GENDERATE

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Gender Mainstreaming in Technical Vocational Education and Training Providers

Final Gender Analysis report

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INTRODUCTION

The digital transformation offers immense opportunities for economies and societies. However, the benefits of the digital transformation are currently not equally balanced between societal groups and genders and access, use and ownership of digital tools are not gender-neutral. The term "digital gender divide" is frequently used to refer to these types of gender differences in resources and capabilities to access and effectively utilise ICTs within and between countries, regions, sectors and socio-economic groups (see UN Women, 2005).

There are a number of root causes of the digital gender divide, including hurdles to access, affordability, education (or lack thereof) and lack of technological literacy, as well as inherent biases and socio-cultural norms that lead to gender-based digital exclusion (OECD, 2018d; OECD, 2015a; Hilbert, 2011; Cooper, 2006; Korupp and Szydlik, 2000).

Study after study finds that women have ability, good grades, and high test scores in STEM subjects, and yet women are turning away, or being pushed away, from engineering and computing fields. A theme that overarches much of the research on this topic is that women often feel as if they don't fit or belong in these fields. Research into this perceived lack of fit provides a complex picture of social and environmental factors influencing and interacting with individual motivations and values that are, in turn, also influenced by the wider culture.

In order to better understand dynamics influenced by an unfair exercise of power, real or presumed, as a consequence of dynamics of structural and systemic inequality and sexist discrimination, it is important to mention the "stereotype threat" that girls can experience when they fear being judged in terms of a group-based stereotype. The threat of the stereotype occurs when individuals they fear they will confirm a negative stereotype on a group to which they belong (self-fulfilling prophecy). One of these group is women.

When negative stereotypes on women's STEM skills are brought to the attention of test takers, women's performance declines. The stereotype threat has been theorized not only to influence women's mathematics performance but also to contribute to the disengagement from the fields in which women are negatively stereotyped, such as engineering and computer science.

Stereotypes and biases are important cultural factors that may influence women's representation in engineering and computing. Stereotypes can be descriptive (what women and men are like) or prescriptive (what women and men should be like). Gender stereotypes tend to place greater social value on men and evaluate men's competence as greater than women's.

One specific area in which men are stereotypically deemed more competent than women is mathematics. Parents' and teachers' expectations for children's mathematical achievement are often gender-biased and can influence children's attitudes toward math. Even individuals who consciously reject gender stereotypes often still hold implicit gender biases.

In male-dominated science and engineering fields, women are less likely than men to be seen as experts by their colleagues and to serve in important roles on teams.

Gender biases affect not only how we view and treat others, but also how we view ourselves and the choices we make about our own futures.

From early childhood, cultural stereotypes guide our choices and behaviours, steering us toward certain careers that seem to be the best fit for our interests and abilities and away from others.

Girls who associate mathematics with boys and men are less likely to perceive themselves as being interested in or skilled at mathematics and spend less time studying or engaging with mathematics concepts. As early as first grade, children have already developed a sense of gender identity, and most have developed implicit biases associating boys with math as well. Focusing on girls' and women's choices might seem to "blame the victim"- women - for their underrepresentation in engineering and computing.

The argument that women's preferences and choices are partly responsible for sex segregation doesn't require that preferences are innate. Career aspirations are influenced by beliefs about ourselves (what am I good at and what will I enjoy doing?), beliefs about others (what will they think of me and how will they respond to my choices?), and beliefs about the purpose of educational and occupational activities (how do I decide what field to pursue?). And these beliefs are part of our cultural heritage.

Stereotype threat is triggered by cues from the environment that alert an individual to the possibility of confirming a negative stereotype about a group to which she or he belongs. For example, being a member of a minority group, as women in engineering and computing often are, in and of itself can trigger a sense of threat.

Sense of belonging can have important effects even when individuals are unconscious of it.

Implicit gender biases are more prevalent today than explicit gender biases are, and in the long term (Lai et al., 2013), positive role models appear to make a difference.

By the time women begin formal engineering or computing training in college, they likely have encountered gender-biased behaviours on many occasions. **Microinequities** have been described as "apparently small events frequently unrecognized by the perpetrator which occur wherever people are perceived to be 'different'" (Rowe, 2008, p. 45). Examples include facial expressions, gestures, tone of voice, and subtle actions, such as assigning the role of note taker to a woman rather than a man. Accumulated over time, these microinequities can affect students' self-concept, which may, in turn, influence their choice of a career (Rowe, 1990; Bandura, 1997). Camacho and Lord (2011) found that female engineering undergraduates frequently encounter gender-based "microaggressions", small

discriminatory behaviours of mostly nonphysical aggression (Pierce, 1970), in the engineering education environment. Such behaviours include encountering surprise that a woman would be interested in engineering, having male students interrupt or speak over them, experiencing difficulty having their ideas heard, being exposed to sexual discussions and joking, hearing suggestions that women are in the department only as a result of affirmative action policies rather than because of their achievements and abilities, and hearing gendered statements by professors during lectures.

Microinequities illustrate how discrimination in school and the workplace is often subtle and not overt in its intent to harm (Hebl et al.,2002). Nonetheless, microinequities may result in increased stress and feelings of exclusion among women.

Then **in-group favouritism** is an important mechanism by which unequal group outcomes — including unequal outcomes for women — are maintained and is, therefore, a practice that individuals trying to reduce discrimination should minimize.

Interacting with subtly sexist male peers caused women who were majoring in math, science, or engineering to experience stereotype threat.

More in general, it is possible talking about sexism hostile or "benevolent".

Benevolent sexism is rooted in a belief that women need the help and protection of men. Women who are seen as warm but not competent are especially likely to be the recipients of benevolent sexist behaviours such as being called "sweetheart" or being offered help with dangerous aspects of a job. While on the surface benevolent sexism may seem positive toward women, its effects are quite the opposite. Benevolent sexism is often not viewed as sexist. In some cases is viewed as positive, chivalrous behaviours, it is plausible that benevolent sexists are often viewed more favourably than hostile sexists.

Women might begin to see themselves as less capable professionals than men because they are interacting in a space that tends to be masculine and tends to devalue what are seen as feminine traits or feminine contributions to the field. At the same time, men expressed significantly more professional role confidence, both expertise confidence and career-fit confidence, than women did.

GENDERATE PROJECT

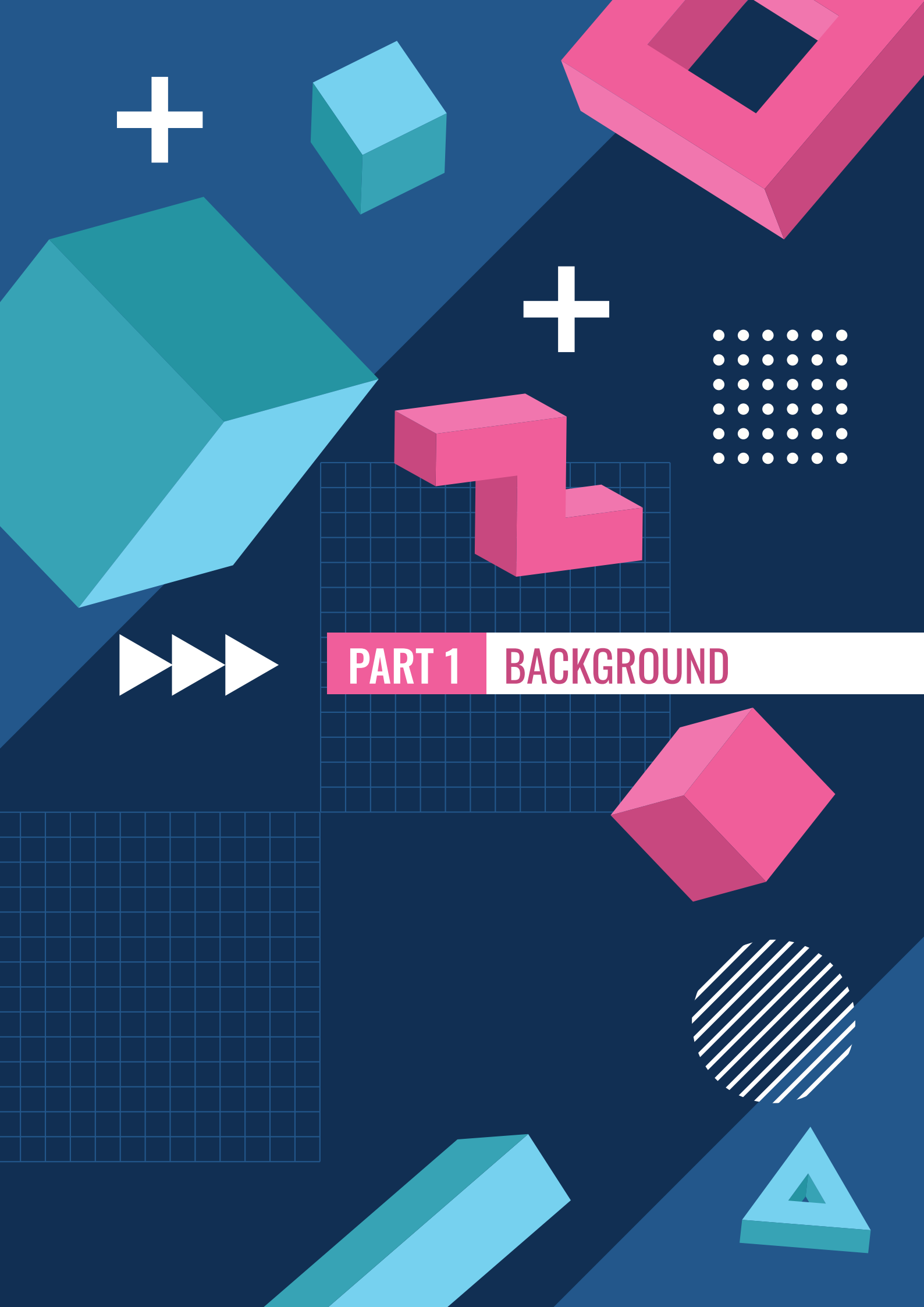
GENDERATE is an Erasmus + KA2 project aimed at

- **FOSTERING** the adoption of gender mainstreaming strategies by Technical and Vocational Education and training Institutions.
- **SUPPORTING** the TVET institutional transformation by building capacity in the TVET sector at an institutional and individual level.
- **IMPLEMENTING** new and more relevant teaching and learning approaches that have female students in the centre of the educational process
- **EMPOWERING** female students to continue their education in technical professions.
- **ENHANCING** the attractiveness and social image of TVET institutions through actions targeting various groups: students, parents, enterprises, decision-makers, and the general public.
- **RAISING** awareness about the gender disparities in the TVET sector and the importance of creating a gender-responsive education by implementing policies, actions and programmes that effectively support female individuals.

THE AIM OF THE REPORT

The aim of this report is to see how much VET education is inclusive in terms of gender issues, and to understand how GENDERATE can contribute to fill the gender gap in VET especially in STEM subjects. The report is divided in two main parts: The first one offering an overall overview on attractiveness and inclusiveness in STEM and VET, and any kind of exclusion/inequality/inequity which can be observed.

The second one offer an overview on the Country reports related to the survey and the desk research did in Italy, Spain, Greece, Portugal and Turkey, about the gender gap in VET education.



PART 1 BACKGROUND

What are attractiveness and inclusiveness in STEM and VET in EU under a gender perspective

Attractiveness and inclusiveness are important considerations in the fields of Science, Technology, Engineering, and Mathematics (STEM) and Vocational Education and Training (VET) in the European Union (EU). Let's explore each of these aspects in more detail:

Attractiveness in STEM and VET:

Attractiveness refers to the ability of STEM and VET programs to engage and retain individuals, particularly students and professionals, in pursuing careers, not usually involved, such as women, since these sectors are particularly affected by gender gap. In the EU, efforts are being made to enhance the attractiveness of STEM and VET through various means, including:

a. **Promotion and Outreach:** Actively promoting the benefits and opportunities available within STEM and VET programs. This includes awareness campaigns, information sessions, and collaborations with industry stakeholders to showcase the potential career paths and prospects.

