



IO1 - Recruitment, Retention and Progression framework testing

National Report - Luxembourg

Women in Digital Initiatives Asbl Luxembourg

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General Overview

In the European Union, 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 women¹. This underrepresentation of women in STEM is not only reflected in the low number of women and girls who decide to enroll in STEM studies, but also in the proportion of women who have a career in STEM related jobs. At an European level for example, the EIGE (European Institute for Gender Equality) report² demonstrates that chances of employment for women graduating from STEM fields is lower than those of men. For instance, in 2014, the employment rate of EU women STEM graduated at tertiary level was 76%, which is 10 percentage point less than the employment rate of men in these fields, even though women and men both have the same qualifications.

The number of women employed as scientists and engineers grew on average by 2.9% per year³ between 2013 and 2017. However, in 2019, only 1 in 3 STEM graduates is a woman, only 1 in 6 ICT specialists is a woman, women working in ICT still earn almost 20% less than men do for the same job, and finally, only 1 out of 5 of ICT entrepreneurs in the European Union is female⁴. 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.

In fact, the FemSTEM Coaching project, funded under Erasmus+, aims to bridge the soft skills gender gap in STEM, by providing women with tools and techniques to develop their self-confidence, soft skills and employability skills through a combination of online training and a face-to-face peer-support Coaching Circles™.

As women and girls continue to be underrepresented in STEM positions, the main aims of this project is to coach women in STEM, and to support them at all stages of their career, from the recruitment to the progression, through the retention within a company or organisation, using the RRP Framework for a comprehensive approach.

The FemSTEM Coaching project was started with 5 European partners:

- Inova Consultancy Ltd in the UK, coordinator of the project and the organisation specialises in providing consultancy services and project work in the field of gender and non-traditional fields and entrepreneurship

¹ Women in Digital brochure, European Commission, 2019

² EIGE Report, Study and Work in the EU set apart by gender, 2014

³ She Figures, European Commission, 2018

⁴ Women in Digital brochure, European Commission, 2019

- CESIE in Italy which is a European centre of studies and initiatives that promotes educational innovation, participation and growth.
- CESUR in Spain, founded within the Coresma Group and specialised in higher level vocational education and training geared towards employment.
- University of Thessaly (UTH) in Greece. UTH provides undergraduate and postgraduate programmes and extra-curricular modules in specific research and business fields, for over 43000 students.
- Women in Digital Initiatives Luxembourg Asbl is a non-profit organisation initiated in 2013 in Luxembourg and officially founded in 2014, currently acting as WIDE (Women in Digital Empowerment). WIDE core activity is to offer a variety of programme and training for women (coding, business and entrepreneurial) 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.

As part of the first **Intellectual Output (IO1) Recruitment, Retention and Progression (RRP) Framework**, each partner of the project will perform a country analysis to assess the current situation of women in STEM in their respective country. The purpose of this 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 Luxembourg in the scope of the IO1 part of the project.

After detailing the situation of women in STEM in Luxembourg, we will outline the key results of the two questionnaires distributed in Luxembourg, targeting first women in STEM and then companies offering STEM jobs. Finally, we will outline the insights gathered during our two online focus group with women studying or working in the field of STEM in Luxembourg.

Country Analysis

WOMEN IN STEM IN 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.

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 field⁵. That same year, about 12% of ICT specialists were female⁶. In 2016, education statistics by the European Commission, indicate that the amount 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%).⁷ 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 female⁸. Two years later, in 2018, the proportion of female students in ICT remains at 9%.⁹

As for the proportion of female ICT specialists in employment, in 2017, 13%¹⁰, of ICT specialists were women, whereas the percentage of both female scientists and engineers reached 25%¹¹. 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. The percentage of both female scientists and engineers reached 31%¹², which is a considerable improvement compared to 2017. Unfortunately, Luxembourg does not indicate what percentage of women do have a manager position in the field of STEM. Finally, generally speaking, 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.

⁵ See annex n°1

⁶ See annex n°1

⁷ Eurostat 2016, see annex n°2

⁸ Eurostat 2016, see annex n°3

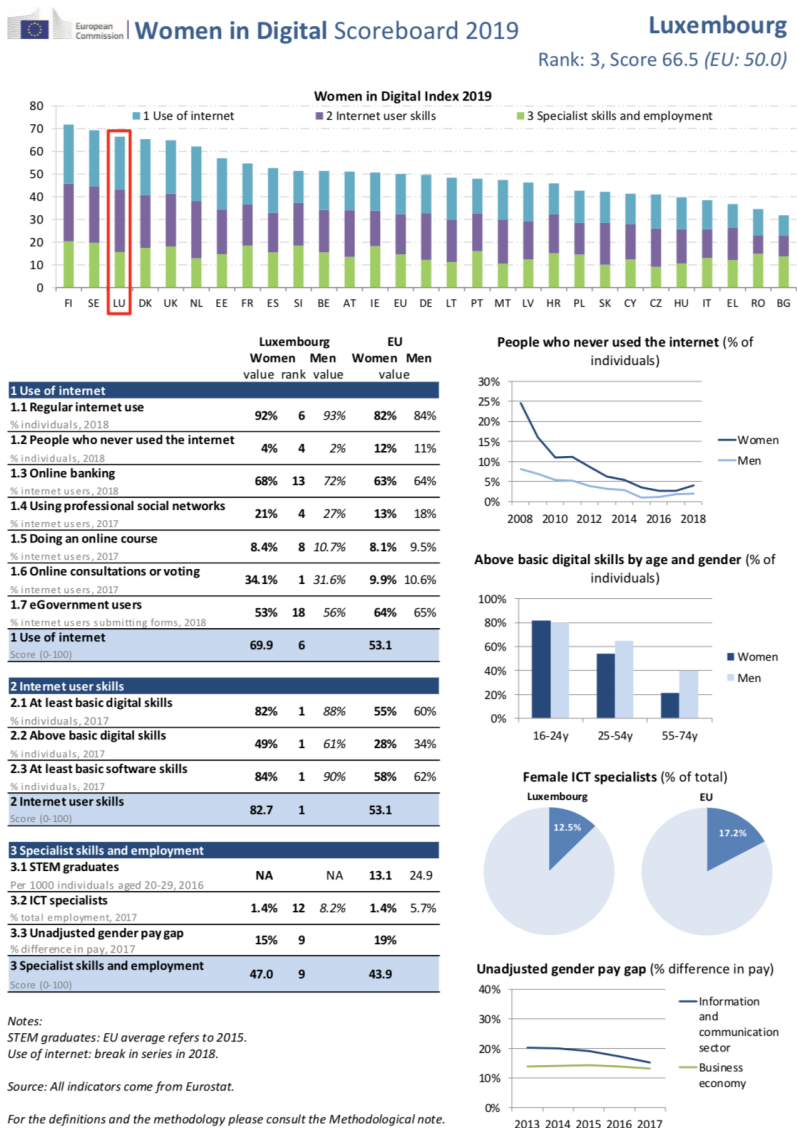
⁹ Eurostat - Share of female students in ICT studies

¹⁰ Eurostat 2016, see annex n°4

¹¹ Eurostat 2017, see annex n°5

¹² Eurostat 2018, see annex n°6

However, in 2019, Luxembourg ranks 3rd, with a score of 66.5, for the Women in Digital (WiD) scoreboard. 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, as shown in the statistics below. Among those indicators, the European Commission evaluates for example the basic digital skills by age and by gender. We remark 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. Furthermore, as shows the graph below, 12,5% of Luxembourgish women were ICT specialists in 2019, which is a bit more than in 2018 (12%).



