



Women in higher education: has the female advantage put an end to gender inequalities?

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Foreword by Stefania Giannini, Assistant Director-General for Education -UNESCO



It would seem intuitive that women’s leadership and their full and effective participation in public life and decision-making should correlate closely with their attainment in higher education.

But this is not the case, revealing the paradoxes and pitfalls of achieving gender equality just over 25 years after the adoption of the transformational Beijing Declaration and Platform for Action. The commitment to gender equality and the empowerment of all women and girls is further set out in Sustainable Development Goal 5, with the elimination of gender disparities in education specifically referred to in Goal 4.

Female enrolment in tertiary education has tripled since the Beijing Conference in 1995. In all regions except Central and Southern Asia that has achieved parity and in Sub-Saharan Africa, where 73 female students are enrolled for every 100 men, women are actually overrepresented at this level. This progress is commendable from a human rights, social justice and economic perspective, but the advantage stops there. Equal access is not enough for the fulfillment of equal opportunities in all areas of society. This Report goes beyond these headline figures to brush a much finer picture, covering the share of women at doctoral level, their leadership positions in universities, their research and publications and their fields of study.

On all these fronts, inequalities run deep and glass ceilings are high. Women are under-represented at senior faculty level and in higher education decision-making bodies in many

countries, with persistent wage gaps. They are heavily under-represented in STEM (science, technology, engineering and mathematics) areas of study – precisely fields where job opportunities are expanding. Nor is the high proportion of women in tertiary education translating into a greater presence in research. Gender differences in academic publication rates remain and are most pronounced in top journals. During the first wave of COVID-19 lockdowns, although the submission of academic papers for publication increased, this growth was much slower for female researchers, and was particularly pronounced among younger cohorts of women academics.

Whether aggregated or disaggregated, the numbers alone do not reflect how women continue to report working and studying in climates that privilege male perspectives and organizational and leadership approaches. Besides, the data reveal that women studying and working in post-secondary institutions hit glass ceilings, experience gender-related wage disparities; and face the threat and reality of sexual harassment and violence on campus. Issues such as these, along with the complexities associated with demographic differences such as race, sexual identity, and women's socioeconomic status, help shape women's experiences in higher education and thus must be taken into account when assessing progress toward gender equity.

This document therefore is an attempt to address some of these most pressing issues, to inform policy and to support the implementation of the SDG 5 (Gender Equality) of the 2030 Agenda for Sustainable Development. Such research provides important and timely evidence from which to develop targeted policies and programs to address the needs of women in higher education – and to implement reforms that are genuinely inclusive and gender responsive.

I am confident this analysis will provide useful insights to institutions and actors committed to supporting women in higher education, to bringing down systemic barriers and widening opportunities for their leadership and full participation in society, as we stand at a critical crossroads.

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The team also wishes to highlight the fact that this document is intended to be a preliminary analysis and will be subject to updates, new ideas and additional information. Contributions are encouraged as part of the continuous development of this research. For more details on how to contribute, please write to info-iesalc@unesco.org.

Executive Summary

Key takeaways from the Report:

1 Regardless of encouraging statistics on women access to higher education, women still encounter obstacles when seeking to occupy key academic positions in universities, to be involved with relevant research, and to take leadership roles.

2 Women are overrepresented among teaching staff at lower education levels, while their presence is markedly lower in tertiary education (vertical segregation). The same is true in school management and education policymaking. Women are also still underrepresented as senior faculty and in higher education decision-making bodies in many countries.

3 In the area of research, men publish on average more articles than women showing there is a gender publication gap. Differences in men's and women's academic publication persist and are most pronounced for publications in top journals.

4 STEM (science, technology, engineering, and mathematics) areas of study show a heavy underrepresentation of female students in most countries. This underrepresentation of female students is closely linked to the underrepresentation of female researchers in those areas. Globally, the percentage of females studying engineering, manufacturing and construction or ICT (information and communications technology) is below 25% in over two-thirds of countries.

5 During the first wave of the COVID-19 pandemic, although submission of academic papers for publication increased in all months during the lockdown period, the rate of increase in submissions by female researchers was significantly less than those by male researchers. This deficit was also found to be especially pronounced among younger cohorts of female academics.

1 Introduction

This report entitled *Women in Higher Education: has the female advantage put an end to gender equalities* follows on the report *Towards universal access to higher education: international trends* launched by UNESCO IESALC in November 2020. The first report mainly addresses gender issues from the perspective of the increased enrolment of women in higher education (HE) identified worldwide. In preparation for International Women's Day 2021 celebrated on 8 March, this report will further expand on the gender dimension in HE.

International Women's Day is an important date dedicated to celebrate the social, economic, cultural and political achievements of women worldwide. This Day was launched in 1911 and the event has since promoted gender parity, celebrated women's achievements, raised awareness about women's equality, and also secured funding for women's initiatives.

In this report, UNESCO IESALC reviews some available global data on the topic of women in higher education, taking into account developments in women's participation in HE, and in this way contributes its expertise to this important debate. If women constitute the majority of undergraduates, then why are they still a diminishing minority among lecturers, senior lecturers, and professors? Why are there few women researchers and published authors? If women and men receive the same type of university education necessary to attain professorship, and are expected to perform the same tasks, then why are they receiving different wages? With more women than men studying and graduating, what is preventing highly capable women from occupying half the seats at the head table? These are important questions to ponder, and included here below, is a brief analysis of a few probable reasons for this.

The report was developed through a literature review and data gathering for a systematization of the main elements characterizing women's participation in higher education. The data was collected including sources such as the UNESCO Institute for

Statistics, HEI documents, government ministries, OECD, World Bank, Web of Science, online reports, online observatories, and policy documents.

Examples of those countries which are advancing in women's participation in higher education have also been included throughout the document. It is important to highlight that the objective of the analysis is to encourage policy debate on the topic and contribute to the 2021 International Women's Day celebrations, and not to comprehensively represent the world or a given region. Therefore, the examples included in the study are intended to be illustrative.

Finally, this report, as is the case for other studies, has its limitations. Most importantly, that of access to information. Since women's participation in HE might not be well documented worldwide, available data is quite limited. Also, as mentioned earlier under acknowledgements, this is a preliminary document and does not aim to be a finite source in itself. It is also important to highlight that this report takes a binary understanding of gender as male or female, and does not account for non-binary genders or other categories. Although the binary construction might be limited, it was not possible at this point to bring more than two genders into the analysis, mainly because solid data is still missing. Nevertheless, these limitations do not prevent the report from providing a good overview of the topic under analysis, nor do they reduce the quality of the material included in this study.

2 The rise of the female advantage in higher education

Over the past few decades, there has been a rapid increase in higher educational attainment worldwide. The reversal of the gender gap in education accompanied the dramatic increase in educational attainment. Much of this growth is due to the increase in women's educational attainment. Over time, women caught up with men's education levels and progressively attained higher levels of schooling than men. Whereas decades ago, there were more males than females enrolled in and graduating from tertiary education, a greater increase in women's educational attainment over the past decades led to the convergence of female and male attainment patterns, first in most industrialized countries and then in a growing number of developing countries (Heath & Jayachandran, 2016). The data, disaggregated by gender, show that educational attainment in industrialized countries not only converged to relatively equal levels between genders but that female attainment continued to rise faster than male attainment. This rise allowed women to outperform men in tertiary educational attainment and led to a growing gender gap between women and men in higher educational attainment (Plötz, 2017).

2.1 Global trends in female enrolment

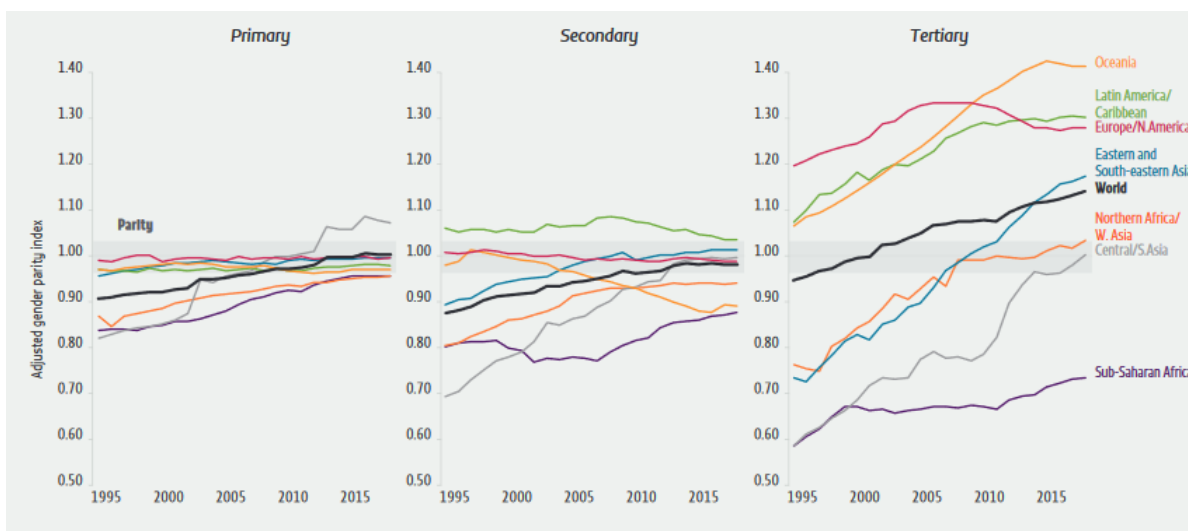
All the regions of the world have seen a considerable increase in female enrolment in tertiary education, which tripled globally between 1995 and 2018, growing at a higher rate than male enrolment over the period (UNESCO, 2020a). This explains why the adjusted average gender parity index¹ rose from 0.95 to 1.14. Women are overrepresented in tertiary education enrolment in 74% of the countries with available data, as well as in all regions² except for Central and Southern Asia, where there is parity, and sub-Saharan Africa, where men are

¹ The Gender Parity Index (GPI) is the ratio of females divided by that of males (either as a total number of enrolments per gender or when comparing their respective rates of enrolment; if not explicitly clarified, this latter form of calculation is the one being used). Parity is represented by the value 1, while a number between zero and one indicates overrepresentation of men and a value above one indicates overrepresentation of women.