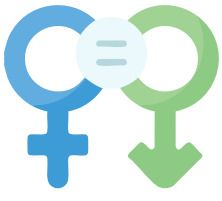
b. **Incentives and Scholarships:** Providing financial incentives, scholarships, and grants to attract talented girls into STEM and VET programs. These initiatives aim to make education and training more accessible and affordable.

c. **Role Models and Mentoring:** Highlighting successful role models and offering mentorship programs to inspire and guide girls and women, particularly underrepresented, in pursuing careers in STEM subjects. This can help overcome gender and diversity imbalances within the field.

Inclusiveness in STEM and VET:

Inclusiveness refers to ensuring equal opportunities, access, and representation for individuals from diverse backgrounds and underrepresented groups within STEM and VET programs. The EU is actively working towards creating a more inclusive environment through the following measures:

a. **Gender Equality:** Promoting gender equality by addressing the gender gap in STEM and VET. Initiatives such as targeted recruitment strategies, mentorship programs, and support networks aim to encourage and retain more women.



b. Diversity and Inclusion Policies: Encouraging diversity and inclusion within STEM and VET programs by implementing policies that prioritize equal representation and opportunities for individuals from diverse backgrounds, including ethnic minorities, persons with disabilities, individuals from disadvantaged socio-economic backgrounds, and avoiding gender segregation.

c. Collaboration with Industry: Building partnerships and collaborations with industry stakeholders to identify and address barriers to inclusiveness. This can involve joint initiatives to create internship opportunities, apprenticeships, and work-based learning programs that provide hands-on experience and facilitate career progression.

d. International Cooperation: Engaging in international cooperation to learn from best practices and share experiences in promoting inclusiveness in STEM and VET programs. Collaborative efforts can help leverage knowledge and resources to create more inclusive educational environments.

Overall, ensuring attractiveness and inclusiveness in STEM and VET programs in the EU is crucial for developing a diverse and skilled workforce.

Who are the most disadvantaged groups and what types of exclusion/inequality/inequity can be observed in STEM and VET and how inclusive is VET, for disadvantaged groups especially for women

In STEM and VET several disadvantaged groups can face exclusion, inequality, and inequity crossing their underrepresentation and/or exclusion with gender issues (intersectional approach).

Intersectional Exclusion:

Multiple dimensions of disadvantage can intersect, leading to compounded barriers and exclusion. For instance, women from ethnic minorities or individuals with disabilities from low-income backgrounds may face intersecting forms of discrimination and limited access to opportunities in STEM and VET.

These forms of exclusion and inequality can result in limited representation, reduced diversity, and a loss of talent. Efforts to address these challenges involve implementing inclusive policies, providing targeted support, creating awareness, promoting diversity and role models, offering scholarships and financial assistance, and fostering supportive and inclusive learning environments. By addressing these inequities, the goal is to create a more inclusive and diverse workforce that can drive innovation and advancements.

Gender Disparities:

Women are underrepresented in STEM and VET programs and professions. Gender disparities can be observed in terms of access to educational opportunities, career progression, and leadership positions. This exclusion can stem from social stereotypes, biases, and cultural norms that discourage women from pursuing STEM and VET fields.

Gender segregation, a deeply rooted feature of education and employment systems in the European Union, refers to the concentration of one gender in certain areas of education or work (horizontal segregation) or in specific grades, levels of responsibility or positions (vertical segregation).

Gender segregation in the labor market is both cause and consequence of the same phenomenon in education and training pathways, which create a vicious circle of exclusion of women from sectors a male prevalence. The challenges women face in ICT and STEM jobs can indeed discouraging girls from undertaking a course of study in these areas and thus reducing their access possibilities to them.

Interestingly, it is possible to identify two trends in relation to gender segregation that shed light on how gender norms affect the division of labour: the ICT and STEM sectors see the predominant participation of men, while in the Education sector, Health and Wellness (EHW) are majority women. These mechanisms of gender segregation represent the perpetuation of similar stereotypes, as the prevalence of women in the EHW field is closely linked to the traditional care roles covered in the family environment and rooted in patriarchal structures. Furthermore, in these sectors, employment and labour contracts are subject to greater precariousness, lower wages and unfavourable working conditions, especially compared to male-dominated sectors.

Heteronormativity, Homophobia and Transphobia:

Many educational institutions and workplaces may lack gender-inclusive facilities, such as restrooms or changing rooms, which can make LGBTQI+ and non-binary individuals feel uncomfortable or excluded. Then, they may be subjected to misgendering deadnaming (using their birth name instead of their chosen name), which can create a hostile and disrespectful environment. This can occur in academic settings, professional interactions, and social contexts.

Institutions and organizations may have also policies that do not explicitly address the needs of LGBTQI+ and non-binary individuals. This can result in a lack of support systems, such as gender tran-

sition guidelines, non-discrimination policies, or employee resource groups that cater to LGBTQI+ and non-binary concerns.

At European level there are percentages of women (54%) and men (46%) who conclude their studies with a degree in natural sciences, mathematics and statistics, however there are large differences, on the one hand, in the area of engineering, of manufacturing and construction, and on the other in the ICT sector, where women represent respectively 28% and 20% of graduates.

The structure of the educational system influences individual choices in this area, especially during early adolescence at the level of vocational education, with the consequent separation of work paths. Questioning gender expectations by choosing educational or occupational paths considered atypical for their gender is more difficult in the case of adolescents, due to their stage of life from a social and psychological point of view and the need to assert personal gender identity.

People having a migrant background:

Language barriers can be a significant hurdle for individuals with a migrant background in STEM and VET. Limited proficiency in the language of instruction or workplace communication can limit their participation, understanding, and advancement opportunities. Then, migrants with STEM qualifications obtained from their home countries may face challenges in having their credentials recognized in the host country. Differences in educational systems and certification requirements can result in their qualifications being undervalued or not recognized at all.

Migrants face also limited networks and professional connections in the host country, which can impact their access to job opportunities, mentorship. Discriminatory practices or biases within existing networks may further hinder their integration and advancement.

STEM sector may lack cultural diversity, with underrepresentation of individuals from migrant backgrounds. This can perpetuate feelings of exclusion, limit diverse perspectives in problem-solving, and hinder innovation within the industry. Cultural differences and institutional practices can create barriers for individuals with a migrant background in STEM and VET. These may include unfamiliarity with local work norms, lack of awareness about available resources and support systems, and difficulty navigating bureaucratic processes.

Cultural, "Ethnic and Racial"1 Minorities:

Some minorities may face barriers in accessing and participating in STEM and VET programs. These barriers can include limited educational resources in their communities, direct and/or unconscious racism, discrimination, lack of role models, and systemic inequalities that perpetuate unequal opportunities in education and employment.

Socioeconomic Disadvantage:

Individuals from low-income backgrounds may encounter challenges in pursuing STEM and VET education due to financial constraints. The cost of education and training, including tuition fees, materials, and transportation, can pose significant barriers for disadvantaged individuals, limiting their access to opportunities.

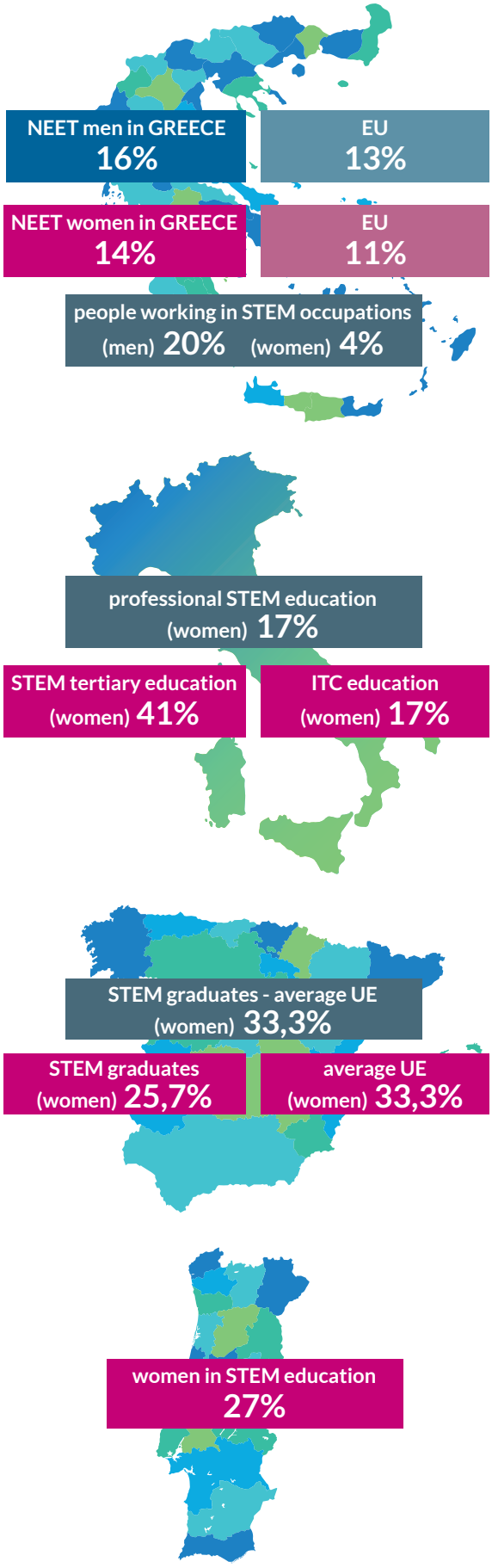
Persons with Disabilities:

People with disabilities can face physical, technological, and attitudinal barriers that impede their full participation in STEM and VET programs. Accessible infrastructure, assistive technologies, inclusive teaching methodologies, and supportive learning environments are essential to ensure their meaningful inclusion.

Overview, definitions and basic statistics at EU level and project partners' countries

In European countries where there is more investment in scientific research, women are present in remarkably low percentages (**18% Lussemburgo** **17% Holland** **23% Sweden** , while in countries where investment in research is low (such as Estonia and Portugal) and consequently low are the wages of personnel in research, the presence of women is higher (She Figures, 2009). This trend can be read in a manner twofold: men abandon the unattractive and profitable research sectors while they are very present where economic investments are significant. In the countries a higher rate of scientific and technological innovation, investments, due to gender stratification present, are concentrated in traditional research areas male (defence, industrial and technological sector), to the detriment of the research sectors in which historically the presence of women has been higher (biology, health, social services, education).

[1] Here we are using the term "racial" by convention, even though we are aware of the insistence of races, but only as a reference to the racist social construction for which in many contexts discrimination is made on the basis of somatic traits or skin colour. We are in fact aware that it is precisely a racist narrative that creates races in the collective imagination, and not vice versa. In this direction, even the term "ethnic" must not be considered as a ploy to reintroduce a rigid distinction of cultural differences with other terms, but once again to consider the social construction that is made of this in the collective imagination, to which discrimination , stereotypes and prejudices inevitably refer.



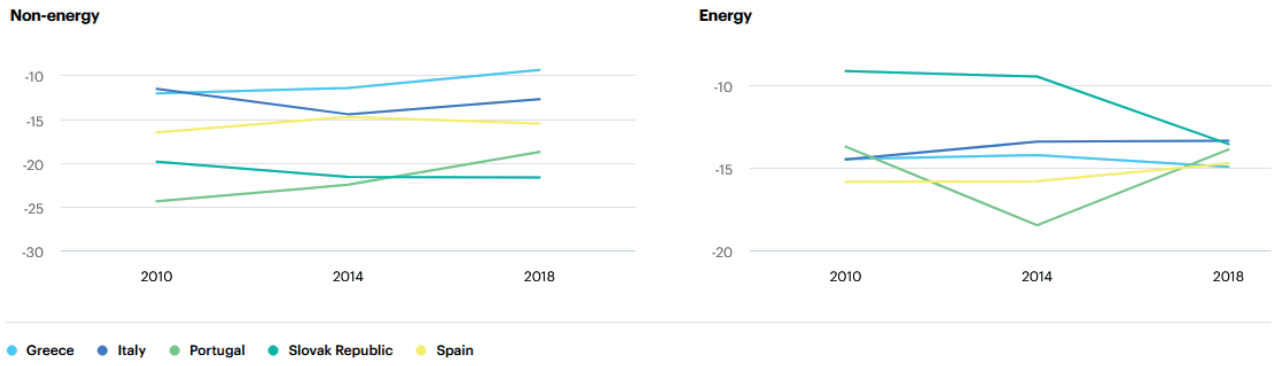
In **Greece**, young people, aged 15-29 that are neither in employment nor in education and training, based on the most recent data in 2022 from EUROSTAT seem to be more that EU. Specifically, NEET men in Greece reach about 16% in comparison to 13% in the EU, and NEET women reach about 14% in Greece in comparison to 11% in the EU.
Generally, in Greece NEETs are 15% while in EU there are 12% Specifically, in research made by the European Institute of Gender Equality in 2019,it showed that men made 20% of people working in STEM occupations, while women made only 4%.

