



UNIVERSITY OF ZAGREB

Faculty of Electrical
Engineering and
Computing

External Gender Equality Assessment

University of Zagreb

Faculty of Electrical Engineering and Computing



This research has been carried out by UZG - FER in the context of CALIPER project through the funded European Union's Horizon 2020 Research and Innovation under Grant Agreement No 873134.

Executive Summary

In the context of the Horizon 2020 project, [CALIPER](#), the Faculty of Electrical Engineering and Computing (FER) of the University of Zagreb (UZG) has conducted an analysis in order to investigate the external conditions such as the legal and cultural framework and the existing national innovation ecosystems in Croatia and identify where gender imbalances occur, why they are created and by which factors they are influenced.

To perform this external assessment a quadruple helix approach was adopted, by involving stakeholders belonging to the following sectors:

- Academia and Universities
- Industry and Business
- Government and Public Sector
- Civil Society

The assessment focuses on the national legal and policy framework on gender equality. Moreover, it presents data about STEM students, researchers, patent registrations, innovative start-up founders within a gender perspective. Finally, it provides a mapping of the existing collaborations of UZG - FER with external stakeholders.

These findings may lay the grounds for the design of the UZG - FER Gender Equality Plan and its implementation and exploitation by the Institution as envisioned by the [CALIPER](#) project, as well as for the set-up of a Research and Innovation Hub by UZG - FER to transfer the knowledge and best practices attained during the project beyond academia.



Introduction

Methodology

The external assessment was aimed at investigating UZG - FER external conditions such as the legal and cultural framework and the existing local/national innovation ecosystems and identifying where gender imbalances occur, why they are created, and by which factors they are influenced.

A quadruple helix approach was adopted, by involving stakeholders belonging to the following sectors:

- Academia and Universities
- Industry and Business
- Government and Public Sector
- Civil Society

The first step of the analysis consisted , in defining the **national legal and policy framework** and in particular:

- the existence of any specific national (and/or regional) policies on gender in Higher Education and/or Scientific Research & Innovation;
- how the frameworks define the relationship between gender equality and quality/excellence in
 - research and/or in education;
- in case there are no specific frameworks, if broader national and/or regional policies on Research, Innovation, and Higher education include any measures on gender equality.

For exploring the national (and regional) policy frameworks two methods were proposed: a desk research/policy analysis and interviews with relevant stakeholders (complementary in case the desk research did not produce enough information).

The second step of the assessment focused on the **National and Regional Innovation Ecosystems**. A **context analysis** through a dedicated desk research eventually complemented with interviews with internal stakeholders was implemented. The aim of the context analysis was to have a clear picture of the challenges faced by UZG - FER in its own innovation ecosystem from a gender perspective. Indeed, the analysis was related to the identification of gaps and challenges related to gender inequalities at different levels (across education, scientific research and knowledge production, transfer to market of research outputs) within innovation ecosystems.

Besides the context analysis a **mapping** was conducted in order to identify existing and potential synergies with external stakeholders, through the following methods:

- a focus group with internal stakeholders¹;
- a survey for external stakeholders;
- a Social Network Analysis (SNA).

Both the focus group and the survey had the purpose of exploring the existing collaborations with external stakeholders from a gender perspective, as well identifying actions already undertaken by stakeholders in order to overcome gender inequalities, potential synergies and risks from further collaborations on gender issues.

¹ Suggested internal stakeholders to involve were: the President and/or vice president(s) research and/or innovation, professors leading researchers/coordinators of clusters or centres or subject areas with a high density of regional cooperation, the Head of administration and heads of research support office and technology transfer office, the Head of continuing professional development/continuing education office, the Head of start-up support service.



On the one hand the focus group, consisted of 5 internal stakeholders and on the other, the survey was submitted by 13 external stakeholders.

Finally, a **SNA** was conducted by FER's researchers with the aim at providing a broad view of national/regional/local networking activities that took place the Organisation through external projects or joint initiatives. It helped spotlighting gender gaps within every partner's institutions in the leadership of external interactions and identifying how frequently gender issues are taken into account in the external stakeholders' interactions. The Organisation focused on collaborations on STEM, in order to narrow the analysis down.

The result of the SNA consists in visual maps spotlighting the collaborations in place with stakeholders belonging to the following categories:

- academia & universities
- industry & business
- government & public sector
- civil society
- schools
- others

Per each category a map is created showing those collaborations having female leaderships (from the side of the UZG - FER) and those focusing and/or taking into account gender issues. KUMU² was used as tool in order to conduct the SNA.

² <https://kumu.io/>



University of Zagreb - Faculty of Electrical Engineering and Computing (Research Performing Organisation)

The Croatian national legal and policy framework

In Croatia, in the Article 14 of the national Act on Gender Equality³ it is stated that the **RPOs are obliged to work on gender balance**, but they have the freedom to define and monitor their own gender equality policies. In the same act there is an obligation for public administration bodies being mainly owned by the state, to have quotas and legal persons to facilitate the adaptation of gender equality plans. Furthermore, in Article 3 it is stated that educational institutions and research performing organizations are obliged to conduct educational programs about gender equality for staff members. Furthermore, institutions are required to promote gender equality and elimination of inequalities, stereotypes and prejudices in the education process at all levels.

The Report on the Implementation of National Policy for Gender Equality 2011 - 2015⁴ shows that most of the measures regarding gender sensitive education and equal opportunities on the market were implemented. But, for example, there are hardly any results on gender equality in ICT sector. There is no national policy for gender equality at the moment, however, in the Report for 2019 of the Ombudsperson for Gender Equality⁵ it is stated that the Government of Croatia plans to adopt a new national plan for gender equality for the period 2021 – 2027.

