RESEARCH REPORT

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WOMEN`S CAREERS IN STEM: BARRIERS AND MOTIVATIONS

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INSCIENCE

Cedos

TOGETHER AGAINST GENDER STEREOTYPES AND GENDER-BASED VIOLENCE
#eu4genderequality

Dr. Sabine Freizer Gunes,
UN Women Representative in Ukraine

Every discovery, every innovation, every step toward Ukraine's recovery is stronger when women scientists are empowered to lead it. This research makes visible both the barriers that hold women back and the resilience of women in STEM that keeps them contributing despite war, displacement, and scarce resources. If we invest in their potential and ensure fair conditions, we do more than advance gender equality — we secure the innovation and leadership Ukraine urgently needs for recovery. It will take all of us — government, academia, business, civil society, and international partners — to make sure women scientists are not just present, but lead the way in building Ukraine's inclusive and resilient future.

Anna Oriekhova and Olena Skyrta,
Co-founders and Partners
at NGO INSCIENCE

Since its founding in 2018, INSCIENCE has identified gender equality in science as one of its key strategic priorities. Although women make up almost half (49%) of employees in research institutions in Ukraine, only 12% of their leaders are women, and among the members of the National Academy of Sciences, women account for just 4%. This imbalance is a clear sign of structural inequality — one we are determined to change. We believe that only through collective efforts can a supportive environment for women in science be created. We also hope that the results of this study will serve as a foundation for developing effective policies and programs aimed at overcoming gender barriers. After all, we envision a future where women in STEM have equal opportunities for growth and development, where their ideas drive innovation, and where gender bias and the "glass ceiling" are left in the past.

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This study was conducted with the financial support of the European Union. Its content is the sole responsibility of UN Women and UNFPA and do not necessarily reflect the views of the European Union.

The UN Women Regional Office for Europe and Central Asia and the UNFPA Regional Office for Eastern Europe and Central Asia, in collaboration with the European Union (EU), are implementing Phase 2 of the regional programme **"EU 4 Gender Equality: Together Against Gender Stereotypes and Gender-Based Violence."** The programme aims to reduce gender discriminatory attitudes and practices between women and men in both institutional and community spheres, including unpaid domestic and care work, across six Eastern Partnership countries: Armenia, Belarus, Georgia, the Republic of Moldova, and Ukraine. The programme is addressing the root causes of gender inequalities by engaging a wide range of government bodies, civil society and women's organizations, media representatives, private sector and other non-traditional partners. Strong focus is given to partnering with civil society organizations and generating knowledge on social norms change.

Website of the programme "EU 4 Gender Equality: Together Against Gender Stereotypes and Gender-Based Violence": http://eca.unwomen.org/en/what-we-do/ending-violence-against-women/eu-4-gender-equality

UN Women Ukraine website: https://ukraine.unwomen.org/en

UN Women Ukraine, as the leading agency for gender equality and women's empowerment within the United Nations system, integrates gender perspectives into UN coordination and decision-making processes. UN Women in Ukraine plays a pivotal role in advancing gender equality and women's empowerment across the country, working with over 67 staff and 22 national consultants based in Kyiv and Dnipro. The organization provides vital support to government partners and civil society organizations, aiming to advocate for women's rights, promote gender equality, and empower women in all sectors. Its efforts are particularly focused on 3 key priority areas: Governance, Leadership and Women Peace and Security (WPS), Economic Empowerment and Growth, Humanitarian Response and Coordination, ensuring that women's voices and needs are central to these processes. UN Women is actively involved in supporting Ukraine's EU integration and the transposition of the EU gender acquis into national laws and policies.

Cedos is an independent analytical centre, urban bureau, and community that has been working on issues of social and spatial development since 2010. We believe that every person has the right to a decent standard of living. That is why Cedos aims to identify the systemic causes of social problems and develop strategies to solve them. Our approach is grounded in research. We study social processes and public policies, disseminate critical knowledge, promote and implement progressive change, provide education, and strengthen a community of change supporters. In our work, we are guided by the values of dignity, equality, solidarity, participation, quality, and empathy.

Cedos website: https://cedos.org.ua

INSCIENCE is an organisation that promotes science and evidence-based medicine, enhancing theirvalue for society, business, and the state through science communication projects. INSCIENCE makes Ukrainian scientists and doctors visible and fosters the development of critical thinking by advancing a scientific approach to understanding the world.

INSCIENCE website: https://inscience.io

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RESEARCH SUMMARY

The study aims to fill gaps in understanding the status and experiences of women scientists in STEM (science, technology, engineering, and mathematics) in Ukraine amidst a deep crisis in the scientific system caused by chronic underfunding, weak state support, and a lack of awareness about the role of science among segments of society.

The inclusion of women in STEM makes science more inclusive, has a positive impact on the economy, and fosters the development of new technologies and innovations. However, the uneven representation of women across scientific fields and their underrepresentation in leadership positions highlight the need for targeted policies to support and empower women scientists in STEM.

The goal of the study was to identify the factors that motivate female students and researchers in STEM to pursue or leave academic careers. To this end, the researchers conducted in-depth interviews, focus group discussions, and surveys with women at various stages of their STEM careers. This approach provided a comprehensive view of how women chose their field of study, selected their universities, their satisfaction with education, working conditions, relationships with colleagues and supervisors, and the factors that either motivated them to stay in STEM or pushed them to leave the field.

In addition, a series of expert interviews was conducted with representatives from government agencies, the business sector, universities, research institutions, NGOs, and the media. These interviews helped capture stakeholders' perspectives on the systemic challenges faced by women in STEM and potential strategies to overcome them. Based on these insights, practical recommendations were developed for stakeholders across different sectors to improve the experience of women scientists in STEM.

KEY FINDINGS

For many participants, an interest in science emerged during school or adolescence, influenced by family, teachers, and access to quality education. However, the lack of career guidance programs often complicated the choice of specialization, and some respondents reported making this decision almost randomly. Higher education played a pivotal role in reinforcing interest in academic careers through exposure to a positive research environment, role models among professors, and opportunities to engage in scientific research.

Working conditions in science remain a significant challenge for most women researchers. Inadequate funding, outdated equipment, a shortage of materials, and even basic infrastructure issues—such as lack of heating—substantially limited research opportunities. The full-scale Russian invasion further exacerbated existing problems, causing power outages, infrastructure damage, and increased workloads due to staff shortages. Moreover, due to low salaries, many women scientists were forced to take on multiple jobs or side projects, resulting in excessive workloads.

Among the factors that support motivation to remain in science, respondents highlighted autonomy at work, a positive psychological environment, stable professional networks, and peer support within teams. Conversely, low pay, overwork, poor infrastructure, and toxic workplace dynamics significantly reduced motivation and often led to doubts or decisions to leave academia.

Barriers faced by women scientists also include gender discrimination and sexism, manifested in sexist remarks, biased task distribution, and instances of sexual harassment. Another key challenge is balancing motherhood and an academic career, which often limits professional opportunities due to working conditions and persistent social stereotypes.

INTRODUCTION

In order to develop effective policies to support women scientists, it is important to understand their current situation and the reasons why women choose or leave scientific careers. In Ukraine, there is no research that systematically analyses the working conditions, motivations, and challenges faced by women in STEM, particularly in times of war. Our study aims to fill this gap and provide recommendations for improving the situation of women scientists in Ukraine.

Science in Ukraine, particularly in STEM[1] (Science, Technology, Engineering, and Mathematics), is in a deep systemic crisis. By 2022, the total number of researchers and the funding for science were declining(Pysarenko, Kuranda et al. 2023). Female scientists faced household and economic difficulties, namely low incomes, which hindered their ability to meet personal needs. They also faced professional challenges, particularly due to poor material and technical support at the institutions where they worked (Zhabin & Kazmina, 2020). In addition to the underfunding of science, experts working in the field believe that the crisis is related to the state's low interest in scientific research, insufficient support from business, and a lack of understanding of science's role in society (Shulga, 2018).

Russia's full-scale invasion of Ukraine in 2022 further exacerbated the existing problems. The NAS of Ukraine's report notes the significant impact of the war on the Academy's activities due to the complications and deterioration of conditions for conducting full-fledged scientific work, the forced relocation of scientists abroad, and the complication of international cooperation (National Academy of Sciences of Ukraine, 2023).

