IO1 - Recruitment, Retention and Progression framework testing

EUROPEAN COMPARATIVE REPORT

CONSOLIDATED BY WOMEN IN DIGITAL INITIATIVES ASBL LUXEMBOURG

Co-funded by the Erasmus+ Programme of the European Union

INDEX

INTRODUCTION 2

PARTNERS 5

GREECE - UNIVERSITY OF THESSALY 5
ITALY - CESIE 5
LUXEMBOURG - WOMEN IN DIGITAL INITIATIVES 6
UK - INOVA CONSULTANCY LTD 6
SPAIN - CESUR 7

WOMEN IN STEM: EUROPEAN OVERVIEW 9

COUNTRY'S CURRENT SCENE AT EUROPEAN LEVEL 16

LUXEMBOURG 16
SPAIN 19
ITALY 25
GREECE 27
THE UNITED KINGDOM 29

SUMMARY OF THE KEY FINDINGS FROM THE SURVEY WITH WOMEN IN STEM 32

METHODOLOGY 32
1. Evaluation of the respondent's soft-skills 32
2. Respondents' opinion on whether they are treated equally to men in STEM 34
3. Respondent's interest in the FemSTEM modules 36

SUMMARY OF THE KEY FINDINGS FROM THE SURVEY STEM COMPANIES 37

SUMMARY OF THE KEY FINDINGS FROM THE FOCUS GROUP 41

METHODOLOGY 41
The situation of women in STEM: education, work and identified barriers 41
Inclusion and diversity in companies offering STEM jobs 43
Opportunities for promotion within companies offering STEM jobs 44
Soft-skills trainings offered at their workplace and their interests in specific soft-skills 45

CONCLUSIONS AND RECOMMENDATIONS 47

ANNEXES: 50

REFERENCES 55

Introduction

The **Erasmus+ FemSTEM Coaching project** aims to **provide women in STEM with tools and techniques to develop their confidence and other soft skills** through a combination of **online training** and **peer-support** Coaching Circles™.

While STEM (Sciences, Technologies, Engineering and Mathematics) is a sector that is growing fast and has to face a shortage of workers, **the number of women in this field is often lower than that of men** (especially in engineering), which results in a **large gender gap**. In 2025, the European Union expects that the demand for STEM professionals will grow by 8%, which is much higher than the average need of professionals in other sectors.[1] Therefore, women's participation would be highly needed in STEM fields.

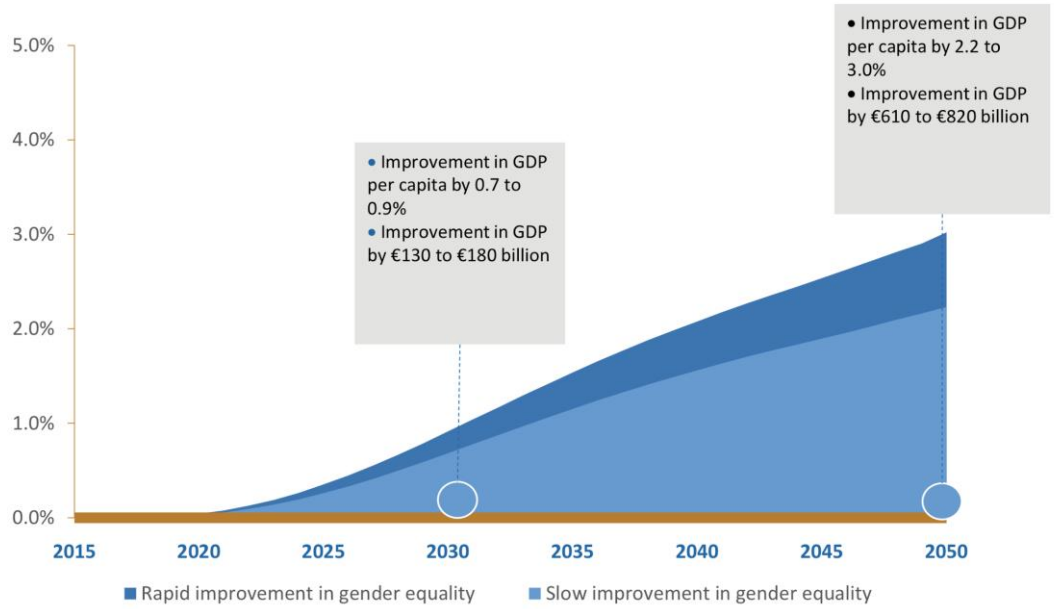
However, with this report, we are trying to confirm the several factors behind the reason why women are less represented in STEM, which have been identified in many reports in Europe as:

- A lack of female role models, which means that young girls do not have enough positive examples of successful women who made their way through these fields;
- Stereotypes and social norms keep women out of STEM;
- Sciences, technologies, engineering and mathematics are still seen as male fields, whereas educational or caring jobs are mainly considered as female careers;
- There is an important lack of female peers in STEM companies, which makes it difficult for women to stay in STEM companies (male-dominated sector);
- Girls are not aware of the possible careers and opportunities they might have if they decide to enrol in STEM studies;
- STEM fields are not considered as being family-friendly and there seem to be biased recruitment and promotion procedures.[2]

Finally, if women's participation in STEM is crucial to break persistent stereotypes, to provide role-models for young girls and thus attract more women in this field, it would also be beneficial for the European economy, as shows the graph below.

[1] EIGE, *Women in STEM: progress stalled or being eroded?*, dr. Jolanta Reingarde
[2] *Ibid.* EIGE.

Effect of narrowing the gender gap in STEM on GDP per capita



Source: European Institute of Gender Equality (EIGE), *Women in STEM: progress stalled or being eroded?*, dr Jolanta Reingarde

Along with a beneficial effect on GDP per capita, narrowing the gender gap in STEM would also have positive consequences on employment (see Annex n°1), with a (rapid) growth up to 1000.

For all these reasons, it is important to shed light on the difficulties that women face in STEM fields, and to help them overcome these, thanks to the acquisition of useful soft skills, among other support. In order to support women in STEM, the FemSTEM Coaching project aims to:

- Research the situation for women in STEM to create a comprehensive approach to address the challenges they face during their career.
- Establish an eCoaching programme for women in STEM.
- Create a face-to-face peer coaching programme for women in STEM.
- Develop the soft skills and employability skills of participants.

The target group for this project is all women in STEM. However, the project will focus on providing support for those facing a double disadvantage, including BAME (Black, Asian and Minority Ethnic) individuals, those from lower socioeconomic backgrounds, older workers, people with disabilities, etc.

This project serves as a tool for women in STEM to use for career development long after the end of the project.

As part of the first Intellectual Output (IO1) Recruitment, Retention and Progression (RRP) Framework, each partner of the project performed a country analysis to assess the current situation of women in STEM in their respective country. The purpose of this European comparative report is to highlight the needs and barriers of a woman within the STEM sector in order to create a training programme matching the expectations of this target group. This report serves as a summary of the background researches conducted in all partners' countries in the scope of the IO1 part of the project.

Partners

The FemSTEM Coaching project has been established in partnership with five European organisations:

GREECE - UNIVERSITY OF THESSALY

University of Thessaly (UTH) in Greece provides undergraduate and postgraduate programmes and extra-curricular modules in specific research and business fields, for over 43 000 students.

UTH aims to provide new concrete knowledge, to change paradigms, to aid society in its development and meet new challenges as they come along. The development of innovative and state of the art educational and training material through various project initiatives is the core philosophy of the institution following and demonstrating the vast experience as far as the STEM subjects are concerned.

Using STEM as a stepping stone, a variety of methodologies for youngsters and adults have been developed taking into consideration their personalised and tailored needs.

ITALY - CESIE

CESIE is a non-profit and non-governmental organisation based in Palermo (Italy) and established in 2001. Cesie is a European centre of studies and initiatives that promotes educational innovation, participation and growth and is committed to promote the cultural, social, educational and economic development at local, national, European and international levels. CESIE contributes to growth and development through the active participation of people, civil society and institutions, always valuing diversity.

Inspired by the work and life of sociologist Danilo Dolci (1924-1997), CESIE focuses its actions on the research of social needs and challenges and the use of innovative learning approaches. In this way, CESIE actively connects research with action through the use of formal and non-formal learning approaches.

The organisational structure is divided into 6 thematic units working in synergy and managing activities in their specific fields:

- Adult education

- School education
- Migration
- Youth
- Higher Education and Research
- Rights and Justice

The units are supported by 3 geographical departments (Local, European and International) and 4 transversal offices (Visibility and Communication, Networking, HRs, Financial).

Moreover, CESIE benefits from a broad network of partners with 3000+ civil society organisations, youth centres, social actors, schools, universities, research centres, public authorities, enterprises and entrepreneurs around the world.

LUXEMBOURG - WOMEN IN DIGITAL INITIATIVES

Women in Digital Initiatives Asbl is a non-profit organisation initiated in Luxembourg in 2013 and officially founded in 2014, currently acting as WIDE (Women in Digital Empowerment). WIDE's core activity is to offer a variety of programmes and trainings (coding, business and entrepreneurial) for women in STEM, especially women in digital while focusing on three pillars: Networking, confidence building and skill acquisition.

- WIDE's vision is to empower women with and thanks to digital as and to increase the number of women seizing their opportunities in the digital economy and society,
- WIDE's Mission is to offer practical support and activities to include more women and men in the field of digital as well as the contribution to build a more diverse workforce and a wider ICT talent pipeline for Luxembourg.

UK - INOVA CONSULTANCY LTD

Inova Consultancy LTD is the coordinator of the project. Inova has been running since 2001 and provides consultancy services in the area of entrepreneurship and career development, with a focus on diversity and equal opportunities. In particular, Inova's work has focused on supporting those who are under-represented or who face particular challenges to fulfil their potential in a professional setting. For example, Inova has worked extensively with women in non-traditional fields such as Science, Technology, Engineering & Maths (STEM) and our director, Marina Larios, is president of WiTEC, the European Association of Women in SET.

Inova works with a wide target group for which they provide a wide variety of training and support programmes, all co-funded by the European Union's Erasmus+ programme, to support others to become entrepreneurs or build careers following challenging times. This includes NEET young people, those aged 50+ and women who have been victims of violence, trafficking, homelessness or abuse, to name a few.

Many of Inova's programmes use coaching and mentoring to develop the 'soft skills' needed to be successful. They provide one to one coaching, workshops and Enterprise/Career/Mentoring Circles™ – the Circles are a series of products developed by Inova which combine mentoring, coaching and action learning to support individuals to reflect on and develop either a new or existing business, change or progress in their career or consider their personal life goals. This methodology was recognised by Aberdeen University business academics as a successful programme for the development of entrepreneurial skills.

SPAIN - CESUR

Cesur was founded within the Coremsa Group and is specialised in higher level vocational education and training geared towards employment.

CESUR has been accredited by the Ministry of Education and the Ministry of Employment to provide official training in Vocational and Educational Training (VET) as well as Professional Certificates (EQF levels 1, 2 and 3). Nowadays, CESUR is made of 19 reference VET centres due to its pedagogical proposal and educational quality. All centres are based in the most important Spanish cities: Madrid, Málaga, Sevilla, Zaragoza, Murcia, Cáceres, Ceuta Badajoz, Las Palmas de Gran Canaria and Santa Cruz de Tenerife.

From an academic point of view (Ministry of Education), CESUR is accredited to provide a large catalogue of VET courses. More than 93 different degrees are offered belonging to the most requested industrial sectors: Aeronautics, Health, Sports, Financial and Management, Trade and Marketing, Tourism, Audiovisuals, Computing and ICT. Those degrees are offered in three different modalities: under attendance (presence-based), online or dual system (work-linked training).

From a professional point of view (Ministry of Employment), CESUR is an official centre accredited to teach more than 250 Professional Certificates in presence-based and online modality. The aim of these degrees is to provide lifelong learning to employed workers as well as to unemployed adults through different public funds calls managed by either the state government or by the regional ones.

Both degrees categories, which means, VET as well as professional certificates degrees, offer a theoretical and practical curriculum since they all include a period of internship in a company within the industry. Doing and passing the internship period with success is mandatory in order to get the official certification. Currently, CESUR counts with more than 400 partner companies that welcome our students as host organizations for their internships.

Moreover, from **an international perspective,** CESUR has maintained a gradual but sustained continuous and growth trajectory participating in several international projects as beneficiary or partner.