The National Anti-discrimination Plan for 2017 – 2022⁶ is still ongoing. The objectives are the protection against discrimination, the promotion of rights to equal treatment in Croatia and raising awareness about the importance of knowing and exercising these rights.

A Committee for Gender Equality is in place at the Croatian Parliament. In 2004 the National Office for Gender Equality was established by the Government of Croatia. The office monitors the enforcement of the Gender Equality Act and other regulations regarding gender equality since 2011.

Existence of specific mechanisms to promote the under- represented gender in Higher Education and/or Scientific Research & Innovation at national or regional level

At the moment there are no mechanisms in place in Croatia to promote gender equality in Higher Education, but there were some attempts. The ERA Implementation Plan for Croatia 2016 - 2020⁷ states as one of the priorities, gender equality and gender mainstreaming policy in research. However, the measures introduced were only those concerning female entrepreneurship development. Indeed, the Strategy of Female Entrepreneurship Development in Croatia, 2014 – 2020⁸ includes different measures for the promotion of women in entrepreneurship.

³ Act on Gender Equality (2008) Official Gazette, No. 82/08,69/17
<https://ravnopravnost.gov.hr/UserDocImages//dokumenti/Zakoni/2018//Act%20on%20Gender%20Equality%20ENG.pdf>

⁴ Governmental Office for Gender Equality. (2015). Report on National Policy for Gender Equality 2011 – 2015.
<https://ravnopravnost.gov.hr/UserDocImages//dokumenti/Izvje%C5%A1%C4%87a%20URS/2017//Izvje%C5%A1%C4%87e%20o%20provedbi%20Nacionalne%20politike%20za%20ravnopravnost%20spolova%202011.-%202015.%20%20u%20razdoblju%20od%202014.%20do%202015.pdf>

⁵ Ombudsperson for Gender Equality. (2019). Report 2019.
https://www.prs.hr/attachments/article/2894/IZVJESCE_O_RADU_ZA_2019_Pravobraniteljice_za_ravnopravnost_spolova.pdf

⁶ Office for Human Rights and Minority Rights. (2017.) National Anti-discrimination Plan 2017 – 2022.
<https://pravamanjina.gov.hr/UserDocImages/dokumenti/Nacionalni%20plan%20za%20borbu%20protiv%20diskriminacije%20za%20razdoblje%20od%202017.%20do%202022.pdf>

⁷ Ministry of Science and Education. (2016.) ERA Roadmap – Implementation Plan for Croatia 2016 – 2020.
<https://mzo.gov.hr/UserDocImages/dokumenti/Znanost/ElstrazivackiProstor/Plan%20implementacije%20Republike%20Hrvatske%20za%20razdoblje%202016.%20-%202020.pdf>

⁸ Government of the Republic of Croatia. (2013). Strategy of Women Entrepreneurship Development in the Republic of Croatia 2014 – 2020.
<https://ravnopravnost.gov.hr/UserDocImages//dokumenti//Strategy%20of%20Women%20Entrepreneurship%20Development%20in%20the%20Republic%20of%20Croatia%202014%20-%202020.pdf>



In the Report on the Implementation of National Policy for Gender Equality for the period 2011 – 2015⁹ it was stated that the part of the Measure 3.3 „Achieve gender balance in selecting the field of education in secondary schools and in higher education“ regarding the promotion of gender equality in STEM fields and scholarships were not put in place at all.

Existence of national policies on implementation of quotas or targets for promoting the underrepresented gender in management positions and committees

The National Policy for Gender Equality 2011 - 2015¹⁰ has adopted 11 measures on equality in political and public decision-making processes, including the implementation of quotas in political and public decision-making bodies. They are based on Article 12 of the Gender Equality Act which prescribes the quota of 40% of the underrepresented gender in political and public decision-making bodies, election lists, local, regional and national governmental bodies.

The Ombudsperson for Gender Equality for Croatia conducted, in the period 2013 – 2015, an EU project called “*Dismantling the Glass Labyrinth – Equal Opportunity Access to Economic Decision-making in Croatia*”. A part of the project was about conducting a research on the representation of women and men in management positions in business entities in Croatia¹¹. In the ERA Progress Report for Croatia of 2018¹², it was stated that representation of women in research is high, but there is still a glass ceiling on their scientific career advancement.

Existence of national legislation promoting equality and non-discrimination in employment

In Croatia, the Anti-discrimination Act¹³ is in force since 2009. It follows the legislation in place at the European Union level. The Labor Act of Croatia¹⁴ contains the Article 4 which is about “Protection of Pregnant Employees, Parents and Adoptive Parents”. The National Anti-discrimination Plan for 2017 – 2022¹⁵, instead, includes, as one of the main priorities, the measure of promoting equal opportunities in the area of labor and employment.

In the report of the Ombudsperson for Gender Equality for 2019¹⁶, it is stated that most of the discrimination complaints are related to work, employment and social security (46%).

Existing policies at national level for reducing unequal gender division of labor related to housework and family care

In the National Act on Maternity and Parental Benefits¹⁷, the rights regarding parental leave, part-time contracts, breastfeeding breaks and financial support are prescribed. Parental leave is paid, transferable

⁹ Governmental Office for Gender Equality. (2015). Report on National Policy for Gender Equality 2011 – 2015.

<https://ravnopravnost.gov.hr/UserDocsImages//dokumenti/IzvjecjeC5%A1%C4%87a%20URS/2017//IzvjecjeC5%A1%C4%87e%20o%20provedbi%20Nacionalne%20politike%20za%20ravnopravnost%20spolova%202011.-%202015.%20%20u%20razdoblju%20od%202014.%20do%202015.pdf>

¹⁰ See reference n. 66

¹¹ Ombudsperson for Gender Equality. (2016). Research on the representation of women and men in management positions in business entities in the Republic of Croatia.

http://staklenilabirint.prs.hr/wp-content/uploads/2014/08/PRSRH_Izvjescje_muskarci-zene500_web.pdf

¹² European Commission. (2019). ERA Progress Report 2018 – country profile Croatia.

https://ec.europa.eu/info/sites/info/files/research_and_innovation/era/era-2018_country_profile_hr.pdf

¹³ Anti-discrimination Act (2009), Official Gazette, No. 85/08.