In addition, women scientists face additional challenges: obstacles due to social stereotypes affecting the scientific field (United Nations Population Fund (UNFPA), 2023), as well as a significant workload due to the combination of scientific activities and caregiving responsibilities, which are often performed by women (Strelnik, 2021).

Science in Ukraine is characterised by horizontal segregation, with women unequally represented across different fields of science, and vertical segregation, where the proportion of women decreases as qualifications increase in many scientific fields. (Cedos, 2024). For example, in the National Academy of Sciences of Ukraine, as of 1 January 2025, women accounted for almost half of all researchers. However, their representation in leadership positions is significantly lower: 27.9% among deputy heads of scientific institutions, 12.8% among heads, and only 4% among full members (academics) (National Academy of Sciences of Ukraine, 2025). This leads to the underrepresentation of women in certain scientific areas and senior positions, including in STEM.

Additional barriers further complicate the path for women wanting to pursue a STEM career, preventing them from realising their human potential. At the same time, women's involvement in STEM fields contributes to inclusive approaches to studying various problems and expanding research methods while positively impacting the economy through their contribution to the scientific field (McKinsey & Company, 2023). In addition, improving working conditions and increasing the involvement of female scientists can help ensure the viability of the state at a time when a significant portion of the male population is being mobilised.

1 S — Science, T — Technology, E — Engineering, M — Mathematics.

METHODOLOGY

The study's purpose is to identify the factors that motivate female students and scientists working in STEM to pursue or leave a scientific career.

Main research objectives:

- Identify the factors that motivate women to pursue a scientific career in STEM.
- To examine the professional challenges women face in their STEM careers.
- Identify the differences in working conditions for women in STEM depending on the type of institution they work for, including disparities in working conditions between private and public institutions.
- Explore the factors that influence female scientists in STEM to leave their research careers.

As part of the study, we analysed the experiences of **women who have studied or worked as scientists in the STEM field,** in particular:

- Students of bachelor's and master's programmes[2].
- Researchers and research and teaching staff of higher education institutions (hereinafter referred to as HEIs) and research institutions involved in basic or applied research.
- Scientists who worked in private institutions (enterprises, laboratories, etc.).
- Former scientists — women who ended their careers in STEM science or moved to another field (no earlier than 2020).

The study focused on the experiences of Ukrainian female students and scholars who, at the time of the survey, were living and studying/working in Ukraine or living abroad while working/studying at Ukrainian institutions[3].

For this study, we used the definition of a "scientist" as provided by the Law of Ukraine "On Scientific and Scientific-Technical Activities," which states the following:

> **"[A] researcher is a scientist who has a higher education of at least the second (master's) level and, in accordance with the employment agreement (contract), is professionally engaged in scientific, scientific and technical, scientific and organisational, scientific and pedagogical activities, and has the appropriate qualifications, regardless of whether they hold a scientific degree or academic title, as confirmed by the results of certification in cases determined by law."**

To achieve these goals, we chose a mixed-methods research design consisting of **a quantitative component** (an online survey) and **a qualitative component** (in-depth interviews, focus group discussions, and expert interviews).

The study's field phase occurred between November 2024 and April 2025.

In-depth interviews were conducted between November 2024 and March 2025. They took place online via Zoom. Informants were searched for through social media (LinkedIn, Facebook), websites of institutions related to scientific activities, and the snowball method (those who had already participated in the study were asked to share contacts of their friends who might be interested in participating).

A total of 29 in-depth interviews were conducted with representatives of the following groups:

- Female researchers and academic staff of state HEIs and research institutions involved in basic or applied STEM research — 9 interviews.
- Female scientists collaborating with businesses in STEM (private enterprises, laboratories) — 6 interviews.
- Female students and scientists who have decided to leave their careers in STEM in the last 5 years — 8 interviews.
- Male scientists in STEM — 6 interviews.

Focus group discussions were held between December 2024 and February 2025. They were conducted online via Zoom. Participants were recruited using the snowball method — informants who took part in the study shared contacts of others who met the sample criteria.

2 According to the Cabinet of Ministers of Ukraine Resolution "On Approval of the List of Fields of Knowledge and Specialities for Training of Higher and Professional Higher Education Applicants", the following fields are included: Natural Sciences, Mathematics and Statistics, Information Technology, Engineering, Manufacturing, and Construction.

3 The quantitative phase of the study also included students and researchers who lived and studied/worked abroad. However, due to the small size of these groups (less than 50 people), their responses were not included in the overall analysis.

The study included 6 focus group discussions. Each of them included 3–6 female participants representing the following groups:

- Female students enrolled in master's programmes in STEM fields at Ukrainian universities (2 focus groups).
- Female postgraduate students from STEM-related programmes (2 focus groups).
- Female scientists engaged in innovative[4] (applied) research (2 focus groups).

The survey was conducted from March 13 to April 12. Data was collected online using a self-completion questionnaire in Google Forms. A total of 276 people took part in the survey.

The sample included representatives of the following groups:

- Female students of bachelor's and master's programmes in STEM specialities studying at Ukrainian higher education institutions.
- Students of bachelor's and master's programmes in STEM specialities studying at foreign higher education institutions.
- Scientists working at Ukrainian institutions.
- Scientists working at foreign institutions.[5]

During the survey, it was not possible to recruit a sufficient number of female students from bachelor's and master's programmes in STEM fields studying at foreign higher education institutions or female scientists working in foreign institutions for statistical analysis. Therefore, the answers of these people were not analysed. Thus, the results of the quantitative part of the study will present the experiences of 234 respondents.

The questionnaire was distributed through various channels:

- INSCIENCE disseminated information about the questionnaire through higher education and research institutions, NGOs, initiatives, knowledge-based businesses, scientists, etc.

  Targeted advertising was launched on Facebook and Instagram.
- INSCIENCE and Cedos posted invitations to complete the questionnaire on their social media pages, and the project team shared it through their personal social media accounts.

Appendix 1, "Socio-Demographic Characteristics of the Survey Participants," provides a detailed breakdown of the socio-demographic characteristics of the survey respondents and informants.

The study also included **16 expert interviews** with representatives of institutions involved in formulating and implementing science policies, as well as those promoting gender equality in STEM. The purpose of these interviews was to gather perspectives and experiences from different sectors that can influence the development of women's scientific careers and provide support for women scientists.

The following groups were involved in the expert interviews:

- Governmental institutions.
- Business sector (in particular, knowledge-intensive companies that provide or could potentially provide opportunities for internships, mentoring and career development for women scientists).
- Universities and research institutions.
- Non-governmental organisations and foundations working in the fields of gender equality, support for women in science or research funding.

The interviews were conducted online via the Zoom platform in April–May 2025, with four interviews held face-to-face.

When inviting participants to in-depth interviews, expert interviews, and focus group discussions, potential participants were informed about the research's purpose and objectives, the use of its findings, the topics to be discussed, and the protection of their data. Participants were informed again at the beginning of each focus group discussion and interview. In addition, we emphasised the possibility of skipping any question and withdrawing from the study at any stage without providing a reason.

The data collected was accessible only to the research team to ensure the confidentiality of the participants. The quotes used in this report have been anonymised and do not contain any information that could identify an individual.

The online survey also provided information about the study's purpose, the topics covered in the questionnaire, and data protection and anonymity.

4 According to the Law of Ukraine "On Innovative Activity", innovations are newly created (applied) and/or improved competitive technologies, products or services, as well as organisational and technical solutions of a production, administrative, commercial or other nature that significantly enhance the structure and quality of production and/or social sphere.

5 The survey also included researchers who are temporarily unemployed but have previously been engaged in research activities at a Ukrainian or foreign institution.