Women in STEM: European Overview

According to a study conducted by the European Union, in 2021, around **45%** of the jobs will be part of the digital era and about **900,000 professional workers** will be needed in this field. Despite significant growth of employment in the digital sector, **women are still highly underrepresented in Science, Technologies, Engineering and Mathematics** (STEM). In fact, if women make up more than half of the European population, only **17%** of the ICT specialists are now women[3]. In order to examine the reasons for the low representation of women in these fields, it seems important to analyse their position during several phases of their career, using the RRP Framework :

- Recruitment
- Retention
- Progression

Recruitment

The underrepresentation of women in STEM is not only reflected in the **low number of women and girls who decide to enrol in STEM studies**, but also in the **proportion of women who have a career in STEM-related jobs**. At a European level, for example, the European Commission's study Women in the digital age (2018) underlines that only **24 out of every 1000 female tertiary graduates** have an ICT related subject, of which only **six ends up working in the digital sector**. This is a decrease as compared to 2011. In 2017, only **17%** of students in ICT were female (Eurostat). According to OECD, one of the main factors causing the low representation of girls in STEM studies/careers is their **lack of confidence in STEM**.[4]

Another reason why women do not opt for STEM studies in the first place can be explained by the fact that they are **less likely to find a job in this field**. For instance, the EIGE (European Institute for Gender Equality) report in 2014[5] demonstrates that **chances of employment for women graduating from STEM fields are lower than those of men**. In 2014, the employment rate of EU women STEM graduated at tertiary level was **76%**, which is 10

[3] European Commission, *Women in Digital brochure*, 2019
[4] OECD, *The ABC of Gender Equality in Education: Aptitude, Behaviour, Confidence.* https://www.oecd-ilibrary.org/education/the-abc-of-gender-equality-in-education_9789264229945-en
[5] EIGE Report, *Study and Work in the EU set apart by gender*, 2014

percentage point less than the employment rate of men in these fields, even though women and men both have the same qualifications.

According to the Women in the Digital Age report conducted by the European Commission, only 24 of 1,000 graduated women in Higher Education in the EU occupy positions related to new technologies. In fact, the **chances for women to find a job matching their educational background are higher for women graduates in fields such as education, health and welfare** (EHW) **than for women STEM graduates**, whereas the opposite holds true for men graduates in these sectors.[6] For instance, at the tertiary level, **only one-third of women graduated in STEM work in STEM occupations**, compared to one in two men. As for vocational education graduates, the gap is more important, since only **10% of women are working in STEM occupations**, against 41% of men. Finally, among the women graduated in STEM at tertiary level who do not work in this field, 21% work as teaching professionals and 20% of women with vocational STEM education work in sales.[7]

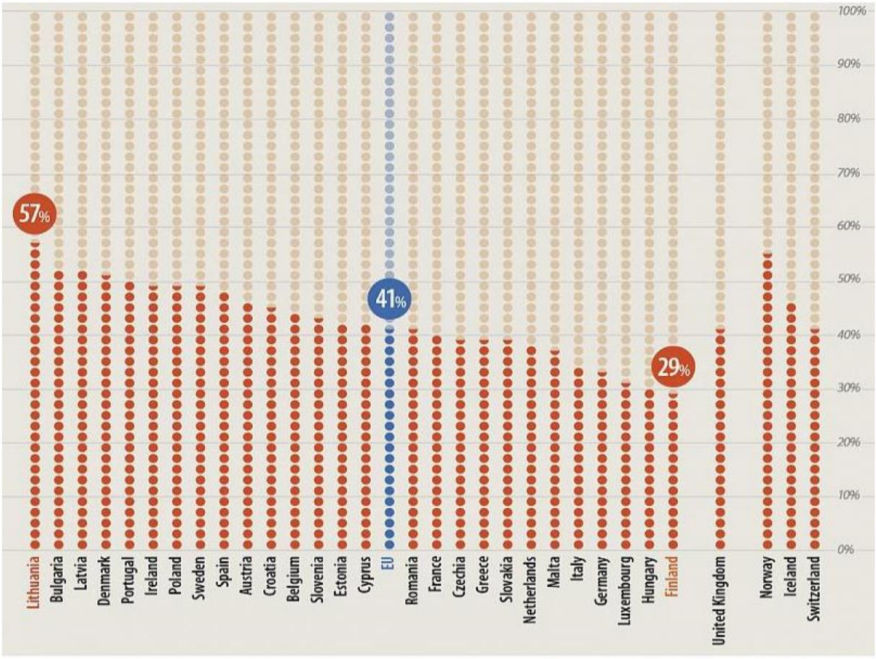
The table below[8] illustrates indeed that in 2013-2014, in the European Union, there are much **more men working in STEM occupations than women**. For example, the **EU average of men ICT professionals is 84%, whereas that of women is 16%**. Moreover, it also highlights that women are more represented in EHW positions. For example, the average of female personal care workers is 90% in the European Union.

Table 3: Proportion of women and men in STEM and EHW occupations (EU-28, %, 2013-2014)

		Men			Women		
		EU average	EU min.	EU max.	EU average	EU min.	EU max.
STEM	Science and engineering professionals	75	56	80	25	20	44
	ICT professionals	84	68	92	16	8	32
	Science and engineering associate professionals	84	71	91	16	9	29
	ICT technicians	82	65	91	18	9	35
	Building and related trades workers	97	94	100	3	0	6
	Metal, machinery and related trades workers	96	93	100	4	0	7
	Electrical and electronic trades workers	96	89	100	4	0	11
	Stationary plant and machine operators	67	37	82	33	18	63
EHW	Health professionals	30	11	55	70	45	89
	Teaching professionals	31	15	38	69	62	85
	Health associate professionals	20	6	48	80	52	94
	Personal care workers	10	2	19	90	81	98

[6] Report on Equality between women and men in the EU, 2018
[7] Report on Equality between women and men in the EU, 2018
[8] EIGE Report, Study and Work in the EU: set apart by gender (2013-2014)

The number of women employed as scientists and engineers **grew on average by 2.9% per year**[9] between 2013 and 2017. Then, in 2018, the proportion of female engineers and scientists in the European Union reached **41%**.



Proportion of women scientists and engineers in the EU (2018) (source: ec.europa.eu/eurostat)

However, in 2019, **only 1 in 3 STEM graduates is a woman**, **only 16% (1 in 6) ICT specialists are women**, women working in ICT **still earn almost 20% less than men** for the same job, and finally, **only 19% of ICT entrepreneurs in the European Union are female**[10]. These numbers highlight the growing necessity to include more women and to retain them in STEM fields, which is part of the objectives of the FemSTEM coaching project.

Retention:

Unfortunately, when women and girls decide to enrol in STEM studies or to pursue a career in this field, the drop-out rate remains quite important at all stages.

This is often linked to a **lack of motivation and poor self-concept**. In STEM subjects, women are proven to be **less self-confident than male students**, even if they have the same grades as them. For example, women who have no math skills, or who *believe* they do not have these

[9] She Figures, European Commission, 2018
[10] Women in Digital brochure, European Commission, 2019

skills, will seldom consider a career in STEM or to enrol in STEM studies.[11] As for the lack of motivation, this one often results from the general assumption that mathematics are a male-dominated field.[12]

Other factors should be taken into account regarding women leaving the STEM sector. For instance, **women tend to drop out in key phases of their life**, such as "childbearing" years and the **proportion of women decreases in higher position career grades**. Then, if women find themselves in leadership positions, **the lack of female peers plays also an important role in their decision to drop out**. Across the EU, **the proportion of women involved in high-level decision making is very low.** In Finland and Sweden for example, women occupied only a quarter of the seats on boards of important listed companies. In Ireland, Greece, Luxembourg, Italy, Estonia, Portugal and Hungary, only one in 10 board members were female.[13] These figures are even lower in technology firms.
The number of female executives in 25 manufacturing companies listed on the FTSE 100 keeps dropping, from 7 in 2013 to 6 in 2014, and finally to 5 in 2015, which highlights an increasing under-representation of women on boards in the STEM sector across the European Union.[14]

Finally, important differences between women and men still exist in terms of working conditions as researchers. For instance, in the EU, **the percentage of women researchers working part-time was higher than that of men**, since 13%[15] of women researchers were working part-time, against 8% of men researchers. Moreover, **8,1% of women against 5,2% of men researchers worked under contract arrangements identified as 'precarious employment'**, which might result in more women leaving the STEM sector.

Progression:

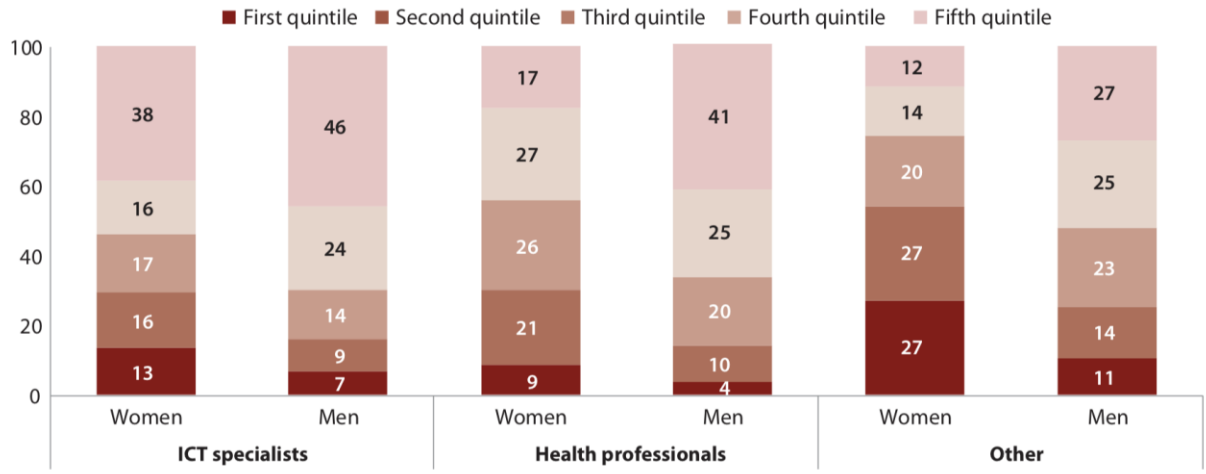
[11] Bernard Ertl, Silke Luttenberger, Rebecca Lazarides, M. Gail Jones and Manuela Paechter, *Gendered Paths into STEM. Disparities between Females and Males in STEM over the Life-Span*
[12] Ibid. Bernard Ertl.
[13] KGWI, *Women in STEM, why an inclusive strategy is critical to closing the science, technology, engineering and maths gender gap in Europe.*
https://fr.slideshare.net/thetalentproject/kgwi-women-in-stem-a-european-perspective
[14] Idem
[15]https://euraxess.ec.europa.eu/worldwide/south-korea/status-update-gender-equality-research-careers-europe-she-figures-2018

In terms of progression, it should be noted that women in STEM across the European Union are **less likely to be promoted**, **to reach positions of responsibility and are paid less**. Moreover, in 2019, only **one manager out of three is a woman** in the European Union.[16]

The Women in Tech Report by HackerRank in 2018 illustrates for example that **women developers remain longer in junior positions**. 20% of women over the age of 35 are still in junior positions according to this study[17], and women are 3,5 times more likely to remain in junior positions than men.

In addition to getting promoted later, **women ICT specialists are also paid less than men** (a gap of 13% in monthly earnings). It is important to note that this gap is less important in ICT than in health professions (a gap of 26% in monthly earnings), or other working fields (gap of 33% in monthly earnings).[18] However, inequalities in terms of income remain high between women and men ICT specialists. In fact, the figures below show that **70% of men in ICT are in the top two quintiles, against 54% of women**. Women have an average monthly income of 2 212 euros, which is lower than the monthly earnings of men (2 538 euros).[19]

Figure 18: Income quintiles in the EU-28, by occupational group and gender (20-64, %, 2015)



Source: EIGE calculation based on EWCS 2015 microdata.
Note: The income quintiles were calculated considering the entire working population within each country.

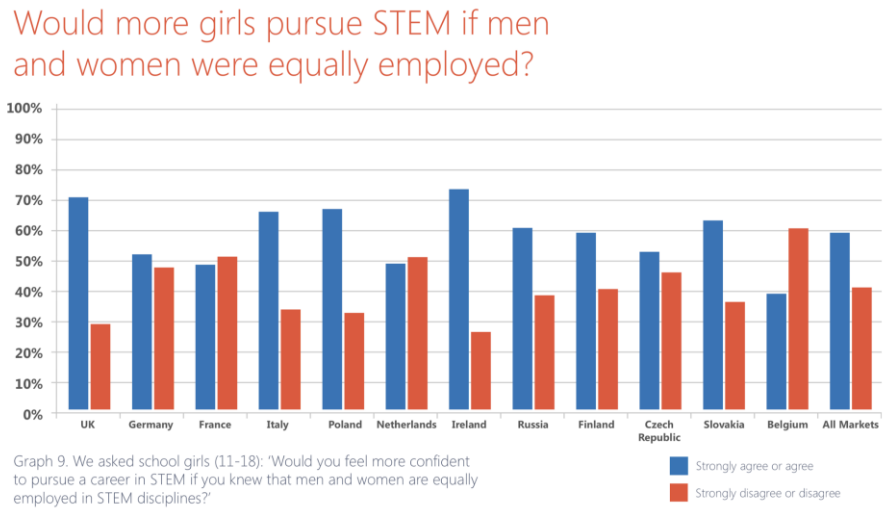
[16] https://ec.europa.eu/eurostat/documents/2995521/9643473/3-07032019-BP-EN.pdf/e7f12d4b-facb-4d3b-984f-bfea6b39bb72#:~:text=Nearly%209.4%20million%20persons%20hold,3.4%20million%20women%20(36%25)
[17] HackerRank, *Women in Tech Report*, 2018 https://research.hackerrank.com/women-in-tech/2018
[18] European Institute for Gender Equality, *Women and Men in ICT: a chance for better work-life balance*
[19] Idem

Source: European Institute for Gender Equality, *Women and Men in ICT: a chance for better work-life balance*

There is also still a **considerable gender pay gap in scientific R&D occupations**. Across the European Union, women in R&D earned around 17% less than men in 2014[20].