<https://ravnopravnost.gov.hr/UserDocsImages//dokumenti/Zakoni//The%20Anti-discrimination%20Act.pdf>

¹⁴ Labour Act. (2009). Official Gazette, No. 149/09.

<https://ravnopravnost.gov.hr/UserDocsImages//dokumenti/Zakoni//Labour%20Act.pdf>

¹⁵ Office for Human Rights and Minority Rights. (2017.) National Anti-discrimination Plan 2017 – 2022.

<https://pravamanijina.gov.hr/UserDocsImages/dokumenti/Nacionalni%20plan%20za%20borbu%20protiv%20diskriminacije%20za%20razdoblje%20od%202017.%20do%202022.pdf>

¹⁶ Ombudsperson for Gender Equality. (2019). Report 2019.

https://www.prs.hr/attachments/article/2894/IZVJESCE_O_RADU_ZA_2019_Pravobraniteljice_za_ravnopravnost_spolova.pdf

¹⁷ Act on Maternity and Parental Benefits. (2008). Official Gazette, No. 85/08, 110/08, and 34/11.

http://www.hzzo-net.hr/dload/zakoni/06_procisceni.pdf



between parents or guardians and there is flexibility in the use of parental leave. Fathers are encouraged to take a parental leave by getting two months extra.

Concerning the Labour Act¹⁸, it contains articles about the protection of pregnant women, parents and adoptive parents, their working hours and leaves.

This issue is also addressed in The National Policy for Gender Equality 2011 – 2015 (Measure 2.3.1)¹⁹. The Report on the Implementation of The National Policy for Gender Equality 2011 – 2015²⁰ describes the promotional activities that were carried out in order to encourage the equal distribution of household and family affairs as well as equal sharing of parental responsibility for childcare, including the promotion of the usage of parental leave by fathers.

Existing framework conditions regarding childcare facilities

According to the Barcelona Objectives Report for 2018²¹, the percentages of children using childcare facilities in Croatia in 2016 were the following: 15,7% of children under 3 years old and 51,8% of children over 3 years old. The European goals are 33% and 90% respectively. There are big differences between the regions across the country. For instance, availability of childcare facilities is improving in the city of Zagreb (where UNIZG-FER is located). The data for the city of Zagreb in 2016 are: 40% of children under 3 years old of age and 83% of children over 3 years old are using childcare facilities.

Employment conditions at university and research organization

The National Act on Science and Higher Education, 2003²² regulates the employment conditions at public universities and research performing organizations. The Act foresees a fixed number of years to access the following stage in a scientific career. According to Article 42 of the Act, for scientific positions (assistant professor, associate professor and full professors), the employment contract is of permanent type, but there is the obligation of re-election in a fixed number of years. Associate positions (doctoral and postdoctoral researchers) are not permanent, they have fixed term contracts. Article 45 of the Act prescribes the possibility of postponement of the end of contract, in case of fixed-term contracts, and the postponement of the election deadline in career progression, in the case of parental leave, longer sick leave, public service or other significant reason. In the case of employment contracts of associates in projects funded by the Croatian Science Foundation, there is no possibility of postponement, not even in the case of project leaders.

Share of precarious contracts on the overall employment positions in Higher Education in Croatia in the year 2018 is of 3.97% for female researchers and 4.92% for male researchers²³.

Existence of national programs which promote the integration of gender in the content of scientific research

In the Report on the Implementation of the National Policy for Gender Equality 2011 – 2015²⁴, it is reported that the planned measure n. 7.3.3 “Support and funding scientific research on gender issues” was not implemented. The new strategy for 2020 – 2024 is expected.

National/ policies and legal frameworks on sexual/gender harassment in the workplace

¹⁸ Labor Act. (2009). Official Gazette, No. 149/09.

<https://ravnopravnost.gov.hr/UserDocsImages//dokumenti/Zakoni//Labour%20Act.pdf>

¹⁹ Governmental Office for Gender Equality. (2015). National Policy for Gender Equality 2011 – 2015.

<https://ravnopravnost.gov.hr/UserDocsImages//arhiva/images/pdf//National%20Policy%20for%20Gender%20Equality%202011-2015.pdf>

²⁰ See reference n. 66

²¹ European Commission. (2018). Barcelona objectives report.

https://ec.europa.eu/info/sites/info/files/bcn_objectives-report2018_web_en.pdf

²² Act on Science and Higher Education (2003), Official Gazette, No. 123/2003.

<https://www.zakon.hr/z/320/Zakon-o-znanstvenoi-djelatnosti-i-visokom-obrazovanju>

²³ European Commission. (2019). She Figures 2018 https://ec.europa.eu/info/publications/she-figures-2018_en

²⁴ See reference n. 66



The Anti-discrimination Act²⁵ describes forms of discrimination, states the prohibition of discrimination, provides institutional framework and penalty provisions.

The Labour Act²⁶ prescribes the obligation of the employer to protect the dignity of employees regarding discrimination and harassment. In particular, the employer has to nominate a Commissioner for the protection of the dignity of workers in the institution among the employees. The Act also presents the mechanism for reporting to the Commissioner.

Every university in Croatia has its own the Code of Ethics²⁷, in which harassment, discrimination and other forms of unethical behaviour between staff and students are declared as inappropriate and prohibited. Universities and faculties have Ethics Committees for reporting unethical violations of the Code of Ethics.

Funding opportunities for collaborative actions on gender equality at national and regional level

No funding opportunities for collaborative actions on gender equality exist at national and regional level.