Source: European Commission

Then, 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 science, 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).

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

Source: SHE figures 2018, European Commission

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%.

Finally, in Luxembourg, to address this underrepresentation of women in science and engineering 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 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.

Summary of the key findings from the surveys

PURPOSE & METHODOLOGY OF THE SURVEY

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.

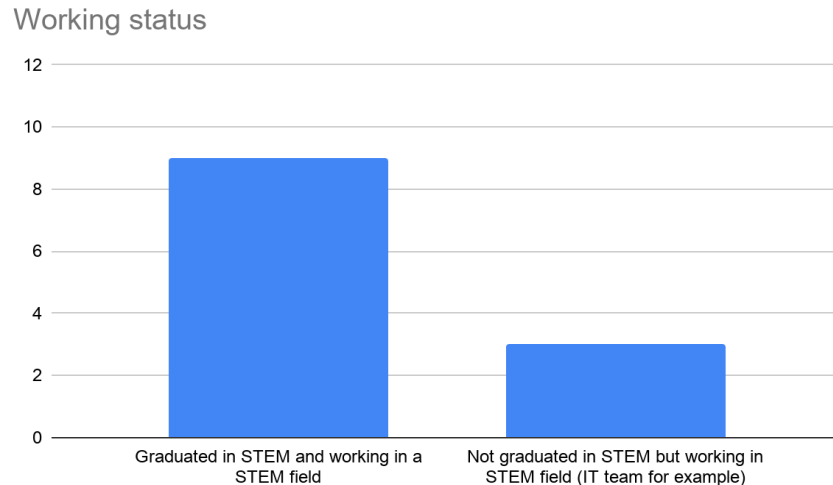
To collect the answers of these questionnaires, we chose to create an online format, using the "Google Form" tool. This online tool allows us to disseminate the surveys widely on WIDE's social media such as Facebook for women in STEM and LinkedIn to reach the recruiters and managers of companies offering STEM jobs. We recruited the participants thanks to our existing community, network and in contacting women who previously volunteered with us.

QUESTIONNAIRE FOR WOMEN IN STEM

In total, twelve women answered our survey on women working in the fields of STEM. The purpose of the first questionnaires targeting women in the STEM sector is to have some of their insights regarding how they feel as women working in STEM and also to identify some of the barriers they face at all stage of their career in STEM (Recruitment, Retention, Progression) as well as the soft skills they want to develop.

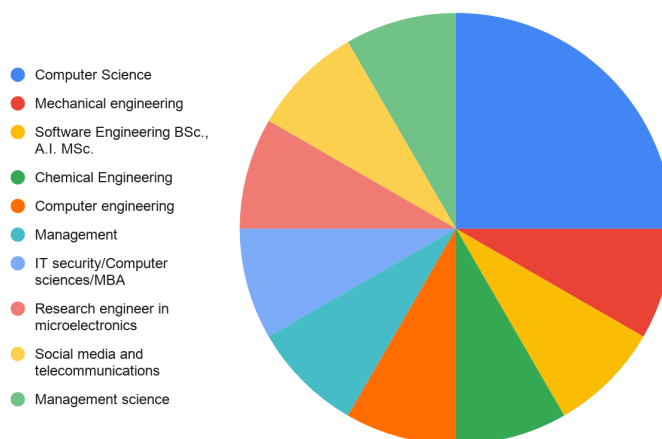
1. Background of the respondents

The first part of the questionnaire helped us to know more about the background of these women. As shows the graph below, most of the women who answered the questionnaire are graduated in STEM and are currently working in jobs related to STEM.



Moreover, they have studied in various fields, such as mechanical engineering, chemical engineering, and management. In the graph below, we observe that a **higher percentage of women studied in the field of computer science** (about 27%).

Field of study



Another interesting aspect which needs to be taken into account, is **the number of years these women have been working/studying in STEM**. To this question, most of them (six) answered 15 and more, one answered 10 to 15, three answered 2-5 years, and two answered 5-10 years.

2. Evaluation of the respondents' soft skills

Then, **the second part of our survey aimed at understanding better the way women see themselves** and how they evaluate their soft-skills. Therefore, we asked them to react to various affirmations, with either "I strongly agree", "I agree", "I rather agree", "Neutral", or "Disagree".

To assess their **creative thinking** for example, we asked them to react to the following statement "I can turn creative ideas into workable solutions". Most of them strongly agreed, the others agreed. Thus, our survey underlines the idea that women positively assess their creative thinking. Then, another important soft-skill, is of course that of problem solving. A majority of the women answered "strongly agree" to "I am able to choose the best alternative to solve issues and problems in my workplace".

Our survey also indicates that **women see themselves as being able to work in teams and to reach a consensus when there are disagreements**. For example, 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 high majority of the women answered "Agree", three "strongly agreed", one "rather agreed" one answered "neutral" and one "rather agreed".

As for the way women evaluate their **interpersonal communication skills**, our survey showed that opinions differ a lot. Four find it easy to establish a good rapport with others, four answered "neutral", five "rather agreed", and finally one "agreed".

Concerning **women's ability to speak in public**, a high majority of the women who answered our questionnaire, do not feel afraid to speak in public. A small part of them answered "neutral" and "agree". None of them did not agree at all with this assertion.

Moreover, our survey shows that women **mostly assess positively their critical thinking and reasoning**. In fact, when we asked them to react to the assertion "I am able to understand other viewpoints, interpretations and perspectives", five "strongly agreed", three "agreed", two "rather agreed" and one answered "neutral".

When it comes to **time management and self-organisation**, such as being **proactive and taking initiatives**, almost all women(8) "strongly agree" with the fact that they are able to be proactive and to take initiatives. A small part "agreed", and only two persons "rather agreed".

Moreover, the affirmation "I give positive feedbacks to my colleagues when appropriate, I am sensitive to the implications of my decisions" aimed at assessing **the way women evaluate their leadership**. To this question, all women answered positively. Almost all women "strongly agreed", a small minority "agreed", only one person "rather agreed".