The study has several limitations:

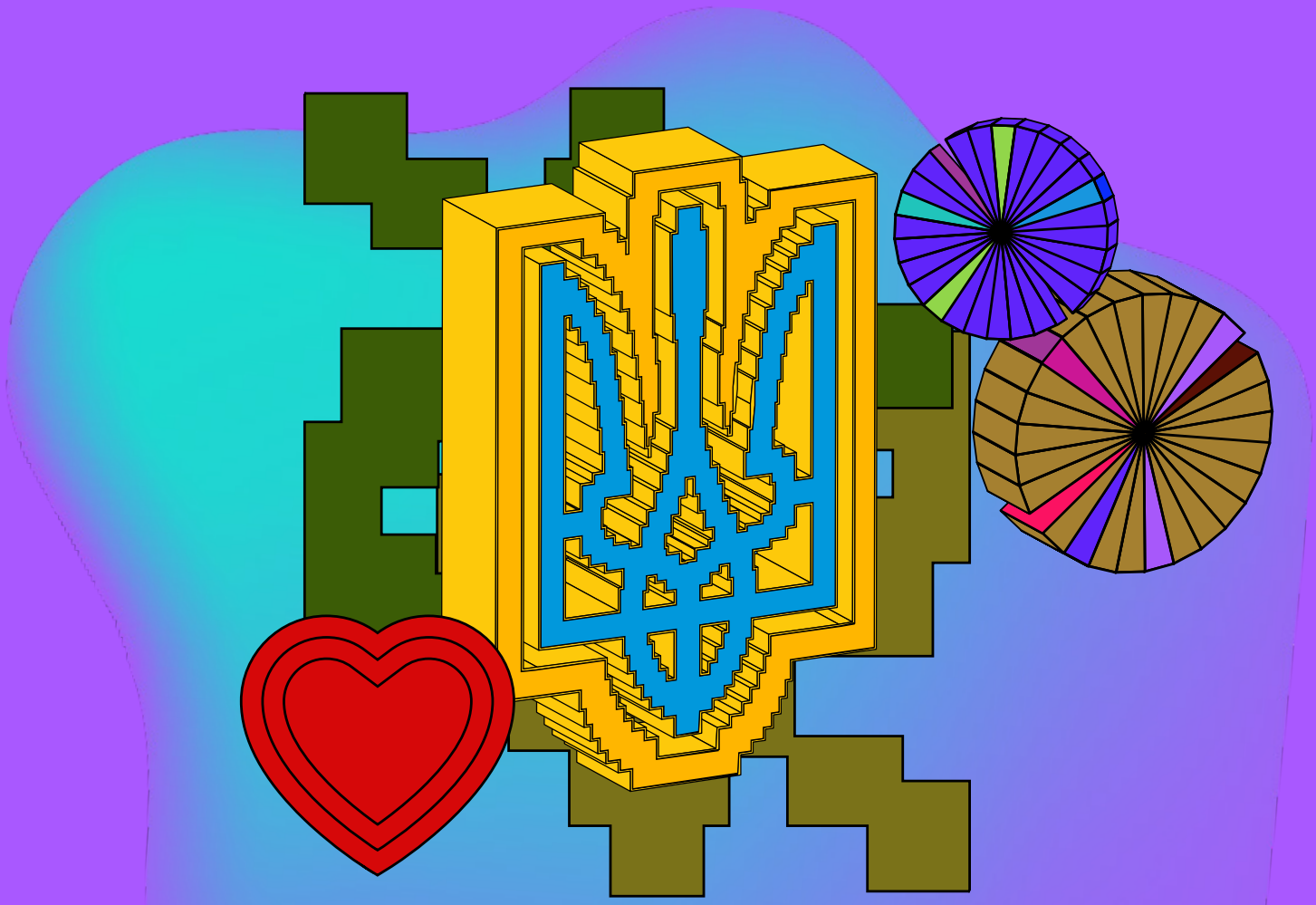
The survey sample is not representative of the entire population of female STEM educators and researchers, as the exact boundaries of this group are unknown, and the available statistics are limited. Therefore, assessing how much the results can be generalised to the entire community is impossible. At the same time, the data collected allows us to identify key trends, shared experiences, and challenges women in science face. These results provide valuable insights into the contexts where women scientists will pursue their careers.

Some groups of scholars are less represented. Among the participants in the in-depth interviews and focus group discussions, there are more female students and scholars who lived and studied/worked in large cities (in particular, Kyiv, Kharkiv, and Lviv). The experiences of scholars from other, especially smaller, towns are less reflected in the study. Additionally, women scientists specialising in biology, bioengineering, and chemistry are more numerous in the sample.

The report consists of five thematic parts. The first part presents the results of a desk study describing the situation regarding gender inequality in STEM, the barriers women may face in their scientific careers both globally and in Ukraine, and existing examples of strategies to attract more women to STEM.

The next three sections analyse the findings of the in-depth interviews, focus group interviews with Ukrainian scientists, and surveys of Ukrainian women scientists and students in STEM conducted as part of this study. In particular, the second section describes how scientists chose their speciality and science in general, their choice of higher education institution, and their satisfaction with their education. The third section covers working conditions, including working with innovations, relationships with colleagues and supervisors, and research conditions. The fourth section lists the factors that motivated women scientists to pursue a career in STEM or led them to abandon it. The fifth section presents the results of expert interviews with representatives of government agencies, universities and research institutions, the business sector, and NGOs regarding their perceptions of current barriers to women's STEM careers and appropriate steps to address them.

SECTION 1



WOMEN IN STEM: ANALYSIS OF STATISTICS, RESEARCH, AND TRENDS IN THE GLOBAL AND UKRAINIAN CONTEXTS

This section presents the findings of the desk research — a review of secondary data and previous studies. It outlines trends in gender inequality in STEM fields both globally and in Ukraine, as well as potential strategies to attract more women to STEM and provide them with better conditions for career development. The information in this section provides context for the overall situation, including the structural barriers that women face in building their careers.

1.1 KEY TRENDS IN GENDER INEQUALITY IN STEM

Historically, science has been regarded as a predominantly male domain. Until the twentieth century, women were largely excluded from the academic education available to men. Depriving women of formal education severely limited their participation in science and fuelled social stereotypes about the "role and place of women in the world." Art, translation, and writing in foreign languages were considered more open to women. As a result, disciplines like art, philology, and linguistics gradually came to be perceived as "feminine" areas of knowledge.

In 2023, a study examining the impact of the full-scale Russia-Ukraine war on career choices among Ukrainian women found that 55% of men and 49% of women agreed with the statement that certain professions are suitable exclusively for men or exclusively for women (UNFPA, 2023). These perceptions were based on at least one gender stereotype that is not true. **According to the researchers, the sociocultural environment in which adolescent girls grow up plays a significant role in shaping their professional aspirations** (Master, Meltzoff & Cheryan, 2021). At the same time, the educational system in general and schools in particular play a central role in determining their interest in STEM subjects and ensuring equal opportunities to access and benefit from quality STEM education (UNESCO, 2017).

According to the European Commission's report on the new European Research Area, the gender balance among graduates of doctoral programs has almost been achieved (European Commission, 2022). However, at successive stages of their careers, the share of women is decreasing. In the European Union, women are significantly underrepresented in the research sector, accounting for only 33% of the region's research community. The inequality is most pronounced in science and technology, and particularly in STEM (European Commission, 2022). In some countries, the number of women has actually equalled the number of men in such sciences as biology, botany, zoology, biochemistry, and related subjects. But women remain in the minority in digital information technology, computing, physics, mathematics, and engineering (Hromadske Prostir, 2022). According to research, only 16% of engineers in the UK are women (EngineeringUK, 2022). The situation is similar in the United States (Fictiv, 2023).

The unequal representation of women and men in STEM professions can be attributed to gender bias and discrimination, which are barriers to attracting girls to study the relevant specialities, and women's access to research funding and leadership positions. The problems faced by women scientists include the following:

- **The "glass cliff"** – invisible and unspecified barriers that hinder women's advancement into leadership or management positions. According to research, in the European Union, women hold only one-quarter (26%) of A-level positions (equivalent to a professor's position), and 24% of women are heads of higher education institutions (European Commission, 2021). Achieving the rank of professor – a necessary step toward becoming a faculty or university leader – is more difficult for women than men.

- **The "Cool climate"** – confusing academic processes for women, making the academic environment unfriendly.

- **The "leaky pipeline"** – the loss of women's share during their academic careers - for various reasons.

