Policy Brief 2

Maximising opportunity to advance gender equality in higher education and in careers linked to STEM fields, and physics in particular

This policy brief is intended to inform and improve policies for midstream gender equality interventions (e.g. within a field and/or inter-institutional partnerships), and for downstream interventions (within organisations). Relevant intended actors in Europe are associations of research institutions such as LERU, EUA, EMBO, FEBS, CESAER, and national RPOs and RFOs.

Key messages

- According to She Figures 2015 (the 2018 issue will be published in March 2019), there has been a slow but positive trend across several key indicators of women's participation and status in higher education and in academic career progression, in the EU (see table below).
- There are, however, still significant (but decreasing) differences between individual Member States in the rate of progress made, which may have historical backgrounds, or indicate the presence/absence of top-level policy commitment to gender equality at national level.
- There are more men than women in Grade A academic positions across all fields, regardless of how many women there are in the 'talent supply pipeline'.
- In the life sciences, for example, more women gain PhD degree than men (EU-28), but this increase in the supply of new research talent has not been translated into matching improvements in subsequent academic career stages. This is a situation that could benefit from the introduction of (a cascading model) quota.[1]
- By contrast, in the physical sciences, engineering, and computing the low presence of women persists at each stage, from entry into higher education to Grade A positions. However, small improvements between 2004 and 2012 have been reported in She Figures 2015.
- Across EU-28, more men than women apply for research grants; men are more successful in obtaining research grants; and men receive larger grants than women. Some improvements have been reported but overall men still have 4.4% higher chance of success. Carefully thought out quota mechanisms have been shown to deliver positive results with fairer impact (see the example in NOTES)
- Due to the fact that men in senior academic positions are generally older than women, it can be expected that in the next 10 years more men than women will be retiring, creating opportunities for more women presently in Grade B positions to compete for top academic posts (with the help, perhaps, of cascading quota intervention, and targeted leadership training).
- Among emerging issues in the workplace has been sexual harassment. Academic workplaces have the highest rate of sexual harassment after military (58% vs. 69%).[2]
- Among persistent issues are work-life balance and employment conditions: fewer women researchers than men researchers have children; more women than men hold part-time positions;

[1] Wallon, G,. Bendiscioli, S., and Garfinkel, M.S. (2015), Exploring quotas in academia, EMBO

[2] National Academies of Sciences, Engineering, and Medicine. 2018. *Sexual Harassment of Women: Climate, Culture, and Consequences in Academic Sciences, Engineering, and Medicine*. Washington, DC: The National Academies Press. doi: https:// doi.org/10.17226/24994.

women earn less than men. This makes academic research careers appear more precarious for women than employment in other sectors.

Data from She Figures 2015 (with some other earlier She Figures data included for comparison)	
Glass Ceiling Index, EU *(GCI = 1.0 means women have same chance top men of being promoted to Grade A position)*	1.76 (decrease from 1.90 in 2004)
Share of women PhD graduates	47.4% (increase from 43.6% in 2004)
Share of women PhD graduates in STEM (LS, PS, M, C)	37.5% (increase from 33% in 2004)
Share of women in Grade A academic positions	20.9% (increase from 15.3 in 2002)
Share of women scientists and engineers in total labour force	2.8% (increase from 1.75% in 2010)
Research grant success rate difference *GSRD = 1.0 means women and men applicants have equal chance to secure a grant*	4.4 (decrease from 6.8 in 2010)
Proportion of RPO's that adopted gender equality plans	36%

Recommendations

- **Continue the use of She Figures** as a source of reliable statistical overview of progress in achieving gender equality in research and innovation in the EU, including integration of gender dimension in research content, which was introduced in the 2015 edition. However, She Figures do not provide contextual information that can help to causally explain the observed statistical trends.
- **Information is needed to provide field-specific context, behind the statistics in She Figures about the shares of women at each education and academic career level,** to help better understand how women transit over time from one level to the next, especially Grade C and Grade B, before tenure and after. This would help institutions to improve their gender equality interventions, and make them more responsive to the issues that are specific to each stage, also reflecting the differences between the fields.
- **Quantitative, gender-segregated data on career paths and working conditions of researchers are needed** to monitor and better understand how the patterns or moves through career positions, institutions, sectors, and nations develop during the 17 years that it takes on average to traverse from gaining a PhD to reaching Grade A position.[3]
- **Systematic analyses of the evolving discourse on why more women should choose STEM subjects to study, and/or as a research career, are needed** to improve future efforts to promote gender balance. Four separate but interconnected general reasons have dominated the calls to improve women's participation in STEM in the past: social justice; economic benefits from women's intellectual contributions different to those of men; improved

