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"Promoting comprehensive security, stability and sustainable development in the OSCE area through women's economic empowerment"

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Building women's human capital

Increasing women's participation in "Science, Technology, Engineering and Mathematics" (STEM)

Talking points by Anna Koukkides-Procopiou, Senior Fellow, Cyprus Center of European and International Affairs, University of Nicosia

ILO employment statistics for 2020 show that female unemployment in Europe and Central Asia (the OSCE region) has been higher than male unemployment. The COVID pandemic seems to have made matters much worse, as a number of 'female' jobs have been, temporarily at least, wiped out of the market. This includes jobs in leisure, tourism and retail, where women have been at the front line. Some of these jobs could possibly never be recovered. Experts, such as Nicole Mason, President of the Institute for Women's Policy Research, have gone as far as dub the economics underpinning the global pandemic a 'she-cession', a recession which first and foremost affects women throughout the globe, as this trend is expected to continue.

This trend is expected to increase the pay gap between men and women and subsequently, widen the savings gap and the pension gap that is in existence. More women are expected to find themselves treading on the poverty line. Additionally, this could result into more women finding themselves trapped in gender-based violence, trafficking, sextortion, increasing social exclusion. Unfortunately, lower levels of social and economic inclusion for women are, also, reflected into lower levels of political inclusion for women. Women will not run for office and will not actively engage and participate in civic life, unless they feel economically and socially secure. **The more women are left behind socially, economically, politically, the more women will continue to be absent from decision-making positions, where the future is decided and policy is made.** This feeds into a mutually reinforcing vicious cycle, which must be broken through conscious decision-making, which includes gender awareness, gender mainstreaming and gender budgeting.

One way out of this situation is to **encourage increased female participation in STEM**- Science, Technology, Engineering and Math. These are **the reasons why.**

1. This is the sector where jobs can be more easily found now and will be more easily found in the future. STEM **job creation rates** make long-term unemployment less likely for skilled workers in this field.
2. STEM **skills** have universal appeal, are more easily transferable and thus, make workers more agile and more easily employable at an international level. Therefore, STEM skills usually translate into less probability of being/remaining unemployed.

1+2=> female workers choosing to work in STEM will exhibit **higher resilience to long-term unemployment**

3. This is the sector where jobs **pay higher salaries** and thus, increased female participation in STEM could possibly translate into a gradual closing in the future of the **pay gap**, the **savings gap** and the **pension gap** women face. The absence of women from STEM professions contributes to the pay gap between men and women. In fact, since the 1980s, gender pay gap on a global level is actually increasing and a great part of it is attributed to the choice of jobs women take (over and above discrimination and their 'preferred' choice to work flexi hours, part time, on hourly wages, from home etc. for family reasons-taking care of children, sick relatives or the elderly)
4. STEM professions are **higher status professions** and the absence of women from the field contributes to the reinforcement and sustainability of the 'superiority' of male hierarchy, leading into the rather vicious cycle of the propagation of gender stereotypes and discrimination.
5. At **macro-level**, there is a noticeable socioeconomic long-term multiplier effect. If women are in STEM, they find jobs easier and make more money. Research shows that the marginal propensity to consume and save differs between men and women. The more disposable income women have, which could happen if they are encouraged to work in higher-salaried professions, the more they would usually spend on improving the standard of living of their family, by allocating funds, for example, on their children's nutrition, health and education. In the long term, the 'caring spirits' (a term used in feminist economics to replace JM Keynes' concept of 'animal spirits') of women contribute to the human capacity of the economy and could possibly lead to higher rates of endogenous growth, resulting from a better equipped, more educated and more healthy labour force and thus, higher potential in terms of human capital. Feminist economics focusses on the benefits accruing from such mechanisms of **inclusive growth.** Research conducted by EIGE (European Institute of Gender Equality) links higher female participation in STEM with higher GDP growth rates in EU economies.