² UIS World regional categories.

overrepresented, with 73 female students enrolled for every 100 males in 2018 (UNESCO, 2020a). The next illustration reflects how the regional differences are much greater for tertiary education than for secondary and primary levels.

Figure 1: Progress towards gender parity has been uneven across region and education levels



Source: UNESCO (2020a)

The following graph represents how, unlike in primary and secondary education, parity³ in tertiary education is the exception rather than the rule in the majority of countries, with many having moved from overrepresentation of men to overrepresentation of women. It also shows how a sizeable number of countries still have fewer than 80 women for every 100 men in tertiary education, even though this number has decreased since 1995.

³ Parity is understood as the range going from 97 girls per 100 boys to 97 boys for every 100 girls.

Figure 2: More countries have moved towards gender parity in basic education, but much remains to be done in upper secondary and tertiary education



Source: UNESCO (2020a)

Overall, the number of female undergraduate students worldwide has exceeded the number of men since 2002. Data from UNESCO’s Institute of Statistics (UIS) shows that between 2000 and 2018, the Gross Enrolment Ratio (GER) in tertiary enrolment⁴ for males increased from 19% to 36%, while that for females went from 19% to 41%.⁵ Women have therefore been the main beneficiaries of the rapid increases in tertiary education enrolment making up the majority of undergraduate students in all regions, save for Sub-Saharan Africa (UNESCO-IESALC, 2020a). Not only do females make up most of the undergraduate students, but they are also more likely to complete tertiary education than their male counterparts (OECD, 2020; UNESCO, 2017a).

In short, gender inequalities in higher education worldwide have reversed in recent decades. Women have made dramatic strides in educational attainment, being more likely than men

⁴ Number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education. For the tertiary level, the population used is the 5-year age group starting from the official secondary school graduation age.

⁵ <http://data.uis.unesco.org/>

to further their education and obtain an undergraduate and graduate degree (Callister, Newell, Perry, & Scott, 2006). Women outperform men on virtually every educational indicator in HE, with recent statistics showing, for example, that nearly two out of every three bachelor's degrees awarded in the United States are awarded to women (U.S. Department of Education 2018). Studies in Europe (Smyth, 2005) also show that women's educational attainment exceeds men's. Using time-series on enrolment and completion rates by gender, several papers show that the reversal occurred in almost all high-income countries, as well as in an increasing proportion of lower-income countries in all regions of the world, from sub-Saharan Africa to the Arab Gulf States (DiPrete & Buchmann, 2013). Numerous international studies on the impact of higher education have reported similar patterns in female advantage and persistent gender gaps in labor market outcomes (Machin & Puhani, 2003) (García-Aracil, 2008) (Williams & Wolniak, 2021).

This phenomenon has been defined as the "female advantage" in higher education (Buchmann & DiPrete, 2006) (Niemi, 2017). Since the late 1970s, the male advantage has evaporated and turned into a disadvantage. Women's overall success in acquiring human capital may be one of the major social changes in recent history (Williams & Wolniak, 2021). This reversal of the gender gap, also known as the rise of women, is unlikely to disappear soon and is suggested to grow further in the coming years (DiPrete & Buchmann, 2013).

2.2 Interpreting the female advantage

The analysis of the gender gap in labor market outcomes has received much more attention than the female advantage in educational attainment which is comparatively understudied. The forces that led women to accumulate human capital faster than men during the post-1975 period and outperform them in higher education are still relatively well understood (Chiappori, Iyigun, & Weiss, 2009; Fortin, Oreopoulos, & Phipps, 2015).

First, there is a combination of a wide range of factors and policy changes that have facilitated this gender revolution. For example, the widespread availability of contraceptive

methods has enabled women to delay childbirth (Bailey, 2006). The spread of anti-discrimination laws and regulations made gender discrimination in education and the labor market illegal. The expansion of education, the growing demand for educated workers, and the increased demand for female labor, e.g., due to the service sector's growth, have changed women's qualifications (Becker, Hubbard, & Murphy, 2010) (Akbulut, 2011). Moreover, welfare states have evolved, adopting more family-friendly policies that allow or even encourage women to combine family responsibilities with paid work (Gøsta Esping-Andersen, 1990; Gosta Esping-Andersen, 1999) (Gornick & Meyers, 2003) (Mandel & Semyonov, 2006). In short, the growing demand for highly educated workers generated a greater supply response among women than among men.

Second, the above contextual and political changes are inextricably linked to cultural change, which translates into the increasing adoption of gender-egalitarian norms and values (Brewster & Padavic, 2000) (Inglehart, Norris, & Ronald, 2003). Dramatic changes in social norms and attitudes regarding the role of women are well documented. In Germany, for example, a major series of surveys regularly asked whether women should leave their jobs after marriage, stay at home, and take care of their children. The proportion of respondents agreeing with these statements fell from 57% in 1982 to less than 30% in 2008 (Riphahn & Schwientek, 2015). Inevitably, once the constraints imposed by gender norms loosened, higher wage premiums encouraged women to attend higher education institutions and enter career-oriented programs at increasing rates.

Third, some important gender-specific changes in the costs and benefits of higher education have a large impact on entry into higher education. Some authors consider the female advantage in the total cost of education to be central to the reversal of the educational gender gap (Becker et al., 2010). Analysts have proposed several explanations for the gender gap in higher education participation and academic performance in general. These include gender differences in cognitive and non-cognitive skills (Becker et al., 2010; Conger & Long, 2010) (Jacob, 2002), job opportunities and returns to schooling (Goldin, 2014), as well as

parental valuations of education, and aspirations and plans for the future (Fortin et al., 2015), among others. In particular, changes in gender gaps in PISA reading scores, which measure gender differences in cognitive and non-cognitive skills, are significantly correlated with changes in the gender gap in higher education enrolment (Plötz, 2017). In short, women have more and better non-cognitive skills and thus have lower "total costs" of education, also referred to as "psychic costs" (Becker et al., 2010). In other words, schooling and education are more suitable for women than for men, or women have more favorable traits and behaviors for schooling in its current form.

Gender differences in the educational system relate to educational outcomes and differences in behavior, development, learning, expectations, and aspirations. Several studies have shown that boys exhibit more developmental disabilities, more antisocial and disruptive behaviors, lower school engagement, less effort, and a less positive orientation toward learning (Entwisle, Alexander, & Olson, 2007) (Buchmann, DiPrete, & McDaniel, 2008). Also, girls are ahead of boys in terms of non-cognitive skills, also known as social and behavioral skills, such as goal-directed behavior, organization, task persistence, self-discipline, cooperative ability, and attentiveness (Keulers, Evers, Stiers, & Jolles, 2010) (DiPrete & Buchmann, 2013). Although "non-cognitive skills" is a relatively amorphous term, it often refers to concepts such as self-control, self-motivation, reliability, sociability, perceived self-esteem, locus of control, time preference, and delayed gratification (Becker et al., 2010) (Heckman, Stixrud, & Urzua, 2006). Overall, girls consistently show higher school-friendly behavior levels than boys (Farkas, Grobe, Sheehan, & Shuan, 1990). Interestingly, the female-favorable gap in educational achievement and non-cognitive skills appears to increase during high school (Dekkers, Bosker, & Driessen, 2000) (DiPrete & Buchmann, 2013; DiPrete & Jennings, 2012).

3 The limits of the female advantage: persisting forms of gender-based inequality in higher education

Regardless of these somewhat encouraging statistics on women participation in higher education, concerns about the issue of gender equality in the tertiary education system have been growing over the last decade. A valid assumption is that women, after they graduate, are also able to proceed and study for higher degrees that would enable them to occupy most academic positions in universities, be involved with relevant research, take on leadership roles, and even earn competitive and comparable wages. Yet, as it will be shown in this section, this has not been the case. The failure of universities, for instance, to recruit, retain, and promote women academics has increasingly raised attention.

The recognition of the female advantage should not be interpreted as an indication of full gender balance in higher education. Along with the fact that men are now underrepresented, which also requires careful consideration, a more nuanced analysis of existing evidence of gender balance in higher education shows that there are some persisting inequalities. These are analyzed in the following sections.