- **The "Matilda effect"** is a sexist bias against recognising the achievements of female scientists whose work is often attributed to their male colleagues. It is proven that articles written by women scientists received fewer citations than those authored by men (Burleson & Brant, 2011).

In addition, women's career development may be hindered by work-life imbalances (for example, because women take on childcare responsibilities more often), societal perceptions of gender roles and fields stereotypically considered female or male, and other biases that may distort the assessment of women's scientific achievements (European Commission, 2021). The evaluation of women's scientific activities by relevant commissions, whose members may have similar biases, also does not favour women, thereby reducing their chances of career advancement.

Differences in the upbringing of girls and boys, social stereotypes about the areas of activity that are considered feminine or unfeminine, and gender-based difficulties in building a career for women scientists **hinder the development of science, economy, and innovation both globally and in Ukraine in particular.**

Attracting more women to science is not just a matter of equity, as greater representation of women and girls in STEM will drive greater technological progress and economic development (United Nations Development Programme, 2023). Research confirms that **scientific teams with an inclusive approach** to gender, race and orientation **can better create, test and implement new ideas** (Great Place to Work, 2020).

Closing gender gaps in STEM education also creates additional opportunities for engaging women in the rapidly growing labour market. By 2050, the number of jobs in this sector in the EU could rise to 1.2 million (BBC StoryWorks, n.d.), and attracting more women will help meet this demand for specialists. Furthermore, it is estimated that increasing the share of women in the technology sector to approximately 45% could contribute between €260 billion and €600 billion to GDP (McKinsey & Company, 2023), and **closing the wage gap could increase women's total income by $299 billion over the next ten years, accelerating global economic development** (Council on Foreign Relations, 2021).

This data is highly relevant for the Ukrainian context, where the STEM sector continues to develop despite the ongoing challenges of the full-scale Russian invasion. Closing the gender gap in STEM could significantly strengthen Ukraine's human capital and innovation potential.

As the country advances its European integration, **following the EU trend of boosting STEM employment,** particularly by reducing the gender gap, **offers a strategic pathway toward both sustainable economic growth and greater gender equality.**

1.2 WOMEN IN SCIENCE IN UKRAINE: AN OVERVIEW

In Ukraine, there has been an overall downward trend in the number of scientists — from 313,000 in 1990 to 63,900 in 2015[6]. According to UNESCO statistics, **in 2021, the share of women researchers in Ukraine was 48.2%, higher than in many other European countries** (UNESCO Institute for Statistics, 2020). In 2023 (State Statistics Service of Ukraine, 2023)[7], 27,700 women were involved in research and development in Ukraine. Of these, 17,400 belonged to the category of researchers (including support staff and technicians), which accounted for almost 45% of the total number of researchers.

Nevertheless, both vertical and horizontal segregation persist in the field of science. **Horizontal segregation** refers to the uneven representation of women across different scientific disciplines. A study of gender segregation in professional higher education conducted in 2024 showed that **starting from the first educational levels, women are underrepresented in many STEM fields compared to men** (Cedos, 2024).

Although the share of women is higher in some fields and specialities, there are fewer such situations. For example, at the bachelor's level, certain STEM fields were segregated in favour of women (e.g. biology) or in favour of men (e.g. mechanical engineering, electrical engineering, agricultural and food sciences, information technology). In contrast, in some other fields, the representation of women and men is almost equal: this applies to mathematics and statistics, production and technology, natural sciences, chemical engineering, and bioengineering. At the master's and doctoral levels, the number of fields segregated in favour of men was higher.

Vertical segregation is evident in the declining proportion of women as qualification levels rise. The 2024 report of the National Academy of Sciences of Ukraine presented gender ratios in the Academy for the reporting year (see Table 1.1) (National Academy of Sciences of Ukraine, 2023). Most heads of scientific institutions, their deputies, and the heads of scientific departments are men.

One of the reasons for gender segregation, particularly in education, may be gender stereotypes and stereotypes about professions that are considered "female" or "male." The results of a study involving students of schools and vocational training institutions under the UN Recovery and Peacebuilding Programme showed that 59% of respondents agreed or somewhat agreed with the idea that some professions are purely "male" and some are

GENDER RATIOS IN THE NAS OF UKRAINE IN 2024

Category	Women	Men
All employees of scientific institutions	49.7%	50.3%
Scientific secretaries	56.0%	44.0%
D. / Ph.	43.2%	56.8%
Researchers	41.3%	58.7%
Deputy managers	27.9%	72.1%
Doctor of Science	26.4%	73.6%
Heads of researc departments	25.7%	74.3%
Corresponding member of the National Academy of Science of Ukraine	14.0%	86.0%
Heads of scientific institutions	12,8%	87.2%
Full members (academicians) of the National Academy of Sciense of Ukraine	4.0%	96.0%

Table 1.1: Gender ratios in the NAS of Ukraine in 2024 (as of 01.01.2025). Source: National Academy of Sciences of Ukraine, 2025.

6 According to the data of the State Statistics Service of Ukraine. The data for 2015 exclude the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, and part of the anti-terrorist operation zone. https://www.ukrstat.gov.ua/operativ/operativ2005/ni/ind_rik/ind_u/2002.html.

7 The data excludes the temporarily occupied territories and parts of the territories where hostilities are ongoing.

"female" (UNDP, 2021). At the same time, more than 60% of respondents believed that success in mastering disciplines such as science, mathematics, and the humanities does not depend on the student's gender.

Science requires consistency and a significant time commitment, and without support from family or other sources, combining such activities with caregiving, which women often do, can be difficult (Strelnik, 2021). Travelling, attending conferences in different cities or abroad, and foreign internships can be challenging, especially if the researcher is also a mother. A study by the United Nations Population Fund shows that as of 2020, only 2% of families had a father as the primary caregiver for children under 3 years of age. In addition, 35% of respondents were unaware that a child's father has the right to take parental leave for children under 3 instead of the mother. Most men reported that they did not consider taking paternity leave, even in cases where it would be financially beneficial for the family. They largely justified this decision with beliefs such as: "Childcare is a woman's responsibility" or "It is unacceptable for a woman to be the breadwinner." (UNFPA, 2020). **Stereotypes about parental leave —** such as the belief that childcare is exclusively a woman's responsibility or that a man taking parental leave is something unusual **— together with the lack of state or institutional support systems for women who need childcare, create conditions in which women may be forced to sacrifice their academic careers.**

There are also a number of other challenges that anyone working in the scientific field may face.

In particular, even before Russia's full-scale invasion of Ukraine, the total number of scientists, including young scientists, was declining, as was funding for science (Zhabin & Kazmina, 2017). The results of a survey of young scientists of the National Academy of Sciences of Ukraine conducted in 2015 and 2016 showed that at that time, they faced a range of household, economic aad professional difficulties, namely:

- **Low income:** according to the survey, almost half of the surveyed scientists had additional sources of income.
- **Difficulties with renting or buying housing:** 29% of young scientists surveyed in 2015 and 26% in 2016 lived with their parents.
- **Lack of necessary equipment (instruments, materials, reagents):** 63% of the surveyed young scientists faced this problem.

Although the survey was conducted in 2015–2016, it can be assumed that these difficulties remain relevant for young scientists.

In addition, the full-scale Russian invasion has created further obstacles to the development of science in Ukraine. The National Academy of Sciences of Ukraine report states that the war has significantly impacted the Academy's activities, particularly through the complication and deterioration of conditions for conducting full-fledged scientific work, the forced relocation of scientists abroad, and the complication of international cooperation (National Academy of Sciences of Ukraine, 2023). Among the various disciplines, the most significant number of scientists who left Ukraine were physicists — about 500 people. Some institutions, organisations, and enterprises of the Academy ended up in the temporarily occupied territories. Other buildings were damaged by explosions and rocket attacks. In addition, with the introduction of martial law in Ukraine, the planned expenditures of the general fund of the State Budget allocated to the National Academy of Sciences of Ukraine were reduced by UAH 1.0543 billion, i.e. to UAH 5.1088 billion, leading to a reduction in funding for academic institutions, including spending on the purchase or modernisation of scientific equipment (National Academy of Sciences of Ukraine, 2023).