In our survey, we also noted that most women who answered our questionnaire **take responsibility for their feelings, emotions, thoughts and actions**, which helped us to evaluate the way they perceive their **level of personal awareness**. In fact, six "strongly

agreed", 2 "agreed", 3 "rather agreed" and finally one answered "neutral". Thus, we see that most women perceive positively their level of personal awareness.

Finally, the last soft skill we wanted to assess was their **capacity to work across cultures**. Here, our survey showed that most women agreed to 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". In fact, seven "strongly agreed", two "agreed", two "rather agreed", and one answered "neutral".

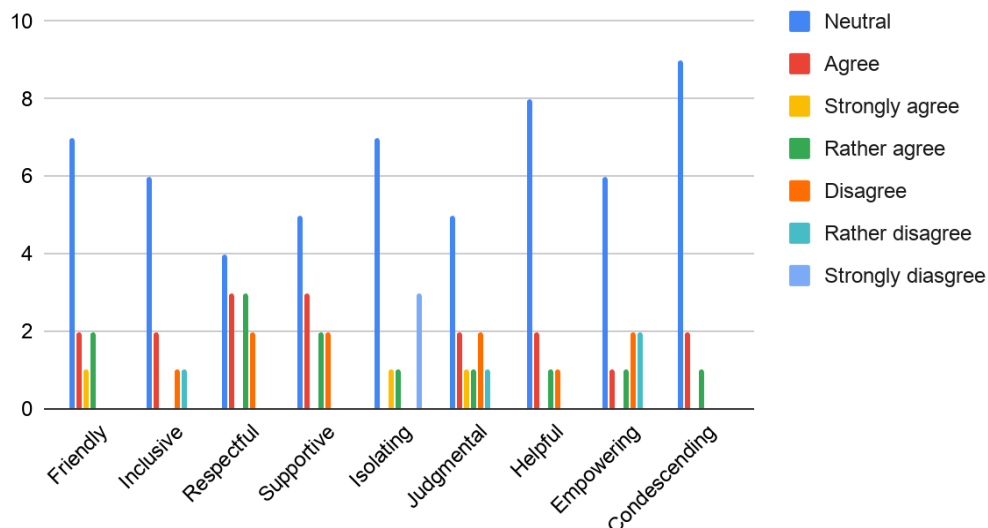
3. Respondents' opinion on whether they are treated equally to men in STEM

The third part of our survey aimed to evaluate if women feel that they are **treated equally with men at work**. Our survey highlighted that a majority of the women who answered our questionnaire believe that women and men are treated equally at work regarding job advertisement, recruitment and training and development. However, concerning salary, performance, and opportunities for promotions, almost all answered that women are treated less favorably than men.

In STEM fields, **role models are very important for women**. In our survey, most of the women (9) believe they have inspiring role models in STEM. Only a small minority doesn't have any role models in STEM (3). Our survey indicates that female colleagues and professors are important role models for women and girls. Some women also mentioned nobel prize winners in general, as well as Margherita Hack and Mileva Maric.

When we asked women to describe the **atmosphere at work in STEM companies**, as shown in the graph below, their opinions varied a lot. We see that most of the time, women answered "neutral" to categories such as "friendly", "isolating", "helpful" and "condescending".

Atmosphere at work

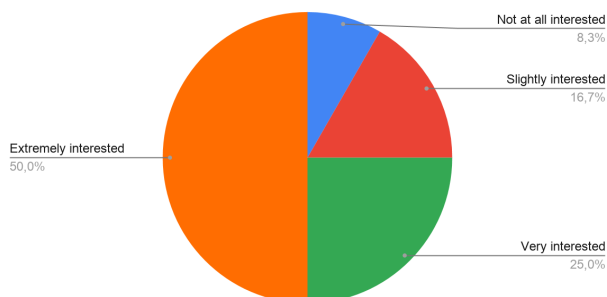


Our survey also highlights that a high majority of the women **do not think it is likely that they will get a promotion in the three next years**. This is due to various reasons, such as family commitment (4), not seeking for a promotion (2), lack of opportunities (3), the lack of management support and internal policies (1), but also because they do not want to have such responsibilities. (2)

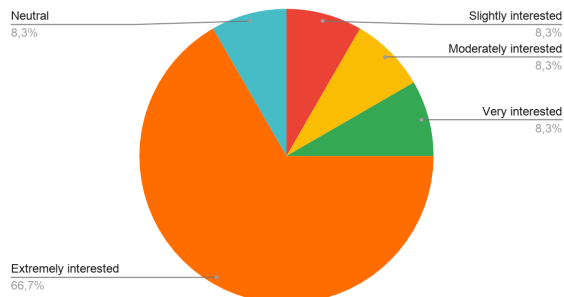
4. Respondents' interest in the FemSTEM modules

Finally, in order **to determine if 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 regarding the soft-skills below :

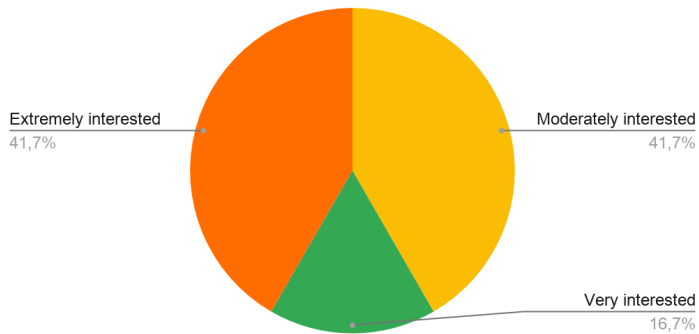
Developing the self (self-awareness: Self-regulation, internal motivation, empathy, and social skills)



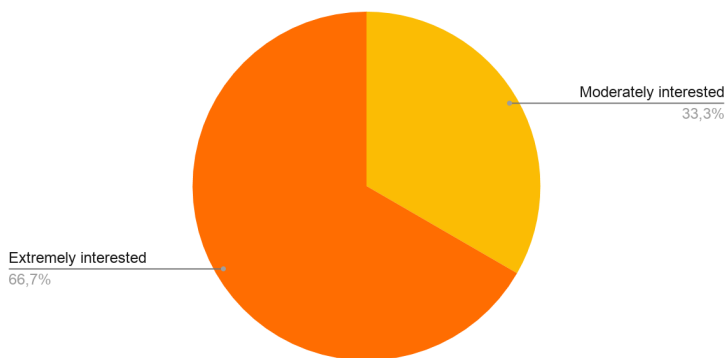
Developing leadership skills (looking at the needed soft skills to enhance leadership and develop practical tools) par rapport