   STEM is still a closed shop for women

   - According to the **International Labour Office (ILO),** only 3% of the information and communications technology graduates globally are women.
   - Latest (2015) OECD countries **PISA findings among 15-year-olds** show that 4.8% of boys worldwide are interested in a career in ICT, compared to 0.4% of girls.
   - According to a 2016 survey by The Times, over 90% of registered **inventions** and patents in STEM are by men.
   - Only 10% of specialised Artificial Intelligence personnel working on Artificial Intelligence at Google and Facebook (tech giants whose algorithms shape both our reality and our future) are women

   How can we, then, break barriers to entry?

- A gender lens needs to be actively applied to policy-making. Change does not happen on its own. **Conscious decision-making** at policy level and **active implementation** of such policies is required. Gender diversity and inclusion must be promoted at top decision-making level. More gender sensitive women need to be present at the table where decisions are being made.

- Start early. This includes encouragement from **parents** at a young age for girls to be active, creative, play with puzzles, construct things with their hands, get dirty outdoors, explore nature. While parents expect boys to be active, they expect girls to play with passive, often decorative, toys indoors, by not getting messy or exposing themselves to challenges. This affects skills and preconceptions necessary for career choices later on.
- Encouragement from individual **teachers**, school authorities and career counsellors towards a STEM career orientation. Practical measures to this effect could be that girls are taught about women in science from a young age, provided with opportunities to join empowering female STEM networks, such as GirlsWhoCode, GirlsCanCode, TeachHerInitiative. Also, changing photos in science textbooks to portray female scientists etc.
- Empowering girls with the required **self-confidence** to embark on a STEM career. Research shows that girls lose interest in STEM with age and do not want to take up the challenge, as they become convinced that boys do or will do better than them. In fact, it has been demonstrated that unqualified, gender-insensitive and ineffective teachers (especially male teachers at high education levels) presuppose that boys are better than girls in STEM, provide boys with more lab opportunities than girls, send more boys to training or workshops for honing extra skills and restrict girls' creativity in solving problems, by asking them to stick to the rules when answering questions in class, even though they accept answers shouted out by boys. A study recently published in the Psychological Science journal showed that women kept rating their ability at math much lower than men, even if their calculus results were pretty much the same!
- Necessary requirements for **advancing academically or in research** include the following preconditions (which often act as gender barriers to entry/promotion): teaching tenure at university level; participation in international competitions/funding calls; attending/presenting in international conferences; conducting/publishing research internationally; participation in academies of science and other prestigious professional bodies; research/teaching posts abroad. In many cases, family obligations or gender bias act as a glass ceiling to prevent women from fulfilling these conditions. These act as practical reasons for having less and less women as we move higher up the hierarchy in research and academic foundations. Work-life balance measures and gender equity evaluation criteria need to be introduced.
- The absence of women from prominent, high-level academic and research positions in STEM, also, translates into an **absence of female role models and possible mentors**, who could have encouraged younger women to pursue this path, despite practical obstacles they will face. This results into the 'leaky STEM pipeline' phenomenon: the higher you go up the ladder, the less women you will eventually find. Even if you initially train them, you come to lose them at some point. Quotas on boards and decision-making bodies are absolutely necessary to combat this.
- Possibility for **sexual harassment**, which remains high in male-dominated fields, makes women uncomfortable to work in such an environment and often discourages them from choosing to take up such a job. For example, a New England Journal of Medicine study showed that 3/4s of women students and residents had been at least harassed one during their training: 40% of female engineering graduates in the USA choose not to work in the field. Effective policies and operating manuals should be put into place, making the workplace a safe space for women in science.

Encouraging more women to participate in STEM is not only the right thing to do, in terms of promoting equal opportunities in the most profitable and resilient of sectors, but, also, the

clever thing to do for governments looking towards sustainable economic growth and prosperity. Women in STEM could prove the powerful growth driver that post-COVID world will be in dire need of.

Anna Koukkides-Procopiou

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