Furthermore, women also tend to be **underrepresented in the writing of scientific papers**[21]. For instance, between 2013 and 2017 in the EU, the **ratio of women to men among scientific publications authors was one to two**. However, since 2008, we remark that the situation improved since this **ratio has been increasing by almost 4% per year**. The highest proportion of women authors was observed in the fields of medical and agricultural sciences.

The inequalities mentioned above might have important consequences. In fact, research conducted by Microsoft shows that in 10 European countries out of the 12 countries who participated in their study, **girls believe that if they would be equally employed, they would feel more confident to pursue a career in this field**.[22]

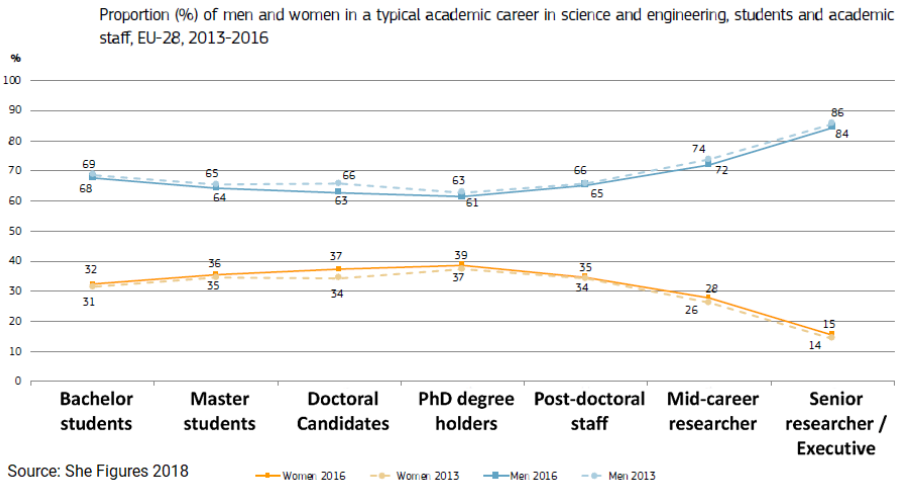


Source: Microsoft study, *Why Europe's girls aren't studying STEM*

Finally, according to a study conducted by the European Commission, the share of women is considerably smaller in STEM than in other fields of study, affecting both tertiary education levels and higher career grades. As shows the graph below[23], **the presence of women gets**

[20] https://euraxess.ec.europa.eu/worldwide/south-korea/status-update-gender-equality-research-careers-europe-she-figures-2018
[21] Idem
[22] Microsoft Study, *Why Europe's girls aren't studying STEM*
[23] https://euraxess.ec.europa.eu/worldwide/south-korea/status-update-gender-equality-research-careers-europe-she-figures-2018

smaller in higher career grades, such as post-doctoral staff, mid-career researcher and senior researcher/executive. In these positions, women's progression in STEM is slower than that of men. For instance, in 2016, **72% of all mid-career researchers in the EU were male, whereas only 28% were female**. This gap is even more important in Senior researcher/executive positions, since **in 2016 84% of the researchers across the European Union were men, against only 15% women**.



Country's current scene at European level

This part of the report is based on research conducted by each partner of the FemSTEM project and aims at illustrating the main findings and figures collected during the IO1 researches.

LUXEMBOURG

In 2019, Luxembourg's population reached nearly 614,000 people, among which women accounted for 305 174 people, whereas nearly 309 000 were male. These numbers are important to take into account when looking at figures regarding women in STEM.

Recruitment of women in STEM studies and careers

First, concerning women and girls enrolled in ICT studies, it is important to underline that in 2015, **among all women who graduated in Luxembourg, only 10% graduated in the ICT field**[24]. That same year, about 12% of ICT specialists were female[25]. In 2016, education statistics by the European Commission, indicate that the number of women who graduated in journalism, social sciences and information (68%), or in arts and humanities (64%) was considerably higher than the proportion of women who graduated in the fields of natural sciences, mathematics and statistics (50%).[26] The SHE figures from 2018 show however that the field of natural sciences, mathematics and statistics was the most popular field among female doctorates in Luxembourg in 2016.

Moreover, figures from the European Commission show that few women decide to enrol in STEM studies in the first place. In 2016 for example, **nearly 9% of Luxembourgish ICT students were female**[27]. Two years later, in 2018, the proportion of female students in ICT remains at 9%.[28]

[24] See annex n°2
[25] See annex n°2
[26] Eurostat 2016, see annex n°3
[27] Eurostat 2016, see annex n°4
[28] Eurostat - Share of female students in ICT studies

As for the **proportion of female ICT specialists in employment, in 2017, 13%[29], of ICT specialists were women**, whereas the percentage of both female scientists and engineers reached 25%[30]. Finally, in 2017, there were **almost 10 times more men than women who are working in the fields of science, technology, engineering and mathematics** (STEM) in Luxembourg.

Concerning the number of female researchers in the higher education sector, the graph below shows that in 2015, **21% of the researchers in the fields of engineering and technology were female**. In the **field of medical and health sciences**, this percentage was more important, since **40% of the researchers in this field were women**.

Table 4.2 Evolution of the proportion (%) of women among researchers in the higher education sector, by field of research and development, 2008–2015

	2008						2015					
	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities
BE	32	19	50	43	47	42	33	22	52	46	50	49
BG	43	30	55	35	47	57	54	34	55	42	54	60
CZ	24	24	46	36	42	37	31	22	47	35	43	40
DK	29	22	47	53	47	47	30	24	52	41	47	46
DE	26	17	44	44	33	46	32	20	50	50	44	49
EE	38	27	60	42	57	63	40	32	56	45	60	61
IE	30	18	58	49	47	48	36	26	60	53	53	52
EL	30	31	40	33	36	48	37	32	45	34	39	41
ES	39	36	41	38	40	40	42	38	44	41	43	43
HR	41	31	52	44	52	52	48	37	56	44	61	58
IT	38	23	31	35	39	50	43	27	37	40	43	53
CY	30	21	59 (10/17)	25 (2/8)	38	47	33	30	42	30 (3/10)	41	47
LV	40	30	60	50	63	70	41	37	61	58	64	68
LT	44	33	59	50	66	63	45	35	62	56	65	65
LU	25	19	-	-	46	:	21	21	40	-	57	48

Source: SHE Figures 2018, European Commission

In terms of senior academic staff, the graph below indicates that in Luxembourg, in 2016, there is an **important gap between the number of male senior academics and female senior academics.** This gap is quite important in fields such as engineering and technology (2 women against 17 men)[31].

[29] Eurostat 2016, see annex n°5
[30] Eurostat 2017, see annex n°6
[31] SHE figures 2018, European Commission, see annex n°7

Generally speaking, in 2016, according to the Eurostat-Statistics, only **one-fourth of researchers and engineers in Luxembourg are women**, whereas the EU average is 40%.

Retention of women in STEM studies and during their career

To address the underrepresentation of women in science and engineering in Luxembourg and to understand the reasons preventing women from choosing these sectors, WiSE (Women in Science and Engineering) colloquiums are organised. In 2018, around 100 participants (politicians, research administrators, engineers and researchers) concluded that to include and retain more women in these fields, more **flexibility for researchers with children** has to be offered. Moreover, **female role models should be promoted and a gender-sensitive workplace has to be created**. Another important conclusion is the need for a **gender-balanced model for parental leave**. These are important factors that could help retain women in STEM in Luxembourg.

Progression of women's career in STEM

In 2018, a new study conducted by the European Commission shows that the number of ICT specialists was fairly the same as in 2017, since 12% of ICT specialists in Luxembourg were female. However, **in 2018, the percentage of both female scientists and engineers reached 31%**[32], which is a considerable improvement compared to 2017.

Luxembourg does not indicate what percentage of women do have a manager position in the field of STEM. However, in 2019, Luxembourg ranks 3rd, with a score of 66.5, for the Women in Digital (WiD) scoreboard[33]. The Women in Digital scoreboard is a tool created by the European Commission, which aims to measure and assess the participation of women in the digital economy. To do so, the WiD scoreboard evaluates several indicators. Among those indicators, the European Commission evaluates, for example, the basic digital skills by age and by gender. We see that, when it comes to girls between 16-24 years old, 81% have basic digital skills, which is slightly higher than boys, since 80% among the boys in Luxembourg have basic digital skills. Regarding the age range from 24-54 and 55-74, we see that the gap in terms of digital skills is more important and that women are less skilled than men in this field.

[32] Eurostat 2018, see annex n°8
[33] Women in Digital Scoreboard Luxembourg 2019, see annex n°9

Furthermore, according to these figures, 12,5% of Luxembourgish women were ICT specialists in 2019, which is a bit more than in 2018 (12%).

SPAIN

In 2019, Spain's population reached 47,100,396, among which around 24 000 000 people were female. Despite the growth of the digital economy, female representation has raised very little within the last 20 years in this industry.

Recruitment of women in STEM studies and careers

In this context, in Spain, even if rates of women enrolled and graduated in University (54.8%) is greater than men (45.20%), their attendance at Engineering Colleges is still much lower: over 5 engineering students, only one is a woman. According to data provided by Eurostat, the average of female STEM (Science, Technology, Engineering and Mathematics) students in Spain is 7.6%, while the European Union average is around 9%. Even if this data could be considered as a positive thing, if the participation of women in this industry is deeply observed, it can be observed that for those industries that are not socially stigmatized, such as Mathematics or the ones related to Architecture or Industrial Design, the rate of women is much greater than in those Degrees socially identified as "for men" such as Computer Engineering, Software and Applications Development, Video-games Development, Computer Science, Mechanical Engineering, or Electronic, Industrial and Control Engineering. In those programs, women attendance is below 15%.

According to the data collected in the "Women in the Digital Age" report by the European Commission, only 24 over 1,000 graduated women in Higher Education in the EU are working in positions related with new technologies.

In Spain, the Ministry of Education has published on its website the statistic data related to enrolled students during the 2018/2019 academic year, in which the following information is provided:

Students enrolled at University during the 2018/2019 academic year in Spain

	DEGREE	MASTER	PHD
Total of enrolled students	1,293,892	214,528	86,619
Men	579,419	97,890	43,236
Women	714,473	116,638	43,383

Students enrolled in STEM programs at University during the 2018/2019 academic year in Spain

	DEGREE	MASTER	PHD
Total of enrolled students	262,202	44,272	20,407
Men	189,569	31,008	13,630
Women	72,633	13,264	6,777

The comparison between women and men in the number of enrolments in concrete areas of the STEM field is the following:

Degree programs

STEM area – 2018/2019 Year	Women	Men
Engineering	33,356	99,785
Mathematics and statistics	5,265	8,584
Physical, Chemical and Geological Sciences	13,690	19,007
Computer Sciences	6,450	43,410
Architecture and Construction	13,872	18,783

There is a notable negative evolution regarding female attendance with Computer Sciences programs. The percentage of women enrolled during the first recorded year (1985/86 academic year) was 31%. Since then, the percentage has been decreasing, unless in 2002

where it was 30% again, to continue decreasing until 2016/17 (last year with closed published data), when this percentage was on 11.9% over the students enrolled in that degree program.

Master Programs

STEM area – 2018/2019 Year	Women	Men
Engineering	**6,531**	**17,561**
Mathematics and statistics	**723**	**1,797**
Physical, Chemical and Geological Sciences	**1,640**	**2,534**
Computer Sciences	**1,436**	**5,187**
Architecture and Construction	**2,934**	**3,929**

It can be observed that, in general, in Master programs, male attendance is also higher. Specifically, in computer sciences programs it is where men rate is the highest (78.3%), compared to enrolled women (21.7%).

PhD programs

STEM area – 2018/2019 Year	Women	Men
Engineering	**2,431**	**6,005**
Mathematics and statistics	**341**	**706**
Physical, Chemical and Geological Sciences	**2,624**	**3,775**
Computer Sciences	**409**	**1,527**
Architecture and Construction	**972**	**1,617**

Higher Education VET programs

In Vocational Education and Training (VET) programs, data are not better. Even if, in general, in the frame of Higher Education VET programs, the number of enrolments comparing male and female is not very different, (192,826 men facing 160,408 women in the 2018/2019

academic year), the reality is that there is only 12.56% of female enrolments in the STEM area facing 87.43% of male.