[3] MORE. (2017). *Final report MORE3: Comparative and policy-relevant analysis of mobility patterns and career paths of researchers*. https://cdn5.euraxess.org/sites/default/files/policy_library/final_report_1.pdf

intellectual quality and impact of research and innovation; and improved research and work cultures. The choice of the core argument for instigating change will influence what corrective action and intervention to adopt. For example, the 'economic' argument has been particularly attractive to industry, whilst the 'quality' argument is particularly attractive to science policy makers. For example, many companies have adopted gender quota in hiring staff to improve talent pool. The issue of why women are not attracted to fields such as engineering or computing could be linked to the lack of awareness of possible career opportunities, or what work engineers do. This then suggests that the corrective actions will have to focus on outreach and informing girls of the opportunities engineering careers offer them.[4]

- **Work environments, employment conditions, and work-life balance need improving** so that women researchers do not have to feel that pursuing a research career means not being able to be a parent or fulfil caring responsibilities; or that pursuing a research career means committing to potentially precarious and uncertain employment future, with short term contracts and necessity to be geographically mobile; resulting in economic penalties in terms of salary and pension levels.
- **Actions to prevent and tackle sexual harassment are needed** by enabling easy and confident reporting and monitoring of unprofessional behaviour. Academic science and research institutions exhibit at least four characteristics that create higher levels of risk for sexual harassment to occur: 1) strongly male-dominated environments, with men in positions of power and authority; 2) organizational tolerance for sexually harassing behaviour (e.g. failing to take complaints seriously, failing to sanction perpetrators, or failing to protect complainants from retaliation); 3) the fields share hierarchical and dependent relationships between faculty and their trainees (e.g. students, postdoctoral fellows, residents), 4) the fields share isolating environments (e.g. labs, field sites, and hospitals) in which faculty and trainees spend considerable time. Such actions should be included in the design and implementation of gender equality plans (GEPs), and in the institutional commitments to adopt the Euraxess' HRS4R.
- **Improve the criteria and processes used in the assessment and awarding of research grants to ensure that women have the same chances of winning as men do**[5], but also allowing time flexibility in grant duration due to maternity leave, maternity cover, and eligible care costs.
- **Provide opportunities for leadership training** targeting young women researchers, in particular, to provide them with confidence to compete for more senior research and management roles.
- **Promote and monitor implementation of Gender Equality Plans** by research performing and research funding institutions to ensure systematic and systemic structural and cultural change, across different scientific fields, and sectors.[6]

[4] Beddoes, K. D. (2011). Engineering education discourses on underrepresentation. Why problematization matters. International Journal of Engineering Education, Vol. 27 No 5, pp.1117-1129, 2011
[5] https://www.gender-summit.com/attachments/article/1346/Ferguson_GS9Eu.pdf
[6] http://genera-project.com/portia_web/GENERA_Toolbox_2017_final_revision.pdf

NOTES

Best Practice in advancing gender equality in research organisations

Science Foundation Ireland: *Increasing the number of applications for research grants from women*

In 2013, the SFI put a cap on 6 applications per University. This resulted in 27% of applicants being female and 27% of awardees being female. In 2015, the SFI added a gender dimension to the process by raising the cap per university to 12 but the maximum 6 could be men. There was no change to the assessment and selection process. This has produced 47% of applications from women and 55% of awardees being female.

GENERA: *Toolbox for implementing GEPs in physics, as well as other fields*

The GENERA Toolbox aims at assisting GENERA partner organisations that are in the process of the implementation of gender equality plans (GEPs) in tailoring their GEPs and gender equality measures to their needs. The Toolbox is a structured collection of over 100 good practices – measures, instruments, and activities –the information for which was collected and catalogued to reflect related structural, social, cultural, and political aspects of work environments in various (mainly physics related) research performing organisations (RPOs) and research funding organisations (RFOs) as well as higher education institutions (HEIs).

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