According to the Gender Equality Index 2020, in **Italy** the rate of female participation in education has seen improved at all levels, even if large differences between the sexes emerge in vocational training, upper secondary school and tertiary education. Women account for 17% of pupils completing professional STEM education, 41% for STEM tertiary education and 17% for ICT.

First, data from Eurostat from 2020 show that, compared to the EU average of 33.3%, women made up only 25.7% of STEM graduates who were employed in **Spain**. Moreover, according to the Spanish Ministry of Education, women made up 43.4% of all undergraduate STEM students in Spain during the 2019–2020 academic year. However, as education levels rise, the proportion of women falls. Women made up just 29.8% of STEM doctoral students in Spain during the same academic year.

Portugal has a share above the EU-27 average in terms of women graduated in STEM as reported by CIG (Commission for Citizenship and Gender Equality) in its 2021 statistic bulletin. This report also states that the sub-representation of women among STEM graduates is less accentuated in Portugal than in most other EU countries. The share of female students enrolled in higher education per field of training. Looking at the field of STEM and related fields, the participation of females in "Sciences, Maths and ICT" has decreased from 47,2% to 42,6% between 2013 and 2022. The participation of women in engineering-related fields (engineering, industries and construction) has kept relatively steady but low (circa 27%).

Graph 1 - Evolution over time off the gendere wage gap conditional on skills for the selected sector (Energy, Non-energy)



Gender issues inclusiveness in STEM and VET

The EU has been actively promoting inclusiveness in VET, aiming to address gender disparities and enhance diversity. Through initiatives like the European Alliance for Apprenticeships and the New Skills Agenda for Europe, the EU encourages member states to implement inclusive policies, provide equal opportunities, and foster gender balance in VET programs.

Although there is an increasing number of jobs required within the STEM area, there is a lack of profiles with suitable characteristics to fill them. This is partly attributable to an under-representation of women in these study programmes.

Existing literature agrees that gender differences in STEM achievement typically arise quite late in students' careers. Some students, for example, discovered through a meta-analysis that differences in solving math problems do not exist in elementary or primary school, but arise in secondary school and college.

The gender gap in STEM participation becomes more evident in lower secondary education, as supported by the literature. This is in fact the moment in which the specialization begins and the students choose which subjects to study. Those who have studied STEM subjects at advanced levels in upper secondary school are more likely to progress to STEM-related degree programs in higher education. Regardless of level of education, exposure to STEM and intentions do not always guarantee the continuation of this type of education.

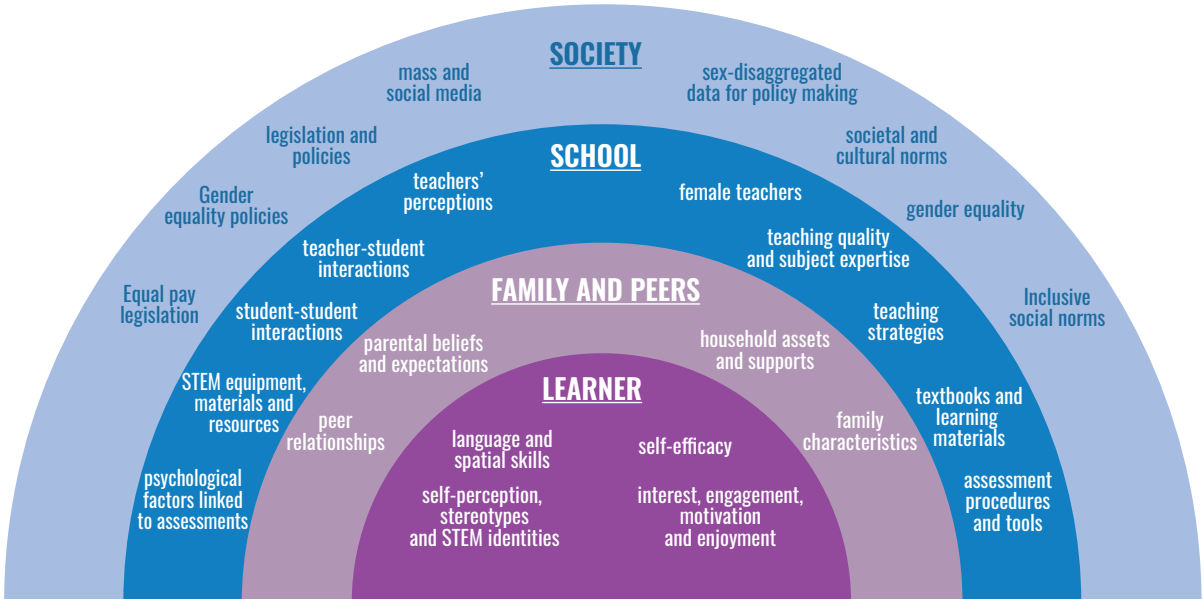
Gender experts, female academics and feminists have long denounced the negative consequences that the phenomenon of occupational and educational segregation has for women and men individually, as well as for society as a whole. This segregation derives from the difficulty of questioning the imbalance of power in gender hierarchies and patriarchal structures, functional to maintaining stereotyped gender roles and expectations on the basis of the presumed innate characteristics of one or the other sex

and therefore the activities that they are believed to be performed by both women and men in productive and reproductive work. These are mechanisms that have significantly influenced the role of women in the world of work and, in particular, in the most currently most important occupational sectors, such as technology and engineering. There are several factors contributing to gender segregation both in education and in the labour market which need to be analysed at different levels: at the individual level (personal goals and motivation), at the organizational level (teaching practices, study curriculum, gender culture at the organizational level) and at the social (structural) level. Overall, educational segregation is closely associated with labour market segregation.

In the past, gender gap analysis in STEM focused especially on the discrimination suffered by women in scientific contexts, professional and academic issues, still alive and evident in the choice of many female students to abandon the STEM path. Again, among the determining factors include a dissatisfaction of women with the climate cultural present in the department, to the opportunities for advancement of career, faculty leadership, and research support (Hill, Corbett and St. Rose, 2010).

However, recent analyses no longer support the idea that this is the main factor of why there are fewer women in this area (Ceci, Williams, 2011). The authors, on the contrary. identify 3 main factors: choices reproductive factors, differences in abilities, and career preferences.

Fig. 1 - Ecological framework of factors influencing girls' and women's participation achievement and progession in STEM studies



What intersectionality means in these fields and its possible applications

The intersectional perspective adds significant value when addressing the gender gap and promoting inclusivity in STEM disciplines and VET.

Intersectionality refers to the understanding that an individual's experiences and identities are shaped by the intersection of multiple social factors, such as gender, "race", ethnicity, sexuality, disability, socio-economic status, age, culture, educational background, etc.. By considering these intersecting identities, we can better comprehend the unique challenges and barriers faced by individuals within marginalized groups.

In the context of the gender gap and inclusivity in STEM and VET, an intersectional approach recognizes that the barriers and biases faced by women are not the same for all women. Women from different "racial" or ethnic backgrounds, socio-economic statuses, or with disabilities may encounter additional obstacles that compound the gender-based challenges they already face.

By incorporating an intersectional perspective, we can:

- **Recognize diverse experiences:** An intersectional lens acknowledges that experiences of gender inequality in STEM and VET vary across different identity groups. It highlights the importance of understanding the specific barriers faced by women with multiple marginalized identities and tailoring strategies accordingly.
- **Address multiple dimensions of discrimination:** An intersectional approach helps uncover how discrimination and bias based on gender intersect with other forms of oppression. It enables us to tackle systemic issues such as racism, ableism, and classism, which may exacerbate the gender gap and hinder inclusivity in these fields.
- **Develop targeted interventions:** By understanding the unique challenges faced by different groups, we can design interventions that are more effective in addressing specific needs. For example, initiatives could focus on increasing representation of black women in STEM leadership positions or providing support systems for women with disabilities pursuing STEM education.
- **Foster inclusive environments:** An intersectional perspective promotes the creation of inclusive environments that embrace diversity. It encourages the adoption of policies, practices, and educational approaches that account for the experiences of all individuals, fostering a sense of belonging and equitable opportunities for everyone.

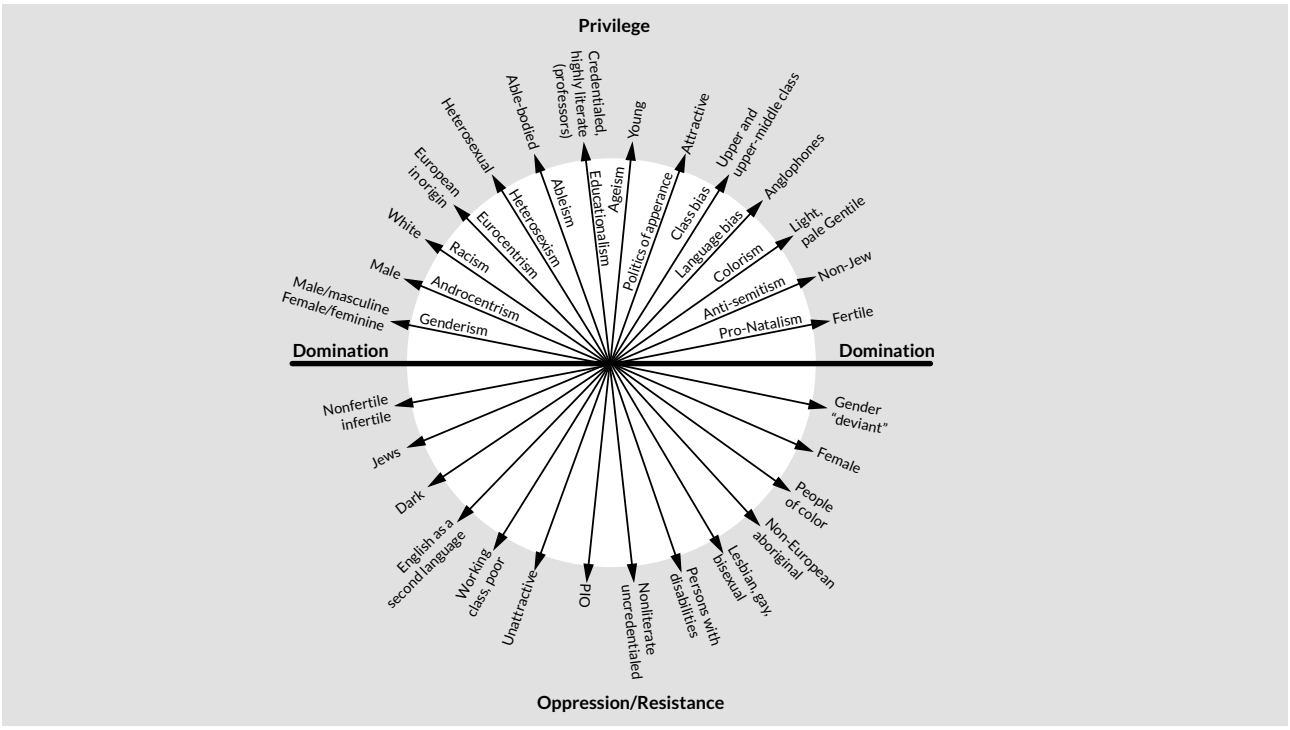
Overall, by adopting an intersectional perspective, we can gain a more comprehensive understanding of the gender gap and inclusivity issues in STEM and VET. This approach allows us to develop more targeted and effective strategies to address systemic barriers, promote diversity, and create inclusive environments where all individuals can thrive.