Students enrolled in VET centres during 2018/2019 academic year

	Higher education VET programs
Total of enrolled students	353,234
Men	192,826
Women	160,408

Students enrolled in STEM programs in VET centres during 2018/2019 academic year

	Higher education VET programs
Total of enrolled students	82,972
Men	72,544
Women	10,428

If the comparative between men and women is more detailed, paying attention to concrete areas within the STEM sector in Higher Education VET programs, the results are the followings:

Higher Education VET programs

STEM sector area 2018/2019 academic year	Women	Men
Computing and Communications	3,831	35,407
Construction and Civil Works	1,232	2,528
Electrics and electronics	1,232	21,631
Energy and Water consumption	127	1,610
Mechanical manufacturing	848	8,468
Chemistry	3,158	2,900

Only in the Chemistry professional family, it can be observed a greater number of female enrolments facing the male ones. In the rest of the programs, male enrolment is more than 50% respecting the female enrolment.

Retention of women in STEM studies and during their career

The difficulty to balance work and family life is one of the main reasons why women break their professional careers or reject it in all business sectors. Since they turn 30 years old, the balance of family and work is one of the most important variables that set professional priorities between men and women.

Generally, women are who usually take care of minors, sick people and elders in the family. This way, according to the data provided by the Spanish National Employment Institute, 92% over almost 44,000 unpaid leaves that were approved in 2017 for childcare was requested by mothers, facing 8% that was requested by fathers. Regarding the 11,234 unpaid leaves that were approved for taking care of other dependent relatives, 84% of them was requested by women, facing 16% requested by men.

When it is not possible to request unpaid leave, maybe for financial, professional or personal reasons, women usually ask for a reduction of their working hours. According to the data collected by the Spanish consultant AFI, for the report titled “ClosinGap. Women for a Healthy Economy: Brecha de Género y Conciliación (2019)”, 24.2% of the total of female workers in Spain worked part-time in 2017, a percentage three times higher than males (7.3%). One over five women chose working part-time with the aim of being able to balance their work with taking care of children, sick relatives, dependent or elder people. That means, more than 400,000 women had to reduce their working hours to take care of their families.

To this social role of women as caregivers, it must be added their “responsibility” of carrying out daily activities related to housekeeping. This is a task in which women spend approximately two hours more than men.

Their situation gets even more complicated if they are mothers. Despite this is a shared responsibility, the fact of having children affects in a negative way to women professional careers. The research “Maternidad y Trayectoria Profesional” (2017), created by the IESE Business School and UIC Barcelona, points out that 40% of Spanish women did not have the chance to access to employment, and 35% of them have not been promoted because of the fact of being mothers.

In many cases, coordinating all these responsibilities is impossible, and the only option they have is to break their professional career. The data provided by AFI consultant for the report ClosinGap indicate that 22.6% of women end up breaking their professional careers to take care of their family and household chores, facing 2.5% of men.

The research “Romper la brecha salarial. Una cuestión de justicia” (February 2019) by Comisiones Obreras (Spanish workers committees) reveals that 63% of women who leave the labour market do it because they cannot afford the services needed by the care of minors, elder, sick or disabled people in their families.

The lack of financial and human support in terms of dependency, the absence of day centres for minors, the few numbers of public residences, the impossibility of access or to afford to these services and the lack of and the need of flexible working hours are some of the reasons why women are forced to break temporally their employment contracts and their professional development. 8.3% of these women (over 7,000 people) gets out of the labour market every three months.

Progression of women's career in STEM

In Spain, the research titled “Mujeres en el mercado de trabajo, mujeres pensionistas y mujeres migrantes en el siglo XXI” [*Women in labour market, retired women and migrant women in XXI century*] (2019) created by the Ministry of Labour, Migrations and Social Security, states that in Spain, women earn 22.35% less than men in an average per year. Also, they have two of every three precarious jobs within the labour market.

The report by the Ministry of Labour analyses how the last 15 years have been (2003-2018). It confirms how slow the progress towards real equality between men and women is within the labour market. It also identifies the gender pay gap as one of the consequences of the precariousness of the employment of women. Currently, women in Spain earn around 15% less per working hour and €6,000 less per year’s salary than men.

In the STEM sector, where the average wage is much higher than in other sectors (22.1% more for women and 22.2% for men), the gender pay gap also exists; although it is smaller, around 8.9% according to the report “Mujeres en la Economía Digital en España” [*Women in Digital Economy in Spain*] (DigitalES – 2018). This indicates that within the technological

industry, there is less gender pay discrimination than in other sectors, and the salary difference between men and women in the same positions is less.

ITALY

Recruitment of women in STEM studies and careers

The promotion of gender-atypical fields of study still remains a main challenge. In fact, in Italy the existence of “typical” female fields of study as well as “typical” male fields of study is still present, with women predominantly engaged in fields of humanities, healthcare and education.

For example, the gap between males and females in IT is one of the highest in Europe. Only around 30% of the total graduates in IT are women. At the same time, the number of women enrolled in the fields of “science, maths and computing” as well as “engineering, manufacturing and construction” in Italy is above the EU average.

However, 30% of these women find jobs that don’t allow them to make use of their studies. Many reasons explain this phenomenon, but mainly this happens since Italian STEM labour market remains male-dominated.

In the past 10 years, the distribution of women graduated in the STEM sector in Italy was the following: Engineering 23.5%, Architecture 54.8% and Science, including Mathematics, 36.5%.

The employment rate in Italy is 58.8%, which is some points below the average in the EU (68.4%).

Retention of women in STEM studies and during their career

There are a few main levels, on which women face significant challenges and barriers which might have a negative impact on their retention in STEM.

- ***Societal level***

Even though Italy has a developed legal framework for the equal representation of women in all fields, there are notable cultural and societal stereotypes that often hold women back. The current society that sees a woman as a mother and a homemaker represents a strong obstacle for women who aspire to pursue careers in STEM.

- ***Organisational level***

Unemployment in Italy remains historically high and the demand for specialists is quite low, hence many young female specialists chose to move to another country or to change career.

The duration of maternity leave in Italy is only five months, and distance work is not a usual practice. The high costs for childcare services and the limited number of places in kindergartens are often named as one of the main reasons why women have difficulties with combining professional and private life in Italy. Hence, many of them are forced to start working part-time or abandon their careers.

Investments in research and innovation, as well as the level of public-private cooperation in scientific research and development in Italy are quite low.

Female participation in the labour market remains low also due to weak labour policies.

- ***Individual level***

Many women want or need to have a flexible work schedule in order to achieve work-life balance. This often puts many female professionals in a position where they need to choose a lower salary, part-time employment or a less interesting job offer in order to be able to continue working.

Progression of women's career in STEM

Between 2007 and 2014 the proportion of the population in the labour force increased, an unusual development given the increase of long-term unemployment and the protracted slack of labour utilization. However, the youth unemployment rate is at 28% and there is still a noticeable lack of opportunities, both in the academic and industrial sector. Hence, a significant amount of young Italians is choosing to move to other EU countries in order to pursue a career in STEM.

The current percentage of women on boards reaches 11.0% in the largest publicly listed companies in Italy (FTSE MIB index), which is below the EU average (15.8%). Women account for 12.9% of non-executive directors in the largest publicly listed companies and 3.9% of executive directors. Both figures are below the respective EU averages (10.2% and 16.8%).

The female representation in the Italian government and parliament are 40% and 30% respectively.

Last 10 years have seen a positive trend for Italy. The female share in STEM positions, business environment and even corporate boards have increased considerably, but the

challenge for the establishment of gender equality remains and the numbers are still lower than the EU average.

GREECE

The United Nations Educational, Scientific and Cultural Organization (UNESCO) released the report on the participation of women in science on November 10, 2015. Some statistical data for Greece are collected in order to inform and sensitize the institutions and the citizens, in general.

Recruitment of women in STEM studies and careers

- Regarding female students and candidates for a doctorate degree, women represent a percentage of 48%,
- Women researchers in Greece are estimated to represent the 37% of the countries' researchers,
- The employment rates of women researchers in our country are distributed as follows: 48% work in the public sector, 36% in academic and 31% in the private sector,
- The areas of research that Greek women choose to follow prove that stereotypes are present: physical sciences 31%, engineering and technology 30%, medicine 43%, agriculture 33%, social sciences 38%, Humanities 54%.

According to data published by Eurostat in 2018[34], on the occasion of International Women's and Girls' Day in Science, there were about 15 million scientists and engineers in the EU, when 59% were men and 41% women, Cyprus ranks close to and above the EU average of 42% followed by France (40%) and Romania (41%), when Greece along with the Czech Republic and Slovakia follow with 39%.

Retention of women in STEM studies and during their career

Despite the international progress on women's access to education at all levels, the challenges and obstacles to women's retention and advancement in their professional careers remain, especially in STEM fields. In general, women face difficulties in retention and promotion in the workplace, while the pay gap between men and women is still evident in some positions.

[34] https://ec.europa.eu/eurostat/web/products-eurostat-news/-/EDN-20190211-1

The main obstacles that women face in their professional development are summarized as follows:

- family obligations and motherhood
- division of professions into "male" and "female"
- wage inequality - gender pay gap
- stereotypes about the roles of both sexes, which often lead to a lack of ambition, vision and trust
- restrictions on access to specific occupations and sources of funding
- lack of management experience
- sexual harassment.

According to the report by the European Commission entitled "Women in Digital (WID) Scoreboard"[35], women represent only 34% of STEM graduates in Europe while the corresponding percentage in ICT studies reaches only 17%. At the same time, the corresponding skills and jobs are considered critical for the European economy and development.

As it is stated in the She Figures 2015[36], in Greece, women in higher education make up only 35.6%, which is lower than the EU average at 41%. In government agencies, Greek researchers are above the average of 48.1% (in the EU the average is 41.6%), while their presence in entrepreneurship is also dynamic with a percentage of 30.8% (in the EU the average is 19.7%).

Progression of women's career in STEM

As for financial data, male researchers in Greece occupy an overwhelming percentage (74%) of research positions in the private sector, where wages and opportunities for career progression are higher, while female researchers are mainly employed in the public sector and in research institutes, where they constitute 50% and 39% of the workforce, accordingly. Wage disputes also persist between men and women in the Research and Development sectors. In 2010, the average wage for women per hour was 18% lower than for men.

In 2014, the percentage of women with leading positions in higher education institutions was 20%, despite an increase of 4.5% compared to 2010, with Greece below average, at 13.5%. Women, who participate in scientific and administrative committees, in European Union

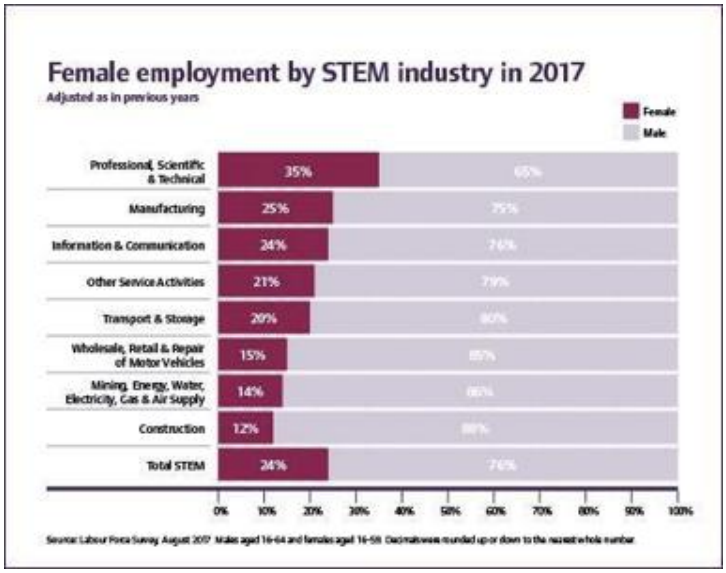
[35] http://ec.europa.eu/digital-single-market/news-redirect/652562
[36] https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-final.pdf

countries are at 28% (in Greece it is at 11%) and only 22% have a leading position in a committee (in Greece it is at 5%).

As it is stated in the She Figures 2015[37], in Greece, women in higher education make up only 35.6%, which is lower than the EU average at 41%. In government agencies, Greek researchers are above the average of 48.1% (in the EU the average is 41.6%), while their presence in entrepreneurship is also dynamic with a percentage of 30.8% (in the EU the average is 19.7%).

THE UNITED KINGDOM

In the UK, in 2017, women made up 24% of the STEM sector, as can be seen from the data below. Despite this low representation, the **percentage of women in both academia and the industry is growing**. Steps must be taken to ensure that STEM can cater to the needs of women.



Recruitment of women in STEM studies and careers

During the academic year of 2017/18, women made up 35% of the students in core STEM subjects at universities in the UK (as can be seen in the data above). Evidently, girls are being deterred from opting to study STEM-related subjects. This aversion to the field of STEM occurs even though girls perform as well as or outperform boys in STEM classrooms across Europe. Irrelevant of strength and ability, the OECD has found that many girls around the world lack

[37] https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/she_figures_2015-final.pdf

confidence in STEM, and therefore they do not pursue an education or a career in this sector. It is necessary that there are initiatives and training programmes which tackle this issue.