²⁵ See reference n. 70

²⁶ See reference n. 71

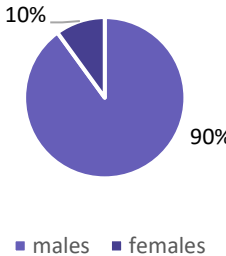
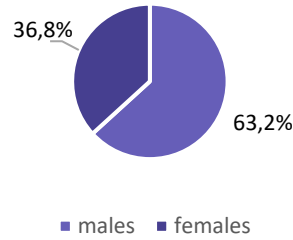
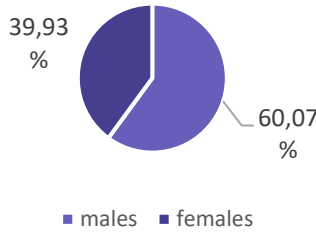
²⁷ University of Zagreb. (2007). Code of Ethics.

https://www.hrstud.unizg.hr/images/50014335/Eticki_kodeks-1.pdf



The innovation ecosystem context analysis at UZG

The following table presents the results of the context analysis conducted by UZG in terms of quantitative and qualitative indicators.

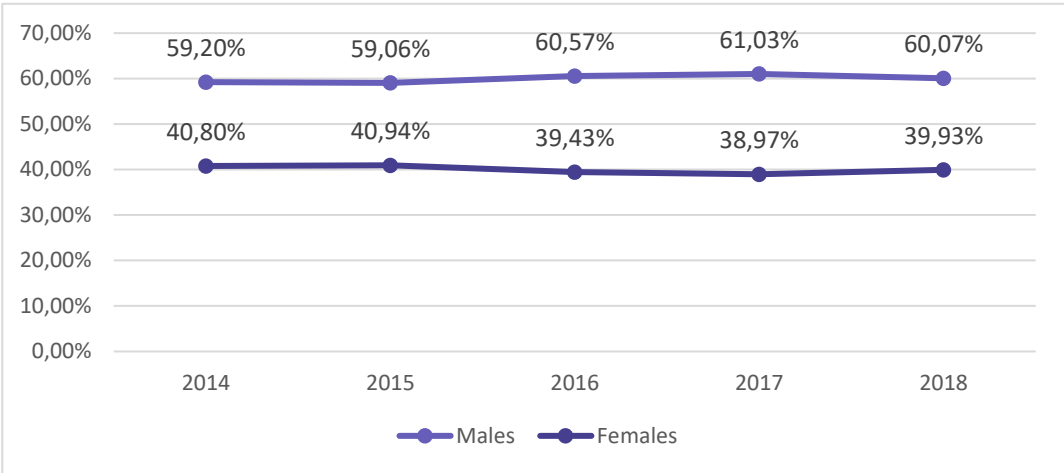
Area	Indicator	Results
Talents and workforce education and acquisition	High School and Higher Education students in STEM by gender, at regional and national levels	<p>STEM High School students (1st gr., 2018/2019)²⁸</p>  <p>■ males ■ females</p>
		<p>STEM Higher Education students (1st year, 2018/2019)²⁹</p>  <p>■ males ■ females</p>
	Researchers in STEM by gender in R&I, at national and regional levels	<p>STEM researchers in 2018³⁰</p>  <p>■ males ■ females</p>
	Evolution of employment rate in R&I by gender	<p>Evolution of employment rate in R&I by gender</p>

²⁸ Croatian Bureau of Statistics. (2018). High Schools and dormitories, end of school year 2017. /2018. and beginning of school year 2018. /2019. (SR 1643) https://www.dzs.hr/Hrv_Eng/publication/2019/SI-1643.pdf

²⁹ Croatian Bureau of Statistics. (2018). Students enrolled on Professional and University Study, Winter Semester of 2018/2019 Academic Year. (FR 8.1.7) https://www.dzs.hr/Hrv_Eng/publication/2019/08-01-07_01_2019.html

³⁰ Croatian Bureau of Statistics. (2020). Research and Development 2018. (SR 1667) https://www.dzs.hr/Hrv_Eng/publication/2020/SI-1667.pdf



		<p>Data available for 2014³¹, 2015³², 2016³³, 2017³⁴, 2018³⁵</p> 
Leadership	Patents registrations by gender	<p>Patent registration teams³⁶</p> <p>One woman: 6.67%; All women team: 0.83%; Team with at least 60% women: 2.08%</p> <p>Mixed team: 4.17%; Team with at least 60% men: 2.92%; All men team: 16.68%; One man: 66.65%</p>
	Founders and leaders of innovative enterprises and start-ups by gender	<p>Data 2013³⁷ : TEA³⁸ males/TEA females = 2.24 (EU 1.86); TEA (Males): 11.47%; TEA (females): 5.11%</p> <p>Data 2018³⁹: TEA males/TEA females = 1.7 (EU 1.8); TEA (Males): 12.1%; TEA (females): 7.1%</p>
Knowledge and tech production issues	Level of integration of gender as a scientific research dimension	The total percentage of Croatia's publications having a sex or gender dimension in their research content for the period 2013 – 2017 is of 2.94 %. ⁴⁰ (The average at EU-28 level is of 1.79%)

³¹ Croatian Bureau of Statistics. (2016). Research and Development 2014. (SR 1572) https://www.dzs.hr/Hrv_Eng/publication/2016/SI-1572.pdf

³² Croatian Bureau of Statistics. (2017). Research and Development 2015. (SR 1601) https://www.dzs.hr/Hrv_Eng/publication/2017/SI-1601.pdf

³³ Croatian Bureau of Statistics. (2018). Research and Development 2016. (SR 1623) https://www.dzs.hr/Hrv_Eng/publication/2018/SI-1623.pdf

³⁴ Croatian Bureau of Statistics. (2019). Research and Development 2017. (SR 1646) https://www.dzs.hr/Hrv_Eng/publication/2019/SI-1646.pdf

³⁵ *ibid*

³⁶ European Commission. (2019). She Figures 2018 https://ec.europa.eu/info/publications/she-figures-2018_en

³⁷ Singer, S., Šarlija, N., Pfeifer, S., Oberman Peterka, S. (2019). What makes Croatia (non)entrepreneurial country? GEM Croatia 2018. CEPOR, Zagreb. <http://www.cepor.hr/wp-content/uploads/2019/04/GEM2018zaweb.pdf>

³⁸ Total early-stage Entrepreneurial Activity (TEA) Rate: Percentage of 18-64 population who are either a nascent entrepreneur or owner-manager of a new business <https://www.gemconsortium.org/wiki/1154>

³⁹ *ibid*.