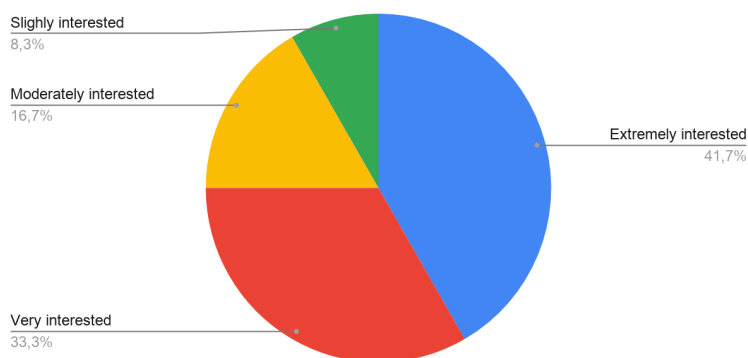
Creativity (create new perspectives, management of change, creativity for self and team)



Coaching for increasing influence (developing strong networks, managing conflict, leading positive change)



Results driven coaching (motivation, creativity in learning and the pursuit of goals - understanding obstacles and driving forces)



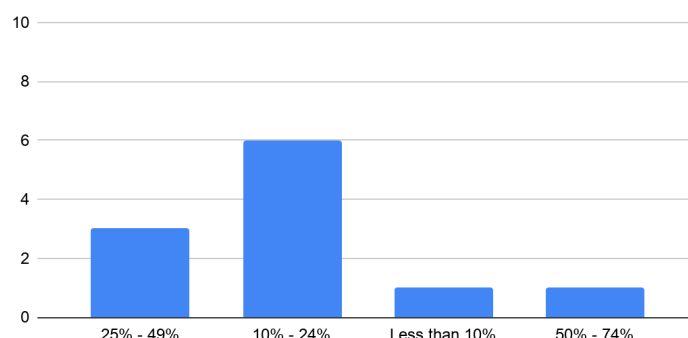
QUESTIONNAIRE FOR COMPANIES OFFERING STEM JOBS:

The second questionnaire targeting recruiters or managers in companies offering STEM jobs aims to investigate the training opportunities for soft skills available within their companies as well as the company's current situation in terms of inclusion and work-life balance.

In total, 10 companies offering STEM jobs participated in our survey. All the respondents are working for private companies as HR Managers or Directors in Luxembourg, mainly in the field of IT. This questionnaire was answered by 2 men and 8 women.

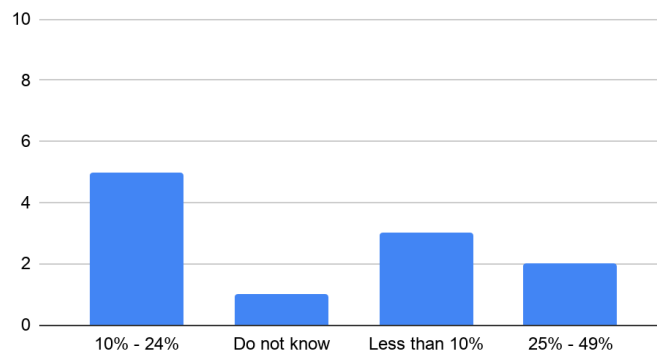
Concerning the number of women working in these companies, this survey highlights that this percentage remains quite low. In fact, as shows the graph below, in most of the companies who answered our questionnaire, there are **between 10% and 24%** women in their company.

Which percentage of women do you have in your company?



Among these women, the percentage of them who occupy positions related to STEM remains quite small as well. As indicates the graph below, in most of these companies, **only 10-24% of the women who work there do have a position in STEM**, whereas only two companies indicate that the percentage of women in STEM positions varies between 25% and 49%.

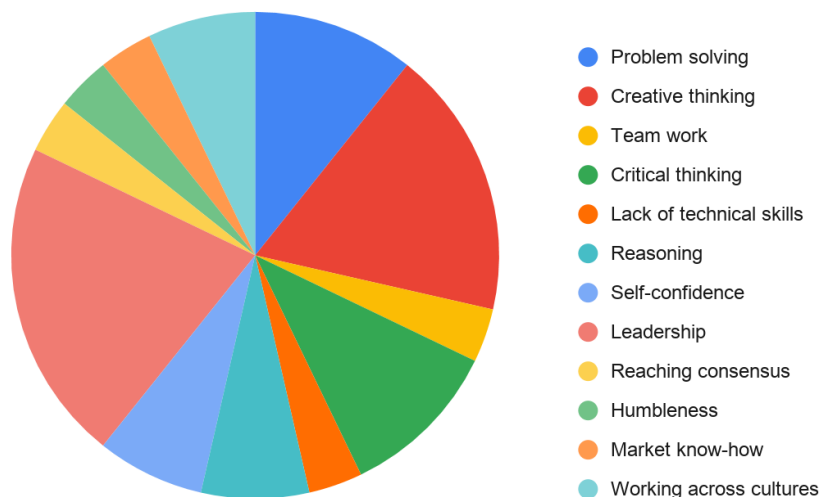
% of women in STEM positions



Then, regarding the number of women who occupy a **leadership position**, a high majority of them answered less than 10% (8 out of 10), whereas two answered between 10% and 24%.

Our survey also aimed at understanding better what soft skills applicants lack today, according to these companies. The graph highlights that an important part of the companies believe that **creative thinking (5) and leadership (6) are two considerable soft skills that applicants lack today**. Then, in their opinion, the lack of critical thinking (3) and problem solving (3) are also to be a soft skills which seems to be missing in today's applicants.

What soft skills do applicants lack today according to you?



To the question “Do you have a specific process to improve the number of female applicants”, almost all answered “No” (8), only two answered “Yes”. For those who replied “yes”, the process consists mainly in trying to **find a 50/50 balance in terms of gender**, and in **hiring the female candidate** if both the female and male applicants have the same skills.

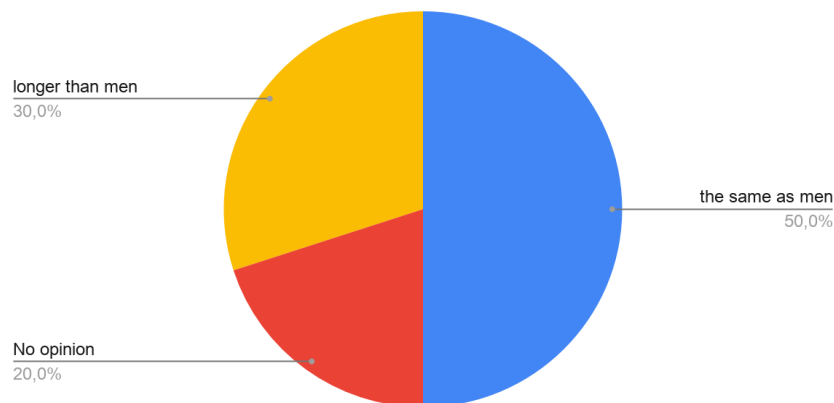
Furthermore, to assess whether companies would find it beneficial to have **a program dedicated to women in their company**, almost all replied “No” (6), whereas 4 participants

answered “Yes”, which underlines the idea that most of the companies do not see the necessity to create special programs for women. On the one hand, those who replied “Yes”, explain that these programs would be beneficial to create gender-balance, help them improve their leadership and self-confidence and ensure that women have the same opportunities and be able to reach leadership positions. On the other hand, those who replied “No” explain that the reason why they would not find it beneficial is because they do not have enough applicants in a specific sector, or because they already try their best to create gender-fair practices in their company (same level of responsibilities and salaries for instance).

