. Progress made and remaining gaps and challenges

The review aims to inspire an interactive dialogue on progress made in the implementation of the 2011 agreed conclusions with a specific focus on women and girls in science, technology, engineering and mathematics (STEM) education and employment. It intends to illustrate broad trends in actions taken and initiatives implemented and highlight remaining gaps and challenges. The examples included below are not intended to provide an exhaustive list, but rather to be illustrative and demonstrate good practices.

STEM education

Global innovation and advancements in STEM have strong relevance and potential impact for poverty eradication and the achievement of sustainable development. At the same time, the information and communication technologies (ICT) sector is expanding, and an increasing number of labour fields require job applicants to possess a minimum set of ICT skills. It is of critical importance that women and girls have equal access to education at all levels and acquire relevant skills, particularly in STEM-related fields, in order to take advantage of the growing opportunities in these fields.

Poverty, gender inequality and place of residence continue to be among the main obstacles to women's and girls' enrollment in and completion of education. Girls are more likely to be out of school than boys in primary and secondary school, however with a widening gap in secondary education.[1] At the tertiary level, the global rate of women's enrollment has increased almost twice as fast as men's enrollment over the last four decades. However, women in low-income countries are less likely to be to be enrolled in tertiary education. One of the reasons for the increasing number of women in post-secondary education is that women often require more education than men to get the same jobs due to gender-discrimination.

Gender stereotypes, cultural barriers and low quality of education continue to affect young women's and girls' career choices and opportunities. These factors are even more prominent in STEM fields and have resulted in their low participation in STEM education at all levels.[2] Women show relatively low interest in pursuing studies in computer science, with significant disparities among countries, ranging from 21 percent in North America and Western Europe to 39 percent in Central Asia. In the area of engineering, manufacturing and construction, males constitute a majority of graduates in all but one of the 84 countries for which data are available.[3]

Since the adoption of the 2011 agreed conclusions, a number of Member States, United Nations agencies, civil society organizations and other stakeholders, such as private sector companies and foundations, have launched initiatives to expand women's and girls' access to and participation in STEM-related education and training. Initiatives include academic and after-school programmes and camps for women and girls to develop their STEM skills; mentoring and networking programmes connecting women professionals and female students; awareness-raising campaigns and awards to highlight women's and girls' contributions to the STEM sectors; and academic scholarships for female STEM students. These activities have also helped to address gender stereotypes, biases and negative attitudes that constitute barriers to women's and girls' STEM-related education and training.

Launched during CSW55, the Global Network of Women ICT Decision-Makers has developed a series of initiatives, such as a mentoring programme to link girl students with women ICT professionals, and a project to provide young female students with the opportunity to gain hands-on ICT experience in the

workplace by shadowing a professional.[4] The 'Girls in ICT Day' campaign, led by the International Telecommunication Union (ITU), celebrates girls in ICT education and careers, and included over 1,500 events in more than 120 countries in 2013.[5] In 2012, Zen Digital Europe launched www.DigitalMuse.org to serve as the platform for a global collaborative network to raise girls' interest in STEM and improve their digital skills in the areas of music, design and visual arts, video games, software programming and television, film and audio production. The platform also connects girls with role model artists and practitioners from these creative sectors.[6]

A number of organizations in Nigeria have implemented STEM camps and intensive training programmes for girls. For example, the Working to Advance STEM Education for African Women (WAAW) Foundation's first STEM Camp for African girls in August 2013 was themed "Robotics and Renewable Energy Camp".[7] The three-month Young Girls Science and Health Tele-Academy in Nigeria, a Youth for Technology Foundation initiative, encourages girls to identify pressing real-life issues in their communities and to use the appropriate technology to conduct science research, adapt engineering techniques and measure the impact of their intervention mathematically. An estimated 55 percent of the girl graduates from the Tele-Academy have gone on to pursue STEM careers or to declare a STEM major in their university studies.[8] Similarly, the Computer Club for Girls, sponsored by the FDM Group, introduces girls in the United Kingdom to leading-edge technology in a fun and interesting online environment.[9]

In order to address a decline in female computer science graduates in the United States, Girls Who Code (2012) developed a new model for computer science education, pairing intensive instruction of girls in robotics, web design and mobile development with mentorship and exposure among the industry's top female engineers and entrepreneurs.[10] UN Women has launched a partnership with Microsoft to raise women's and girls' interest in ICTs and STEM through the Microsoft Global Women's Hackathon.