⁴⁰ European Commission. (2019). She Figures 2018. https://ec.europa.eu/info/publications/she-figures-2018_en



		Concerning the percentages by fields, they are the followings: natural sciences 1.02%, engineering & computing 0.27%, medical sciences 5.88%, agricultural science 2.54%, social sciences 5.38% and humanities & arts 3.98%. (She Figures 2018)
	Level of consideration of the gender dimension in product/service development	No information are available with reference to this indicator.
Broader issues featuring the R&I 'cultures	Gender sensitiveness/family friendliness of supporting services to start up and entrepreneurship	One of the strategic goals of The Strategy of Women Entrepreneurship Development in Croatia, for the period 2014 – 2020 ⁴¹ is the improvement of supporting services for women entrepreneurship. Croatia is one of the rare countries with this kind of strategy. The Croatian Chamber of Commerce is organizing international conferences on women in business on a regular basis. It also organizes a School for Entrepreneurship for Women in cooperation with the International Network of Businesswomen. Moreover, in Croatia, there are various non-profit organizations and associations with different programs and projects for developing and supporting women in business. In 2016, Ombudsperson for Gender Equality and Croatian Employers' Association established the electronic Database of businesswomen who are capable and qualified to assume management positions in companies.
	Perception of existing stereotypes/bias on gender and innovation/ entrepreneurship	In The Strategy of Women Entrepreneurship Development for Croatia, for the period 2014 – 2020, the following structural barriers are presented: educational choices of women decrease the possibility to start the business in technology and research, stereotypes about women in science and technology, traditional attitudes about the women's role in the society and lack of support for women with two jobs (work - life balance issues). In the research paper by Zirdum and Cvitanović (2011) ⁴² the following examples of discrimination of women at work are identified: <ul style="list-style-type: none"> - "In Croatia today it is easier for men to get a job,, - "The best paid jobs are mostly for men,, - "The abilities of women at work are more often underestimated than the abilities of men,, <p>The National Agency for Electronic Media established the online portal „Women in Media“ with the purpose of strengthening the correct media visibility of women and reducing harmful stereotypes.</p>

Table 1_ Results of the context analysis conducted by UZG

⁴¹ Government of the Republic of Croatia. (2013). Strategy of Women Entrepreneurship Development in the Republic of Croatia 2014.-2020.

<https://ravnopravnost.gov.hr/UserDocImages//dokumenti//Strategy%20of%20Women%20Entrepreneurship%20Development%20in%20the%20Republic%20of%20Croatia%202014%20-%202020.pdf>

⁴² Zirdum, G., Cvitanović, V. (2017). Barriers and Opportunities for Developing Women's Entrepreneurship in the Republic of Croatia, *Obrazovanje za poduzetništvo - E4E*, 7 (2), 205-222. <https://hrcak.srce.hr/191725>



UZG Mapping of external stakeholders and SNA

Results of the focus group with internal stakeholders

As far as the **focus group** is concerned the most relevant insights are reported below. 5 internal stakeholders (2 males and 3 females) took part in the session, 3 professors and 2 heads of administrative offices, all of them having strong connections with the ecosystem of the institution.

Concerning the current **existing or prospective collaborations on broader areas** beside gender equality, participants reported that UNIZG-FER has a wide network of existing partners and collaborations through different areas of interest. In particular, a fully developed scientific and professional network of collaboration with industry and technical institutes exists. Indeed, in recent years, the university made a big effort to deepen a cooperation on employment processes with companies in the fields of IT, telecommunication, electrical engineering and energetics through Career Center and activities such as Job Fair or Career Speed Dating. Also, UNIZG-FER follows the trends on the market and has strong connections with the industry and collaborates on promotional STEM activities with schools, NGOs, faculties and other universities. Finally, participants stressed that the cooperation with media, social media and promotional activities has been developed for one year, since the Public Relations Office was established in 2019.

The group then focused on the ways in which gender inequalities represent a **challenge** for external stakeholders. Participants reported that all educational STEM institutions in Croatia face the same issues regarding how to attract more female students to STEM and in their opinion gender prejudices and gender bias in jobs should be addressed in the early stage of the education process (e.g. elementary school). The lack of females is spread through the whole STEM industry, especially at the top leading position. Women are mostly employed as project managers in companies because of their developed soft skills, such as better organization and administration skills, while men usually work as software developers. This is also due to a false perception of the different jobs related to STEM, which are seen as no stimulating, creative. This leads girls to opt for different studies. Also participants reported how female students are in general not inclined to initiate start-ups and need much more encouragement than man. The reasons should be investigated in order to tackle them. Finally, participants pointed out how there is the risk to become unequal in the fight for equality, therefore instead of imposing quotas they would opt for raising awareness actions with the use of examples, role models.