In almost all the companies, a **gender equality plan** is in place (6), only 4 companies do not have such a plan.

Then, another interesting aspect is the way STEM companies qualify the promotion of women in STEM jobs. The graph below highlights that the majority of the companies who participated in our survey believe that **the promotion of women in STEM is the same as that of men** (50%). Only 30% believe that it takes more time for women to be promoted, whereas 20% do not have an opinion about the subject.

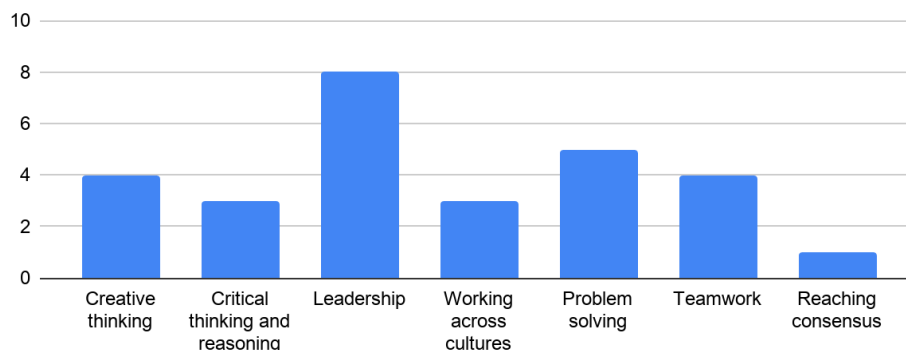
In general in the STEM field, the promotion of women seems to you :



Our survey also indicated that 9 out of 10 companies have created **policies supporting a work-life balance within their company**. These policies consist in the creation of flexible working hours, a home-office work schedule, as well as the permission to take unpaid leave of absence.

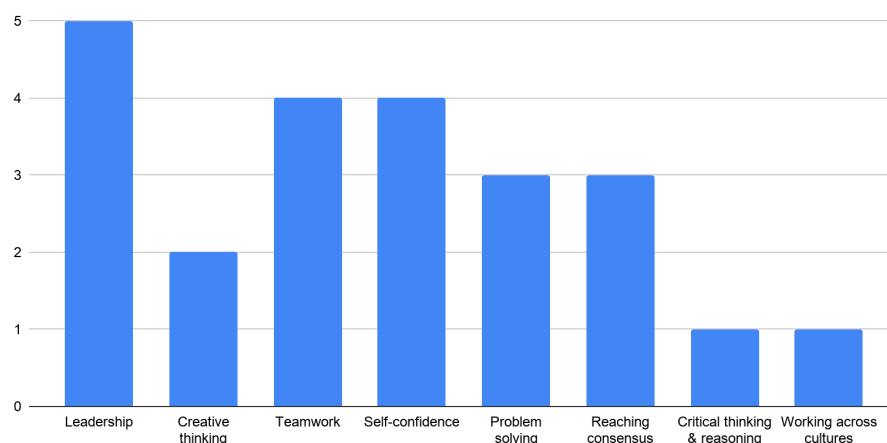
As for the skills these companies define as the three most important ones for a manager, the graph below underlines that **leadership** is the soft skill considered to be the most important one (8), followed by **problem solving** (5).

3 most important skills for a manager



Finally, our questionnaire also aims to ascertain whether these companies provide **soft-skill training programs** for employees occupying STEM positions. To this question, half of them answered “Yes” (5), whereas the other half (5) answered “No”. The graph below highlights that the soft skill trainings that were offered the most in these five companies were leadership (5), teamwork (4) and self-confidence (4). Then, some companies offer trainings aimed at improving problem solving (3), reaching consensus (3), creative thinking (2), critical thinking and reasoning (2) and working across cultures (2). We note that the answers are rather consistent with the skills they defined as being the most important ones for a manager.

If yes, which soft skill programs are you providing?



Summary of the key findings from the focus group

The main aim of our focus group was not only to discuss and identify the main barriers and gaps in STEM employment, but also the existing training and promotion opportunities for women in this sector.

Because of the COVID-19 worldwide crisis, the consortium agreed on conducting the focus group online.

WIDE organised 2 online focus group sessions on the 20th of May 2020, one in English and one in French. We had 4 participants for the English session and 3 for the French one, in total 7 women participated. We used the online tool "Google meets" to host these online focus groups. First, participants were introduced to the project objectives and future steps and the importance of their participation to the focus group.

Regarding the background of the participants, we have been pleased to welcome a wide variety of profiles in terms of age and job positions. Some of the participating ladies have 15 years or more experience in the field of STEM, so they were able to give us their insight on all stages of women in STEM careers, from the recruitment to the promotion in a company.

Here are the detailed profiles of the 7 women who participated in our focus group:

1. Started her career in STEM (more precisely Engineering and IT) in her home country Bulgaria before moving to Luxembourg. She is now head of the unit of IT security in Luxembourg a public institution.
2. More that 20 years of experience in STEM. She now work in an innovation agency in Luxembourg and is in charge of the digital innovation hub. She has experience in both public and private sector and occupied different job position throughout her career (research engineer, executive in management...)
3. Researcher in a Research Centre in Luxembourg but was more of a social studies background.
4. Head of the service security in a public institute in Luxembourg
5. Work in a the IT department of a public institution in Luxembourg. She is a communication and change manager for many IT projects.
6. Product Manager in telecommunications for an ICT and Technology private company in Luxembourg.
7. Background in biotechnologies and is currently completing a master's degree in public health. She is creating her own company in Digital Health.

The situation of women in STEM: education, work and identified barriers

All agreed on saying that there are still not enough women in the STEM journey.

- There are still not enough girls or young ladies who would choose to go for STEM, and one of the reasons could be that there is a lack of role models and mentors. Girls can not be interested in STEM if they do not see what are the possibilities in terms of career in the future. It is also hard for girls to feel legitimate in this sector as there are most of the time less than 5 girls following STEM classes. This situation is quite similar to what women experience in STEM companies.
- They do not find the right place that corresponds to their education or desire after graduation
- Once they are graduated from this kind of education, the career path is not the same for women and for men inside a company. Indeed, they agreed that there is still a difference between a man and a woman in STEM companies. For example, women are more likely to be judged on their "outside" (physical appearance, being a mother...) whereas men are judged on their knowledge.
- They also all agreed on the idea that women need to work 3 or 4 times harder than men to be taken seriously and prove their value. They added that sometimes colleagues or customers do not want to talk to a woman and ask to talk to the male manager.