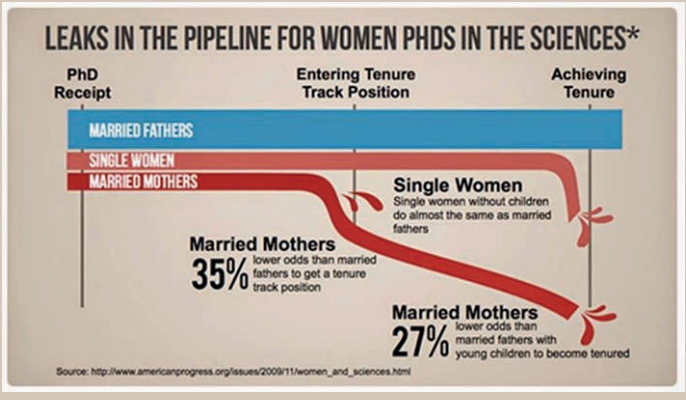
All forms of inequality are mutually reinforcing and must therefore be analysed and addressed simultaneously to prevent one form of inequality from reinforcing another. For example, tackling the gender

pay gap alone – without including other dimensions such as "skin colour", socio-economic status and migration status – will likely reinforce inequalities among women.

Intersectionality, understood as a fundamental hermeneutical tool for the analysis of social phenomena, serves a threefold purpose:

1. understanding how social categorizations, including gender, ethnic origin, socio-economic hardship and disability, shape the identities and multiple belonging of the participants;
2. revealing "intersectional" oppressions, barriers and discriminations "qualitatively" different from those pertaining to a single area;
3. analysing the interaction between structures, policies and statements that make specific experiences invisible in terms of access to rights and opportunities, with specific reference to girls' experiences and access to STEM education and training.





PART 2

RESEARCH DESIGN PLAN AND METHODOLOGY DESCRIPTION

Objectives

This final Gender Analysis combine national Gender Analysis reports on the TVET sector of each partner country. For Cyprus, Italy and Greece, the gender analysis report focus on gender differences and gaps present in their respective TVET systems, while in Portugal, Spain and Turkey, the report analyses not only the national TVET sector but also focus on their institutions, providing qualitative and quantitative data. The causes, influencing factors and effects of gender related differences within the TVET sector had been analysed and presented also.

Target Groups

As target group has been identified both male, female and non-binary VET trainees.
Around 192 trainees from Portugal, Spain and Turkey.

Tools and methodologies

In order to detect any conscious and unconscious misbehaviours and misperception related to gender issues (such as homophobia, transphobia, sexism, machismo, and so on) the partners decided to divide the research in:

- Desk research including VET National background information, qualitative and quantitative data in all partners Countries;
- A survey composed by online questionnaires just in Portugal, Spain and Turkey;
- A focus-group, targeted teachers, trainers, and VET key actors.
  - The focus group is a useful tool for additional data in research, for issues identification, and to determine areas needing further research, such as cultural bias, (mis)perceptions, prejudgments, (mis) representations and stereotypes conscious and unconscious ones, very relevant for inclusivity and gender issues;
  - offering discussion and debate a reticular rather than vertical form, for greater spontaneity;
  - allowing the amplification of information that can be debated and, above all, the considerations at the individual level, also through the activation of aspects overlooked by the participants or to which they do not pay sufficient attention.

The focus-groups, as gender balanced as possible, were composed by:

1 . at least 8 among teachers/trainers/mentors/carrier guides, gender balance experts, deeply involved and sensitive to inclusivity;

The aims of the focus groups were:

- To review feed-back and results collected through the survey;
- To explore more in-depth needs and priorities to fill the gender gap in STEM;

Additional methodological notes followed to manage the focus-group:

- Encouraging open and respectful dialogue, ensuring psychological safety for all participants;
- Being careful to give space to female voices, avoiding mansplaing[2] and any overrepresentation of male ones (see the pictures below)
- Remaining neutral and avoiding imposing personal opinions or biases.
- Using active listening skills and rephrase key points to ensure clarity and understanding.

[2] Mansplaining indicates the condescending and paternalistic attitude with which a man explains to a woman something obvious, unsolicited or of which she is an expert, in the tone in which one speaks to a child, to a stupid person or to a person who does not understand. In facts, it is a pattern of overlooking and dismissing women's point of views, knowledge, experiences and voices, to be avoided.

Focus Group questions based on TVET students' questionnaire results:

General Perception:

- How prominent are female role models in your VET experiences (teachers, leaders, scientists, etc.)?
- What is your overall impression you get about gender representation in your VET studies.

Encouragement and Potential:

- How readily are students, regardless of gender, encouraged to pursue STEM training?
- Did the survey responses reveal any discrepancies in how family, trainers, friends, and educators encourage students towards STEM?
- What factors contribute to any feelings of undervaluing or not having potential recognized?

Improving Inclusivity:

- What changes or initiatives suggested in the responses do you think would make the VET environment more inclusive for diverse groups?
- How can training methodologies, programs, classrooms, and the overall VET center be adapted to foster a more inclusive STEM learning experience?
- What role can educators, peers, and the wider community play in combating gender discrimination within the STEM field?

Future Aspirations:

What concrete steps could be taken to increase the engagement and retention of underrepresented groups in STEM fields?

Focus-groups results

Participants:

8 persons including Head of Studies, Pedagogical Coordinator, Project Manager and Teachers

Some highlights:

Teachers believed that, as stated in the survey, students are encouraged to take on STEM studies mostly thanks to tutoring and orientation paths. However, teachers, educators, family, etc. still need to break gender stereotypes and focus on inspiring more female students to pursue STEM training.

Suggestions were made to foster a more inclusive STEM learning experience, including incorporating active learning methodologies, using technology to facilitate participation, and designing workshops on empowerment and inclusive language. Additionally, programs targeting women in industrial and technological fields could help address the gender gap. Teachers need to ensure that teaching materials, examples and case studies reflect diverse perspectives and backgrounds. This will help students from diverse backgrounds feel included and represented in STEM fields.

Educators, peers, and the wider community were seen as pivotal in combating gender discrimination within STEM. Role modelling equitable behaviours, providing diverse perspectives in teaching materials, and showcasing female role models in STEM were highlighted as crucial steps. Ultimately, by encouraging equal participation and providing support to all students, regardless of gender, the education community can work towards a more inclusive and diverse STEM landscape.

Participants:

10 persons including School Manager, Manager Assistant and Teachers

Some highlights:

Showing women working in the sector as role models and inviting them to participate in promotional activities for vocational high schools are some methods that can be useful.
Structure, regulations and curriculum of the education system and especially vocational education should be changed.

Participants:

11 persons including a representative of Women in Tech Portugal, a representative of the Municipal Education Department, Project Managers, Schools Career Orientation and Guidance experts and Teachers

Some highlights:

Stakeholders play critical roles in creating a supportive environment and implementing strategies that could encourage and facilitate female participation in VET.

Implementing programmes/activities/events for parents, starting as early as primary school, to show them female students are capable of pursuing STEM areas of work, thus fighting stereotypes and prejudice.

Training school staff to deal with gender issues and to make the necessary changes regarding methodologies and classroom dynamics to make lessons more inclusive.

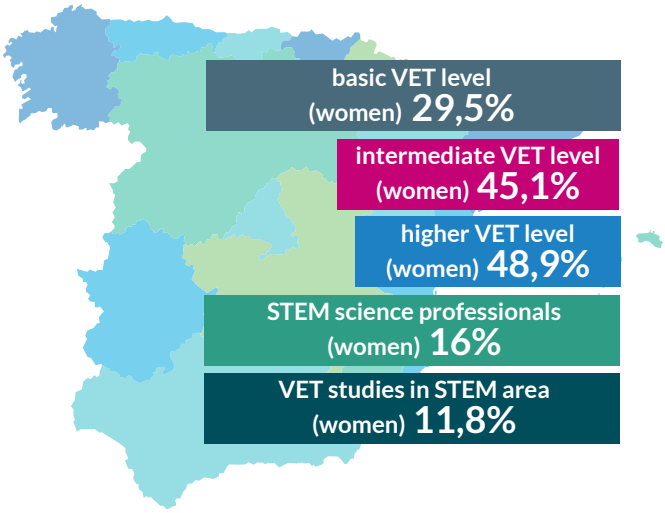
Implementing "mentoring programmes"/"role model programmes" in lower secondary education to provide female students with guidance and advice from female STEM professionals. These programmes would require collaboration between schools, local companies, VET schools, and higher education institutions to have inspiring female STEM professionals visiting schools.

Organizing "Short period traineeships", "Job shadowing periods" and "Open Days" in companies allowing female students to experience the real world of work.

Changing the language used by education authorities and schools in course materials to eliminate bias. Schools should adopt neutral, inclusive language in their activities and marketing materials to change the mindset from within the education system.

Working with companies on changing the work environment and facilities and adapting them to female characteristics, for example adjusting the size of uniforms, the access to tools and machines, and other workplace ergonomics to ensure they are suitable for women.

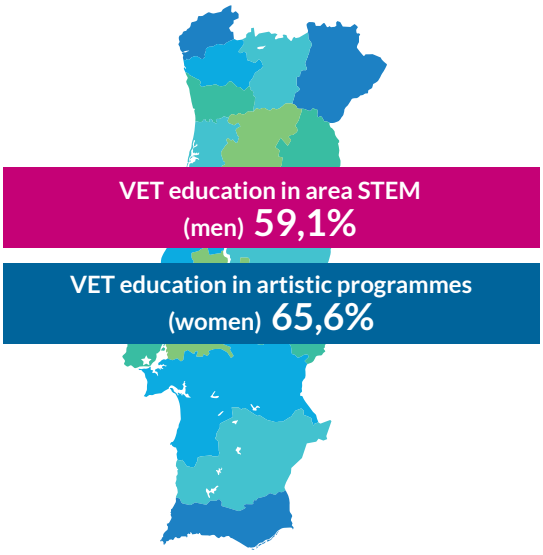
DESK RESEARCH SUMMARIES



In **Spain** women represent 29.5% of students at basic VET level, 45.1% at intermediate level and 48.9% at higher level, according to the data from Cedefop. However, the greatest differences can be observed in the distribution by sex by sectoral branch: women are in the clear majority, for example, in personal image, sociocultural and community services, textile, clothing and leather, administration and management and health; while men are the majority in installation and maintenance, extractive industries, vehicle transport and maintenance, electricity and electronics, energy and water and mechanical manufacture. That is, there is still a need to attract more women into industrial fields, especially those requiring STEM training.

In Spain, only 16% of STEM science professionals are women, according to data from the Social Observatory. Moreover, only 0.7% of teenage girls show interest in these studies. Although the gender gap in VET has been decreasing in the following years, the figures do not point to an immediate transformation. According to data from the Vocational Training Observatory in Spain, in the 2021-2022 academic year only 11.8% of women enrolled in VET studies in STEM areas.

This low participation of women in STEM professions has made the educational community and companies aware of the lost potential of women in these professional profiles. Attracting female talent to STEM studies is key for companies and creates an opportunity to reduce the gender gap and achieve a more equal society.

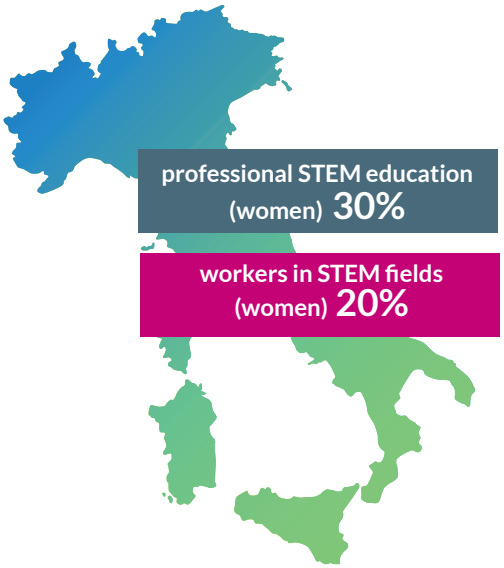


In **Portugal** historically, women have been underrepresented in technical and vocational education, particularly in areas like STEM (Science, Technology, Engineering, and Mathematics). Usually, more males participate in VET (59.1%), apart from in specialized artistic programmes where, in 2018/19, 65.6% of learners were female. To fight these trends, several initiatives have been implemented.