3.1 Aversion to science? Inequalities in STEM enrolment and niche care

Despite the overall positive trend shown by the previous data on enrolment rates, one must not forget that these are country averages, which do not take into consideration the gender distribution across fields of study. This distribution is considerably uneven. One clear example of this is the so-called STEM areas of study (that is, science, technology, engineering and mathematics), which show a heavy underrepresentation of female students in most countries. Female participation in STEM programs varies from less than 1% in the Maldives to 41% in Oman. In 2017, within the OECD, just 20% of new enrolments in short-cycle tertiary programs and 30% of new enrolments in bachelor's degrees in STEM fields were women (OECD, 2020; UNESCO, 2020a). This underrepresentation of female students is then closely linked to the underrepresentation of female researchers in these fields.

Facilitating women's participation in vocational training and programs in science and technology has been a strategic objective since the 1995 Beijing Declaration and Platform for Action. Nevertheless, women's choice of studies is often still influenced by cultural barriers, such as the perception of STEM as 'male' disciplines (CEDAW, 2017). By contrast, education, health, arts, humanities and social sciences tend to see an overrepresentation of women (UNESCO, 2020a).

Globally, in over two-thirds of countries, one can find that less than a quarter of the students of engineering, manufacturing and construction or ICT are female. Within the OECD, less than 20% of the newly enrolled students in tertiary computer science programs and about 18% of those starting engineering are female (OECD, 2017). While around 10% to 12% of ICT students are female in high-income countries, including Belgium, the Netherlands, Spain or Switzerland, this share can be as high as 58% in Myanmar and 51% in Tunisia (UNESCO, 2020a).

It must be highlighted that, according to the International Computer and Information Literacy Study carried out in 2018 with grade 8 students in 21 mostly high-income countries, the lower interest of girls in ICT programs and careers was not linked to their performance in digital skills, which was actually higher on average than that of boys (Faulstich-Wieland, 2020; UNESCO, 2020a).

Gender remains closely linked to higher education choices along a humanistic/scientific divide. In particular, some large-scale comparative analyses have established that women's underrepresentation in the sciences can be observed worldwide (Ramirez & Wotipka, 2001) (Smyth, 2005). Furthermore, about 90% of the association between gender and fields of study is constant in developed countries. However, it is unclear whether this gap tells the whole story of gender segregation in higher education. A recent analysis indicates that this divide accounts for no more than half of the association between gender and degree (Barone, 2011). Moreover, these analyses show that gender imbalance is highly variable

within scientific and humanistic fields. Also, some researchers have argued for the existence of a second gender gap in higher education: the "care-technical divide". Some fields of study prepare students for routine care jobs (e.g., social work), others more often provide access to occupations that retain a symbolic affinity with care jobs (e.g., medicine). Research shows that not all scientific study fields are equally attractive to girls. Those with a stronger direct or indirect connection to occupations that better fit traditional gender stereotypes would tend to score higher in their educational preferences.

Moreover, women's opportunities to enter these occupations are likely to be better, given that the same gender stereotypes operate in the labor market. For example, engineering is perceived as a more "gender-authentic" option for men than women (Faulkner, 2007). Besides, the expansion of the service sector increases the demand for jobs involving soft skills that are considered feminine, such as emotional labor or communication skills (Charles & Grusky, 2007). In short, this evolution may continue to reproduce cultural stereotypes about gender by creating "niches of care" labeled as female in education and the labor market (Barone, 2011).

The degrees that female students earn will drastically influence their future career choices. If fewer women graduate with STEM degrees, high-income careers in these fields are not available to them. Even when more women complete a degree, such as in the education sector, higher leadership positions remain out of reach. The data suggests that there is more contributing to educational and career outcomes than just individual agency. These rational incentives are not gender-free, as the perceptions of young boys and girls are shaped primarily by gender role socialization (Eddy, Ward, & Khwaja, 2017). In the end, educational choices are not gender-free and are shaped by students' rational cost-benefit calculations combined with social influences (family, peers, and teachers) that set expectations early during gender socialization (Williams & Wolniak, 2021).

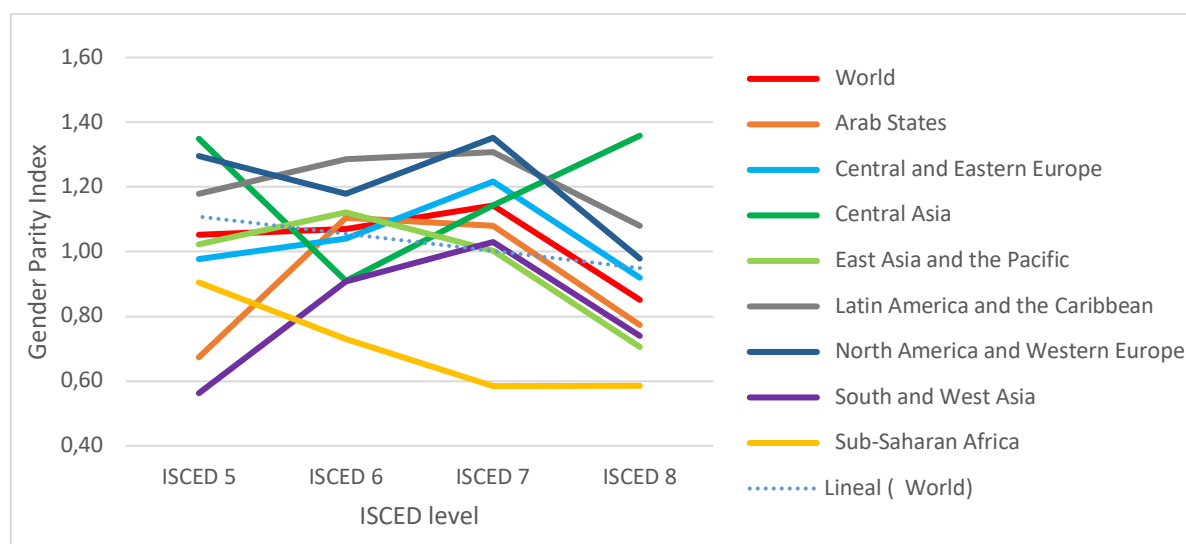
The choice of degrees and fields of study explains between 15 and 25 percent of the male-female earnings gap among higher education graduates (Bobbitt-Zeher, 2007). Male students continue to choose higher-paying degrees and receive higher earnings after graduation than women (Conger & Dickson, 2017). Compared to other historically disadvantaged groups, women experience overwhelming success in higher education. However, the reasons for that success remain largely undefined and have not translated clearly or consistently into labor market success or higher socioeconomic attainment levels. In this regard, the "female advantage" may be an illusion, noting that women's educational successes have not translated into socioeconomic achievement (Niemi, 2017), in part due to broader economic, social, and political responses that have suppressed gains among an increasingly educated female population (Williams & Wolniak, 2021). Despite the increased participation of women in labor markets and educational systems, gender segregation remains strong. Compared to vertical gender segregation, horizontal gender segregation, i.e. the disproportionate concentration of men or women in some educational fields or occupational sectors, has proven to be greater and more stable over time (Charles, 2011).

3.2 Women do not retain their advantage in postgraduate degrees

According to the latest available data (UIS, 2021), there is a pattern in the share of female enrolment in tertiary education. In all World regions except for Central Asia, females represent a smaller proportion of doctoral degree students (level 8 in ISCED terms) than they do for bachelor students (ISCED 6). The trend is not so clear when comparing other ISCED levels across regions. The data for short-cycle tertiary education (ISCED 5) does not show a common pattern. In the Arab States region, East Asia and the Pacific and Sub-Saharan Africa, the gender parity index (GPI) is higher for bachelor students than for master's degree students (ISCED 7), meaning that the share of women students is higher at the bachelor level. However, the opposite is true for Central and Eastern Europe, Central Asia, LATAM, North America and Western Europe and South and West Asia, as well as for the World's average. For the bachelor level, the GPI is below one (indicating overrepresentation of men) in Sub-Saharan Africa, South and West Asia and Central Asia, and above one (indicating

overrepresentation of women) in the rest of the regions as well as in the World's average. For the master's level, all regions are above a GPI of one except for Sub-Saharan Africa. For the doctoral level, all regions are below one except for LATAM and Central Asia. The following illustration shows data from 2018 with the enrolment (total number) in tertiary education, expressed as Gender Parity Index, by level of education: ISCED levels 5 (short-cycle tertiary education), 6 (Bachelor), 7 (Master's) and 8 (Doctoral).