Moreover, the women who participated in the focus group also indicated several persistent barriers in STEM. For instance, they all agreed about the fact that there are still inequalities in terms of income and that motherhood and maternity leave are still prejudicial for the career of a woman, especially in the STEM field. The atmosphere within an organisation in STEM can be very discouraging, since women are not treated equally regarding their performance, salary, opportunity for promotion.

They made a common assumption regarding the atmosphere in STEM, identified as being disrespectful and condescending in our survey. Most of the women participating in the focus groups stated that women are not listened to or taken seriously in STEM and that bad behaviour and sexist jokes are widespread in STEM companies and organisations. They also noted that women are not necessarily friendly to each other in a company.

For instance, one participant explained that she found the atmosphere in some STEM organisations somehow isolating, because as a new employee in a company, being the only woman in a team of 60 men, she needed to adapt her behavior to be respected and listened to.

Regarding the barriers in training, one participant stated that her company refused her a training because she is a calm person and they thought that this kind of leadership training, where they push people to the limit would be too much to handle for her. She was also promoted slower in her career.

Inclusion and diversity in companies offering STEM jobs.

They were all in agreement that companies and institutions are now increasing programs about inclusion and diversity. One asserted that policies and rules are unfortunately the only way to get women on board, otherwise they will be never be promoted as well as men are. She did not necessarily agree with having quotas, but she still sees it as the only possibility at the moment.

One of the participants stated that there are still important differences between small and big companies, as the size of a company determines its amount of financial resources, and this will have an impact on whether the company is able to invest in such programs. Big companies for example can also have partnerships with universities, organise events to raise awareness about the importance of these jobs for young girls and encourage them to follow STEM studies. One other participant declared that the organisation she works for just put in place (end of 2019) a "gender equality plan" that will focus on inclusive recruitment.

According to all the women in our focus group, it is important to have role models in companies as well. For instance, one participant declared that she is very proud and motivated by the fact that the CEO of the tech and innovation institute she works for is a woman.

Finally, our focus-group highlighted that there needs to be a change of mentalities regarding childcare. In fact, the participants explained that today, there is a general assumption that childcare is only for women. This should change, so they believe it is important to raise awareness on this theme in Human Resources (HR). One of the participants also stated that it is hard for women to keep the same job in STEM, because there are not a lot of part time jobs offered by companies in this sector.

Opportunities for promotion within a company offering STEM jobs

Some agreed that women have to work harder to get more visibility, that they have to network internally, make themselves seen, show that they are competent enough to evolve. It takes a lot of networking and training to reach an optimal level of skills and know-how. In particular, one participant stated that for her it is essential to collaborate with structures that showcase the talent of women, since this is not something companies focus on.

A majority of the participants agreed on the fact that woman have to fight to get promotions, have to talk out loud when men don't have to do so. One women explained that this kind of situation puts women in an uncomfortable position and then get tired : "if I have to fight all

the time, I give up". One participant said that the world should be open to more non male behavior, as men and women are different, and have different behavior schemes.

Then, most of the participants claimed that the struggle to have a promotion is due to a mix of women's own limitations and the limits we impose on her. This is why they all believe that women need to train themselves for this kind of situation in order not to be shy, not to tell themselves that no one is listening, not to give up, or to say "I will think about a promotion later".

Finally, they also stated that there is definitely a gap between men and women in managerial positions and that men are promoted easier than woman, especially if women have take a pause in their career because of maternity leave.

Soft-skills trainings offered at their workplace and their interests in specific soft-skills

Most of the women declared that they already had the opportunity to take part in training and programmes for soft skills within their company in mixed groups (nothing specific to women) or by themselves. Some of them also attended mandatory trainings or have the possibility to do so, since a wide catalogue of trainings is available inside their organisation:

Coaching behavior, management, leadership, negotiation, self-confidence...

One participant stated that leadership, talking in front of others and problem solving are the most important soft skills for a woman to acquire, as women often have the technical knowledge but do not know how to talk about it.

The soft-skills that emerged the most from the discussion were:

- Leadership/Negotiation
- Self-confidence
- Entrepreneurial spirit and intrapreneurship: one participant declared that she would found beneficial to also have soft-skills certificates related to their field of activity
- Networking: how to create a networking relationship, to be seen at as professional level

One of the women in the focus group suggested there should be a change in the traditional leadership training. In fact, according to her, in leadership trainings the focus is 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 acquiring strategic and negotiating skills

Regarding self-confidence soft-skills, the participants stressed the need to focus on young girls in particular, especially those starting their career. In fact, in their opinion, if they lose

their self-confidence at this point of their career, it will be extremely difficult to regain it later on. This is also why they would like this training to be extended to women who want to regain their self-confidence, for example after a bad experience of sexism during studies or within a company.

Finally, after we presented the different modules that the FemSTEM consortium will produce, all women declared that the topics identified for future trainings are promising and relevant with the objectives of the project, and they have shown interest in participating in the creation of these trainings or in being the first beneficiaries of future trainings.

Conclusion and recommendations

In view of the figures presented in this report for Luxembourg, **women are still underrepresented in the field of STEM**. Indeed, according to the results of our questionnaire dedicated to companies offering STEM jobs, only 10% to 24% of the company's employees are women, and among these women, less than 25% occupy STEM position. There is, however, a general trend towards an improvement in the number of women in STEM, notably regarding the number of female scientists and engineers. In Luxembourg, some companies and organisations have **recently decided to set up gender equality plans** within their organisation.

In addition to the gender pay gap and gender-based discriminations (e.g the duration of maternity and paternity leave), we can see through the results of our survey and focus groups dedicated to women in STEM that the **atmosphere at the workplace** in a STEM company or organisation is often perceived as **discouraging, condescending and sometime isolating for women**.

Moreover, we can also talk about the **lack of opportunity to be promoted** within a company which, according to the results of our research, comes from both the **limitations imposed on a woman** (gender-based discriminations) and the **limitations that a woman imposes on herself** (lack of self-confidence, lack of negotiation skills, etc.). Indeed, based on the results of the survey less than 25% of leadership positions in companies are occupied by women in Luxembourg.

It can be noted that the training offer for soft-skills is not accessible in all companies offering STEM jobs (50% of the companies surveyed offer soft-skills training) when, according to our results, there is a **real need and interest in soft-skills training** for women in STEM.

Finally, thanks to our research, we have been able to define **which soft-skills are the most important to develop for a woman in STEM** from an HR point of view and which soft-skills are of most interest to women.