For instance, the Portuguese government has launched the National Strategy for Equality and Non-Discrimination 2018-2030, a policy which includes specific action plans to promote gender equality in education and employment. It is based on an Action Plan for Equality be-

tween Women and Men to ensure governance that integrates the fight against discrimination in sex ratio and the promotion of IMH in policies and actions; guarantee the conditions for education and training free of gender stereotypes; promote IMH and non-discrimination in research and development (R&D) and in the digital world; guarantee the conditions for full and equal participation of women and men in the job market; promote reconciliation between professional, family and personal life and response to the demographic challenge; combat poverty and social exclusion and promote non-discrimination in culture and communication. The measures here included aimed at encouraging girls' participation in traditionally male-dominated fields and vice versa.

The government encourages training programmes for VET educators focused on gender-responsive teaching methods and strategies for promoting gender equality in the classroom and develops public awareness campaigns to fight gender stereotypes, encouraging girls and boys to pursue their interests and talents regardless of traditional gender norms. These campaigns are extended to the field of vocational education and training.



In **Italy**, the gender gap in vocational education and training in STEM fields remains a challenge. Women are underrepresented in these areas due to various factors:

- Participation in STEM Education: Women account for a lower percentage of enrollments in STEM-related degree programs and vocational training courses. For example, in engineering and computer science programs, female students often represent less than 30% of the total enrolment.
- Workforce Representation: Women are underrepresented in STEM-related occupations. According to a report by the National Institute of Statistics, only about 20% of workers in STEM fields in Italy are women.
- Leadership Positions: Women also face barriers in accessing leadership positions in STEM. They are often less represented in decision-making roles and positions of influence within organizations.
- Gender Stereotypes: Cultural and societal gender stereotypes play a significant role in shaping career choices. Stereotypes that associate STEM fields with masculinity can discourage girls and women from pursuing education and careers in these areas.
- Lack of Role Models: The absence of visible female role models in STEM can contribute to limited aspirations and lower levels of confidence among women.

Efforts are being made to address these disparities. Initiatives include promoting STEM education among girls, establishing mentorship programs, organizing awareness campaigns, and implementing policies that support gender equality in education and the workforce.

While progress is being made, more work is needed to bridge the gender gap and create equal opportunities for women in vocational STEM education.

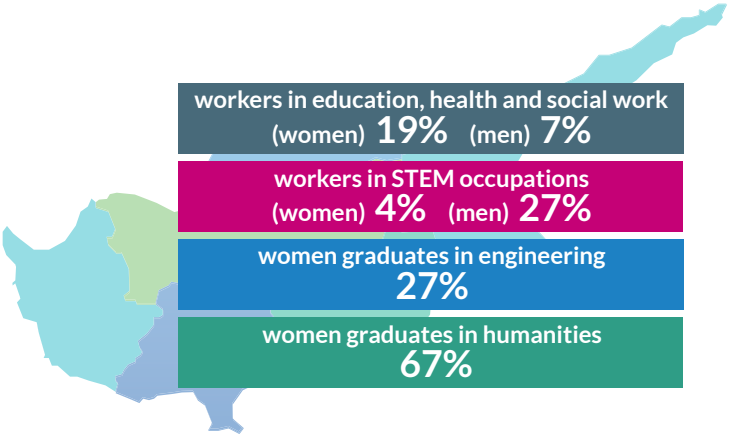
In **Greece** the big gap that can be noticed in TVET fields seems to STEM from a plethora of individual, institutional and societal factors. At the individual level, socialization and stereotypes play a significant role, as internalized gender norms often dissuade women from pursuing technical fields. Additionally, limited exposure to female role models and self-doubt contribute to a perceived lack of belonging in such environments. Career aspirations and guidance are further hindered by a lack of awareness of opportunities in male-dominated fields, biased guidance counselling, and unrealistic expectations about work-life balance.

Institutional factors exacerbate these challenges, with the hidden curriculum and practices perpetuating gender stereotypes through language and teaching methods.

At the societal level, deep-rooted gender norms dictate cultural expectations of female roles and responsibilities, leading to limited family support for women in non-traditional careers and potential harassment in male-dominated workplaces. Labor market barriers such as the gender pay gap, discrimination in hiring and promotion, and work-life balance challenges exacerbate these issues, contributing to the underrepresentation of women in technical fields and their consequent limited career opportunities and earning potential.

Currently, certain initiatives and Strategies are implemented in Greece for the purpose of combating these stereotypes and establishing a new more inclusive environment in TVET fields that promotes Gender Equality.

Several initiatives and legislative measures have been implemented to promote gender equality within the field of Vocational Education and Training (VET). The National Action Plan for Gender Equality (2021-2025) encompasses strategies to increase women's engagement in STEM fields, such as Science, Technology, Engineering, and Mathematics, within VET, while simultaneously tackling gender stereotypes prevalent in vocational guidance. Additionally, the "Women Go Digital" program, backed by the European Commission, endeavours to empower women with digital skills and facilitate their integration into the technology sector, where stereotypes often portray it as male-dominated. Furthermore, Law 4763/2020 represents a significant legislative reform highlighting gender equality in VET by advocating for balanced participation in programs historically monopolized by one gender.



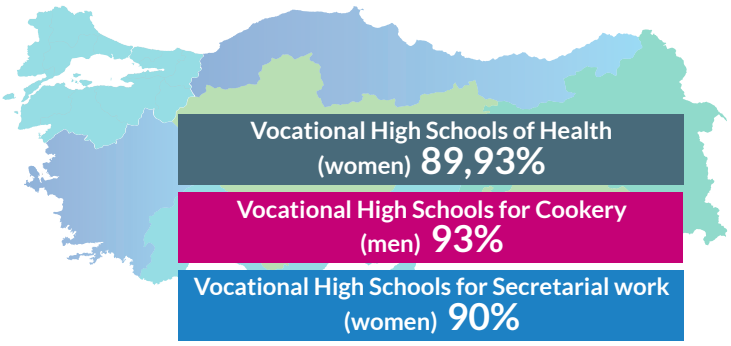
In **Cyprus,** according to CYSTAT (2022), women make up 51.2% of the whole population, and 48% of the labour force aged (15+). With 60.7 points out of 100, Cyprus ranks 21st in the EU on the Gender Equality Index. Its score is 9.5 points below the score for the EU as a whole. It is worth mentioning, that since 2010, Cyprus's score has increased by 11.7 points, due to improvements in the domains of power (+13.8 points), time (+12.5 points) and domain of work (+6.6 points) however there are still many areas of improvement.

For example, the uneven concentration of women and men in different sectors of the labour market remains a concern. About 19% of women work in education, health and social work, compared to 7% of men. In general, proportions of both women and men working in STEM occupations in Cyprus are among the lowest in the EU. Fewer women (4%) than men (27%) work in science, technology, engineering and mathematics (STEM) occupations. Moreover, this gap is also evident in recent research by the Mediterranean Institute of Gender Studies (2022), which has shown that women represent a minority among engineering graduates, reaching only 27%, but a majority of graduates in the humanities (67%).

Taking a closer look and examining this gender gap in TVET from a critical perspective, as in most areas of life, a key contributing factor traced back to traditional, patriarchal stereotypes and social prejudices exist in Cypriot society.

In addition, to the stereotypes and misconceptions about the involvement of women in TVET education, the FeSTEM survey (2022) focusing on empowering women to be more involved in the STEAM field, found that work-life balance and lack of acknowledgement/ recognition from superiors are acting as additional challenges for women to pursue a career in the STEAM industry. Nevertheless, work-life balance and lack of recognition are closely related to gender expectations and misconceptions identified in previous research.

In Cyprus, the promotion of gender equality through policy and legislation is a relatively recent phenomenon, however the last two decades, Cyprus has taken major steps in this area.
At the moment, a national action plan is in place "the National Action Plan on Gender Equality 2024-2026", along with several sectoral action plans on specific aspects of gender equality. The horizontal promotion of gender mainstreaming is one of the main activities of the National Action Plan for Gender Equality.



In **Turkey** the Vocational technical secondary education institutions are the institutions where the gender gap in the distribution of male and female students across school types increases significantly. Although there has been no obstacle to the admission of students of the opposite sex to these schools since 1975, only 12.6% of students in girls' technical high schools are male and only 10.3% of students in boys' technical high schools are female. Anatolian Vocational High Schools of Health is a typically female field with 86.93% female enrolment. In vocational high schools for cookery, 93% of the students are male and in vocational high schools for secretarial work, 90% of the students are female. A noteworthy point is the proportion of female students in Imam Hatip high schools: In 2000, this rate was 50.25 per cent. In the 1999-2000 academic year, 21.33% of girls in vocational technical education, i.e. almost one out of every four girls, were students of Imam Hatip high schools (vocational high schools with religious emphasis). It is thought-provoking for women to receive vocational education in a field that is closed to them.

As a result of the wrong policies implemented, vocational and technical high schools are divided into girls' and boys' high schools. Today, the proportion of male students in girls' vocational high schools is 2% and the proportion of female students in industrial vocational high schools is 7%. Contrary to the contemporary trends in the world, the organisation of vocational and technical high schools in Turkey under different roofs based on gender discrimination is both unwarranted and wasteful of resources. Moreover, this practice is contrary to the concept of coeducation introduced by the Republic. There may not be any legal barriers, but practices make it difficult to attend a 'high school of the opposite sex'.

In some years, it is observed that the number of students in vocational and technical high schools decreased and the tendency towards general high schools increased in those years. It is seen that factors such as job opportunities in the market, the right to attend higher education and gaining social status in the society affect the number of vocational high school students. In today's vocational and technical education, there is a lack of vocational tools, equipment and equipment due to insufficient budget resources. Therefore, applied education environments are insufficient and some subjects are not fully understood by students (Uçar and Özerbas, 2013).

SURVEY SUMMARIES

The online survey involved:

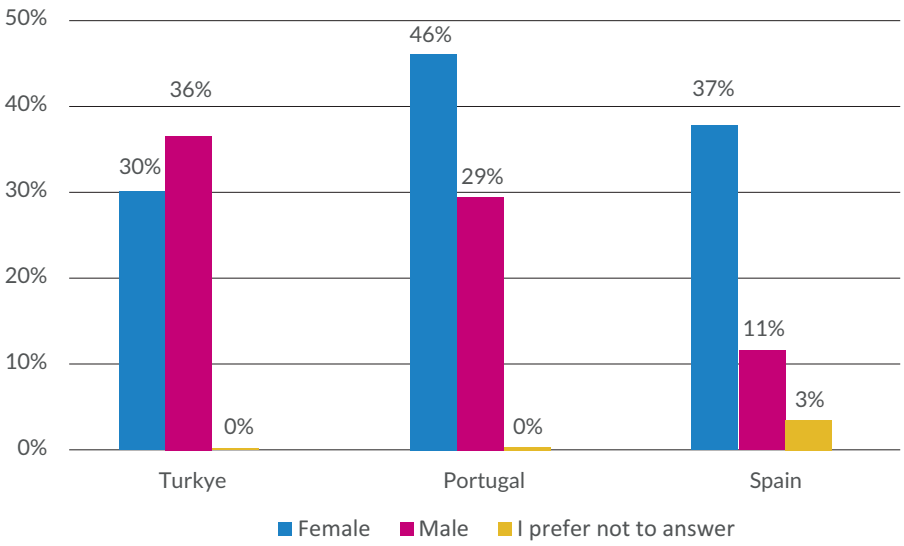
66 trainees among which
30 of whom were female and **36** were male in **Turkey**

75 trainees among which
46 of whom were female and **29** were male in **Portugal**