To ensure that women and girls are equipped to become pioneers and innovators in a green economy and leaders in clean energy related fields, the Masdar Institute of Science and Technology—jointly established by the Government of Abu Dhabi, United Arab Emirates and the Massachusetts Institute of Technology, United States—initiated targeted efforts in 2011 to enroll female students.[11] As a partner of the Equal Futures Partnership (2012), the Netherlands committed to establishing programmes to encourage more girls to choose technical education programmes.[12] The Bunengi Group, a women-owned company operating in the infrastructure, mining and agriculture sectors in South Africa, promotes the advancement of women and girls in STEM education by providing female students with scholarships and information on how to access opportunities.[13]

In order to improve quality STEM education, the United States issued a national challenge in 2011 to recruit and train 100,000 effective STEM educators by 2021. This led to the formation of the "100Kin10", a multi-sector collaboration comprised of federal agencies, states, museums, corporations, universities, non-profits and foundations jointly dedicated to achieving this goal.[14] These efforts include measures to provide educational opportunities and support to women and historically underrepresented minorities through a diversification of teaching methods.[15] A partnership between Girls Inc. and Discovery Education has also provided training for educators in Canada and the United States on innovative STEM curricula.

A number of initiatives have also been launched that use innovative technology to increase women's and girls' access to education. In 2011, UNESCO launched the Mobile Phone Literacy project to build and maintain the literacy skills of semi-literate women and girls through the use of mobile phones.[16] UNESCO has also partnered with Nokia to enhance quality education by using mobile phones to supply quality educational material for the training of teachers in rural areas in Mexico, Nigeria, Pakistan and Senegal.[17]

'iSchool Zambia' has developed a blended e-learning solution, accessible on a low-cost low-(solar) powered tablet, preloaded with the entire Zambian primary curricula for interactive enquiry-based

learning in English, as well as in eight local languages.[18] UN Women has also initiated projects to promote the digital literacy of rural women in Ecuador and Guatemala and of girls in the Dominican Republic.[19] The Government of the Dominican Republic has set a goal in its national plan of achieving a 50 percent digital literacy rate of women within a four year period.[20]

The Broadband Commission Working Group on Gender, which formed in 2012, established a target to achieve gender equality in broadband access by the year 2020. Less than one-third of national broadband plans address gender inequality; however, Bangladesh, Finland, India, Japan, Norway, Spain, Switzerland, Turkey and the United States have all integrated gender perspectives into their plans.[21]

STEM employment

The growing representation of women in higher education has yet to translate into proportional representation in the labour market, particularly in leadership and decision-making positions. Women face barriers in accessing the same job opportunities available to men, and often end up in jobs where they do not use their full potential and skills.[22] The presence of persistent workplace discrimination, sexual harassment, gender biases in performance measurement and promotion criteria, pay gaps and lack of flexible and inclusive policies to promote work-life balance further serve to perpetuate women's lower employment participation.[23] Other influencing factors to women's entry, transition, progression and retention in STEM sectors include young women's limited exposure to female role models and women in decision-making positions and overall gender stereotyping.

Women are underrepresented in STEM employment and, more importantly, in STEM sectors with expanding job potentials and opportunities. In sub-Saharan Africa, for example, it is estimated that 2.5 million engineers and technicians are needed to improve access to clean water and sanitation—a sector that heavily influences the lives of women and girls. In 25 countries combined, women spend 16 million daily hours collecting water. Yet, they have little say in decisions over how water and sanitation resources are managed and improved, and how investments are made in scientific and technological infrastructure and solutions.[24] The energy sector is also expanding with projections that employment in wind and solar energy alone will rise to 8.4 million jobs by 2030. However, today women account for only about 20 percent of energy sector jobs, most of which are in administration and public relations.[25] Opening new paths for women and girls to pursue education and careers in these sectors is a requisite.