In the UK, the WISE Campaign aims to create gender balance in every aspect of STEM, including the classroom. In order to do this, the organisation hosts events for girls which encourage them to consider studying and working in a STEM-related subject. In addition, the WISE Campaign has highlighted the fact that if companies do not employ women, they will "get left behind". In recent years, there has been an educational push to get girls to study STEM-related subjects in the UK.

Retention of women in STEM studies and during their career

Moreover, as well as there is a low number of women in STEM, there is also a high number of women who drop out of the industry as it is unable to cater to their needs. This is the case in many industries as women take a career break to raise children or care for elderly parents. In STEM, this is particularly relevant and has been labelled the 'Leaky Pipeline', as women in the UK leak out of the sector. Those who return to STEM after their break often face a penalty and are ignored by recruiters and managers due to the gap in their CV. However, between 2017 and 2018 in the UK, roughly the same numbers of women and men left the STEM sector; therefore, there appears to be a move towards gender parity in STEM.

As a result of negative perceptions of those who take a break from STEM, many talented individuals are lost from the sector. The Institute of Marine Engineering, Science and Technology (IMarEST) and Women's Engineering Society (WES) have created a programme to support STEM returners both in the UK and further afield. Those returning to their field can access paid placements, career coaching and mentoring to ensure they can return to work. Moreover, STEM Returners https://www.stemreturners.com/ is an initiative in the UK which supports professionals in the industry as they transfer and return to work.

Progression of women's career in STEM

Despite pressure from both men and women to make STEM a more equal industry, there continue to be unbalanced gender roles, particularly in managerial positions. Women make up 24% of the STEM workforce, but only 15% of managerial positions (as can be seen in the data above). This lack of female role models can be off-putting for women who are eager to progress in the industry.

The WISE Campaign in the UK aims to support women in various areas of STEM to network and progress in the field. This campaign is eager to create gender balance in every area of STEM, right up to the boardroom. Therefore, women are supported in their endeavours to

succeed in the field and gain fulfilling careers. The WISE Campaign works with various high-profile organisations, such as the NHS and Network Rail to achieve these goals and make STEM a more hospitable field for women.

Summary of the key findings from the survey with women in STEM

METHODOLOGY

In addition to the desk research, the consortium of the project created two questionnaires directed to two different target groups, women in STEM and companies recruiting in STEM, in order to collect additional insights. The goal of the survey was also to involve potential participants and design the programme based on their insights and the identified needs. Each partner had to collect at least 10 answers for each questionnaire.

To collect the answers of these questionnaires, we chose to create an online format, using the "Google Form" tool.

Number of participants in each country:

Spain: 13
Luxembourg: 11
Italy: 12
Greece: 10
UK: 20

In total, 66 women answered our questionnaires. Concerning their background, a **majority of the respondents have a Master's degree**. Some of the participants have a bachelor degree or a PhD degree. As for their working status, most of the respondents **have studied STEM and are currently working in STEM.** Only the Greek survey highlighted that 40% of the women graduated from STEM but are not working in this field, whereas 30% of them are.

1. *EVALUATION OF THE RESPONDENT'S SOFT-SKILLS*

The first part of the survey aimed at understanding better how women evaluate their **soft-skills**. Therefore, we asked the participating women to react to various affirmations.

To assess their **creative thinking** for example, we asked them to react to the following statement “I can turn creative ideas into workable solutions”. A majority of the respondents reacted positively to this affirmation.

Then, regarding their **capacity to work across cultures**, most women agreed with the assertion “I am aware that in order to learn more about others, I need to understand and be prepared to share my own culture”, which underlines that the respondents believe that they are capable to work in a multicultural environment.

Our surveys also indicated that most women see themselves as being **able to work in teams and to reach a consensus when there are disagreements**. For instance, when they were asked to react to the assertion “When there are different opinions within a group, I encourage people to talk about their differences until a consensus is reached”, a majority of them agreed.

As for the way women evaluate their **interpersonal communication skills**, the surveys indicated that opinions differ a lot. Whereas in some country surveys women indicated that they find it easy to establish good relations with colleagues, in others this soft-skill was poorly rated.

Concerning **women’s ability to speak in public,** responses were varied as well. In fact, in three surveys, a majority of the respondents stated that they are not afraid to speak in public, whereas the other two surveys underlined that most women do not feel comfortable speaking in front of others.

Furthermore, a majority of the respondents positively assessed their **time-management and self-organisation skills**, agreeing with the fact that they are able to be **proactive** and to **take initiatives**. For instance, only one survey underlined that most women do not see themselves as proactive and able to take initiatives.

Almost all of the women positively evaluated their **critical thinking and reasoning**, since most of them agreed with the following assertion “I am able to understand other viewpoints, interpretations and perspectives”.

Then, the affirmation “I give positive feedback to my colleagues when appropriate, I am sensitive to the implications of my decisions” aimed at assessing **the way women evaluate their leadership**. Almost all the respondents answered either “strongly agree” or “agree” to this.

In our surveys, we also noted that the women who answered our questionnaire mainly **take responsibility for their feelings, emotions, thoughts and actions**, which helped us to

evaluate the way they perceive their **level of personal awareness.** Only a small part of them disagreed with this aspect, whereas the average agreed.

Finally, the statement "**I remain patient as I deal with day-to-day issues and problems in my workplace**" received varied responses from the respondents. Whereas some women strongly agreed or agreed, others disagreed or answered with "neutral".

2. *RESPONDENTS' OPINION ON WHETHER THEY ARE TREATED EQUALLY TO MEN IN STEM*

This part of the survey aimed to evaluate if women feel that they are **treated equally with men at work.**

First, a **small majority**[38] of the respondents believe that **women and men are treated equally in terms of recruitment,** whereas a **high majority** of them believe that they are **treated equally** in terms of **jobs advertisement and training and development**. Only a small proportion of them think that women are treated less favourably in these parts of their career.

Almost all the respondents agreed on the fact that women are still **treated less favourably** when it comes to **salary and opportunities for promotion**, which reveals that there are still important inequalities in STEM leadership positions between women and men.

Finally, regarding **performance**, the answers were varied. If in some surveys almost all respondents believed that women are treated less favourably, other surveys contradict this point and underline that women believe that they are treated equally regarding their performance.

Moreover, in STEM fields, **role models are very important for women**. In our surveys, most of the women believe they have inspiring role models in STEM. Only a small part answered that they do not have any role models in STEM. Most of the time, these role models were:

- Female colleagues
- Female scientists
- "My university lecturers who have made powerful progress in the world of STEM"

[38] In fact, in three surveys, the proportion of respondents who believe that women are treated equally regarding recruitment and those who believe that they are treated less favourably than men, is almost the same.

- “Female PIs in my department that have been able to set up their research group and are active members of academia. They have busy lives, but they manage to take care of their students and staff while being efficient and innovative.”
- “My boss because she is a person who helps everyone from the trainees to the colleagues without making distinctions”
- “Marie Curie-Skłodowská: In a Victorian era where academic opportunities for women were very limited, if not to sat scarcely, Marie Curie actually studied in secret, as it was nearly impossible to be accepted in an academic world that belonged to men. She did not only make it but demonstrated the powerful female brain.”
- “People, who contributed to the improvement of our lives in different spheres with their hard work, research and sacrifices. I admire these people and am always inspired by their example”

We also asked a series of questions regarding the **atmosphere at work for women in STEM**, ranked from Strongly Disagree to Strongly Agree. The following categories were assessed: friendly, inclusive, respectful, supportive, isolating, judgmental, helpful, empowering and condescending. Results show that women’s opinions were varied on these aspects, which might illustrate that the situation is different for each woman, depending on the company they work in, their experience and their role. Most of the time, women agreed on the idea that the atmosphere in STEM is **friendly, respectful and helpful**. However, women answered “neutral” or “agree” to the atmosphere being **empowering**.

To the terms qualifying the atmosphere in STEM as being **inclusive**, **supportive and condescending**, a majority of the respondents reacted with “neutral”.

Furthermore, most of the time, respondents disagreed with the assumption that the atmosphere in STEM is **isolating**. However, one survey revealed that the percentage of respondents disagreeing and agreeing with this aspect was identical.

Responses were varied regarding the assumption that the atmosphere in STEM is **judgmental**. The proportion of respondents who answered “neutral”, “disagree”, “agree” appeared to be fairly identical.

Finally, in order to assess **promotion opportunities for women**, they were asked “How likely do you think you can get a promotion in your company in the next 3 years?”. To this question, there was no unanimous answer, since some of the respondents were unemployed when they answered our questionnaires. However, they agreed on **three main reasons that could slow them down from getting a promotion**:

- Lack of opportunities
- Family commitment
- Not seeking a promotion

3. *RESPONDENT'S INTEREST IN THE FEMSTEM MODULES*

In order to determine whether **the modules that will be developed by the consortium for the FemSTEM coaching project are relevant for women in STEM**, we asked women to indicate their level of interest to each of the soft-skills below:

- **Module 1: Developing the self** (self-awareness: Self-regulation, internal motivation, empathy, and social skills);
- **Module 2: Developing leadership skills** (looking at the needed soft skills to enhance leadership and develop practical tools);
- **Module 3: Creativity** (create new perspectives, management of change, creativity for self and team);
- **Module 4: Results-driven coaching** (motivation, creativity in learning and the pursuit of goals, understanding obstacles and driving forces);
- **Module 5: Coaching for increasing influence** (developing strong networks, managing conflict, leading positive change).

All of the soft-skills were popular amongst the participants, however, the "**Results-driven coaching**" and "**Coaching for increasing influence**" were the most popular. The participants also showed great interest in the **leadership module**.

Summary of the key findings from the survey STEM companies

In the frame of the FemSTEM coaching Erasmus+ project, a survey for STEM companies was also created, in order to sketch the situation of women in these companies, and understand what solutions are offered by them for a more gender-fair workplace.

Number of participants in each country:

Luxembourg: 10 participants
UK: 8 participants
Spain: 10 participants
Italy: 10 participants
Greece: 10 participants

The surveys were **mainly answered by women** in **Luxembourg** (80%) and in **Italy** (around 50%, since 10% preferred not to specify). However, **in Greece** a **high majority of the respondents were male representatives (80%)**, and the Spanish and UK reports did not mention the gender of the participants. A majority of the respondents are **working in private companies**, except for Italy, where 50% of the participants are working in private companies whereas the other half is working in public companies. Finally, concerning the main **activities these companies are specialised in**, the following were mentioned the most:

- (Civil) Engineering
- Technology (financial technology, technology transfer)
- Research (Research and security systems, research in the food sector, sociological and statistical research)
- IT (Physical computing, computational thinking applications, informatics, software development)

The surveys in each country highlight that there is still a **lack of women in STEM companies**. Among the women who are working in STEM organisations, only **a small number works in a STEM related position**. In fact, in a majority of the surveys, respondents answered that women in STEM positions account for **10-24%** in their company. However, in **the Italian survey**, half of the respondents indicated that there are **25%-49%** women in STEM positions, whereas **3 out of 10 respondents** indicated that there are **less than 10%** women in STEM positions in their company.

Most respondents indicated that there are **less than 10% women in leadership positions** in their company. Nevertheless, in one country survey **(Greece)**, the percentage (40%) of companies who answered that **women account for less than 10% and for 10-24% in leadership positions was the same**.

The surveys also assessed what **soft skills companies think applicants are lacking** today. Most of the soft-skills that were mentioned were linked to:

- Critical thinking and reasoning;
- Creative thinking;
- Leadership;
- Teamwork;
- Self-confidence;
- Problem solving.

In terms of **efforts to include more women** in their company and create a more gender-fair working space, the surveys showed that:

- A high majority of the companies **do not have a specific process** in place to **improve the number of female applicants**;
- In most of the companies, a **gender equality** plan does exist;
- There was **no unanimous response** regarding the **benefits of a creation of a specific program for women** in their company. Among those who believed that such a program would be positive, the following reasons were given:

- *Equal opportunities for women in a male-dominated field;*
- *To close the gap among men and women in STEM;*
- *Possibility for them to improve their (soft)-skills, for example their self-confidence and reasoning skills;*
- *There are great female professionals;*
- *To promote self-confidence among female workers and motivate them to promote to more responsible positions;*
- *Enable women to reach leadership positions.*

On the other hand, among those who believed that such a program would not be beneficial, the following reasons were given:

- *Equal opportunities for everyone;*
- *Women do not want to be seen as if they need help;*
- *It is not a problem related to gender;*
- *Work in the company is very standardised and can be done both by women and men;*
- *Necessity to hire applicants based on their skills rather than on their gender.*

The question concerning **women's promotion in STEM** resulted in a wide variety of responses. Indeed, the number of companies who seem to believe that the promotion opportunities are the same for men and women appears to be almost equal to the ones who consider that it takes more time for women to be promoted. Some of the respondents answered "no opinion".