Figure 3: Enrolment in tertiary education, GPI per education level (2018)



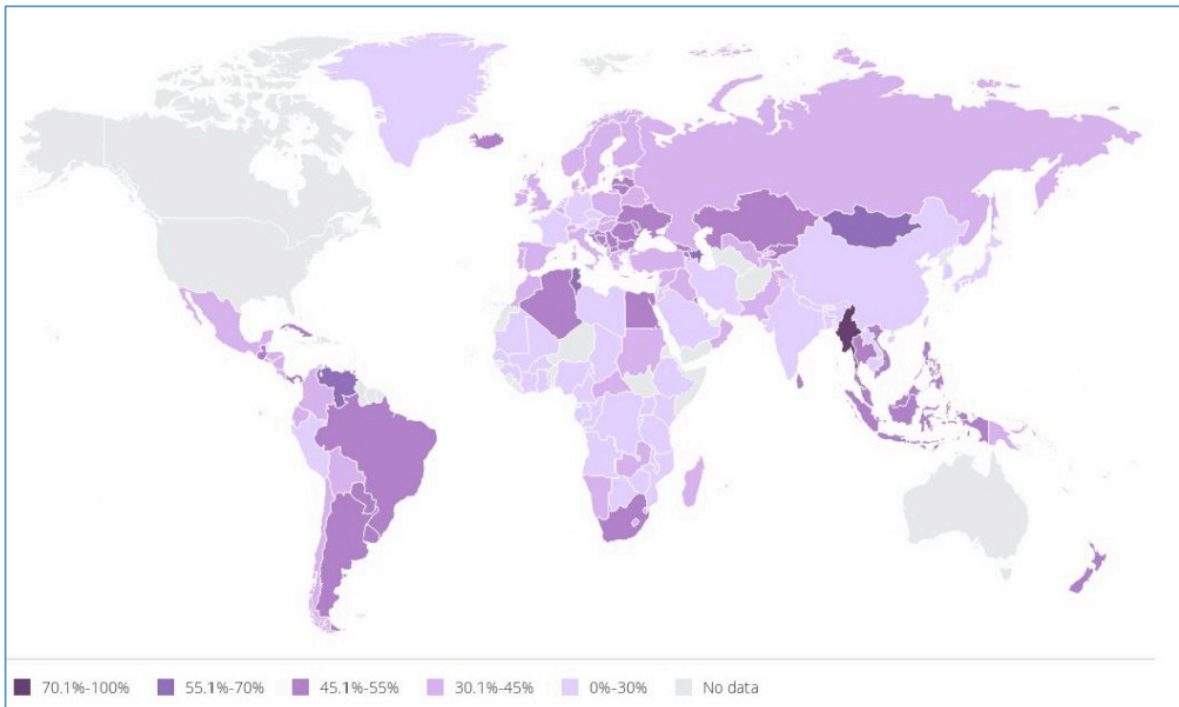
Source: UIS Database (2018)

3.3 The gender-based differentials in research performance

When looking at research dynamics with a gender lens, despite the growing demand for cross-national comparative statistics on women researchers, national data and their use in policymaking often remain limited. Just 30% of the world's researchers at universities are women (UNESCO, 2019). While a growing number of women are enrolling in university, many are forced out at the higher levels, which are normally required for a research career.

The high proportion of women in tertiary education is therefore not necessarily translating into a greater presence in research, as shown in the figure below.

Figure 4: Women as a share of total researchers (2017 or latest year available)



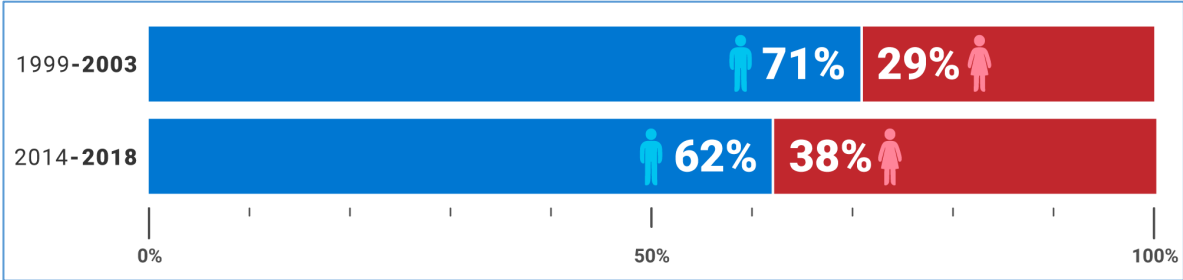
Source: UNESCO (2020b)

The regional averages for the share of female researchers for 2017 was 48.5% for Central Asia, 45.8% for Latin America and the Caribbean, 40.9% for Arab States, 39.0% for Central and Eastern Europe, 32.9% for North America and Western Europe, 31.1% for Sub-Saharan Africa, 25.0% for East Asia and the Pacific, and 23.1% for South and West Asia (UNESCO, 2020b). A closer look at the data reveals some surprising exceptions. For example, in Myanmar, women account for 76% of researchers, compared to Netherlands with 26% or the lowest, Chad, at only 4% (UNESCO, 2020b).

With regard to research output trends in the form of publications using a gender lens, the general theme from the data is that, in most cases, men publish on average more articles than women and that there is a gender publication gap. Differences in men's and women's academic publication rates persist and are most pronounced for publications in top journals. Elsevier's gender report from 2020 examines research participation, career progression and

perceptions across the European Union and 15 countries⁶ globally in 26 subject areas. While the representation of women in research is increasing overall, inequality remains. On average, women researchers author fewer publications than men in every country, regardless of authorship. As shown below, in all countries studied, inclusive of the former EU28, the ratio of women to men among all authors was closer to parity during a recent 5-year period compared with a decade ago.

Figure 5: Percentage of male and female authors between two periods



Source: UNESCO IESALC

In addition to the general global trends, there were notable country-specific findings. For example, Argentina was the closest to gender parity among authors overall, while Japan had the lowest ratio of women to men among authors in all subject areas (18 women per 100 men) (Elsevier, 2020).

In most countries, the ratio of women to men among authors is lowest in the physical sciences and highest in the life and health sciences. Nursing and psychology stand apart with more women than men among authors. The greatest increase in the proportion of women among authors is seen in nursing and psychology and the smallest increase is seen in the physical sciences (median ratio among countries ranged from 20 women per 100 men in mathematics to 51 women per 100 men in environmental science) (Elsevier, 2020).

⁶ Argentina, Australia, Brazil, Canada, Denmark, France, Germany, Italy, Japan, Mexico, Netherlands, Portugal, Spain, UK, USA.

To support these findings, an earlier study by Bendels *et.al.* (2018) reports that, in terms of scientific research output, women accounted for publishing only 29.8% of journal articles. Distinct differences at the journal, journal category, continent and country level were revealed. Women are underrepresented in prestigious authorships compared to men. The underrepresentation is accentuated in highly competitive articles attracting the highest citation rates, namely, articles with many authors and articles that were published in highest-impact journals (Bendels *et.al.*, 2018). A distinction between men and women also exists in the order of authorship with 33.1% of the first, 31.8% co- and 18.1% of the last authorships being held by women. This also has implications for women in higher education as the position on an authors' list is important for reasons unrelated to the article's content, namely, prestige and eligibility for research grants. Differences also exist across continents with South America at 36.4%, Australia and Oceania at 31.1%, North America 39.6%, Europe 32.5% and Asia 19.8%, in terms of scientific research output by women (Bendels *et.al.*, 2018).

A study conducted for 17 African countries by Fisher *et.al.* (2020) indicated that compared to their male counterparts, women in STEM PhD programs had about one less paper accepted for publication during their doctoral studies, citing marital responsibilities as a key factor in reducing women's publication productivity. This has implications for their moving up the career ladder as publication metrics are important determinants of promotion in academia.

3.4 The first glass ceiling: the professoriate

Data from OECD and UNESCO⁷ shows that while a growing number of women are enrolling in university, many are forced out at the highest levels required for a research career. For example, in most OECD countries, there are more male than female students pursuing the Master's and Doctoral degrees⁸, an equity and policy concern in itself. This can explain, in

⁷ <http://data.uis.unesco.org/#>

⁸ https://stats.oecd.org/Index.aspx?datasetcode=EAG_ENRL_SHARE_CATEGORY

part, why few women make it to professorship and publish fewer papers, both areas requiring higher degrees.

In 2018, women represented 43% of teachers in tertiary education, compared to 66% and 54% in primary and secondary education, respectively (UNESCO, 2020a). Sub-Saharan Africa remains the region with the lowest share of female teachers in tertiary education, with a slightly decreasing trend between 1995 and 2018, while all other regions have seen an increase (UNESCO, 2020a).

The following case studies are provided from countries that collect and publish data on gender parity in academia.

In **South Africa**, with respect to universities, in 2016, only 27.5% of their professorial staff (of a total of 2,218 posts) were female. The figure was slightly higher for associate professors, with a female representation of 39.5% (of a total of 2,131 posts). At the senior lecturer level, women occupied 45.1% of 4,900 posts, while at the lecturer and junior lecturer levels they constituted 53.3% (out of 8,498 posts) and 56.6% (out of 1,035 posts) respectively (Naidu, 2018). Thus, while there are more women than men at lecturer levels, the same is not true for senior levels. Between 2012 and 2018, 44 to 45% of PhD students (ISCED 8) were female, similar to the percentage of female senior lecturers (UIS, 2021).

Looking at **Brazil**, the teaching profession is predominantly feminine at all levels of education, save for higher education (UNESCO, 2020c). In 2019, the proportions of female teachers per level of education were 96% (preprimary); 88% (primary); 67% (lower secondary); and 58% (upper secondary). Although the proportion of female professors at the tertiary level of education has increased since 1999 (41%), gender parity has not yet been reached as they only constituted 46% in 2019 (UNESCO, 2020c).