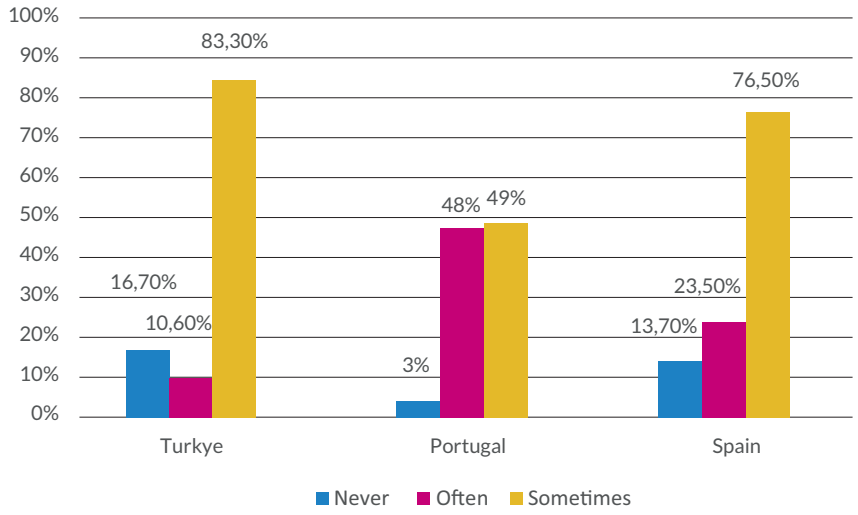
51 trainees among which
37 of whom female, **11** were male and
3 preferred not to answer in **Spain**

Graph. 2 - VET trainees Survey results

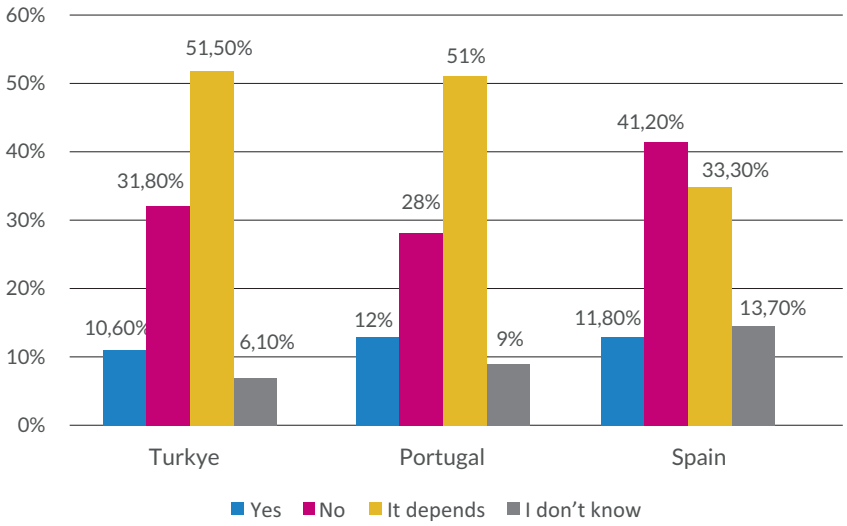
1.How do you identify gender-wise? (Please select all that apply, if any)



2. How often have you encountered in your VET experience (e.g. in the classroom, training programme or in textbooks) female leadership figures, teachers/school principals, scientists, experts, and so on?



3. In your opinion, are Science, Technology, Engineering and/or Mathematics (STEM) subjects in which male students perform better?



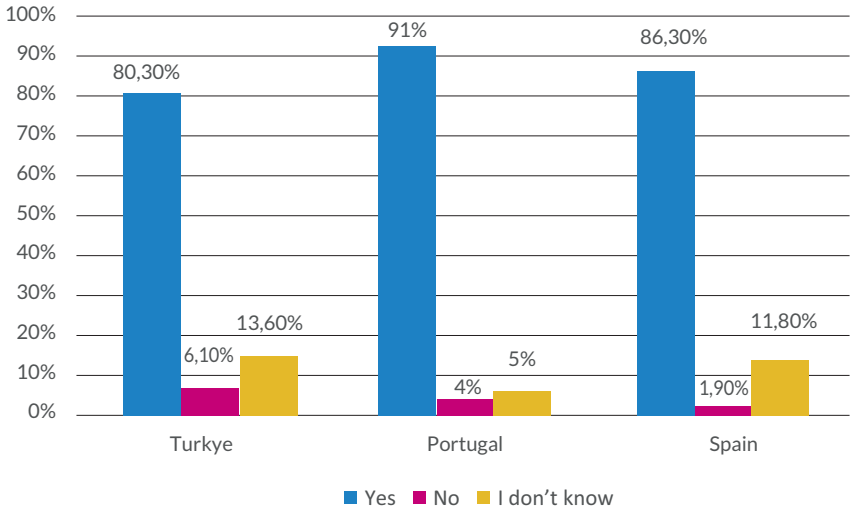
3.1 Why? Please explain your answer:

Most of the respondents to this question said that there is in fact no difference. Below are only the responses that do not fall into the majority cluster above:
Most engineers, mathematicians, and scientists are men

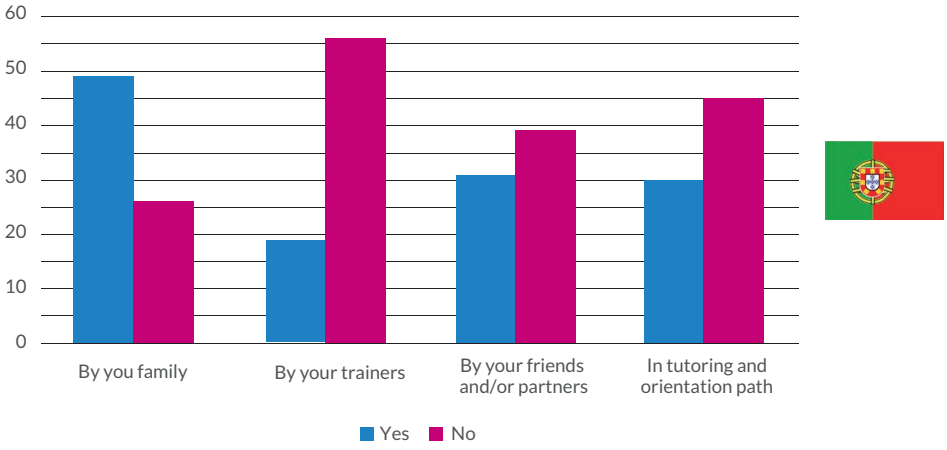
Men are more capable in mental and physical terms
Many jobs are very demanding and men do it better
He is more prone to such lessons

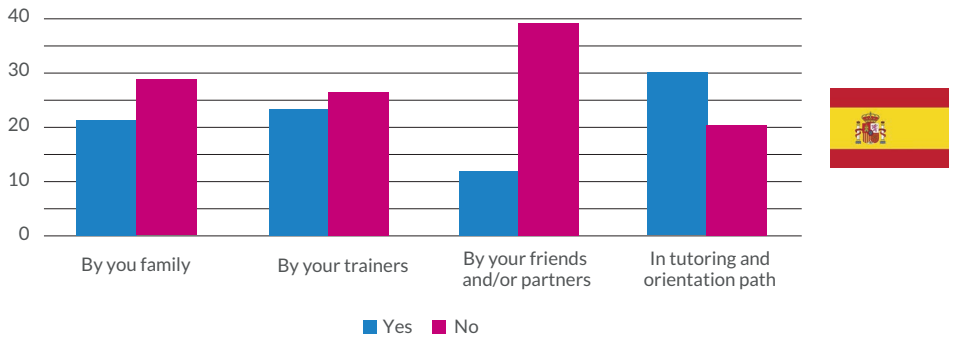
I think it is a programme that more working students can go to.
Some men are men, some are immature
If males are good at it and hardworking
I think women are physically more delicate
Must have experience
More male are interested
Because males are more curious and conscious in this field.
Because men are better at some lectures
Capacity

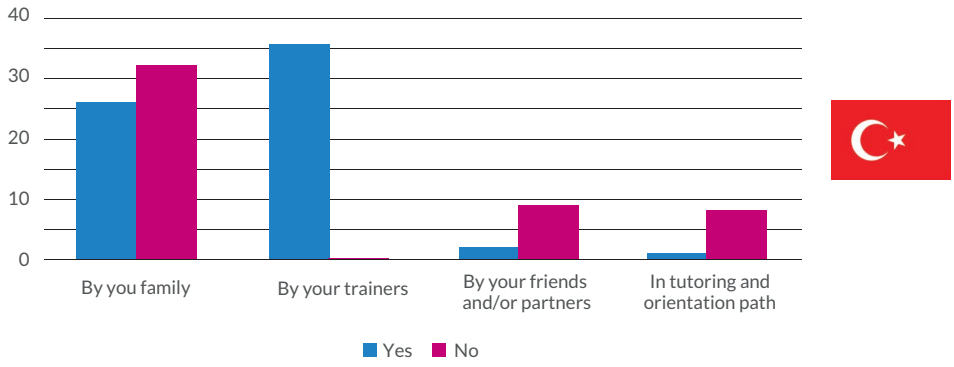
4. In your opinion are Science, Technology, Engineering and/or Mathematics (STEM) sectors both for women and men?



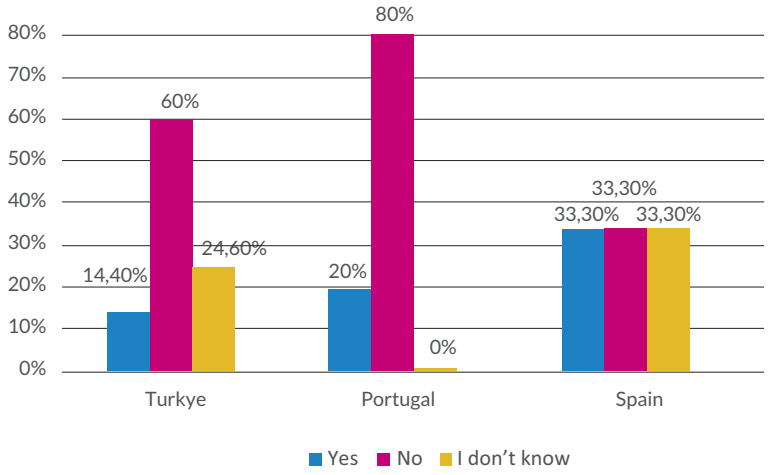
5. Have you ever been encouraged to undertake a training course related to STEM subjects?



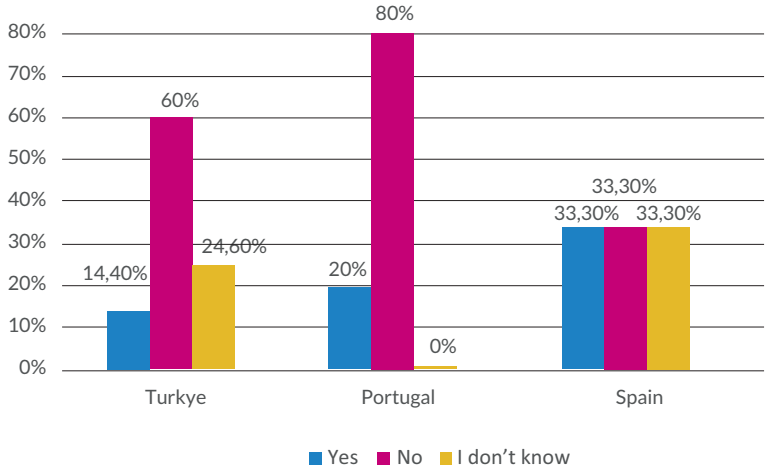




6. Do you feel that your potential in STEM subjects is properly recognized and valued?



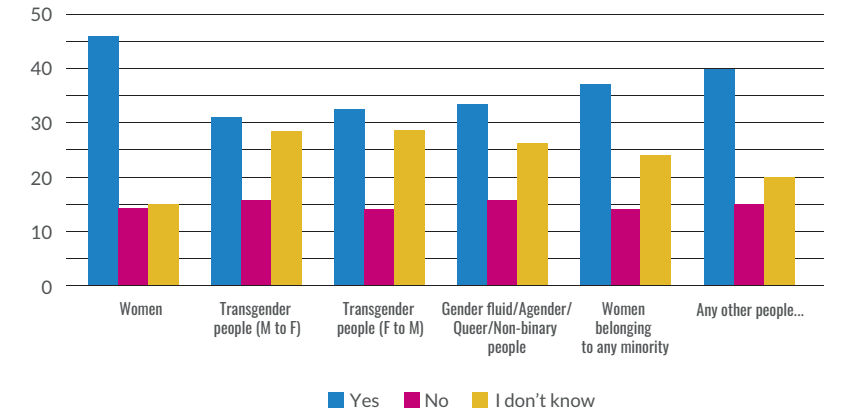
7. Have you ever felt out of context or uncomfortable studying STEM?