Regarding different kinds of policies to **support work-life balance**, the most popular policies noted among all the responses were:

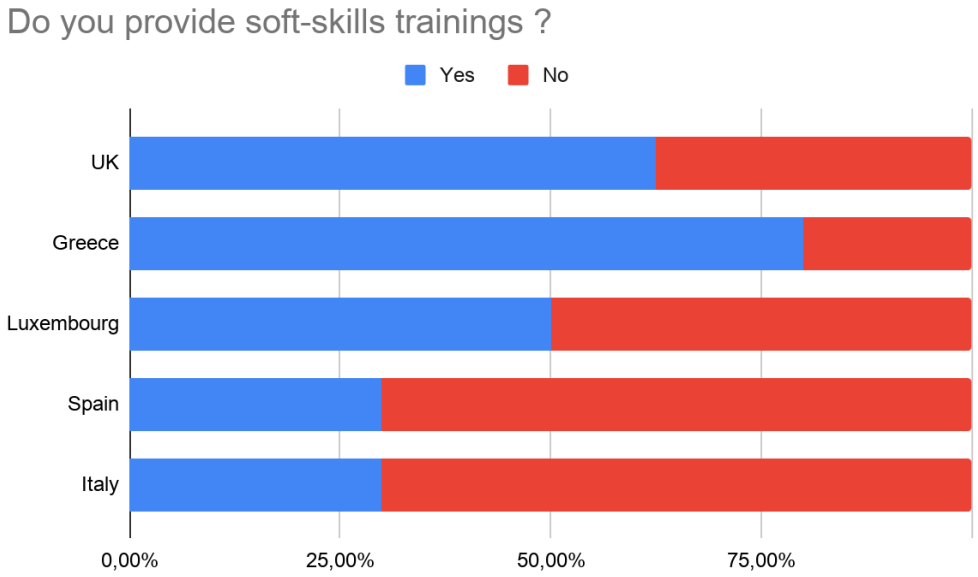
- Flexible hours work schedule
- Home-office work schedule
- Permission to take unpaid leave of absence

However, among the companies who answered our questionnaires, some of them still do not have specific policies or solutions to support work-life balance.

The participants were asked to indicate the **skills they consider as being most important for a manager**. The respondents mainly agreed on the following soft-skills:

- Leadership
- Problem solving
- Teamwork
- Critical thinking and reasoning

Finally, the questionnaires distributed by the consortium also aimed to ascertain whether these companies provide **soft-skill training programs** for employees occupying STEM positions. It is important to point out that in most of the companies of each partner country, soft-skill training is provided (see graph below). Only two questionnaires indicated that a high majority of the companies do not provide such training.



These trainings mainly focus on the acquisition of the following soft-skills:

- Teamwork
- Leadership
- Problem solving
- Reaching consensus
- Critical thinking and reasoning
- Working across cultures
- Self-confidence

It seems interesting to note that these answers are consistent with the skills companies identified as being the most important ones for a manager. Moreover, they are also fairly similar to the skills that applicants are lacking today, according to the interviewees.

Summary of the key findings from the focus group

METHODOLOGY

Spain: 8 participants

Lux: 7 participants

UK: 9 participants

Greece: 5 participants

Italy: 6 participants

Based on the outbreak of COVID19 the consortium agreed to conduct the focus group online so as to safeguard safety procedures while implementing all the activities foreseen.

The women who participated in the focus groups were working in various fields, such as IT, architecture, engineering and biology among others. In terms of students, one undergraduate student participated, as well as one recent PhD graduate.

Participants were introduced to the project aims and objectives and the importance of their feedback to the conducted survey. The focus group was mainly like a discussion where the participated women were asked to provide their feedback and opinion on several questions.

During the focus groups in each partner country, the participants discussed the situation of women in STEM, and especially the main barriers they are currently facing in education and careers in STEM. In addition, the different group discussions were able to outline the soft skills women would like to develop through a STEM-related training programme.

THE SITUATION OF WOMEN IN STEM: EDUCATION, WORK AND IDENTIFIED BARRIERS

First, the focus groups showed a mutual agreement on a **lack of female presence in STEM positions**, as well as a **lack of role models and support for women in STEM**. In addition to the lack of women in STEM, the **work environment remains mainly paternalistic and male-dominated**, which results in a male-centred work culture. For instance, one woman stated that “some women feel that they need men to support them and ensure their professional success.". Moreover, when presented with the results and barriers identified in

the questionnaire dedicated to women in STEM, many of them agreed that the atmosphere within a STEM company may appear condescending and discouraging with sexist jokes still lingering.

Another important aspect which was highlighted during the focus groups, is the fact that **female leadership is not easily accepted**. For example, some leadership attitudes are considered as being positive for men, but are perceived as negative for women. Women do also have to prove the value of their work, since they are always "being tested", while men always have the first vote of confidence. **As their careers progress, women still need to prove themselves regardless of their skills and qualifications.** This might explain why women often feel the need to adopt stereotypical male attitudes at work.

Furthermore, the focus groups also underlined that women are more likely to be judged on their "outside" (physical appearance, being a mother…). This results in women being overlooked or forgotten sometimes, and their position being taken less seriously in STEM fields.
On the one hand, it appears that women who choose to dedicate their time to their career rather than focusing on their caring responsibilities seem to be perceived as deviating from their role as a woman. On the other hand, motherhood and maternity leave are still prejudicial for a woman's career in STEM.

Finally, the focus groups indicated that there is a **common belief that there are a limited number of positions available for women in STEM**. As a consequence, instead of supporting each other, women are pitted against one another.

All these barriers often turn out to lower women's self-esteem and increase self-doubt, as many women start thinking that they are less capable than men (both in work and in their personal life).

Nevertheless, the women who participated in the focus groups, especially in Greece, recognised that there has been an important improvement with the creation of more equality plans and better access to opportunities in their studies and working environment.

INCLUSION AND DIVERSITY IN COMPANIES OFFERING STEM JOBS

Another topic addressed during our focus groups was the inclusion and diversity in companies offering STEM jobs. Women argued that we should put an end to the **general assumption that childcare is only for women**. Having children is seen as an issue for women, but not for men. Moreover, **women are expected to be mothers and carers**, which is believed to have a negative impact on their professional life. In fact, as mothers, they are seen as having less time for their professional life, which is a reason for some organisations to refuse to hire women. In fact, the possibility of maternity leave is often considered as a slowdown for women and **results in discriminating procedures**, especially by male employers. In Italy, the situation has proven to be even more difficult, since there is a limited number of places available in kindergartens. In addition to these disadvantages, in some countries, job interviews are still conducted with questions towards female applicants (that are illegal *a priori*) related to children.

Some women indicated that **implementing quotas in companies is an interesting way of ensuring diversity**. However, other women have expressed their doubts regarding quotas as it often **ends up being a double-edged sword,** since the position is not given because of the skills and qualifications of the applicants, but to cover a quota. Moreover, most of the women present during the focus groups affirmed their desire that days of leave should be the same for men and women, and **remote working should be supported**, since there is a **need to generate a better balance between work and personal life** for everyone, regardless of gender. Both men and women also need more support from employees in higher positions.

As for the inclusion of women in STEM, the focus groups highlighted that there are more **women in medical physics and biology, whereas men are more present in robotics, engineering and computer sciences**. A persistent gender disbalance exists on every step of the career ladder; **the higher you go, the fewer women you see**. Moreover, there are additional difficulties for women in specific fields, such as architecture and construction. When women start their careers in these fields, their subordinates are often older men who are not willing to take orders from younger women. Moreover, women stated that there is still a **lack of role models in STEM, especially in high responsibility positions.**

However, one of the participants of the focus group conducted in Luxembourg explained that the organisation for which she works as a researcher is currently **working on a gender**

equality plan, which should be implemented soon. The majority of participants agreed with the fact that **companies and institutions are starting to increase programs about inclusion and diversity.**

OPPORTUNITIES FOR PROMOTION WITHIN COMPANIES OFFERING STEM JOBS

Opportunities for promotion within companies offering STEM jobs were also discussed during the focus groups.

Sometimes, the situation differs depending on the country. In Spain for example, in private companies, when women are promoted, their family situation is also taken into account. **Any request related to the work-family balance can affect their promotion aspirations.** However, in the greek focus group, women believe that the opportunities for promotion are the same for women and men in Greece.

Some women argued that **women limit themselves in some cases.** In fact, they must value the consequences of the promotion and decide if they want to go ahead with it, or remain in their position. Several factors have to be taken into account when deciding whether to accept a promotion. For example, **women are often afraid to be judged, as women tend to be treated with disdain when they are in high responsibility positions.**

Many of the STEM-related fields remain predominantly male and men have historically always filled the top roles; as a result, there is an understanding that women do not belong here. This perception results in **men receiving more promotions and often achieving higher salaries than their female counterparts**, despite their experience and background. For instance, one of the participants argued that to guarantee career progression in STEM, women must “suppress their personality” to fit in and to progress and evolve in their career. This results in many women leaving the STEM sector.

Some of the participants assert that there are two sides to the problem of promotion for women: **Being a woman in male-dominated fields** in general and also **not having equal opportunities** (maternity leave, "career slowdowns", fewer publications...).

In addition to these difficulties, the Luxembourgish focus-group insisted that women have to fight to get promoted; they have to network internally, to work harder to be noticed and get

visibility. Therefore, the women suggested that there **should be trainings to make women feel more self-confident** and less shy **to ask for a promotion**.

SOFT-SKILLS TRAININGS OFFERED AT THEIR WORKPLACE AND THEIR INTERESTS IN SPECIFIC SOFT-SKILLS

Some participants to the focus groups declared that they **already had the opportunity to take part in training and programmes for soft skills within their company in mixed groups.** (e.g improving communication skills, self-presentation and speaking in public, team management, negotiation). It has been specified that none of these trainings were dedicated only to women. In Luxembourg or the UK, the soft skills training aspect is quite widespread in companies, and some organisations even offer a complete catalogue with various training courses. This is not the case for Greece and Italy, where women reported not having trainings provided in the workplace, forcing them **to train on their own**, **outside the company.**

The majority of the women expressed their **interest in participating in soft-skills training activities**. Moreover, most of the women stated that they often work on their soft-skills in their free time by listening to webinars, taking courses, both on and offline and reading books. Last, women who are close to retirement have not expressed the need for such trainings but understand the **benefits of these trainings for young women at the beginning of their careers.**

The FemSTEM consortium worked beforehand on soft-skills training proposals for the future E-coaching part of the project by identifying 5 modules to be developed and to be adapted following the results of the IO1 background researches:

Modules - FemSTEM coaching project	**Soft-skills women were interested in during the focus group**
Developing the self	- Emotional management - Improvement empathy among co-workers and from leaders - Self-confidence and self-esteem
Developing the leadership core	- Leadership and managerial skills

Creativity	- Creative thinking and reasoning - Adaptation to changes
Results-driven coaching	*(no mention of this soft skill by the participants during the focus groups)*
Coaching for increasing influence	- Entrepreneurial spirit and intrapreneurship - Networking
	- Working across cultures/ interculturality

We notice that **the modules we aim to develop as part of the FemSTEM coaching project meet women's expectations** and the soft-skills they are most interested in. However, it is important to note that in the surveys for women in STEM, they were very interested in result-driven coaching, even though the participants of the the focus groups did not mention it spontaneously.

In addition to the soft-skills corresponding to our modules, **women also showed interest in other soft-skills, focusing on working across cultures and interculturality**. This should be taken into consideration for further development of the project.

One of the women in the focus group suggested **there should be a change in the traditional leadership training**. In fact, according to her, leadership trainings focus mainly on how to manage a team, but you can be a leader in a company without necessarily having a team to manage. She suggests that trainings to improve leadership should also help to acquire strategic and negotiating skills

Regarding self-confidence soft-skills, some women suggested the **need to focus on young girls** in particular. In fact, if they lose their self-confidence at the beginning of their career, it will be extremely difficult to regain it later on. Therefore, trainings to improve self-confidence need to be extended to women who want to regain their self-confidence, for example after a bad experience or sexism during studies or within a company.

Conclusions and recommendations

In this report, we identified some of the barriers that women may face throughout their careers in STEM, from their studies to promotion opportunities. If the European figures show that in 2019, **only 1 in 3 STEM graduates is a woman**, our researches and especially the questionnaire with **companies offering STEM jobs** also demonstrate that the lack of women in STEM is very prevalent. Indeed, from our results among the women working in STEM companies, only **a few of them work in STEM-related positions (10-24%).** Moreover, if women are represented in some STEM sectors such as Health, they are still poorly represented in others, especially in engineering and computer sciences (only 1 in 6 ICT specialists are women).

Moreover, **there are even fewer women in leadership positions in STEM (less than 10%)**. Indeed, as stated in this report, within the companies listed on FTSE 100, the number of female executives dropped to 5 in 2015. This is in line with researches conducted by the European Commission, which revealed that chances of employment for women graduating from STEM fields is still lower than that of men.