Tertiary education in **Bulgaria** has experienced an increase in the share of women holding academic positions from 41% in 1995 to 50% in 2018, or from about 8,000 to 11,000 (UNESCO, 2020a). A more nuanced picture is presented with the differences in women's composition in academic positions as per faculties as follows: humanities (60%), medicine (55%), and natural and social sciences (54%) (UNESCO, 2020a). Although women in academic positions in engineering and technology have increased between 2000 and 2015 from 16% to 34%, gender parity has not been reached and they still remain underrepresented. Between 1995 and 2018, the number of women assistant professors in Bulgaria increased from 44.5% to 53% and from 28% to 47% for associate professors. By 2018, there were 40% female professors in Bulgarian universities from only 12.5% in 1995 (UNESCO, 2020a). The female share of PhD students was 52% in 2018, 50% in 2008 and 45% in 1998 (UIS, 2021).

In **Australia**, women hold fewer senior faculty positions than men. In 2018, Australian women held fewer academic positions than men at the senior lecturer level and above, but more than half of all lecturer and below-lecturer positions. Women held 46.8% of senior lecturer faculty positions and just 33.9% of above senior lecturer faculty positions. Women held 54.7% of lecturer faculty positions and 53.8% of below lecturer faculty positions (DET, 2018). Between 1998 and 2018, the female share in PhD students raised from 44 to 51% (UIS, 2021).

Slightly more than a quarter of professors in Indian academia are women. In 2018–2019, women in **India** held 27.3% of professor and equivalent faculty positions, 36.8% of reader and associate professor faculty positions, and 42.6% of lecturer/assistant professor faculty positions (MHRD, 2019). From the total enrolment in PhD programs, in 2019 44% were female students (42% in 2013, without previous data available) (UIS, 2021).

The situation is worse in **Japan** with only 24.8% of full-time university teachers being female (Government of Japan, 2019). Japan has the smallest share of female tertiary teaching staff of all OECD countries (OECD, 2019). The share of women in the total PhD enrolment raised from 22% in 1998, to 31% in 2008, to 34% in 2018 (UIS, 2021).

In **Canada**, women made up 41% of full-time academic teaching staff at Canadian universities between 2018 – 2019 (Statistics Canada, 2019). However, women are at, or near parity across academic ranks except for professorships. For the same period, women made up: professors: 28%; associate professors: 44%; assistant professors: 50%; positions below assistant professor: 55% (Statistics Canada, 2019). The female share of PhD students raised from 44% in 1998, to 46% in 2008, to 49% in 2018 (UIS, 2021).

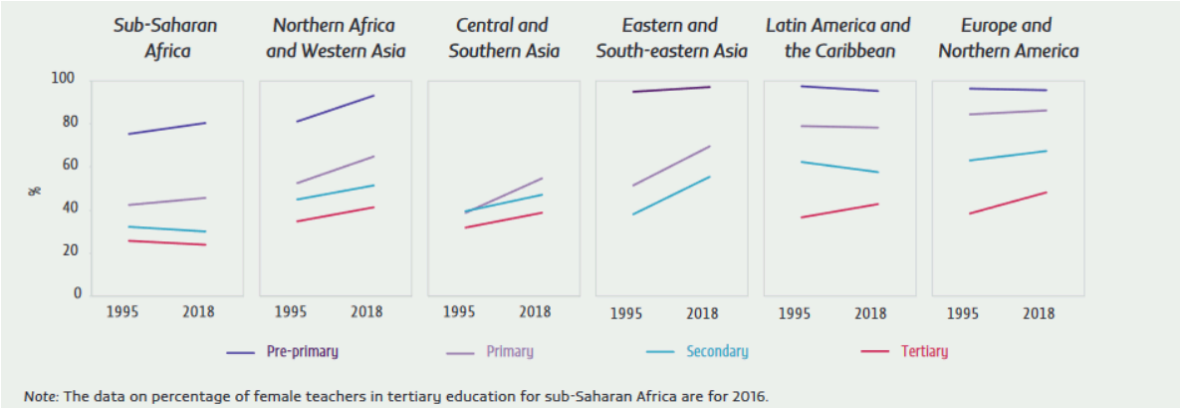
For the **United States**, women are more likely to be found in lower-ranking academic positions. While women represent just over half (52.9%) of assistant professors and are near parity (46.4%) among associate professors, they accounted for barely over a third (34.3%) of professors in 2018 (NCES, 2018). Women held over half (57%) of all instructor positions, among the lowest ranking positions in academia. 22.7% of women faculty are in non-tenure-track positions, compared to 17.3% of male faculty (NCES, 2018). Women represented 53% of all PhD enrollments in 2018, up from 48% in 2014 (no earlier data available) (UIS, 2018).

This section has shown that women are still underrepresented as senior faculty and in higher education decision-making bodies in many countries. UNESCO (2020a) notes that “while this reflects women’s history of lower access to education, it is also often a sign of institutional cultures that are neither inclusive nor geared towards broader social and cultural change for greater gender equality [...] conventional faculty recruitment processes that reward linear, full-time, uninterrupted academic trajectories contribute to women’s underrepresentation in senior academic positions”.

The horizontal gender segregation (per area of studies) described in the previous section does not only affect female enrolment but also female professorships, which are also underrepresented in STEM careers. A vertical gender segregation in professorships is also identified, as stated before. The impact of the gender variable in teaching positions can be clearly appreciated in all the World regions (see illustration below). Nevertheless, it must be noted that from 1995 to 2018 the percentage of women in tertiary education teaching

positions has increased in all regions, with the exception of sub-Saharan Africa, where it decreased from 26% to 24% (UNESCO, 2020a).

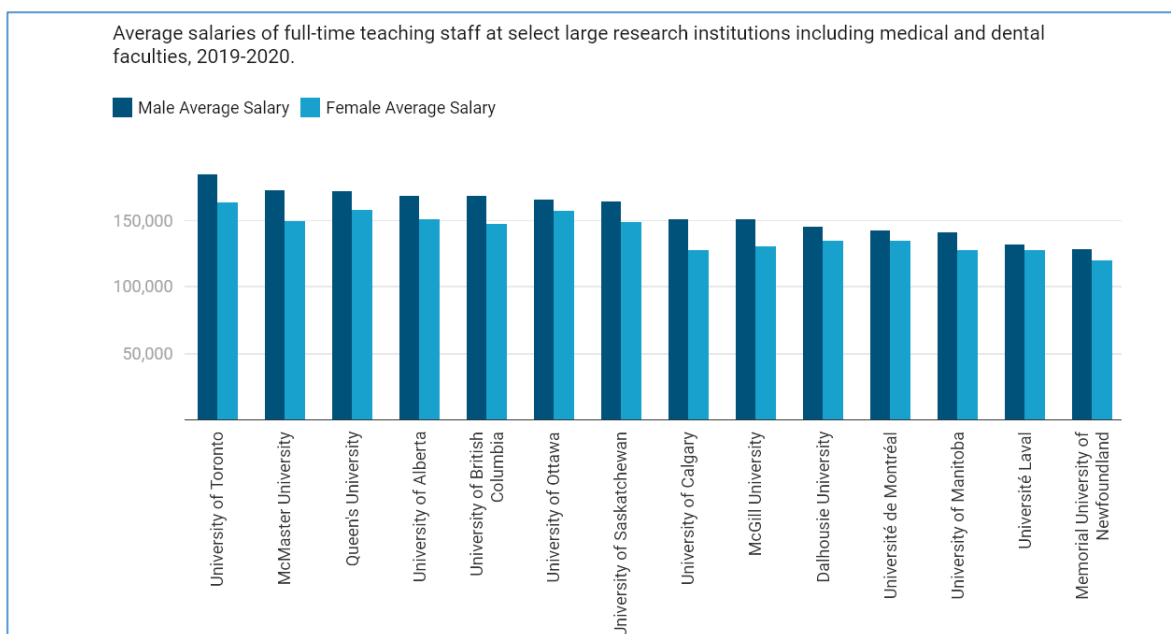
Figure 6: Percentage of women in teaching positions is increasing worldwide at all levels



Source: UIS Database (UNESCO 2020a)

For countries with available data, the persistence of a gender wage gap is a common problem across universities. For example, the existence of a wage gap has been at the center of ongoing conversations at universities in **Canada**. This is supported by the data presented below, with female professors earning less on average compared to their male counterparts.

Figure 7: Average salaries by institutions – selected Canadian universities



Source: Cummings, 2020

UK universities had a gender gap of 10.5% across ranks in 2015-16 (Holmes, 2017). UCU (2018) further finds that in **England**, the largest gender pay gap (7%) is found among leadership and management staff. This is an average of £3,189 less pay per female manager per year. The second largest gap is among trainers/instructors/assessors/verifiers at 4%, an average gap of nearly £1,000 per woman per year (UCU, 2018).

At all faculty levels in the **United States**, men out-earn women. As shown in Annex 1, on average, faculty salaries for women were 81.4 percent of those for men, a slight improvement from 81 percent in 2009–10 (AAUP, 2020). Within the ranks, the gender pay gap for professors (87 percent) and assistant professors (91.2 percent) has increased slightly since 2009–10, when the pay gap was comparatively smaller for professors (87.9 percent) and for assistant professors (93 percent) (AAUP, 2020).

The higher education sector is among those industries that are still struggling to bridge the gender gap (globally women still occupy only 25% of seats in parliament and 36% of senior

private sector management positions (World Economic Forum, 2020). Academia provides however a unique setting to study gender wage inequality because academics are a relatively homogenous group, both in terms of their education and training, and in the performance of tasks within an occupation. While the qualifications and valuation of job-specific tasks may vary across fields, the majority of assistant professors have attained a doctoral degree and their work involves teaching a specified number of courses, various service duties to the department or institution, and conducting and publishing independent research (Chen & Crown, 2019). Based on this relative homogeneity, the existing wage-gap presents a unique problem.