1.3 WOMEN IN STEM AND INNOVATION

Another important issue regarding women in science is their involvement in the development of innovations, as this is essential for scientific progress and economic growth.

Studies show that **gender-diverse teams are more innovative.** Such teams come up with more innovative and creative solutions, especially when addressing complex or "radical" innovation challenges (Díaz-García et al., 2012; González-Moreno et al., 2018; Nielsen et al., 2017). A more gender-balanced management team is also associated with higher innovation performance (Ritter-Hayashi et al., 2019; Teruel et al., 2015). However, there is a lack of research and data on the employment of female scientists in innovation in Ukraine, including information on their needs and demands.

In general, as of 2025, Ukraine has three existing strategies that define the development of innovation, namely:

The Strategy for the Development of the Innovation Sector until 2030 (Ministry of Education and Science), 10 July 2019: it aims to build a national innovation ecosystem to ensure the rapid and high-quality transformation of creative ideas into innovative products and services, increase the innovation level of the national economy, and create favourable conditions for the development of the innovation sector (Cabinet of Ministers of Ukraine, 2019).

The National Economic Strategy 2030 (Ministry of Economy), 3 March 2021: one of the strategy's guidelines is the development of entrepreneurship, innovation and talent, which involves strengthening innovation capacity across various sectors of the economy. One of the strategic goals is to ensure equal rights and opportunities for all, promote inclusion and accessibility, and provide an adequate level of social protection. This goal specifically includes increasing the employment rate of both women and men in the relevant age groups and reducing the gender pay gap. Among its key priorities, the strategy also highlights gender equality, ensuring that its principles are upheld in the development and implementation of public policy (Cabinet of Ministers of Ukraine, 2021).

The Strategy of Digital Development of Innovative Activities of Ukraine for the Period up to 2030 (initiated by the Ministry of Digital Transformation), 31 December 2024: it defines the vision of Ukraine as a leading state in the field of technology and innovation and outlines strategic goals, principles, directions, and objectives of state policy in this area. Among other objetives, the strategy aims to create favourable conditions for women entrepreneurs and innovators, particularly by ensuring their access to financial resources, mentorship programmes, and professional networks that will facilitate their effective involvement in innovative entrepreneurship. In addition, the strategy provides for the introduction of gender-sensitive educational courses and materials for teachers, aimed at addressing unconscious bias, stereotypes, and gender disparities in the teaching of STEM subjects (Cabinet of Ministers of Ukraine, 2024).

According to the Digital Innovation Development Strategy, innovations are critical for rebuilding and supporting Ukraine's transformation process, particularly in developing defence technologies to protect the state, rebuilding infrastructure, restoring the quality of life for Ukrainians, and developing professionals through educational technologies. In addition, innovations can help Ukraine make an economic leap by creating innovative products, goods and services, and become a regional leader and driver of innovation within the European Union (WINWIN, 2024).

Ukraine was ranked 60th among 132 countries in the Global Innovation Index 2024 (World Intellectual Property Organisation (WIPO), 2024). This result demonstrates existing innovative potential but also highlights the need to strengthen institutional support, develop research infrastructure, and more effectively engage professionals — particularly scientists — in the innovation process.

1.4 EXAMPLES OF STRATEGIES IN UKRAINE FOR ATTRACTING WOMEN TO SCIENCE AND SUPPORTING THEM

Since the scientific sphere in Ukraine is characterised by vertical and horizontal gender segregation, an important aspect of improving the position of women in science is to introduce mechanisms to avoid discrimination, attract more women to science, and create satisfactory conditions for their scientific work.

At the end of 2022, the Government of Ukraine adopted the **Strategy for Implementing Gender Equality in Education until 2030** (Cabinet of Ministers of Ukraine, 2022). It targets all levels of education and sets out a number of strategic goals, including the following:

Comprehensive implementation of principles, policies and measures to ensure equal rights and opportunities for women and men, respect for human dignity and non-discrimination in legal and regulatory documents.

Ensuring equal rights and opportunities for women and men, preventing and combating any discrimination, and implementing inclusive practices in education as a basis for overcoming the consequences of hostilities and post-war reconstruction of Ukraine.

In addition, the **Strategy for the Digital Development of Innovative Activities of Ukraine (WINWIN) until 2030** provides for the development of human capital, as well as training and retraining within the context of Ukraine's innovation ecosystem (Cabinet of Ministers of Ukraine, 2024). Among the current challenges in the field of innovation are those that specifically affect women, including their underrepresentation caused by gender stereotypes, as well as persistent gender biases related to women in vocational education and training institutions. To address these challenges, the strategy developers committed to introducing gender-sensitive educational courses to overcome gender bias.

In addition, **individual research and higher education institutions have implemented their policies and strategies to promote gender equality, and to prevent and address discrimination, sexual harassment, and bullying.** Examples of such institutions include:

National Technical University "Dnipro Polytechnic": the university has developed a Gender Equality Development Plan for 2023 – 2025. It contains indicators of gender equality that the university aims to achieve across the following key areas: work-life balance, gender balance in leadership and decision-making, equality in hiring and promotion, integration of the gender dimension into research and teaching content, measures against gender-based violence, including sexual harassment, and prevention of the gender pay gap (National Technical University "Dnipro Polytechnic", 2023).

V. N. Karazin Kharkiv National University: the university has developed a Gender Strategy for 2023 – 2033, which includes gender analysis of internal documents and educational programmes, development of gender competence through lectures, seminars, and training sessions, introduction of gender-sensitive language, regular gender monitoring and personnel audits, support for research in the field of gender equality, legal and psychological assistance to those who have experienced gender discrimination (V. N. Karazin Kharkiv National University, 2023).

Odesa Polytechnic National University: in 2022, the university approved a Regulation on Gender Equality, establishing the principles of equality, non-discrimination, and prevention of gender-based violence. The document regulates mechanisms for preventing discrimination and sexual harassment and ensuring equal participation of women and men in decision-making. The University guarantees confidentiality in dealing with cases of discrimination (Odesa Polytechnic National University, 2022).

In addition to policies aimed at protecting against discrimination and gender-based violence, Lviv Polytechnic National University, for example, discussed the need to create dedicated spaces for female university employees with children who request to bring them to work. However, as of early 2025, this idea was still in progress (Lviv Polytechnic National University, 2025). Instead, Kyiv National University of Construction and Architecture created such a space in December 2024, following requests from university staff (Kyiv National University of Construction and Architecture, 2023).

In Ukraine, the Ministry of Education and Science has a Council of Young Scientists, an advisory body designed to promote the constitutional rights of young scientists to participate in the formation and implementation of state policy in the field of scientific, scientific, technical

AMOUNTS OF ACADEMIC SCHOLARSHIPS FOR YOUNG SCIENTISTS

Level of education/academic degree	Scholarship amount, UAH/month	Scholarship amount, USD/month
Students of a vocational college	1250	30
Students of a vocational higher education institution *increased scholarship	1510 *2198	36 *53
Students of a higher education institution *increased scholarship	2000 *2910	48 *70
Students of the educational level "Doctor of Philosophy"	8023	192
Students of the educational level "Doctor of Science"	9835	235

Table 1.2. Amounts of academic scholarships for young scientists. Data source: Ministry of Education and Science.

and innovative activities (Council of Young Scientists, n.d.). Similar representative bodies operate at the level of universities and institutes of the National Academy of Sciences. Among other things, they provide information on internship and grant opportunities for young scientists in foreign institutions and available global laboratories for Ukrainians. The state also offers academic scholarships to young scientists. While studying at a vocational college, one can receive UAH 1250[8], at a vocational higher education institution — UAH 1510 (increased to UAH 2198), and at a higher education institution — UAH 2000 (increased to UAH 2910). Scholarships amounting to UAH 8023 and UAH 9835, respectively, are also provided for applicants for Doctor of Philosophy and Doctor of Science degrees[9].