In view with the findings presented in this report, we also note a **lack of female role models**, even though these are still crucial to inspire and motivate young girls to enroll in STEM studies. Role models would also be beneficial for women who aim at evolving within their company, since they will help them to feel legitimate.

Other reasons behind the lack of women in STEM are linked to **organisational problems and social norms**. For instance, women are still discriminated against in terms of **salary and recruitment**. Women working in ICT **still earn almost 20% less than men**, a statement that was confirmed as being true during the focus groups. Moreover, **maternity leave** is still considered as being exclusively for women, which is detrimental to them. In addition to these persistent barriers, women also have to face **sexism and bad behaviour** when working in STEM companies, not only from men colleagues, but also women. However, it was pointed out that there has been an improving trend in recent years, with companies making efforts to achieve **equality and create inclusion plans**.

Regarding the acquisition of **soft-skills**, our focus groups and questionnaires highlighted that women show great interest in attending training to develop their soft-skills. The most popular soft-skills among them were **self-confidence, leadership and networking**, which fully match the pre-set modules for the FemSTEM coaching project.

We also noted a correlation between the **soft skills applicants seem to be lacking according to companies** who answered the questionnaire, and the **soft-skills that woman identified as interesting or necessary**:

- Critical thinking and reasoning;
- Creative thinking;
- Leadership;
- Teamwork;
- Self-confidence.

Recommendations:

Thanks to these findings, we collected some recommendations that will serve as guidelines for the further development of the FemSTEM coaching project.

First, as stated, what stands out a lot in this research is **the need to know more about female role models in STEM**, both in the past and those who are currently changing the world. The FemSTEM partnership should consider highlighting female role models in STEM while developing the future E-coaching program. For example, female role models in STEM could be promoted in ways that will resonate with female STEM students and workers and relate to their lives and aspirations.

Another important point that came up very often is that **a special focus should be placed on young girls and young graduates**. Indeed, during our focus groups, participants suggested that there should be a programme helping girls get familiarised with STEM jobs, career perspectives and training options, but also raising awareness among teachers about gender bias in these areas. WIDE is already involved in this matter with the Luxembourg Institute of Science and Technology in the framework of the European project Gender4STEM and its "Teaching assistant".

Research results from two partners suggested that, in addition to the soft skills training provided to women, any training program that aims to change the mentality in the STEM field

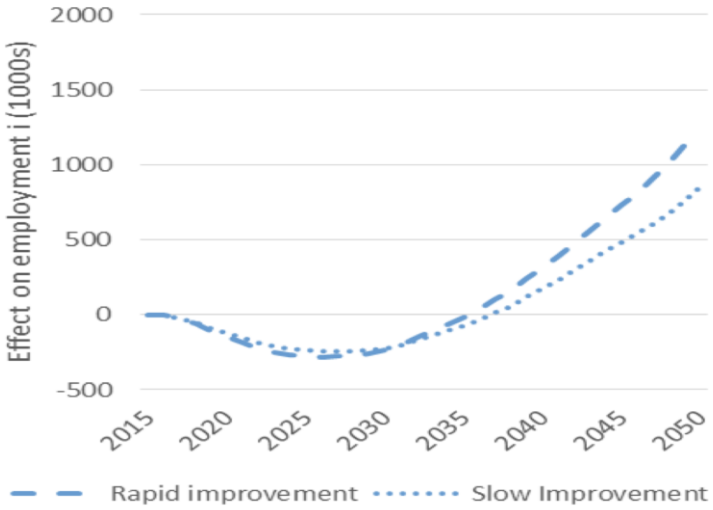
should be implemented in schools and companies, targeting both women and men. In fact, it seems difficult to improve the current situation if not everyone is involved. They declared that improvements on equality and diversity must be worked on with men, and the modules of the program are interesting for both men and women. It could therefore be considered to prioritise the participation of women in these trainings without excluding men.

The training programme that the consortium will develop should focus mainly on **self-confidence and leadership** as this is something that came up very often in our research and seems to be important for women at all career levels.

Finally, the FemSTEM training modules seem to correspond to the expectations of the target group (Women in STEM) but a redesign of some modules could be envisaged to cover other soft kills cited by women, such as **working across cultures and interculturality**.

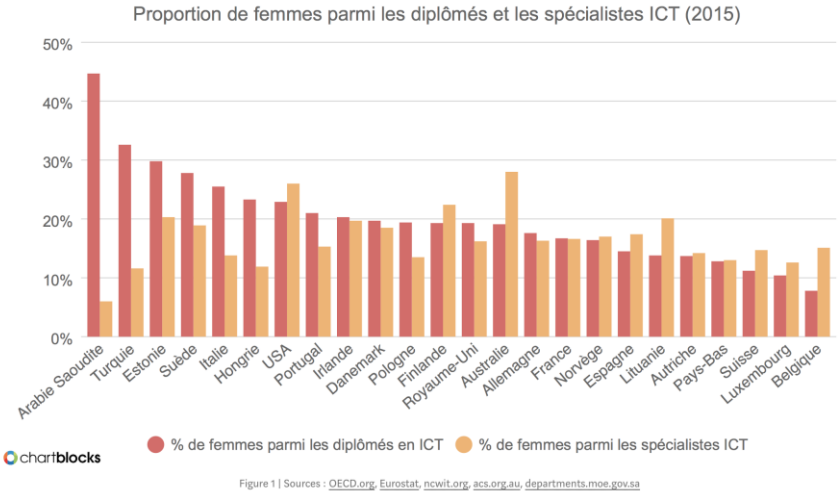
Annexes:

Annex n°1: Effect of narrowing the gender gap in STEM on employment



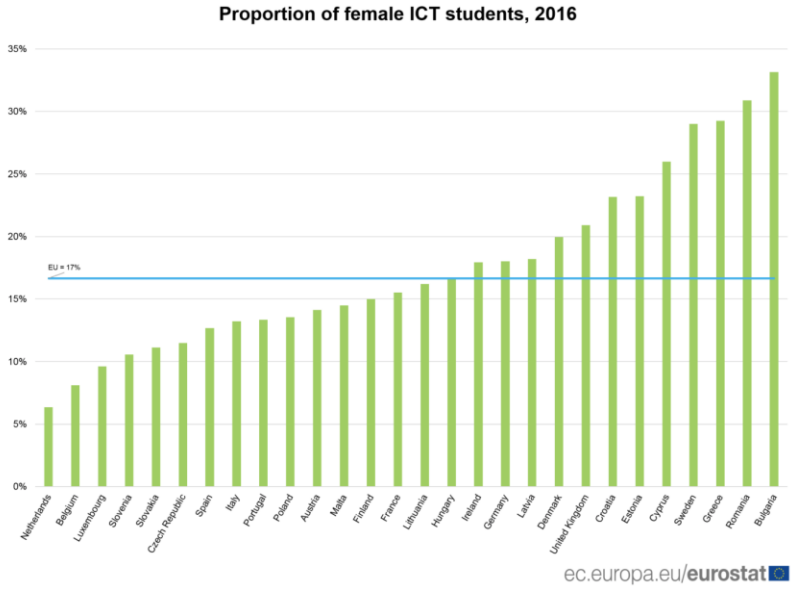
Source: European Institute of Gender Equality (EIGE), *Women in STEM: progress stalled or being eroded?*, dr Jolanta Reingarde

Annex n°2 : Proportion des femmes parmi les diplômés et les spécialistes en ICT



Source: Pourquoi les femmes dans l'IT sont-elles si rares en Belgique? (Why are there so few women in IT in Belgium?) - Guillaume Hachez

Annex n°3: Proportion of female ICT students in 2016

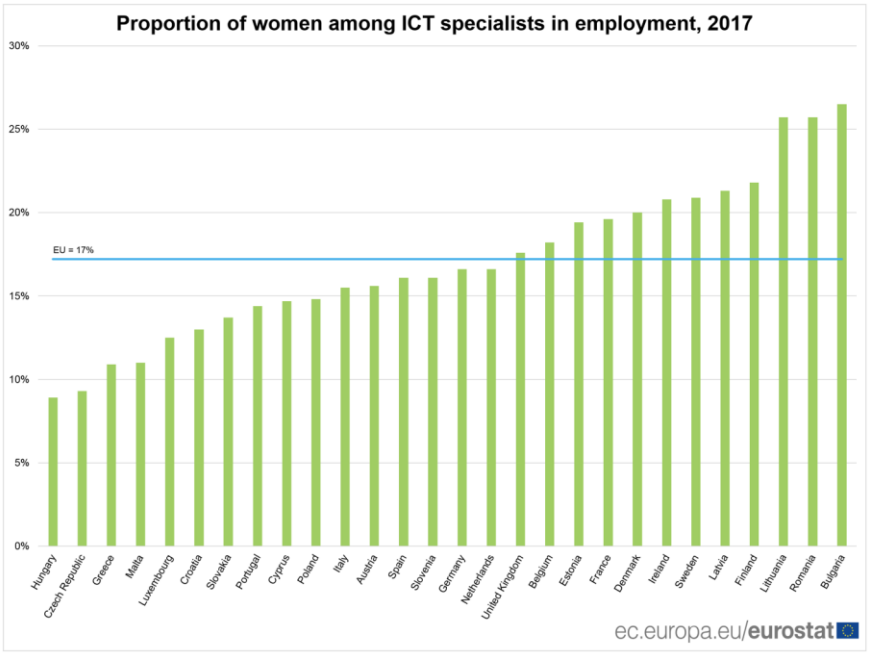


Annex n°4: Proportion of women among doctoral graduates, by board field of study, 2016

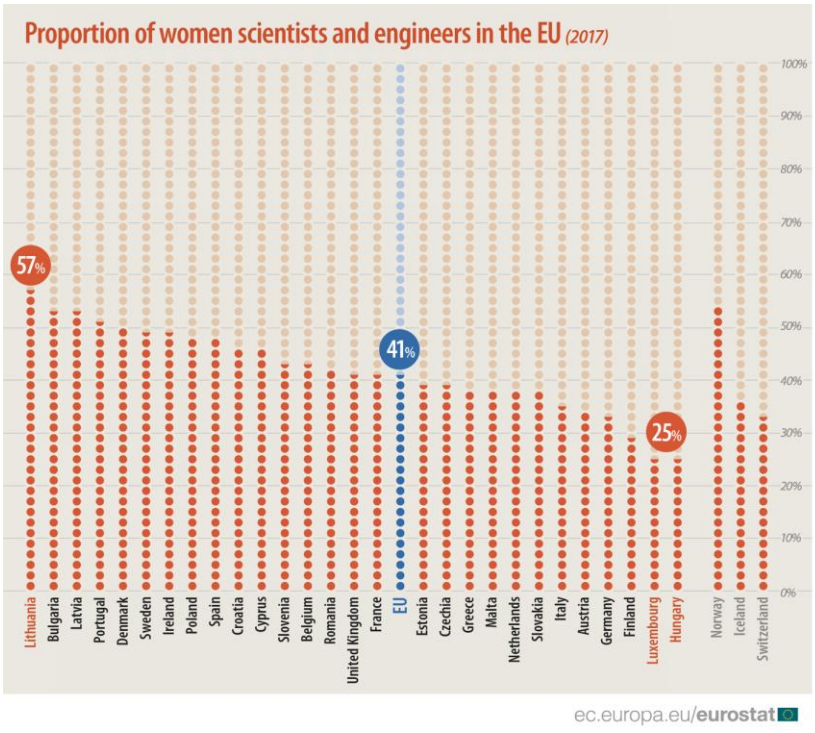
Table 2.2 Proportion (%) of women among doctoral graduates, by broad field of study, 2016