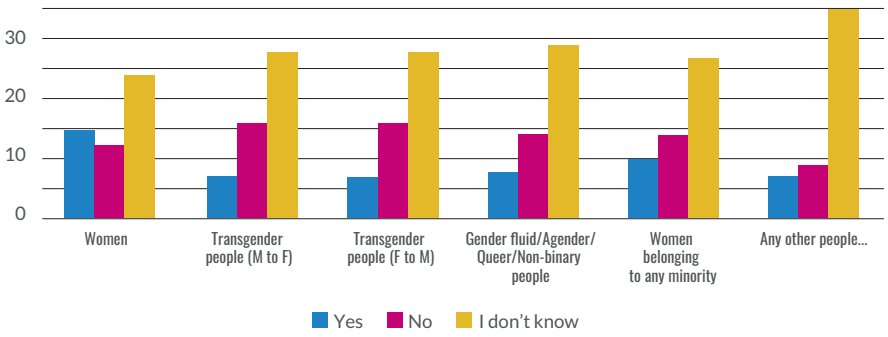


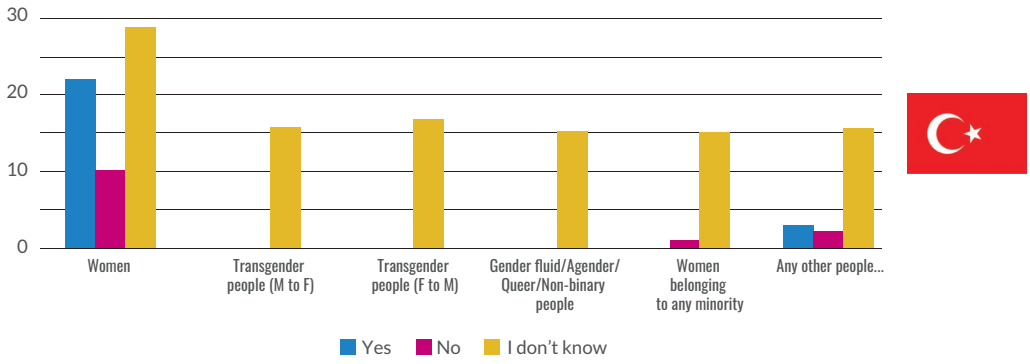
7.1 Please explain your answer:

There were times when I felt I was in a place that does not correspond to me
On many occasions most of the students were boys and being the only girl, they made jokes about it

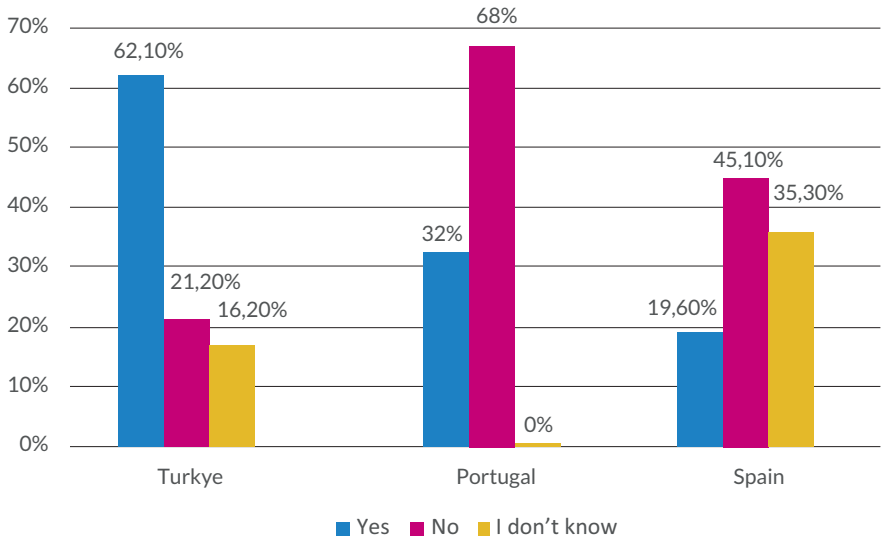
8. In your opinion, STEM education, pays attention and is sensitivity to specific needs of:



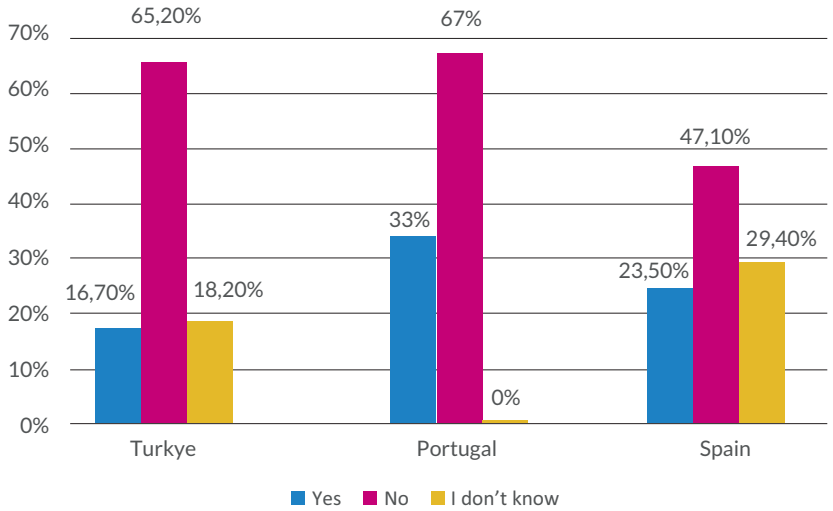




9. *Have you ever felt discriminated in STEM training environment (e.g., classrooms, workshops, social activities, toilets, common areas, etc.)?*



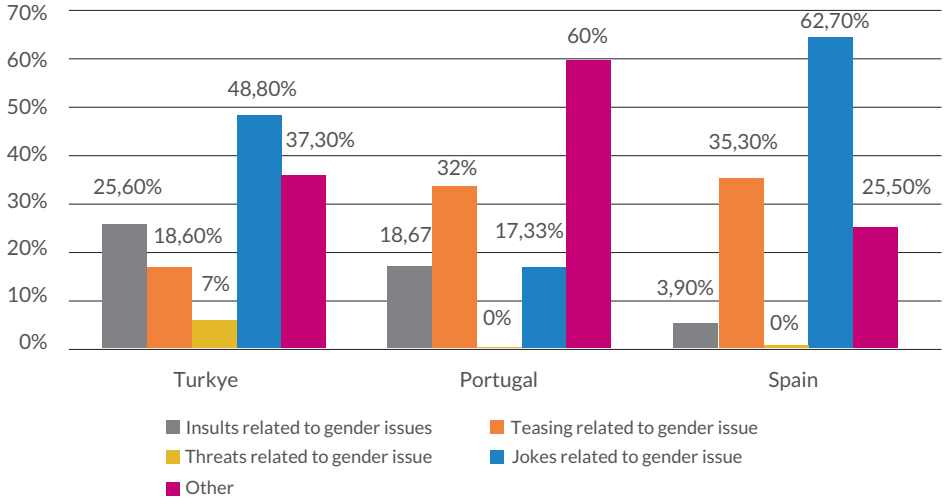
10. *Have you ever felt discriminated by STEM trainers, mentors, teachers, other students, and/or any other key persons within these sectors?*



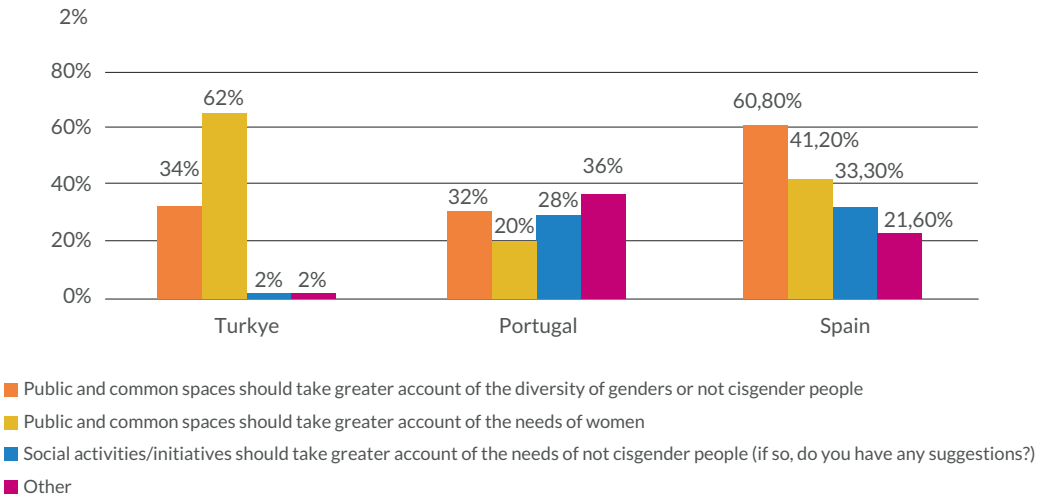
10.1 Please explain your answer

There have been times when I have felt that I was in a place where I didn't belong
It would be more comfortable for some people if the bathrooms were unisex. I know it can lead to complications but it is something that helps a lot for people who are not very clear about their identity
I have had to listen to jokes or inappropriate comments from colleagues and teachers (men), which referred to how a woman does not know how to do something specific because she is a woman.

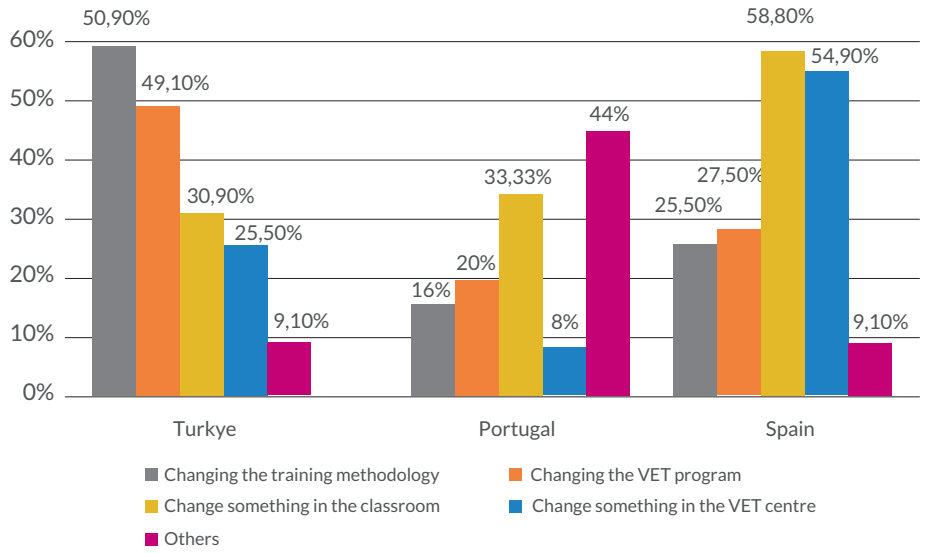
11. Have you ever received or become aware in your VET environment of:



12. How to make the VET school environment more inclusive?



13. In your opinion, what could make STEM subjects more inclusive?



13.1 Please explain your answer

Training is not the problem, but rather the way one teaches or people's reactions
A first step could be to have more female referents, female senior managers and examples of women working in STEM
Teachers have a responsibility to be a good role model for students

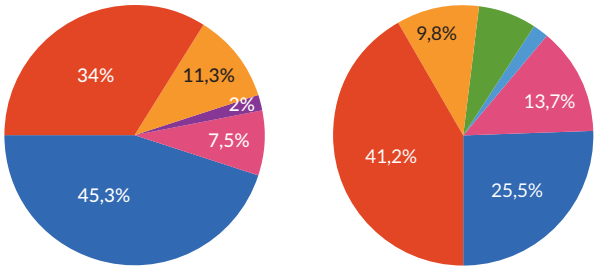
Joint groups can be organised
The changing is better and it takes more attention and sensitivity
The Minister of National Education should be changed

14. In your opinion, what could be done to contrast or prevent gender discrimination within your educational context?

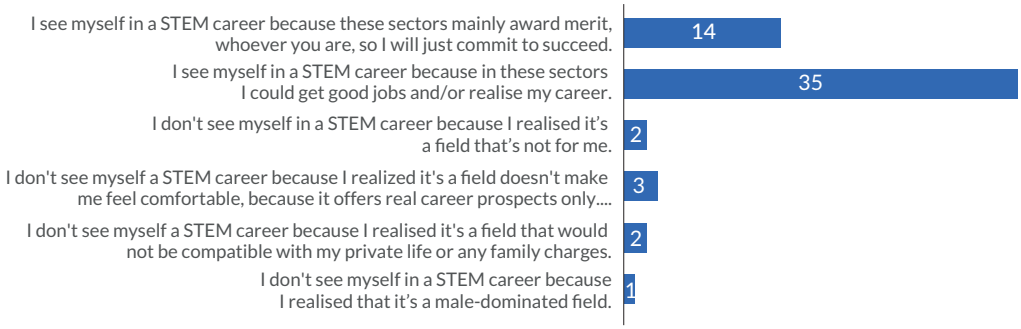
To hold more workshops and talks with people representing these groups
To inform and eliminate stereotypes
To make a practical analysis to draw a parallel with mass trends in the face of injustices, groups, discrimination and bullying
Classes/tutorials/lectures on gender and inclusive methodologies to students but also to workers
Educating in equality
Create some kind of anonymous form in which we can comment or let the appropriate person know if we suffer or hear any kind of comment, joke, etc.