Some research suggests that women are less likely than men to negotiate for higher salary when accepting a job offer, which can cause the pay gap between male and female faculty in the same department (Dey & Hill, 2007). Another reason for the salary gap appears to be that the male professors, in certain fields, are promoted at higher rates (Chen & Crown, 2019). Some experiments found that students tend to give male professors higher ratings in course evaluations, which are sometimes used as one of the indicators for the calculation of salary bonuses. It has also been shown that females' research manuscripts often face a more stringent review process, which has an impact on faculty promotion. Also, the time female assistant professors spend caring for children during tenure-track years can leave them with less competitive portfolios (Chen & Crown, 2019).

It is clear that the 'equal access' to an academic education and career that women have enjoyed for the past years has not thus far led to 'equal outcome' in terms of leadership and academic positions, pay, research and publications in a higher education setting. This is also related to broader conditions of employment and labor (part-time vs full-time, permanent vs temporary contracts, etc.) which are beyond the scope of this document.

3.5 The second glass ceiling: women in senior management positions in higher education

When reviewing data about women leadership in universities globally, the general picture that emerges is one of a dearth of women at the top. Women are over-represented among teaching staff at lower education levels, while their presence is markedly lower in upper secondary and tertiary education (vertical segregation). The same is true in school management and education policymaking and decision-making positions (UNESCO, 2020a). When looking at the Latin America region, according to figures from a survey done by UNESCO-IESALC in 2020, only 18% of public universities in the region have women rectors. The result was obtained from a sample of nine Latin American countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Panama, Peru and Venezuela (UNESCO-IESALC, 2020b). However, although this figure seems low, as it will be shown next, the situation is better compared to that in Europe. The UNESCO-IESALC (2020b) report further notes that despite the fact that university enrollment in the region shows a greater presence of women, to the tune of 55%, leadership in public universities continues to be in the hands of men.

In respect of the situation in European universities, in 2020, 15% of rectors of European University Association (EUA) member universities in 48 countries were female, compared to 85% male. Notably, 20 countries did not have any female rectors. For those countries that have some presence of female rectors, the situation varied across countries as the proportion of female rectors is above the average in 19 countries, and below in eight countries. Similarly, female vice-rectors are outnumbered by male vice-rectors (EUA, 2020). Again, looking at EUA member data, the latest figures showed that, on average, nearly 30% of all vice-rector positions were held by women. In some countries female vice-rectors constituted a majority (Denmark, Finland, Iceland, Latvia, Norway), while other countries had gender parity (Croatia, Cyprus, North Macedonia, Moldova) (EUA, 2020).

Times Higher Education produces annual figures for the number of female-led universities for the top 200 universities according to its annual global rankings. The number of the world's

top universities that are led by women has increased for the first time in three years but still accounts for less than one-fifth of leading institutions. According to this analysis of *Times Higher Education*, 39 (19 per cent) of the top 200 universities in the latest 2020 ranking have a female leader, up from 34 (17 per cent) in 2018 (Bothwell, 2020).

A further analysis of the *Times Higher Education* data showed stark differences among countries, with Sweden topping the list of countries with the highest proportion of female leaders. Of the five Swedish institutions that make the world top 200, three are led by women. Meanwhile, South Africa and Spain tie in second place. In both cases, one of their two representatives has a female leader. Australia and the Netherlands each has four universities that are led by women out of cohorts of 11. France, Italy, Switzerland, the United Kingdom and the United States (US) are the only other countries that outperform the sample's average on the share of universities headed by women, according to the analysis (Bothwell, 2020). The US is still home to the highest number of female rectors – 13, up from nine last year – and it is also the country that has made the most progress in this area over the past 12 months. The US now accounts for a third of female leaders at the top of the table, up from just over a quarter in 2019. Australia and Italy are the only two other countries that have advanced on the number of universities led by women since last year, while Germany is the only nation that has regressed, with just one of its 23 universities now having a female rector (down from three). Of the 27 countries that feature in the top 200, 15 have no female university leaders in that group (Bothwell, 2020).

It is important to acknowledge that the relative dearth of women in senior positions reflects a failure to maximize female talent. This state of affairs is problematic both from a social justice and an organizational perspective given the increasing evidence that the more women executives an organization has, the better it performs (Noland *et.al.*, 2016).

3.6 Transitioning to the labor market: same degree, lower salary

The persistence of gender-specific decisions translates into gender differences in the distribution across fields of study and occupations, with women often ending up in less lucrative jobs in terms of income and status (Gerber & Cheung, 2008) (Roksa, 2005).

Growing gender egalitarianism in the Western world, specifically liberal egalitarian ideals, has encouraged women to enroll in higher education and achieve equal education levels (Charles & Bradley, 2009). As a result, vertical gender segregation has decreased. However, these liberal egalitarian ideals are easily conflated with persistent gender essentialist beliefs, i.e., the belief in innate and fundamental differences between men and women in abilities, desires, and interests (Charles & Bradley, 2002, 2009). In recent decades, it is unquestionable that women have thrived in higher education and have made gains that exceed those of men. These gains have not translated into success in the labor market and require further research, but the most plausible explanations stem from the enduring and cumulative influence of gender socialization, gender norms, and gender differences in affective and aspirational characteristics. These differences change over time, both favoring women to succeed in higher education and disadvantaging them once they enter the labor market.

The female advantage of higher education can affect societies in many ways, from changing labor market structures to family formation patterns (Riphahn & Schwientek, 2015). Women's enrollment in higher education, their educational attainment, and their participation in the labor market have increased tremendously; educational and occupational segregation has decreased; and, consequently, the gender wage gap has also decreased substantially, but still exists (Charles, 2011). In the United States, 57% of higher education students are women, but women's unadjusted median earnings are 78% of men's. In 26 out of former 28 EU countries, there are more women than men in higher education institutions, but women's unadjusted average earnings are lower than men's in all 28 countries (Zhang, 2017).

In the OECD, the individual financial return from tertiary education is USD 295 400 for men and USD 225 400 for women. If one looks at gross earnings benefits, one obtains the average of USD 543 300 per man and USD 388 200 per woman, compared with their peers with upper secondary attainment (OECD average). This gender gap tends to increase with the level of educational attainment.

The wage gap data focus on those with an employment, but the gender gap also affects the employment rate itself. In the OECD countries, there is an eight-percentage point difference between the employment rate of 25-34 year old men with tertiary education (89%) and that of women of the same age and educational attainment (81%). Fortunately, the trend in the last decade was towards convergence in most OECD countries, though often at a slow pace (OECD, 2020).

The causes of these wage and employment gaps include gender stereotyping, social conventions (in particular the effects of an unequal work-life balance between men and women) and discrimination against women, but can also be the result of individual preferences in the choice of studies (which in turn can be influenced by gender stereotypes). Although it is not its only explanatory variable, this choice can have significant impact on the gender wage gap in graduates. For example, men represent a majority of students in fields such as engineering, manufacturing, construction and ICT, which are associated with higher earnings, while women are a majority in areas of study such as education and art and humanities, which are associated with lower earnings (OECD, 2020). In order to ensure that any pay difference is the result of different work and not of gender discrimination (either explicit or via unconscious bias), some countries are implementing pay transparency policies (OECD, 2020). However, the wage gap has been often identified even within the same professional profiles (see Annex 1 for data on HE jobs). This means that individual choice and education level alone cannot account for the income disparity between genders. Factors such as childcaring-related career breaks and other forms of unpaid housework can have a disproportionate impact on women's careers, leading to lower average income and higher

rates in part-time work (European Commission, 2020; EIGE, 2019). This bias can be reinforced by legislation that provides different duration for child-caring-related leaves for mothers and fathers, reinforcing the expectations from society and employers that women are more likely to attend family caregiving activities in detriment of their careers.

3.7 Gender-based violence in higher education

Sexism can negatively affect tertiary education students, not only when choosing and accessing their studies, and in their careers after graduation, but also during their studies. Violence against women on campus, such as sexual harassment and sexual assault, is a pressing issue that must be addressed by both policymakers and higher education institutions. For example, in 2015, 70% of female students at Cairo University experienced sexual harassment. In Bangladesh in 2013, 76% of female students of eight universities reported incidents of sexual harassment. In Australia, 6.9% of students faced sexual assault at least once in 2015 or 2016 (UN Women, 2018).

In order to help governments, HE institutions and students in their implementation of concrete measures that tackle this challenge, UN Women (2018) has created a guidance note on campus violence prevention and response. This note is based on the key principles of a comprehensive, survivor-centered "do no harm", human-rights based approach including perpetrator accountability. Many specific initiatives exist on national and HEI-level, but comprehensive strategies are still often missing, particularly in middle- and low-income countries (UN Women, 2018).