A 2013 study on women's representation in the ICT sector in Europe suggested that if as many women worked in the digital sector as men, the European GDP could increase by an estimated €9 billion.[26] However, just 30 percent of the 7 million people who work in this sector in Europe are women. Recent research in India shows that more women than men leave the ICT sector at the mid-career level and that women are underrepresented in managerial and decision-making positions.[27] In addition to earning less than men, women receive less on-the-job experiences, such as international assignments, and were four times more likely than men to assume the role of the "stay-at-home-partner" during their career.

A key finding from 2012 national assessments on gender, science and technology and innovation carried out by Women in Global Science and Technology in Brazil, India, Indonesia, the Republic of Korea, South Africa, the United States, and the European Union was that women gain ground in countries that have policies for health, childcare and equal pay.[28] Multi-dimensional policymaking approaches are therefore required to achieve results.

Since 2011, a number of innovative partnerships and initiatives have been launched and policies and programmes adopted and implemented by Governments, civil society organizations, foundations, academia and the private sector to address challenges that women and girls face in transitioning from STEM education to STEM employment. These initiatives include a range of activities including concrete skills development; the establishment of STEM professional networks and mentoring programmes for women; and the creation of awards to recognize positive female role models in STEM research and employment.

Some of these initiatives focus specifically on the transition from education to work. For example, in Egypt, Girls Tech is developing a database of pioneering women in the fields of development of mobile applications, online marketing and online media to support their exposure to job opportunities and retention in the workforce.[29] In Australia, Brazil, China, India and Indonesia, the ConnectEd programme, led by the Alcatel-Lucent Foundation and World Education Inc., provides scholarships, job skills training, work placements and 'youth civic voice' actions to improve the technological skills of disadvantaged youth and women, and to increase their eligibility for employment opportunities.[30]

Responding to the fast growing number of female engineering graduates in India and their low representation in the workforce, the Anita Borg Institute and the Lean In Initiative, United States, designed videos, training and resource material and provided network opportunities for women engineers.[31] Thirty-five African women in science fields had the opportunity in 2013 to participate in the first Africa Women in Science and Technology mentoring sessions, organized and sponsored by STEMAfrica based in Kenya and the corporations Goldman Sachs and Fortune.[32]

The Government of China's strategy for women's career advancement (2011-2020) promotes women's technological talent in national laboratories to address their continued discrimination when applying for research positions.[33] In 2013, the European Commission launched the European Code of Best Practices for Women and ICT to support and promote the greater participation and retention of women in the ICT sector.[34]

A number of initiatives have been launched to promote and support female role models in STEM fields and to acknowledge women's leadership and innovation. Since 2012, the Elsevier Foundation, the Organization for Women in Science for the Developing World and the World Academy of Sciences bestows five annual Elsevier Awards for Early-Career Women Scientists in the Developing World to female scientists, rotating between the life sciences, chemical sciences and physical, mathematical and engineering sciences.[35] The British Council and Qatar University launched the first Women in Science Day in 2011 to celebrate the achievements and leadership of female scientists.[36] The Venezuelan Academy of Physical, Mathematical and Natural Sciences initiated Women for Science Venezuela in 2012 to help connect women working in sciences and highlight their contributions. They are also conducting a census of women working in the sciences in Venezuela.[37]

In Europe, the annual increase in female researchers is less than half the annual number of women who graduate with PhDs.[38] Academic institutions, such as Uppsala University in Sweden, have taken steps to address the gender imbalances in their faculty in the science and technology fields. As part of its 2011-2013 gender equality plan, Uppsala University set a goal of achieving 40-60 percent equal representation of women at all levels, and has worked to increase the number of women applying and being hired for senior lecturer positions.[39] The Interregional Civic Organization of Women in Science and Education and the Russian Foundation for Basic Research promoted women's participation in scientific events and conferences to increase the number of female members of the Russian Academy of Science.[40]

Gender equality in science and technology research, and in funding opportunities

In response to the lack of gender dimensions in STEM research, recent initiatives have promoted the use of gender analysis and gender impact assessments in STEM research and development.[41] In 2012, the European Association of Science Editors established a gender policy committee to develop a set of standards for scientific journals. The same year, the international journal *Nature* released self-critical findings from an assessment of the percentage of female scientists contributing articles to its publication (19 percent) and the percentage of female reviewers (14 percent).[42] In view of these results, *Nature* announced a commitment to adopt measures to rectify these inequalities. However, by the end of 2013, its editors reported that much more work remained to achieve equality.[43] One of the five priority research areas of the European Research Area is gender equality and gender mainstreaming to diversify views and approaches in research.[44]