Women can be given more opportunities
Rallies should be held and discrimination should be ended
People of all genders should work together and understand that they are not offensive

15. How do you see your future in STEM (in training paths and/or in your future job)?



- I see myself in a STEM career because in this sector I could get good jobs and/or fulfil my career.
- I don't see myself in a STEM career because I have realized that it is a field that is not for me.
- I do not see myself in a STEM career because I have come to realize that it is a field that would not be compatible with my private life or family responsibilities.
- I don't see myself in a STEM career for other reasons.
- I don't see myself in a STEM career because I have come to realize that it is a male-dominated field.
- I don't see myself in a STEM career because I've realized that it's a field I don't feel comfortable in, becauseit only offers real career prospects if you meet certain requirements.



15.1 How do you think the situation that led you not to stay in the STEM sector could be improved?

Training for equality

Changing the point of view of employers in the sector

GOOD PRACTISES, TIPS AND SUGGESTIONS

- **Closer collaboration with the private sector:** A closer partnership between the business sector and female technicians could have various advantages, such as:
- **Access to Options for Training and Development:** There are numerous private sector businesses with strong programs for training and development that can be helpful to female technicians. By collaborating with these businesses, female technicians may have access to training and development opportunities that will enable them to grow their careers and their skill sets.
- **Expanded Career Possibilities:** Working with the private sector may open up more job prospects for women technicians. In contrast to public sector organizations, private sector businesses may have more employment openings and may be more inclined to hire and promote women who meet the required requirements.
- **Better Work Conditions:** Private sector enterprises may be more likely to invest in bettering working conditions for their staff, which could be advantageous for female technicians who frequently encounter obstacles based on their gender at work. This could involve programs like flexible work schedules, mentorship programs, and laws to stop harassment and discrimination.
- **Access to Networks and Resources:** Collaborating with the private sector may also provide female technicians access to Networks and Resources they might not otherwise have had. In order to launch their own firms or grow in their jobs, they may need access to finance, professional networks, mentorship opportunities, and other resources.

  Overall, increased cooperation with the private sector could contribute to the development of a more encouraging and welcoming atmosphere for female technicians, giving them the chance to enhance their careers, learn new skills, and gain more economic empowerment.
- **Offering high quality training:** For example, it can be enhanced Technical Skills: Female Technicians can become more successful and efficient at their jobs by developing their technical skills with the aid of high-quality training. This may result in better outcomes and higher-quality outputs for the businesses they work for.

  The professional development can also be improved because female technicians who receive high-quality training may also have more chances to advance their careers by learning new skills and methods, getting exposed to cutting-edge technologies, and networking with peers and mentors. They may be able to improve their careers and do their jobs more successfully as a result.

  Moreover, the self-efficacy and confidence is also increased by giving female technicians excellent training, they may feel more certain and confident in their work. They might perform better, be more motivated, and feel happier at work as a result.

- **And of course, we observe a better gender equality:** Training female technicians to a high standard can aid in advancing workplace gender equality. Organizations may support the dismantling of gender stereotypes and the development of more inclusive workplaces by investing in the abilities and skills of female technicians.

Other matters that need to be taken into account:

- More consideration should be given to the internal training in the company given to the trainee, it may be interesting to advance some of this training in the school.
- Companies should be made aware of the calls for projects in which they could collaborate with VET centers (MEF, Erasmus+...). Companies do not know how to get to know these opportunities for collaboration with educational centers, it should be explained to them how to find out about them (which centers may be interested, types of calls ...) so that they can take the initiative to launch a project.
- The lack of students in STEM careers is the basis of the problem due to the lack of critical mass in many sectors, especially in the case of women.
- Communication channels could be improved.
- Bring VET centers closer to start-ups through the existing network of incubators/accelerators.
- Specialization programs can be an answer, but dual training does not always fit all companies (there are cases in which they prefer to train the students themselves), specialization courses can be an answer but it is somewhat slow.
- There are still doubts in companies about the business model related to these technologies (AI, IOT, cybersecurity....), so they are not clear about the level of investment they should make in personnel and equipment and how to implement them in their companies.
- We need to start introducing innovative tools in the classroom (VR/AR, AI...) that drive digitalization in schools.
- They may lack role models (women working in industrial sectors) and knowledge of these professional profiles.
- They may see these sectors as problematic when it comes to balancing work and family life.
- There is still a social component when choosing their professional careers.
- Related to the above, it is necessary to give prestige to STEM and VET and its opportunities to students and families so that it is a prioritized choice.
- We must reach students and their families before high school. Work with Secondary Education guidance counsellors or even from primary school by introducing subjects linked to programming language and computational thinking.
- Organizing more events which gives the opportunity to meet, involve and contact both vocational training centers and companies.

- On the part of the administrations, establishing and defining strategic lines linked to solving needs on the part of companies in terms of qualified personnel, and seeking these solutions with the support of vocational training centers. In relation to the needs, the following are indicated:
  - Knowledge in data center management and data analysis. How to perform secure data exchanges and connect to the cloud.
  - Need for profiles with technical support, mainly to address industrial projects.
  - Knowledge in connectivity issues
  - Knowledge in cybersecurity issues; it is observed that digital skills are being worked on, but in the field of cybersecurity very little and even robotics linked to cybersecurity.
  - Knowledge in infrastructure issues, modernization of infrastructures. Helping customers of ICT companies to have more digitized infrastructures.
  - In companies, except for technology companies, there is a lack of R&D&I departments. It would be good for companies to start having this type of department.
  - It is also commented that there are many obsolete CVs, in the case of training centers that teach programming, they may have the same program from 10 years ago.
  - Sometimes the times and deadlines for training centers to respond to the needs of companies can be 5-6 years.
- Also, in order to address the current needs of the labor market, in general terms, linked to enabling technologies, courses of specialization in cybersecurity, AI and IoT could be organized and taught adapting them to the different profiles.
- Provide data for others to develop applications that companies would use to be more competitive.
- The framework of Erasmus projects allows the creation of competence ecosystems where knowledge can be shared and shared content can be developed to work on digital competences in specific thematic areas (energy, smart cities, industry, etc.). In addition, it also allows to create the necessary frameworks of trust to develop stable strategic alliances over time.
- Seek channels to bring companies closer to vocational training centers, for example, such as initiatives like Iberdrola's, which has its own campus to work on digital skills. It would be good to make it known to other companies and seek partnerships to facilitate learning by other companies.
- Vocational training centers should offer companies to train their employees.
- Offer quality information so that companies know how to train, what for, etc.
- Raising awareness of women leaders in the STEM field over the years.
- Raise awareness in society and encourage the technical vocations of women (if they want to be astronauts, engineers, etc.). For example, there are companies that do not have locker rooms for girls.
- Avoid a social stagnation in relation to women studying STEM careers.
- Promote equality plans in companies.
- Public administrations should also take the lead on this issue and promote aid programs that value the participation of women in R&D&I projects.

• Giving visibility to initiatives such as Inspira STEAM which promotes teaching both boys and girls about women leaders in the STEAM field in schools, or the Women in Science blog, which promotes women leaders who have worked or are working in the STEM field (https://mujeresconciencia.com/).

Recommendations for VET providers and policy makers at EU level

- VET providers should foster inclusive and supportive learning environments that encourage women's participation and success. This can include providing **mentorship programs, peer support groups, and networking opportunities** tailored to the specific needs and challenges faced by women.
- VET providers should strive to **increase the representation of women in teaching and training staff**. Having more female instructors and mentors can provide role models for women learners and create a more inclusive learning environment.
- VET providers should offer **comprehensive and gender-inclusive career guidance and counselling services**. This can include providing information on a wide range of career options, highlighting successful women professionals, and addressing gender-specific barriers or biases in career progression.
- VET providers and policy makers should collect and analyse gender-disaggregated data to monitor the participation, retention, and success rates of women in VET programs. This data can **help identify areas of improvement and measure the effectiveness of gender inclusion initiatives**.
- VET providers should offer **flexible learning options**, such as part-time or online courses, to accommodate the needs of women who may have caregiving responsibilities or other commitments. This can enable better access and participation for women who face challenges balancing education with other aspects of their lives.
- VET providers and policy makers should promote, adopt and enforce **anti-discrimination policies** that protect individuals and groups from any form of discrimination or bias. Awareness campaigns and training sessions can also be organized to promote diversity, combat stereotypes, and foster a welcoming and inclusive learning environment.
- **VET curricula should be revised** to include not only Western people representation and voices, also people belonging to minorities, LGBTQI+ and non-binary perspectives, experiences, and contributions. VET providers should ensure that the curriculum is gender-responsive and reflects the interests, needs, and aspirations of women as well. This includes incorporating examples, case studies, and role models that challenge gender stereotypes and promote a diverse range of career paths, incorporating also diverse perspectives, cultural references, and examples in the curriculum to foster inclusivity and cultural understanding.

  This can be achieved by integrating diverse case studies, historical examples, and inclusive language throughout the course materials. It is important to ensure that the curriculum reflects the diversity of the learners and the industry they are preparing to enter.

- **Inclusive Learning Spaces** should be created, as safe and inclusive learning spaces where LGBTQI+ and non-binary individuals feel supported and respected. This can involve promoting inclusive language, displaying LGBTQI+ inclusive signage, and establishing gender-neutral facilities, such as restrooms and changing rooms, including counselling, mentoring, and peer support groups. These services can address the unique challenges faced by these individuals and provide a supportive network within the VET community.
- VET providers should regularly **monitor and evaluate the effectiveness of their inclusivity initiatives**. This can involve collecting feedback from learners, tracking key indicators such as enrolment and retention rates, and making necessary adjustments to continuously improve inclusivity practices.
- VET providers should ensure that their **facilities, resources, and learning materials are accessible to individuals with different types of disabilities**. This includes providing ramps, elevators, assistive technologies, and alternative formats for content to accommodate diverse needs, including individualized support services tailored to the specific needs of students with special needs. This can include access to **learning support professionals, assistive technology specialists, note-takers, interpreters, or personal assistants** to facilitate their participation and learning.
- VET providers should provide **comprehensive training for educators and trainers** on inclusive teaching methods, disability awareness, and strategies to support students with special needs. This training can equip them with the necessary skills and knowledge to create an inclusive learning environment and adapt their teaching approaches.
- VET providers and policy makers should actively raise awareness about the abilities and potential of individuals with special needs. This includes **promoting positive narratives**, challenging stereotypes, and combating different kind of stigma.
- VET providers should establish **internship and work placement programs in collaboration with employers** paying attention to inclusivity.

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