3.8 Stagnation or progress?

Recent research has provided evidence that gender segregation in higher education has declined very little in recent decades and that it shows a very similar level and qualitative pattern in several countries. This basic invariance closely matches the invariance of gender segregation in the labor market. There are important cross-national and historical variations

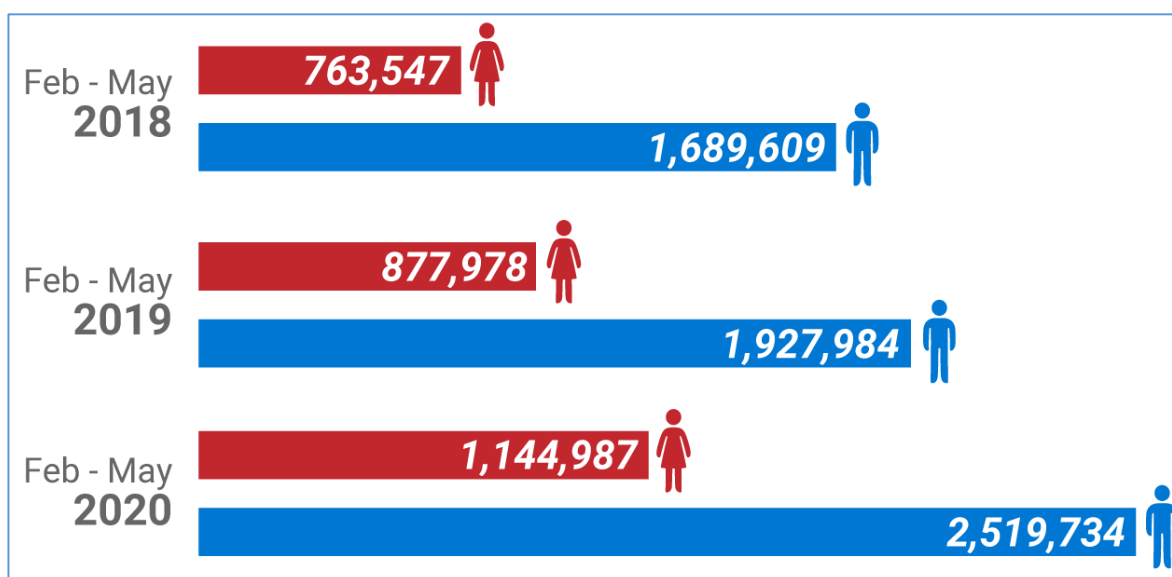
in both aspects, but they are best described as variations on the same underlying theme (Charles, 2011) (Barone, 2011). In this respect, several studies have found that some degree of desegregation occurred in the 20th century in developed countries, and there is evidence that this trend has contributed to some weakening of occupational (England & Li, 2006). Although some scholars of higher education argue that desegregation is a long-term trend that occurred "slowly but surely" over the past century (Ramirez & Wotipka, 2001), others find evidence of a marked slowing of this trend in the 1980s and 1990s (England & Li, 2006). In short, there is little reason to be optimistic that further educational expansion will translate into a large reduction in gender inequality in the labor market.

4 The impact of the COVID-19 pandemic on women participation in higher education

Across every sphere, from health to the economy, security to social protection, the impacts of COVID-19 are exacerbated for women and girls simply by virtue of their gender (UN, 2020). Higher education is one of the key sectors that have been affected by COVID-19 in terms of student enrolment, international student mobility, delivery of teaching and community engagement activities. One of the key areas that higher education has been impacted by the pandemic is its research function. A global survey by the International Association of Universities reported that research at as much as 80% of HEIs had been affected by the COVID-19 pandemic (Marinoni *et.al.*, 2020). This impact is mostly due to the cancelling of international travel, and the cancellation and postponement of scientific conferences (Marinoni *et.al.*, 2020). However, this impact has been felt greater by women researchers with their research outputs plummeting during lockdown while men's have increased.

Squazzoni *et.al.* (2020) analysed submitted manuscripts and peer review activities for all Elsevier journals between February and May 2018-2020, including data on over 5 million authors and referees. Results showed that during the first wave of the pandemic, although submission increased in all months during the lockdown period, the growth of submissions by female researchers accelerated significantly slower than those by male researchers (Figure 4). This deficit was also found to be especially pronounced among younger cohorts of women academics (Squazzoni *et.al.*, 2020).

Figure 8: Total paper submission between 2018 - 2020, by gender



Source: UNESCO IESALC (based on Squazzoni et.al., 2020)

Female researchers, especially in the middle-age bracket, are penalized by closures of their children's schools. Additional lockdown childcare, as well as caring for older family members and an increase in chores such as cooking and cleaning, is slowing up female researchers far more than their male colleagues. Women may also not find time to enter competitions and submit proposals for research funding (Fazackerley, 2020). This is bound to strengthen long-lasting gender inequalities in the academic world; those who have already benefitted from COVID-19 research inflation may have higher chances in the near future to receive prestigious grants and obtain tenures and promotions in prestigious institutions.

With regard to female students, the impact of COVID-19 is felt through increased time spent supporting with household chores and childcare at home, decreasing the time spent on assignments. This disruption results in females taking longer to complete their programs. More so, the impact of COVID-19 could lead to an increased occurrence of early marriage due to poverty, as impoverished families may be inclined to reduce the burden of taking care of their young girls. Instances of Gender-Based Violence against girls, added to increased responsibilities at home can also affect their mental health and the ability to concentrate on

school work while at home. The impact of COVID-19 on education could erase decades of effort and resources put in place to ensure gender equality in education (Norgah, 2020).

5 Recommendations for future action

Gender segregation in higher education is more resistant to change than a superficial analysis might suggest. Its remarkable degree of temporal and spatial stability and a detailed examination of its qualitative pattern indicate that the cultural forces underlying gender segregation are highly resilient, not least because they are underpinned by some structural developments in educational and occupational institutions. Educational institutions function as drivers of gender inequality: after all, inequalities between boys and girls are socially, culturally, and institutionally shaped. In this context, what policy avenues could make educational institutions a lever for change?

First, governments and schools can continue to reduce discrimination against women in education, for example, by combating the stereotype that women are bad at math. Children and adolescents are bombarded with deeply ingrained expectations about what constitutes gender-appropriate behavior, following their parents, teachers, counselors, and peers' opinions. Daily, children are induced to express beliefs, aspirations, and goals consistent with prevailing gender categorizations, including sex-stereotyped educational preferences that will ultimately shape their higher education choices (Marini, Fan, Finley, & Beutel, 1996). In the ongoing process of "gender learning," students must learn to manage their behavior following dominant normative conceptions of femininity and masculinity. Hence, it is thought that women read more often than men in their leisure time and that they must learn to appreciate more subjects and activities, mobilizing empathetic and aesthetic skills rather than "masculine" qualities such as rigor and formal reasoning (Ridgeway & Smith-Lovin, 1999). These cultural pressures provide, for example, a well-known explanation for the existence of a humanistic-scientific divide in education between men and women (Barone, 2011).

The improvement in girls' primary and secondary graduation rates has been considerable in the last few decades, but some countries still have a long way to go. For example, "In Chad, Guinea-Bissau and Yemen, fewer than 80 girls for every 100 boys completed primary school and boys are more than twice as likely to complete secondary school as girls. Gender disparities are particularly persistent when intersecting disadvantages accumulate. For example, in at least 20 countries, mostly in sub-Saharan Africa but also in Belize, Haiti, Pakistan and Papua New Guinea, hardly any poor rural young women have completed upper secondary school." (UNESCO, 2020a).

Nevertheless, with the right policies and systemic change (e.g., in social attitudes and the way that schools are organized), advances in girls' education in one generation can lead to a positive cycle for the following ones as children of educated women are more likely to receive education themselves, and as a consequence continue with tertiary studies. This is particularly the case for girls in low- and middle-income countries, who are statistically more likely to be more influenced by their mothers' education level than that of their fathers (UNESCO, 2020a). Policy interventions can increase the chances of new female generations to avoid starting with the disadvantages that their parents suffered. Policies that have contributed in this direction include quotas in tertiary education for students belonging to vulnerable groups, the expansion of scholarships and cash transfers, as well as free access to primary education (without the need to pay additional fees) (UNESCO, 2020a).

According to a recent UNESCO report (2020a), there are six main areas requiring actions in support of girls' education: (1) gender disparity in education access, participation and completion⁹, (2) support to pregnant girls and young parents, (3) training for various actors

⁹ In 4% of the countries in the world, girls are underrepresented in primary school enrolment with fewer than 9 females for every 10 males. This is also the case in lower secondary education for 9% of countries, for 15% of them in upper secondary and for 21% of countries in tertiary education. Girls also represent three-quarters of the children who may never enter a classroom (UNESCO, 2020a). This gender disparity must be taken into account.

preventing negative gender stereotypes, (4) representation of females in curriculum and textbooks in a way that does not perpetuate gender stereotypes, (5) access to comprehensive sexuality education, and (6) encouragement of women in leadership positions.

Second, it is important to develop cognitive and non-cognitive skills for all, as the performance of non-cognitive skills, such as self-esteem, is positive. The school environment generates conceptions of masculinity in peer culture, encouraging or inhibiting the development of boys' anti-school attitudes and behaviors (Legewie & DiPrete, 2012). Also, the development of women's non-cognitive traits, combined with their increased motivation in a patriarchal society, increases women's success opportunities. Increasing male access to higher education is the responsibility of the family and schools and requires the attention of policymakers (Lenette, 2018).