In addition to academic scholarships, students and young scientists can receive additional scholarships from the President, the Cabinet of Ministers of Ukraine, individual scholarships from the Verkhovna Rada of Ukraine, the National Academy of Sciences of Ukraine, the B.E. Paton Scholarship for Young Scientists of the National Academy of Sciences of Ukraine, individual scholarships for the best young scientists to perpetuate the events of the Revolution of Dignity and honour the feat of the Heroes of Ukraine — the Heroes of the Heavenly Hundred, as well as various scholarships and awards from local and state authorities in the regions.

Additional funding in the form of scholarships can be a good reason for young scientists not to leave research, as the overall situation with funding for science in Ukraine is quite difficult, and young scientists during their postgraduate studies and in the first years of employment in state research institutions hold the lowest positions of laboratory assistants and engineers.

In 2025, the salary of academic staff was determined following the Unified Tariff Scale (Cabinet of Ministers of Ukraine, 2002), according to which a senior laboratory assistant in a higher education institution could claim a salary of UAH 3934–4195, and a lecturer — UAH 7464–9287. At the institutes of the National Academy of Sciences of Ukraine, a technician or laboratory assistant with a university degree could receive UAH 4455–5265, an engineer — UAH 4745–7001, and a junior researcher (after obtaining a PhD) — UAH 5699–9894[10].

There are also monthly bonuses for length of service: over three years — 10%; over 10 years — 20%; over 20 years — 30% of the salary (Verkhovna Rada of Ukraine, 2017) and for academic degrees: Doctor of Science — 25% and Candidate of Science\Doctor of Philosophy — 15% of the salary (Cabinet of Ministers of Ukraine, 2002). It is important to remember that research and teaching staff must annually publish scientific articles with the results of their research not only in domestic periodicals but also in foreign ones. As a rule, publication in a professional journal requires payment and costs more in a foreign journal than in a Ukrainian one[11]. The high cost may encourage researchers to look for co-authors willing to pay but not write an article, or to submit to free

8 Scholarship amount from 01.01.2023, according to the Ministry of Education and Science. https://mon.gov.ua/osvita-2/vishcha-osvita-ta-osvita-doroslikh/studentski-stipendii.

9 The USD exchange rate is 41.8 UAH (as of May 15, 2025).

10 The USD exchange rate is 41.8 UAH (as of May 15, 2025).

11 As of 2025, publications in international Open Access journals cost more than $1,000. For example, publications in Springer Open journals cost from $3000 to $6000 (from UAH 125400 to 250800 at the exchange rate of 41.8 US dollars as of 15.05.2025) — https://resource-cms.springernature.com/springer-cms/rest/v1/content/26206380/data/v16.

The cost of publishing in Ukrainian journals varies:

- in the journal «Technology and Science Today» — from UAH 1200 (USD 28.7) (http://perspectives.pp.ua/index.php/nts/authors),
- in the journal «Bulletin of Odesa National University — from UAH 1500 (USD 35.9) (http://www.visnyk-onu.od.ua/index.php/uk/kriteriji-dlya-publikatsiji)
- while the cost of publication in the journal «Scientific Horizons» is 32000 UAH (765 USD) (https://sciencehorizon.com.ua/uk/editorial-fees).

The latter is indexed in Scopus.

SALARIES OF RESEARCH AND TEACHING STAFF

Position	Salary, UAH/month	Salary, USD/month
Higer education institution		
Senior laboratory assistant	3934–4195	95–101
Lecturer	7464–4195	179–223
National Academy of Sciences of Ukraine		
Technician, laboratory assistant	4455–5265	107–127
Doctor of Science	4745–7001	114–168
Heads of researc departments	5699–9894	137–238

Table 1.3. Salaries of research and teaching staff. Data source: Cabinet of Ministers of Ukraine.

journals with a waiting period of at least six months for the article to be reviewed and published.

Thiscreates additional pressure on young scientists and may be a factor that will encourage them to leave research.

One of the options for additional funding for young scientists is participation in grant projects. Ukraine has the National Research Foundation of Ukraine (hereinafter referred to as the NRFU), which in 2023 funded 98 projects worth more than UAH 255 million (National Research Foundation of Ukraine, 2024). In 2020, the NRFU approved funding for 141 projects worth UAH 975.162 million under the call for proposals "Support for Research by Leading and Young Scientists" (National Research Foundation of Ukraine, 2020). Payments were made until 2022. In addition to grants from the NRFU, young scientists can also receive grants from the President of Ukraine to support research by young scientists, the President of Ukraine for Doctors of Sciences, the President of Ukraine for Gifted Youth (for young scientists of the NAS), and the National Academy of Sciences of Ukraine for the implementation of research projects of young scientists of the NAS. However, grants cannot be called a complete solution to the problem of low funding for research for various reasons. In particular, their competitive nature means that some projects will not be implemented, which can slow scientific progress and innovation. Additionally, fundamental research that cannot be applied immediately may be left without supplementary funding, as grants are mainly focused on practical developments. Not everyone can get a research grant due to a lack of grant writing and project management skills, which require further training and place additional pressure on researchers' already overloaded work schedules. Furthermore, **grants are not a stable funding source, and the uncertainty and constant need to seek financial support for research increases stress on research teams.**

In addition, NGOs and private companies are also implementing initiatives to support women scientists and engage girls in STEM.

UN initiatives. At the end of 2022, a pilot internship programme was launched at the Ministry of Digital Transformation of Ukraine for girls in STEM (UNDP, 2023). Another programme for women's leadership was launched, involving women specialists involved in the digitalisation of public services in central government. The United Nations also implements programmes to support women in science and promote gender equality in STEM and innovation: for example, ''Science is She'' is an educational art project supported by UN Women in Ukraine and UNICEF that highlights the achievements of Ukrainian women scientists and encourages young people to pursue careers in science. In 2019, the United Nations Population Fund organised a competition for biographical articles for the Wikipedia website about women scientists in STEM. The project aimed to raise the visibility of women's contributions to science.

''WOMEN IN SCIENCE'' is a project implemented by the NGO INSCIENCE within the framework of the "EU for Gender Equality: Together Against Gender Stereotypes and Gender-Based Violence" programme, in cooperation with UN Women Ukraine and UNFPA, the United Nations Population Fund, with funding from the European Union. The goal of the "WOMEN IN SCIENCE" project is to promote gender equality in STEM, support women in building scientific careers, and increase their visibility in society. In 2023, the project released two documentary videos about Ukrainian women scientists during a full-scale Russia-Ukraine war. The video feature radiobiologist Olena Pareniuk and biologist Kateryna Shavanova. In addition, 12 text stories were published about women in various scientific fields, from astrophysics to marine biology (INSCIENCE, n.d.).

''Serendipitous Events'' is an artistic and innovative initiative implemented by Port of Culture together with NGO INSCIENCE as its scientific partner, also carried out within the framework of the "EU for Gender Equality: Together Against Gender Stereotypes and Gender-Based Violence" programme (Phase 2). The project brought together 20 women artists and innovators in an art lab that included collaboration, exchange of ideas, concept development, pitching, and implementation of art projects. It culminated in an exhibition at the Ukrainian House in Kyiv, which ran from 20 February to 9 March 2025. The initiative demonstrated the power of an interdisciplinary approach to promoting gender equality through culture, science, and innovation (Ukrainskyi Dim, n.d.).

Support from L'Oréal. L'Oréal, together with UNESCO, has established the Prize for Women in Science to recognise women researchers' achievements and improve their position in the scientific community. This prize is awarded to outstanding scientists who significantly contribute to the development of science (L'Oréal Ukraine, n.d.).