About the **actions that external stakeholders put in place on gender equality**, participants reported that some big companies already have gender policies and pay attention to it. In particular, several IT firms are already participating in some campaigns regarding women in STEM. They use successful female employees as role models in their promotional activities. Participants were aware of two colleagues of the Faculty of Mechanical Engineering and Naval Architecture (UNIZ-FSB) at University of Zagreb taking part in raising awareness activities in schools.

With reference to **complementarities and synergies** with their own institution and the impact for internal institutional change, participants identified the followings:

- Inclusion of gender equality in the existing promotional activities in schools, for instance with the organization of dedicate lectures in high schools about girls in STEM;
- Connection with the faculty UNIZG-FSB regarding some promotional campaign for girls;
- Work with media on changing the public perception of UNIG-FER as a male faculty and changing the idea that STEM occupations are for men exclusively;
- Organization of events about gender equality with companies collaborating with the University Career Center, for instance, during the Job Fair, workshops about gender equality and challenges in STEM can be organized as well as open discussions on the issue, open a blog, etc.;



- Collaboration with companies for tailoring new jobs which can be satisfying for students who want to find a job with a “meaning”;
- Organization of workshops for elementary school teachers about gender sensitive teaching and prejudices in education systems;
- Inclusion of projects more appealing for girls in the presentation of departments at Open Day of UNIZG-FER;
- Improve the communication through the website by including role models;
- Promote STEM-projects with a social impact and soft skills in STEM jobs in order to attract more girls.

No **overlapping/competitive actions** were identified, while risks about the lack of human and other resources as well as the lack of interest of the stakeholders were pointed out.

Results of the survey to external stakeholders

The survey was submitted by 13 external stakeholders, 4 private companies, 3 faculties, 3 associations (NGOs), 2 schools and a public institution, dealing with a wide range of activities: education, research, IT services, promotion of women, sustainable development.

Concerning the **types of collaboration** such external stakeholders have in place with UNIZG-FER the main ones are the followings:

- Project and teaching cooperation;
- Organization of lectures;
- Participation to Job Fairs;
- Agreements for the employment of students in internships;
- Participation to workshops;
- General support to activities (in case of NGOs).

The survey tackled the same topics addressed during the focus group.

External stakeholders were asked to explain how **gender inequalities challenge their own organizations**. Faculties and schools reported that a few number of female students decide to enroll in STEM faculties or high schools, females seem not to be interested in such subjects. Within UNIZG faculties, some of them are balanced from a gender perspective, others not, but until now some of them did not consider it as a significant problem. A big challenge was raised by a school, which reported that female teachers are constantly exposed to attacks by parents, especially men, who investigate about the personal life of teachers and ask whether they plan to have children soon.

Most companies (3 out of 4) reported having a small number of female employees covering technical positions, which is also reflected in the share of women applying for internships and jobs. About NGOs, gender inequalities do not appear to be present internally, the same with the public institution filling the survey.

With reference to the **potential benefits** of addressing the challenges, faculties stressed that removing gender inequalities would benefit both men and women, as well as the faculty itself, since it would allow the selection of the most valuable people regardless of gender. Schools reported as potential benefits a more positive work climate for teachers and an incentive for girls to choose a STEM career and participate in projects, competitions and extra activities. Companies and NGOs pointed out that having heterogeneous teams and communities is beneficial for companies and for the society as a whole. Gender equality also opens new opportunities for future generations both in terms of living and working. According to the public institution, benefits are related on raising awareness about the measures needed in order to improve the status and the opportunities for vulnerable groups in the society.



About **actions and measures** that the external stakeholders undertook to address gender inequalities, only one faculty reported undertaking measures such as: research and dissemination of results of the research on gender equality, promotion of role models, mentoring, many women appointed to the position of leaders of faculties, heads of laboratories, services and centers, promotion of successful female alumni etc. Schools celebrate the “Ada Lovelace Day” and participate in projects (Erasmus+ and national calls) on the topic. A company reported celebrating the “Women in STEM month” and participating in the Ladies in Business Conference, while another one declared having a number of measures related to gender equality in the Code of Business Ethics. Another company reported being constantly committed in promoting gender equality but without explaining with which measures. To be noticed that a company highlighted that women employees are treated equally as male ones and that they have leaderships positions, while another one stated that the percentage of women in the company reflects the percentage of the market therefore, they don’t think they have an issue about gender equality. NGOs explained paying attention on the language used and participating in the projects on gender equality. The public institution, instead, tackles the issue by implementing projects related to vulnerable groups in the society.

About **potential measures** to be adopted to tackle gender inequalities, 2 out of 3 faculties reported that they are not thinking about measures to adopt. 2 out of 4 companies are willing to keep on implementing actions. One NGO reported having actions planned while another one being willing to cooperate with the university for this purpose. The public institution is planning further actions in lifelong learning initiatives and increasing digital literacy.

The following questions explored which **form of cooperation** stakeholders envisaged with UNIG-FER in order to overcome gender equality. Faculties indicated joint projects and research on the topic as form of cooperation but they reported being open to other forms. Schools indicated the adoption of role models but also workshops, lectures and study visits. NGOs are open to any form of formal and informal cooperation also with specific actions towards students to raise their awareness about gender equality. Companies suggested to start joint conversations in order to find common issues/topics and exchange experiences on how to encourage girls to join a STEM career and motivate them to stay. The public institution would instead be available in implementing a cooperation based on the preparation and implementation of trainings related to the topic.

Talking specifically about joint actions, faculties mentioned the promotion of female role models, research activities and mentoring. Schools envisaged the partnership in projects and the promotion of role models and training for female students, but they reported being open for other actions. Only one company indicated possible actions consisting in promoting technological capabilities and good practices. The public institution mentioned actions about cooperation in the preparation and organization of education, the presentation of results and the participation in research.

No overlapping or competitive actions were identified.