Third, it is necessary to act on boys' school disaffection, which subsequently translates into less interest in staying in school and furthering their education. A growing body of literature discusses boys' lagging educational achievement (Heyder, Kessels, & Steinmayr, 2017). The use of terms such as "the boy problem" or "the boy crisis" in these studies highlights a growing concern with boys' educational outcomes in public discourse. Research shows that traditional schooling favors female learning more than male learning and that social influences are stronger than biological influences in determining the gender gap in education. Therefore, boys are more affected than girls by the existing passive and monotonous learning-oriented environment, which is more suitable for females than males (Cappon, 2011). Therefore, substantial policy attention should be given to improving the learning environment by catering to males' and females' different learning styles while motivating them to pursue higher levels of education. Not surprisingly, the debate on how to rebalance the disproportionate female enrollments puts considerable pressure on public institutions of higher education, as it undermines the institutional goals of ensuring access to higher education. The "affirmative action for boys" proposal has sparked significant

debate in the media and among higher education officials about the fairness of gender-sensitive admissions (Conger & Dickson, 2017). (Bossavie & Kanninen, 2018).

Fourth, more research on the labor market regulations against discrimination of women in the labor market should be encouraged to understand better the gender wage gap and its evolution (Li & Zhao, 2020). Understanding the origins of the reversal of the gender gap in education also helps explain gender dynamics in other areas, especially in the labor market. For policy purposes, it is also important to identify whether differences in educational outcomes between genders have their origins in distortions such as social barriers and discrimination or, on the contrary, in optimizing behaviors based on possible gender differences in preferences or traits. Knowing the origins of the gender gap reversal can help determine whether policy interventions are needed to address the increasing disadvantage of boys in school and identify possible intervention areas (Bossavie & Kanninen, 2018).

More specific policy recommendations include the following:

- A coordinated effort by universities and governments to collect and share data on female participation in higher education.
- Better implementation of diversity policies and programs to increase women's full participation in higher education.
- Continuous assessment of diversity policies as well as of the outcomes of women's participation in HE.
- Mentoring and empowering of women to reach leadership positions.
- Wider use and enforcement of strategies for the prevention of and response to violence against women, both on national and HE institutions level, following best practices such as the ones promoted by UN Women.

- Development of pay transparency policies and initiatives, both on the national and HE institutions level.
- Development of initiatives and programs to help students make informed choices, free of gender bias, about their future fields of study and career.
- Development of strategies and campaigns (e.g., fairs, forums) to enhance female participation in traditionally male-dominated careers and improve stakeholders' understanding and participation in this regard. This might include career orientation to deconstruct false images of STEM and their biased connection to gender stereotypes.
- Development of gender-sensitive orientation with professional training in gender-responsive guidance for lecturers and counsellors.

6 Conclusion

Women's participation in higher education institutions is a highly debated topic, particularly taking into account the increasing number of women attending tertiary education worldwide. While women's access to HEIs has indeed expanded in many countries, their full academic participation in HEIs remain an area of concern. The assessment of this phenomenon, particularly in a pandemic period, is of great importance. To this end, and with a view to the celebration of the 2021 International Women's Day, this report gives a preliminary overview of some trends and patterns regarding women's participation in HE globally, including the main disparities which have hindered this participation.

The data gathered clearly shows that women still need to benefit fully from a fair participation in higher education. Despite the fact that women and girls constitute half of the world's population, their underrepresentation in various aspects is evident compared to the male population in higher education institutions.

The main disparities surrounding women's participation in higher education are related to STEM enrollments, achieving professorships and advanced degrees, and the wage gap. Moreover, the COVID-19 pandemic has exacerbated these unequal scenarios women around the world face, forcing female academics worldwide, particularly those in early career stages, to step back or postpone professional duties to accommodate household and children's chores.

This has a clear implication for higher education institutions, which should develop strategies and initiatives to further support women's participation in senior positions and promote their careers in a pandemic and post-pandemic scenario. Just as HEIs have diversity and inclusion access policies, they should have similar policies for women's full professional participation in HE. This would indicate that the institution is an equal opportunity employer, and that it encourages the academic development of women and minorities.

Overall, we can conclude that women still face a fundamental professional problem in academia: their full participation in the higher education system is still lacking, be it in the role of senior leaders, professors or researchers. Recent figures shown above demonstrate just how much still needs to be done to truly achieve women's full participation in higher education. In light of this, HEIs should take stock of this situation and serve as the ideal platform for encouraging women to become leaders, ultimately taking advantage of increased female leadership.

Consequently, there is an urgent need to consider the wide range of gender constructs that are not addressed when the conversation focuses solely on women in higher education and the crises associated with underrepresentation and advancement. The issue goes well beyond women's individual agency and needs to consider the structures or discourse that bind women in higher education settings. The career and economic outcomes of women in higher education need to be analyzed in ways that not only consider the benefits and costs of investment in higher education, the social mechanisms by which inequalities are perpetuated, and the attitudes and expectations that influence career and economic outcomes, but also the complex nature of gender in society. While recognizing the challenges of working with different frameworks, given their inherent incompatibilities, we argue that a thoughtful examination of the complexities, strengths, and limitations of each will lead to a more accurate basis for examining and understanding the relationship between gender and higher education outcomes, ultimately contributing to meet some targets of SDG 4 and 5.

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Annexes

ANNEX 1: Salary disparities in academia, by gender for US universities

Average Salary for Men and Women Full-Time Faculty, by AAUP Category, Affiliation, and Academic Rank, 2019-2020 (Dollars)								
Academic Rank	All combined		Public		Private-Independent		Religiously Affiliated	
	Men	Women	Men	Women	Men	Women	Men	Women
AAUP CATEGORY I (Doctoral)								
Professor	165,051	147,792	150,325	135,131	208,732	187,583	173,408	152,020
Associate	107,782	100,082	102,955	95,635	126,700	116,940	113,704	107,852
Assistant	95,501	85,950	91,136	82,397	114,005	101,944	102,493	91,269
Instructor	69,671	63,019	61,127	57,609	88,777	78,201	82,837	74,663
Lecturer	72,067	64,514	68,199	61,834	86,541	76,308	68,584	61,604
No Rank	84,396	75,263	71,417	64,930	100,621	92,445	114,850	100,018
All Combined	123,688	98,378	114,080	91,926	157,215	122,645	129,594	106,179
AAUP CATEGORY IIA (Master's)								
Professor	106,865	100,975	103,808	98,990	121,581	112,994	106,908	98,550
Associate	84,851	82,153	84,247	81,777	90,693	86,848	82,701	80,056
Assistant	74,792	71,783	74,700	71,462	78,560	75,725	72,530	70,146
Instructor	57,447	55,749	53,118	52,486	66,620	62,835	61,737	59,959
Lecturer	61,057	58,842	59,369	57,806	76,745	69,414	57,772	56,701
No Rank	63,548	59,254	58,992	54,479	79,549	73,022	64,537	60,336
All Combined	86,202	78,060	84,265	76,579	95,525	86,089	85,981	77,117
AAUP CATEGORY IIB (Baccalaureate)								
Professor	109,346	106,061	100,793	96,417	129,241	123,833	90,737	87,832
Associate	83,900	81,566	83,118	79,323	94,062	91,642	73,297	71,079
Assistant	70,547	68,448	69,944	67,400	78,674	76,482	63,025	61,641
Instructor	59,364	57,067	52,138	52,106	65,888	63,106	56,095	54,045
Lecturer	64,248	63,534	62,637	57,500	72,434	74,920	46,859	50,042
No Rank	75,034	67,533	85,274	61,587	70,394	70,726	65,864	59,573
All Combined	87,505	79,968	81,128	73,699	101,507	92,569	75,919	69,583
AAUP CATEGORY III (Associate's with Ranks)								
Professor	93,137	90,857	93,137	90,857	n,d	n,d	n,d	n,d
Associate	75,478	74,362	75,478	74,362	n,d	n,d	n,d	n,d
Assistant	64,042	63,957	64,042	63,957	n,d	n,d	n,d	n,d
Instructor	53,962	53,815	53,962	53,815	n,d	n,d	n,d	n,d
Lecturer	65,014	64,004	65,014	64,004	n,d	n,d	n,d	n,d
No Rank	57,577	45,061	57,577	45,061	n,d	n,d	n,d	n,d
All Combined	74,230	73,021	74,230	73,021	n,d	n,d	n,d	n,d
AAUP CATEGORY IV (Associate's without Ranks)								
No Rank	76,942	76,721	76,942	76,781	n,d	n,d	n,d	n,d
ALL AAUP CATEGORIES COMBINED EXCEPT IV								
Professor	146,613	127,583	137,314	120,713	185,289	158,836	126,913	112,219
Associate	98,497	91,742	96,586	90,009	112,152	103,239	90,316	85,688
Assistant	86,468	78,863	84,934	77,749	99,126	89,014	77,890	72,538
Instructor	64,866	59,976	58,369	55,816	80,336	72,030	69,877	63,644
Lecturer	68,539	62,786	65,283	60,535	84,081	74,986	62,252	58,217
No Rank	78,943	71,128	68,448	62,324	94,056	86,883	99,917	85,363
All Combined	110,033	89,633	104,383	85,981	137,079	107,958	98,407	83,430

Note: the table is based on 928 reporting institutions, For definitions of categories, see Explanation of Statistical Data. N,d, = no data, There were no private-independent or religiously affiliated institutions in categories III or IV.