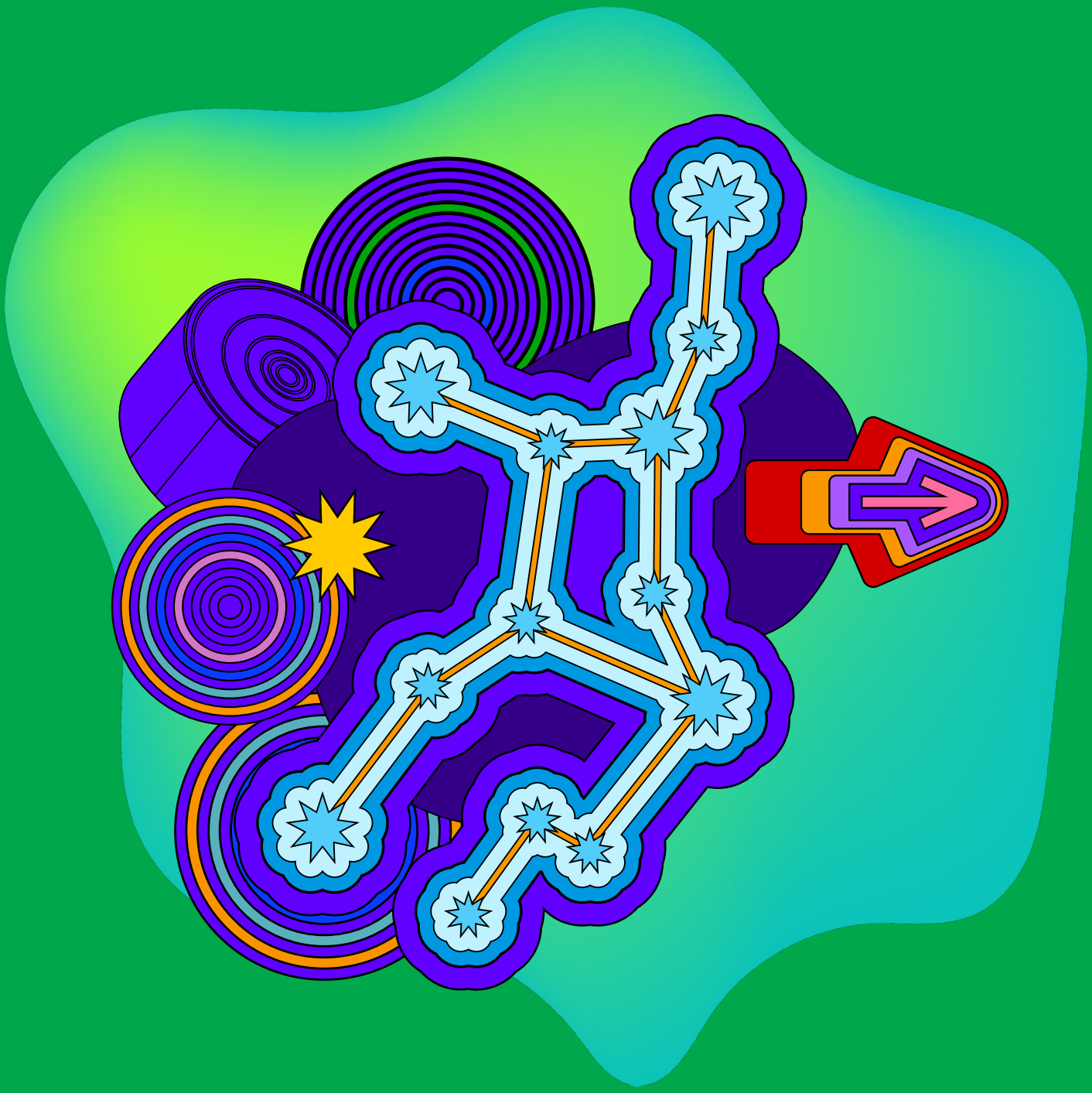
Business initiatives. Some companies support the development of STEM education by upgrading laboratories and providing resources for educational institutions. For example, the Girls STEM initiative, launched by the Centre for CSR Development[12] in 2016, aimed to attract girls to science and technology and develop them in STEM professions (Divchata STEM, n.d.).

Three weeks after the outbreak of the full-scale Russia-Ukraine war, Projector Institute, an online institute for training in the creative and IT industries, founded the Projector Creative & Tech Foundation. The initiative aimed to train 5000 internally displaced women in new creative and technological professions. UNDP supported this initiative with financial assistance from the Government of Sweden (UNDP, 2023). In the summer of 2022, the Ministry of Digital Transformation of Ukraine, together with the Binance blockchain ecosystem and the Lviv IT Cluster, launched the national IT Generation project. It provided Ukrainians with the opportunity to learn a new profession and start a career in the IT sector free of charge. The project was also implemented with the support of the United Nations Development Programme in Ukraine, with financial support from Sweden, and the USAID Competitive Economy of Ukraine Programme. Women accounted for 54% of the total student population (UNDP, 2022).

Another strategy to attract more women to science, particularly in STEM, could be to introduce quotas. In Ukraine, there are currently no mandatory legal requirements for the gender composition of research teams applying for research grants or the composition of institutional research councils. There is evidence that women scientists are generally less likely to apply for grant funding than their male counterparts (Schmaling & Gallo, 2023), so some countries introduce gender quotas for research grants (some grants may be reserved for women only, requirements for forming gender-balanced research teams, etc.) International experience and research show that this practice is helpful for attracting more women to STEM: the introduction of gender quotas in the distribution of positions in scientific institutions contributes to a greater manifestation of female scientists and increases their work efficiency (Nicolo, Maggian & Montinari, 2020; Park, 2020). Based on research, the European Institute for Gender Equality has developed gender-sensitive procedures for grant funding for research and encourages their use among European research funds (European Institute for Gender Equality, n.d.).

12 CSR Ukraine is an expert organisation in Ukraine that unites more than 40 large companies and has been promoting the principles of sustainable business and social responsibility for over 15 years.

SECTION 2



CHOOSING RESEARCH IN STEM AS A PROFESSION

2.1 EMERGENCE OF INTEREST IN SCIENCE AND STEM

We asked the research participants when their interest in STEM emerged and what contributed to it. The initial interest in exploring the world in general or STEM sciences manifested in different ways and at various times in their lives. For some, a strong interest developed during childhood, while others became interested in STEM at school or university. Multiple factors contributed to this: the environment (hobbies or professions of family members, influence of teachers and lecturers), books, films, and TV series on scientific topics, individual character traits and hobbies of future scientists, specific subjects at school, and the quality of education at the institution they attended.

> "We had a book called Introduction to Biology by Kemp and Arms. [...] It was in colour. It was very well printed [...]. And there were a lot of pictures in it. [...] My brother and I were just looking at that book, as if it were just a picture book. And we tortured my mother with questions. [...] And I was 2–3 years old then."
>
> A scientist working in a state institution

DEVELOPING AN INTEREST IN SCIENCE AND STEM IN CHILDHOOD

A significant number of female informants mentioned that their **interest in STEM began in childhood and was influenced by family, friends, acquaintances, books, cinema, and hobbies.** This interest manifested as the desire to learn how the world works or through identifying with characters from cinema or literature.

> "I can say that since I was a kid, even when I didn't understand what it was, I liked some films, science fiction, people in white coats doing experiments. I didn't understand what they were doing, but it seemed incredibly cool. And I imagined myself being the same person in the future."
>
> A scientist who ended her scientific career

According to some informants, their **interest in STEM was inspired and supported by their parents and/or other family members.** They talked, for example, about the plants and animals that surrounded them as children. Family members also set an example with their hobbies, professions or career paths. Some informants said they had been interested in certain fields of knowledge since childhood because their family had several generations of physicists, chemists, or cyberneticists. Several informants' parents later helped them decide on a study area for university, either by offering the help of a specialist in career guidance or by directly advising them on a speciality when their daughters were confused about the choice.

> "The first is my mum. She inspired me because she didn't start her career right after school like I did. She went to a technical school after school and tried one speciality. Then she got married, gave birth to me [...] She enrolled in the University of Radio Electronics. [...] I was already going to kindergarten and school – I was living in that environment."
>
> A scientist working in a state institution

> "It was probably my mother who played the key role. Even though she didn't have a biology degree, she knew a lot of things. Going on walks with her was always interesting – she would tell me what kind of plants, insects, and animals there were. [...] in my childhood, we had a vegetable garden. [...] for example, once we dug potatoes and found a larva of a butterfly moth. To prevent it from dying, you put it in a cup in a humid environment, and then it develops. And it's fascinating."
>
> A scientist working in a state institution

However, **the parents of some female informants were indifferent to their interest in STEM** or even opposed it, urging them to enter more "understandable" or "practical" specialities when choosing a place of higher education. For example, one female researcher said she had a conflict with her grandmother, who worked in medicine and insisted on medical education for her granddaughter, ignoring her interest in another speciality. According to the informants, **this was due to a stereotypical view of science as a field mostly dominated by men, a lack of understanding of what a scientist's work entails, and concerns about the non-profitability of science.**

“At the end of school, [...] I was very confused about what to do, and my parents advised me to select a practical profession. [...] My parents also didn’t take science seriously because the salaries in science were usually low at that time. So, they saw it as an impractical career choice.”