Finally, **potential risks** of the cooperation were addressed. The only ones that were identified were the followings:

- Costs of the activities (by a company)
- Difficulty to identify common needs/issues (by a company)
- Difficulty to implement measures due to the small dimensions of the organization (by a NGO)

All the other stakeholders did not identify any risks but also benefits from the cooperation.

Results of the SNA

The data on collaborations with external stakeholders were collected from the Management of the Faculty of Electrical Engineering and Computing of University of Zagreb (UNIZG-FER). In particular, the data come



from a database which is regularly filled by the project leaders once they start a new collaboration. It is important to notice that the ones appearing in the following maps are only collaborations with stakeholders from Croatia since the focus of the mapping, as explained in the methodology part, in paragraph 4.1, is the national and regional ecosystem, while, in general, at UNIZG-FER, most of the collaborations are with foreign universities. Special collaborations with civil society organizations and schools are managed directly by the Management of the institution.

Overall, **160 external stakeholders** were included in the mapping. The majority of collaborations are with “academia & universities” stakeholders (84 out of 160 stakeholders, representing the 52%), followed by “industry & business” stakeholders (35 out of 160, representing the 22%), “schools” (21 out of 160, representing the 13%), “civil society” stakeholders (16 out of 160, representing the 10%) and “government & public sector” stakeholders (4 out of 160, representing the 2,5%). The most important partners from “academia & universities” are the faculties of Croatian universities specialized in scientific fields of electrical engineering, engineering and computer science, while the most important partners of the “industry & business” sector are companies providing power and energy related services.

About the **intensity** of collaborations with external stakeholders, most of them (81 out of 141, representing the 57%) are “one-time” collaborations. Among “one-time” collaborations, 4 are with “government & public sector”, 11 with “civil society” stakeholders, 19 with “industry & business” stakeholders, 21 with schools and 27 are with “academia & universities” stakeholders.

Concerning the **topic** of the collaborations, most of them (74 out of 141, representing the 52%) are about “scientific research”, 32 about “transfer to market”, 24 about “education”, 9 about “science communication” and 2 are “raising awareness”.

In total, **39 collaborations (24%) are led by women** in UNIZG-FER, 21 of them concern collaborations with schools (54%), while 15 regards projects in place with “academia & universities” stakeholders (38%) and 3 with “industry & business” stakeholders (8%).

The overall number of female researchers involved in collaborations is unknown since that data is not available. Concerning the collaborations focusing or taking into account gender, it is worth to mention that the institutional database does not collect this type of data. However, through the analysis of the descriptions of the projects in place with all the 160 stakeholders, it is possible to conclude that none of the collaborations are focusing on gender or taking gender into account. Also, it is a general opinion that STEM research projects hardly focus on gender, therefore they are not asked to report on gender related data.

The following pictures represent the results of the SNA conducted by UNIZG-FER according to the kind of stakeholders. Therefore, 5 different maps are displayed, one for each category of stakeholders: “academia & university”, “industry & business”, “government & public sector”, “civil society” and “school”.

Per each map it is possible to identify the different departments of UNIZG-FER involved in the collaborations with the different external stakeholders (the nodes with a small green circle), the collaborations having female leaderships (the yellow nodes). As already mentioned, no collaborations focusing or taking into account gender were registered.