- In the survey for women in STEM, we can see a huge interest for the training modules in soft-skills previously defined for the project focusing on **self-confidence, creative thinking and networking**.
- In the survey for companies offering STEM jobs it was stated that applicants for jobs in STEMs lacked primarily **creative thinking, leadership, critical thinking, and problem solving** soft-skills and that these skills are also essential for a Manager.
- During the focus groups' discussions, the participants talked a lot about the importance to gain more **leadership, self-confidence and networking soft-skills** but also that it is very important for a woman to learn how to express herself, how to talk about her technical knowledge.

Recommendations:

During our researches and discussions with women in STEM, one important point that came up very often was that of young girls in the stem education and the lack of female role model. Indeed, most of the women interviewed during our focus groups insisted on the fact that it should exist a programme familiarising girls with STEM jobs and which raise awareness among teachers about gender bias in these areas. WIDE is already involved in this thematic with the Luxembourg Institute of Science and Technology in the framework of the European project [Gender4STEM](#) and its "Teaching assistant".

As we can see from our researches, three soft-skills in particular are emerging from the researches in Luxembourg, leadership, networking and self-confidence. It is therefore necessary to be able to orientate the future training programme of FemSTEM around these skills but also by considering negotiation, creative and critical thinking soft skills. Indeed, based on IO1 researches for Luxembourg, this combination of soft-skills would also widely benefit women in their recruitment, retention and progression in a STEM company or organisation and will results in closing the soft-skill gap that exists between women and man.

Annexes

Annex n°1 : Proportion des femmes parmi les diplômés et les spécialistes en ICT

Source: Pourquoi les femmes dans l'IT sont-elles si rares en Belgique? - Guillaume Hachez

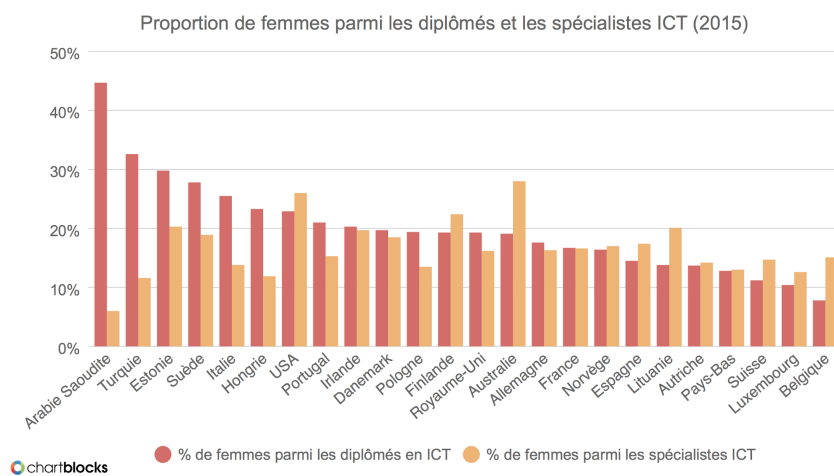
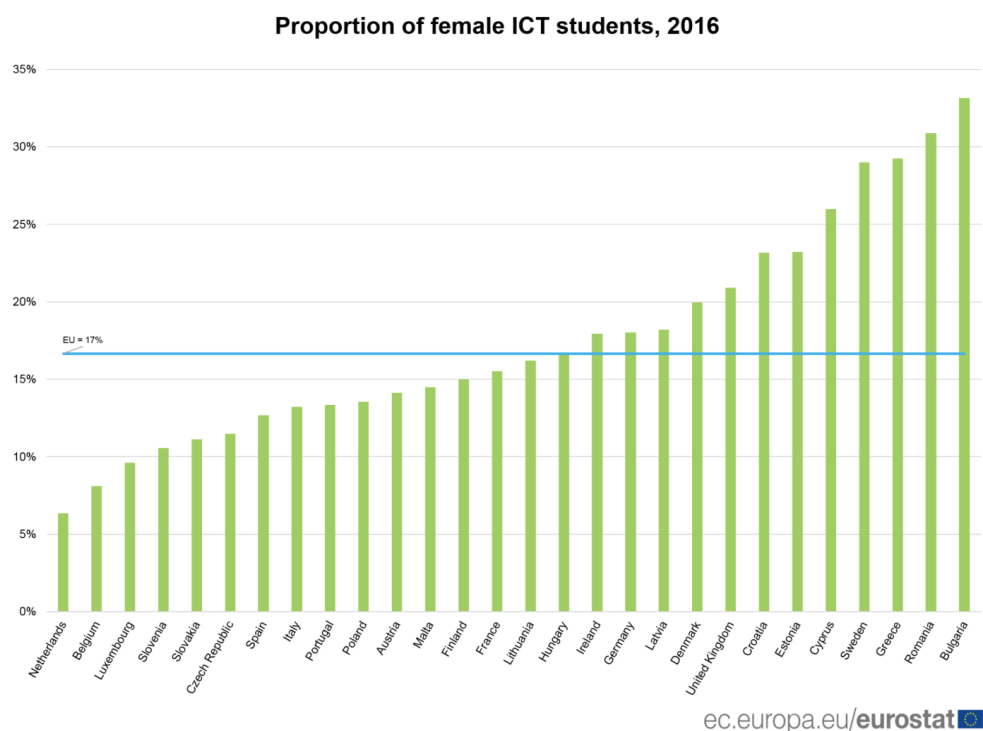


Figure 1 | Sources : [OECD.org](https://oecd.org), [Eurostat](https://eurostat.org), ncwit.org, acs.org.au, departments.moe.gov.sa

Annex n°2: Proportion of female ICT students in 2016



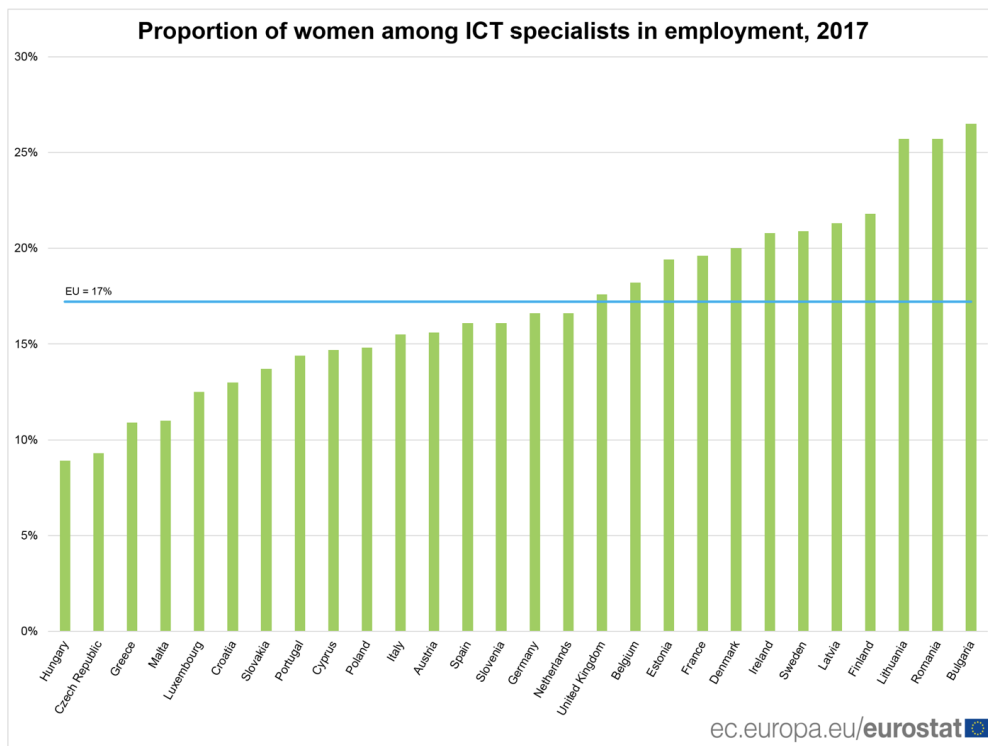
Annex n°3: Proportion of women among doctoral graduates, by board field of study, 2016