Other efforts have focused on increasing the relevance and usefulness of advancements in science and technology for both women and men. The Gendered Innovations in Science, Health & Medicine and Engineering project was launched in November 2011, which is a collaborative project involving experts from the United States, Canada and the European Union. The aim is to provide scientists and engineers with case studies and practical methods for gender analysis to stimulate the creation of gender-responsive science and technology.[45]

A number of granting agencies, such as the European Research Council, the Irish Research Council and the Canadian Institute of Health Research, now require applicants to integrate gender analysis into funding proposals. The Bill & Melinda Gates Foundation requires grant proposals for agricultural development to account for gender differences and to consider how agricultural initiatives may benefit or hinder women or men.[46]

One noticeable trend since 2011 is the increase in use of crowdfunding websites to fund women's startup and entrepreneurial initiatives, including in the STEM fields, as well as projects to promote gender equality and women's empowerment. Indiegogo is one popular crowdfunding platform where 42 percent of its successful campaigns are run by women.[47] Catapult was developed in 2011 by Women Deliver as a new way for anyone to fund initiatives for girls and women.[48] The toy startup GoldieBlox, which makes construction and engineering kits for girls started as a Kickstarter campaign in 2012 and raised more than the original crowdfunding goal.[49]

IV. Format of the interactive dialogue on the review theme

The morning meeting on 18 March will examine progress achieved in implementing the agreed conclusions in regard to women's and girls' equal access and participation in STEM education. This meeting will also review efforts to strengthen gender-sensitive quality education and training in the STEM fields.

The afternoon meeting of 18 March will review the status of implementation of the agreed conclusions relating to the transition of women from education to full employment and decent work, with particular focus on efforts to address the retention and progression of women in STEM employment.

Both meetings will examine the responsiveness of STEM to the needs of women and girls, as well as the use of technology and innovation to advance the status of women and girls in the fields of education and work. Efforts to strengthen national legislation, policies and programmes related to women's and girls' education and work in the STEM fields will also be cross-cutting in both panels.

Each meeting will begin with introductory presentations by invited panelists of five (5) minutes each, demonstrating progress in implementation of the agreed conclusions. Representatives of Member States and non-governmental organizations will be invited to participate in the ensuing dialogue, and are encouraged to share their experiences in implementing the agreed conclusions, highlighting achievements, lessons learned and good practices, as well as remaining gaps and challenges. Interventions from the floor will be limited to three minutes. A discussant will synthesize the comments and contribute guiding questions in the course of the discussion, as appropriate. The outcome of the review will consist of a moderator's summary that will highlight the key findings and recommendations of the event. The panel discussions will also be available via live webcast.

V. Issues for consideration in the interactive dialogue

The Commission's agreed conclusions emphasize that addressing the barriers to equal access of women and girls to education, training and employment in the fields of science and technology will require a systematic, comprehensive, integrated, sustainable, multidisciplinary and multisectoral approach, including policy, legislative and programmatic interventions and gender-responsive budgeting at all levels where appropriate.

During the interactive dialogue, participants will highlight concrete initiatives taken since 2011 and identify means to intensify and accelerate implementation of the agreed conclusions. They will focus on global, regional, national and local activities that respond to the action recommendations in the agreed conclusions, and will provide, where possible, supporting data, statistics and other quantitative and qualitative information to illustrate monitoring and reporting initiatives.

The following questions could be considered during the interactive dialogue:

1. What strategies have proven effective in addressing gender stereotypes and gender bias in STEM education and/or in the workplace?
2. What measures have been employed to advance women's and girls' quality STEM education and training; and the retention and progression of women in STEM employment? What factors have contributed to their success, or lack thereof?
3. What measures have been initiated to ensure that public and private resources for science and technology are allocated in a way that equally benefits women and men and girls and boys?
4. What measures have been taken to monitor and evaluate policies and programmes to promote gender equality and the empowerment of women and girls in STEM education and employment?
5. How can issues of STEM in relation to gender equality best be integrated in the post-2015 development agenda and the Sustainable Development Goals?

ENDNOTES

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