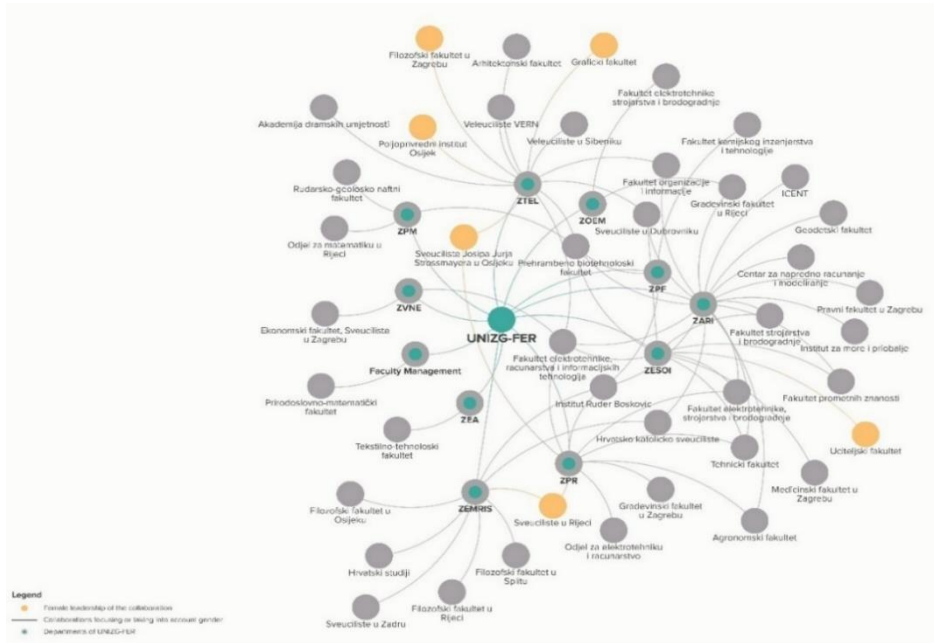


Figure 1_UZG-FER collaborations with "Academia & university" stakeholders



Figure 2_UZG-FER collaborations with "Industry & business" stakeholders

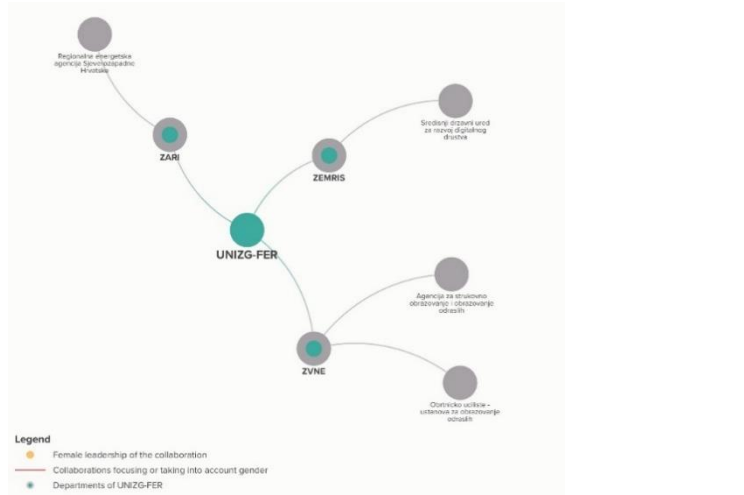


Figure 3_UZG-FER collaborations with "Government & public sector" stakeholders

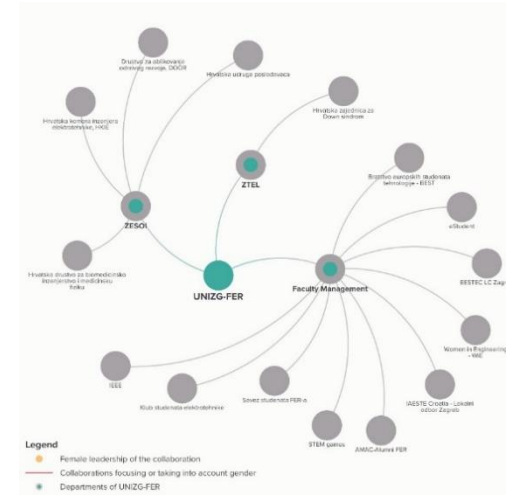


Figure 4_UZG-FER collaborations with "Civil society" stakeholders



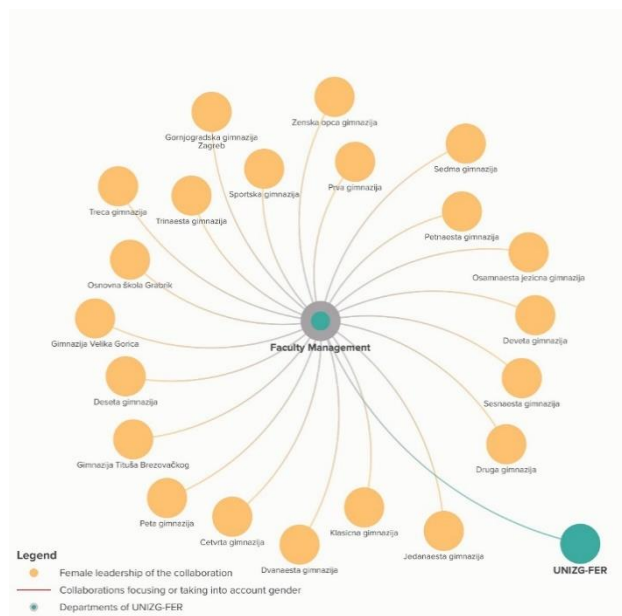


Figure 5_UZG-FER collaborations with schools

Final remarks on the external assessment of UZG

The Croatian national law foresees a series of provisions aimed at promoting gender equality. The most relevant act in this sense is the national **Act on Gender Equality**, which states that RPOs are obliged to work on gender balance. Even though **a national policy for gender equality does not exist** yet, many measures regarding gender sensitive education and equal opportunities have been put in place. Gender equality and gender mainstreaming in research were set as one of the priorities by the ERA Implementation Plan for Croatia 2016 - 2020. Among the adopted measures, worth to mention are the ones targeting **political and decision-making processes**, which prescribe the quota of 40% of the underrepresented gender in local, regional and national bodies. Measures regarding parental leaves, part-time contracts and breastfeeding breaks are foreseen in the national legislation. The availability of childcare facilities is not homogeneously spread through the country. So far, **no specific measures for supporting and funding scientific research on gender issues have been implemented**. However, a new strategy on Gender Equality is expected for the period 2020 – 2024 which will provide with measures on this aspect.

From the analysis of the innovation ecosystems (paragraph 4.2.2) it is possible to observe a great **discrepancy between the number of male and female STEM students** both at high schools and higher education, while the evolution of the employment rate in R&I shows a decrease in the employment of females from 2014 to 2018. Also the data regarding patent registrations, founders and leaders of start-ups show a sensible gender gap. Quite low is also the share of Croatia's publications integrating a sex or gender dimension in their research. A positive trend is the one related to the recent improvement of **services to support women entrepreneurship**.

The analysis was implemented by the **mapping of external stakeholders** through a focus group and a survey and the SNA. According to the activities conducted, UNIZG-FER has a wide network of partners and collaborations in STEM, especially with industrial and technical institutes, related to education and research activities as well to project cooperation. External stakeholders face a lack of female students and employees, especially at the top leading positions. This is due to a biased perception of STEM jobs mainly by girls, leading to a need of implementing awareness raising actions (e.g. events, campaigns, workshops, etc.) involving role models. Only a few external stakeholders already implemented some measures for contrasting gender



inequalities, however, the ones involved through the survey expressed being willing to cooperate with UNIZG-FER on the matter, through joint projects and research on the topic, the organization of workshops, training, lectures aimed at raising awareness.

160 stakeholders were included in the SNA, most of them belonging to the “academia & universities” sector. Almost the 25% of the collaborations have a female leadership, but notably, the vast majority of those are with Schools, while no information could be collected with reference of collaborations taking into account and/or focusing on gender issues, even though, it is possible to assume that the collaboration with one of the “civil society” stakeholders, “Women in Engineering – WiE”, deals with gender issues. The lack of information is due by the fact that the dimension of gender is not monitored for what concerns STEM research projects. Also, according to the analysis provided by the UNIZG-FER researchers none of the STEM projects identified mentions gender in its description.