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

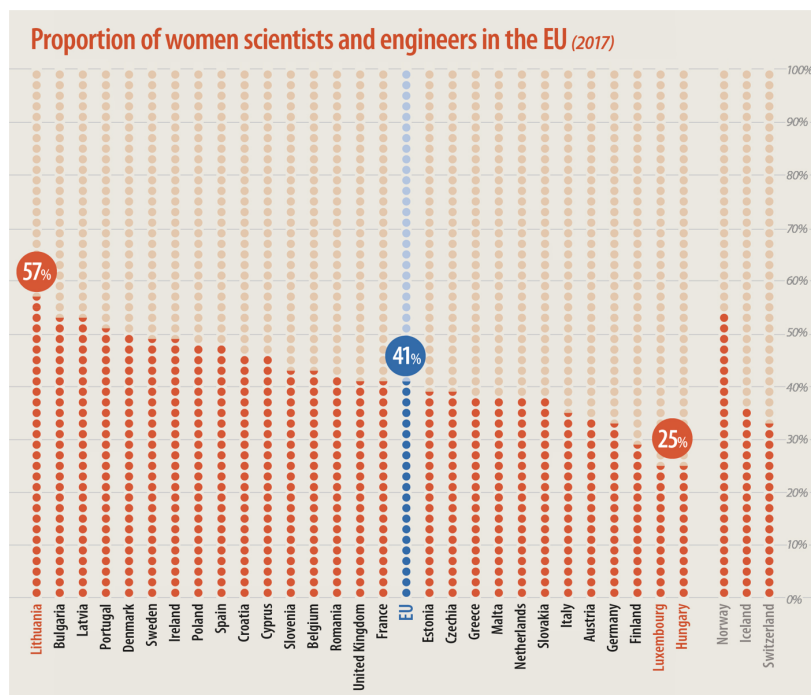
Country	Education	Arts and humanities	Social sciences, journalism and information	Business, administration and law	Natural sciences, mathematics and statistics	Information and Communication Technologies	Engineering, manufacturing and construction	Agriculture, forestry, fisheries and veterinary	Health 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)	38	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°4: Proportion of women among ICT specialists in employment in 2017

Source: Eurostat



Annex n°5: Proportion of women scientists and engineers in the EU in 2017

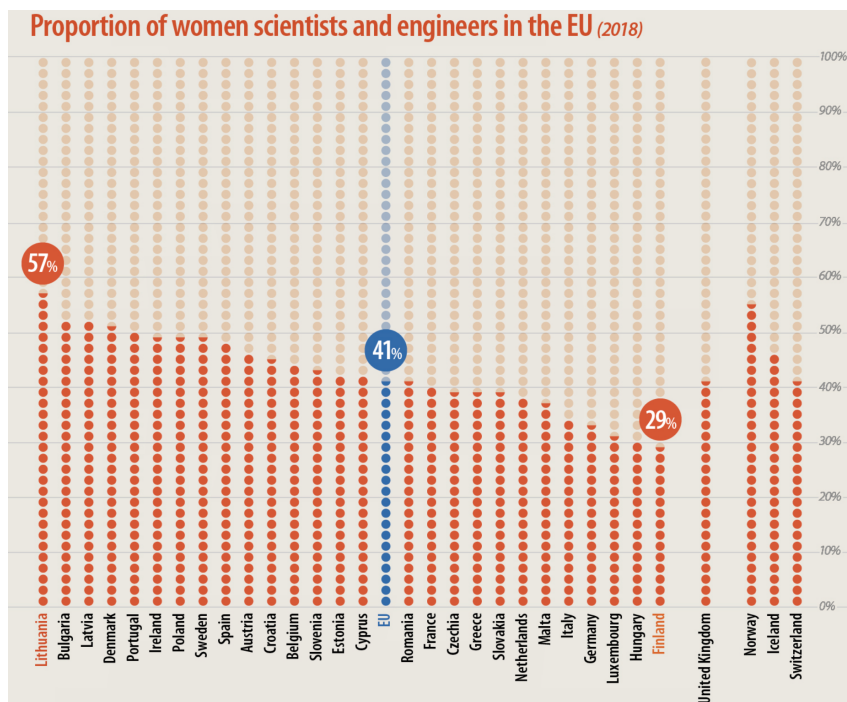


Source: Eurostat

ec.europa.eu/eurostat

Annex n°6: Proportion of women scientists and engineers in the EU in 2018

Source: Eurostat



References

<https://ec.europa.eu/digital-single-market/en/news/women-digital-scoreboard-2019-country-reports>

https://ec.europa.eu/info/publications/she-figures-2018_en

<https://ec.europa.eu/eurostat/web/products-eurostat-news/-/EDN-20190211-1>

<https://ec.europa.eu/eurostat/web/products-eurostat-news/-/EDN-20200210-2>

[https://ec.europa.eu/eurostat/en/web/products-eurostat-news/-/EDN-20180425-1?inheritRedirect=true&redirect=%2Feurostat%2Fen%2Fnews%2Fwhats-ne](https://ec.europa.eu/eurostat/en/web/products-eurostat-news/-/EDN-20180425-1?inheritRedirect=true&redirect=%2Feurostat%2Fen%2Fnews%2Fwhats-new)

https://webcache.googleusercontent.com/search?q=cache:e-9Aj99bljAJ:https://eige.europa.eu/sites/default/files/documents/20173992_kina26893enn_pdf.pdf+&cd=1&hl=fr&ct=clnk&gl=fr&client=safari

<https://ec.europa.eu/digital-single-market/en/news/women-digital>

<https://www.science.lu/fr/international-womens-day/only-one-fourth-researchers-and-engineers-luxembourg-are-women>