Country	Education	Arts and humanities	Social sciences, journalism and information	Business, administration and law	Natural sciences, mathematics and statistics	Information and Communication Technologies	Engineering, manufacturing and construction	Agriculture, forestry, fisheries and veterinary	Health and welfare	Services
EU-28	68	54	54	48	46	21	29	59	60	41
BE	68	44	61	47	38	0 (0/16)	32	62	63	83 (5/6)
BG	67	61	54	54	53	56 (10/18)	37	51	55	30
CZ	66	51	51	47	46	8	27	55	52	22
DK	-	53	54	-	37	-	32	61	63	-
DE	68	53	54	38	42	15	19	65	59	57
EE	82 (9/11)	79	57	68 (13/19)	54	13 (2/16)	36	55 (6/11)	64 (7/11)	-
IE	62	55	60	48	45	28	28	43	58	0 (0/1)
EL	72	55	54	37	58	14	36	37	52	63
ES	58	53	50	43	53	22	39	52	64	39
FR	60	59	50	52	43	27	32	-	51	30
HR	52	56	59	61	68	22	33	57	63	27 (3/11)
IT	81	58	60	51	53	25	37	59	64	-
CY	100 (7/7)	75 (6/8)	80 (12/15)	50 (6/12)	63	0 (0/4)	35 (6/17)	-	67 (2/3)	-
LV	63 (5/8)	87	65	55	53	25 (2/8)	58	33 (2/6)	83 (15/18)	100 (1/1)
LT	75 (12/16)	62	68	65	52	0 (0/6)	33	72 (13/18)	75	-
LU	40 (2/5)	64 (7/11)	68 (13/19)	31 (4/13)	50	16 (3/19)	7 (1/14)	-	-	-
HU	55	51	50	56	45	14	27	51	57	21 (3/14)
MT	-	50 (4/8)	0 (0/2)	0 (0/1)	40 (4/10)	0 (0/1)	33 (2/6)	-	56 (5/9)	-
NL	-	45	-	-	36	-	27	50	59	-
AT	76	53	54	47	38	17	26	54	58	36 (4/11)
PL	84	55	57	47	55	10	42	62	67	44
PT	71	51	63	48	62	28	37	64	74	51
RO	72	60	60	58	66	43	38	51	60	40
SI	84	69	72	67	60	24	32	56	72	37
SK	71	57	57	48	64	12	31	67	62	42
FI	74	59	68	53	49	18	32	63	63	47 (8/17)
SE	73	55	56	41	41	24	28	57	61	33 (3/9)
UK	67	51	51	43	46	24	26	57	59	-
IS	100 (3/3)	62 (8/13)	100 (3/3)	50 (2/4)	37 (7/19)	0 (0/1)	67 (6/9)	100 (1/1)	84 (16/19)	-
NO	64	58	64	49	40	15	27	56 (9/16)	61	38 (6/16)
CH	61	53	58	39	40	15	27	76	57	-
MK	70 (7/10)	64	25 (2/8)	65	53 (8/15)	17 (1/6)	32	71 (5/7)	60	50 (1/2)
RS	63	66	58	34	62	50	42	53	66	17
TR	54	40	42	40	52	44	36	36	69	34
IL	67	52	61	57	48	23	26	53	80	-

Annex n°5: Proportion of women among ICT specialists in employment in 2017



Annex n°6: Proportion of women scientists and engineers in the EU in 2017

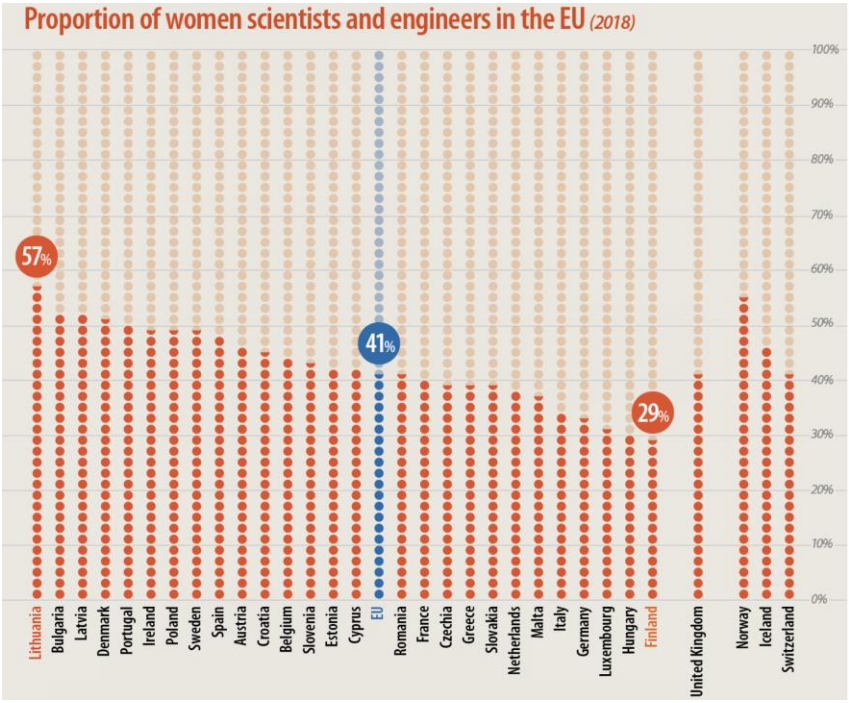


Annex n°7: Number of senior academic staff (grade A), by field of R&D and sex, 2016

nnex 6.2 Number of senior academic staff (grade A), by field of R&D and sex, 2016

	Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities		Unknown		Total	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
EU-28	4.146	18.821	1.996	14.676	4.890	12.914	983	2.876	7.687	19.635	5.741	12.127	191	539	25.619	81.543
BE	75	365	40	302	130	540	28	126	128	508	68	254	3	14	472	2.109
DK	59	450	21	231	186	631	33	89	172	552	83	168	0	0	554	2.121
DE	439	2.675	234	2.325	218	1.369	73	285	856	2.794	1.073	2.594	42	188	2.935	12.230
EL	103	539	107	763	200	542	24	122	211	596	120	212	:	:	765	2.774
ES	808	3.030	158	1.139	221	706	40	211	516	1.829	392	963	1	3	2.136	7.881
HR	195	255	139	501	316	357	134	166	265	289	153	189	:	:	1.202	1.757
IT	673	2.287	260	1.894	268	1.567	119	560	933	2.695	627	1.090	:	:	2.880	10.093
CY	5	44	6	29	5	14	0	1	3	43	4	23	:	:	23	154
LT	14	102	28	161	124	173	0	0	196	202	91	63	0	0	453	701
LU	3	28	2	17	1	6	0	0	14	40	2	13	0	0	22	104

Annex n°8: Proportion of women scientists and engineers in the EU in 2018

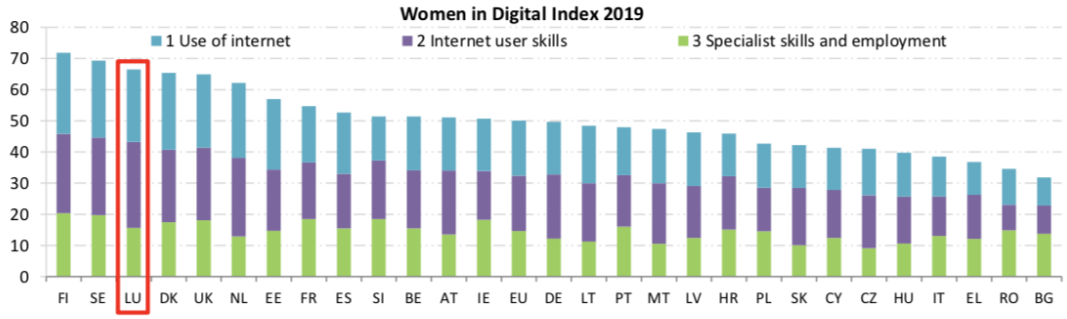


Annex n°9: Women in Digital Scoreboard 2019 Luxembourg

European Commission | **Women in Digital** Scoreboard 2019

Luxembourg

Rank: 3, Score 66.5 *(EU: 50.0)*



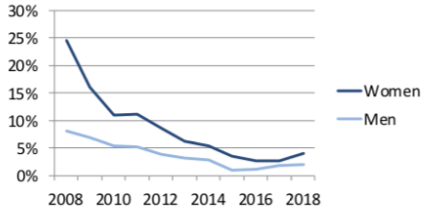
	Luxembourg Women value	rank	Men value	EU Women value	Men
1 Use of internet					
1.1 Regular internet use % individuals, 2018	**92%**	**6**	*93%*	**82%**	84%
1.2 People who never used the internet % individuals, 2018	**4%**	**4**	*2%*	**12%**	11%
1.3 Online banking % internet users, 2018	**68%**	**13**	*72%*	**63%**	64%
1.4 Using professional social networks % internet users, 2017	**21%**	**4**	*27%*	**13%**	18%
1.5 Doing an online course % internet users, 2017	**8.4%**	**8**	*10.7%*	**8.1%**	9.5%
1.6 Online consultations or voting % internet users, 2017	**34.1%**	**1**	*31.6%*	**9.9%**	10.6%
1.7 eGovernment users % internet users submitting forms, 2018	**53%**	**18**	*56%*	**64%**	65%
1 Use of internet Score (0-100)	**69.9**	**6**		**53.1**	
2 Internet user skills					
2.1 At least basic digital skills % individuals, 2017	**82%**	**1**	*88%*	**55%**	60%
2.2 Above basic digital skills % individuals, 2017	**49%**	**1**	*61%*	**28%**	34%
2.3 At least basic software skills % individuals, 2017	**84%**	**1**	*90%*	**58%**	62%
2 Internet user skills Score (0-100)	**82.7**	**1**		**53.1**	
3 Specialist skills and employment					
3.1 STEM graduates Per 1000 individuals aged 20-29, 2016	**NA**		NA	**13.1**	24.9
3.2 ICT specialists % total employment, 2017	**1.4%**	**12**	*8.2%*	**1.4%**	5.7%
3.3 Unadjusted gender pay gap % difference in pay, 2017	**15%**	**9**		**19%**	
3 Specialist skills and employment Score (0-100)	**47.0**	**9**		**43.9**	

Notes:
STEM graduates: EU average refers to 2015.
Use of internet: break in series in 2018.

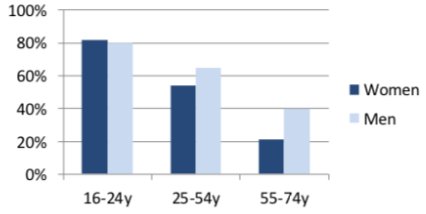
Source: All indicators come from Eurostat.

For the definitions and the methodology please consult the Methodological note.

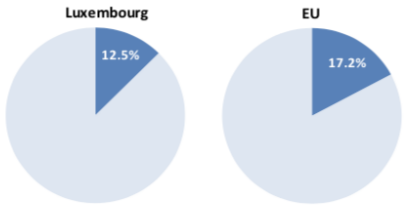
People who never used the internet (% of individuals)



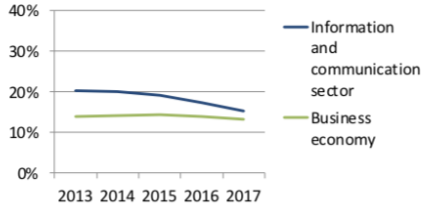
Above basic digital skills by age and gender (% of individuals)



Female ICT specialists (% of total)



Unadjusted gender pay gap (% difference in pay)



References

https://news.microsoft.com/uploads/2017/03/ms_stem_whitepaper.pdf

https://eurogender.eige.europa.eu/system/files/events-files/eige_stem_iwd.pdf

Microsoft Study, *Why Europe's girls aren't studying STEM*

EIGE, *Women in STEM: progress stalled or being eroded?*, dr. Jolanta Reingarde

European Commission, *Women in Digital brochure*, 2019

OECD, *The ABC of gender Equality in Education : Aptitude, Behaviour, Confidence.* https://www.oecd-ilibrary.org/education/the-abc-of-gender-equality-in-education_9789264229945-en

EIGE Report, *Study and Work in the EU set apart by gender*, 2014

HackerRank, *Women in Tech Report*, 2018
https://research.hackerrank.com/women-in-tech/2018

Report on Equality between women and men in the EU, 2018

Bernard Ertl, Silke Luttenberger, Rebecca Lazarides, M. Gail Jones and Manuela Paechter, *Gendered Paths into STEM. Disparities between Females and Males in STEM over the Life-Span*

European Institute for Gender Equality, *Women and Men in ICT: a chance for better work-life balance*

KGWI, *Women in STEM, why an inclusive strategy is critical to closing the science, technology, engineering and maths gender gap in Europe.*
https://fr.slideshare.net/thetalentproject/kgwi-women-in-stem-a-european-perspective

https://euraxess.ec.europa.eu/worldwide/south-korea/status-update-gender-equality-research-careers-europe-she-figures-2018

https://ec.europa.eu/eurostat/documents/2995521/9643473/3-07032019-BP-EN.pdf/e7f12d4b-facb-4d3b-984f-bfea6b39bb72#:~:text=Nearly%209.4%20million%20persons%20hold,3.4%20million%20women%20(36%25)

Cesur, Spanish National Report

Cesie, Italian National Report

Charalampos Samantzis - University of Thessaly, Greek National Report

Inova Consultancy, English National Report

Emeline Petit - WIDE, Luxembourgish National Report

PARTNERS

COORDINATOR

Inova Consultancy (UK)
http://www.inovaconsult.com
Marina Larios: mlarios@inovaconsult.com

Cesur (Spain)
http://www.cesurformacion.com
Amalia Romero Moreno: internacional@cesurformacion.com

CESIE (Italy)
http://www.cesie.org
Maryna Manchenko: maryna.manchenko@cesie.org

Women in Digital Empowerment (Luxemburg)
http://wide.lu
Marina Andrieu: contact@women-digital.lu

University of Thessaly (Greece)
http://www.uth.gr
Charalampos Samantzis: hasamant@uth.gr

FemSTEM

Recruitment, retention, progression

Co-funded by the
Erasmus+ Programme
of the European Union

Co-funded by the
Erasmus+ Programme
of the European Union

The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsi-ble for any use which may be made of the information contained therein.