A scientist who ended her scientific career

“Take a seamstress – that’s understandable. Well, to my family. Some kind of teacher is understandable. But biologist? Well, the only option is to work as a schoolteacher. So, what is science and so on – well, people just don’t know, let’s say. They still don’t understand what I do there, what I did there, etc.”

A scientist who ended her scientific career

DEVELOPING AN INTEREST IN SCIENCE AND STEM WHILE STUDYING AT SCHOOL

Some informants said that their interest developed during their school years when they started studying new subjects or a particular topic within the curriculum. Their environment and interesting textbooks encouraged them to do so.

“Well, actually, maybe when we were studying molecular biology, I became really fascinated by the textbook; there were some really cool footnotes. And it turned out that I like molecular biology and genetics.”

Student of the master’s programme

While at school, **some informants’ interest** in science in general and STEM was also **influenced by the opportunity to conduct research and attend events at the Junior Academy of Sciences (JAS).** Thanks to this experience, future scientists conducted their first scientific research and were able to identify what topic or area they were interested in. In addition, they considered the JAS events to be a place of socialisation where they could meet and connect with like-minded people. The support of family and teachers was also important at this stage. Several participants said that the collaboration with the scientific advisor they started in the JAS continued at the university and led them to choose a scientific career.

Teachers played an important role in maintaining some informants’ interest in science. The women mentioned teachers who explained the material in an accessible way, showed the applied value of science, and encouraged them to participate in Olympiads, JAS competitions, and other scientific competitions and events. These teachers inspired them to choose STEM studies, regardless of their school profile. It was also important for female scientists to have teachers who helped them develop beyond their subject.

“That’s why I entered biomedical engineering - my JAS project was related to this. I met the head of the department in the 10th and 11th grade. And we just kept working together. I participated in all the conferences, competitions, and research projects from my first year. [...] I mean, it was a path I had already set for myself since school, and I just didn’t stray from it.””

A scientist working in a state institutione

“I became interested in biology at school in the 6th grade. I owe it all to my teacher, who instilled in me a love of biology and explained everything very clearly. [...] She really managed to spark my interest. And then I would have continued to participate in school competitions, I think, from the 7th or 8th grade, and they started with biology.”

A scientist who ended her scientific career

“In my second school, one [Maths] teacher knew how to make you fall in love with the subject. She was just [...] an example of a person who could turn people who didn’t understand why they need to do it into people who are in love with it. [...] we had this, you know, sense of ourselves as individuals who were successful in mathematics.”

A researcher working in a private institution

However, **some participants mentioned the indifference of teachers, poor quality of school education, and**

“And you’re studying here, in a gymnasium with a humanities focus, and you start telling people that you don’t want to go to a humanities’ speciality [...]. I want to go to the Faculty of Biology. And I was discouraged by everyone, by teachers at school, because they said, ‘What are you going to do? Who is a biologist in our country? You’ll do lab tests.’ [...] I said, ‘No, I want to’”.

A researcher working in a private institution

instances of gender discrimination against girls. For example, girls were less likely to be invited to participate in **science and mathematics** competitions and related clubs than their male classmates. One informant said that she had studied a subject she was deeply interested in thanks to her mother’s books, but at school, she did not receive the support she expected from teachers for her interest and abilities. For some informants, this situation reduced their motivation to learn, while for others, it increased their desire to get better grades and deepen their knowledge of the subject.

“Well, yes, I think there is probably a very strong bias regarding how boys and girls are taught in school or childhood. For example, we had no girls in our physics electives at all. There were a lot of girls in the lyceum, but they didn’t... well, they went to the Ukrainian language competition. Only boys took physics.”

Male Scientist

“Well, this may not be a very popular answer, but if I were to do science, nothing was pushing me to do it at all. I immediately set myself the goal of entering a state-funded programme. And very, very accidentally, [I entered a geology-related speciality]. And after about 2 years of university, I really grew to like what I was doing, namely geology.”

A scientist working in a state institution

DEVELOPING AN INTEREST IN SCIENCE AND STEM DURING UNIVERSITY STUDIES

University studies was also the period when some informants developed an interest in STEM. **Not all female scientists chose a speciality for their higher education based on their interests and scientific aptitude.** Some did not know what they wanted to study, so they picked a programme that made getting into a state-funded place easier. They were influenced by the stories of the admissions committee’s description of the speciality. However, their interest in the industry and scientific activity grew during their studies. This was facilitated by educational practices, teachers, and supervisors.

2.2 CHOOSING A SPECIALITY AND AN EDUCATIONAL INSTITUTION

ADMISSION TO A BACHELOR`S DEGREE PROGRAMME

The researchers associated the choice of HEI and speciality for a bachelor's degree with the influence of various factors. From the informants' answers, we have identified the following list:

Success at school and personal interest in a particular field of science. Some female scientists chose their speciality and university based on their school grades, more thorough knowledge, and prior interest in a specific field or topic.

> "So when I was selecting a university, I just chose what I was good at. [...] And that's why I decided to really take mathematics, to have a strong foundation and then pursue what I wanted with it."
>
> Student of the master's programme

Influence of the environment. Several female informants entered the university in STEM fields on their parents' advice. Other female scientists said that the admissions office advised them to apply for a speciality.

> "I applied for philology and ecology, and I decided to apply for ecology spontaneously because when I came to the admission committee, they told me: 'Why don't you also apply for ecology! They have such amazing internships in the mountains and at sea'".
>
> A scientist working in a state institution

Personal beliefs and desires. Some women scientists said that their choice to pursue higher education in STEM was driven by the desire to show that Ukrainian researchers are capable of making outstanding discoveries. For others, understanding that a specialised education in the natural sciences is a key to joining the scientific community was important. Several female scientists considered that scientific activity opens up opportunities for international travel through academic mobility and, therefore, chose a STEM speciality.

> "Why biology? [...] Well, to be honest, I used to have this feeling of inferiority, either imposed by society or I don't know where it came from. [...] And I decided, I guess, to challenge myself, to challenge the whole world that this is true, and to prove that we [Ukrainians] are worth something."
>
> Student of the master's programme

An alternative to studying for a medical degree. Several female researchers said that they initially wanted to study medicine. However, due to the difficulty of entering medical universities, the length of medical education and the lack of financial means to pay for it, the informants chose a speciality related to medicine - biology or chemistry.

> "Because of this, I was deciding between biology and going to medical school or chemistry, and I didn't know where to go next. [...] And then I chose chemistry, not medicine, because of financial problems, because I was worried that I wouldn't get into medical school on a state-funded programme, and my parents couldn't pay the contract. So, I chose chemistry because I liked it, and I would definitely enter, and that's how it turned out."
>
> A scientist working in a state institution

In some cases, the informants chose a university and a speciality based not only on their interest in STEM but also on financial considerations or the need for personal changes, such as the desire to self-actualise or distance themselves from their families.

Some informants said they considered studying only in state-funded programmes due to difficulties paying for contract-based education. One researcher said that she chose a university in another city, which was no less important than selecting a STEM speciality because she did not want to continue living with her family.

Another viewed her university studies as a social lift, but later on, she found herself enjoying her research work.

The researchers also mentioned **barriers to entering the desired field of study.** Among the obstacles was

"So there was no question of a contract or anything else. The budget programme was the only possibility. [...] [Name of the university] appeared back in, I don't know, 10th grade, I think, or 9th grade. [...] In 2010-2011, when I interned at the Academy of Sciences in physiology, I realised medicine was not for me. [...] That's why I chose biology."

A researcher working in a private institution

the low quality of school education, which is why some informants sought help from tutors. It was also difficult for several women scientists to choose a speciality, as they liked several STEM fields at school, and there **was no career guidance available at school.**

"I saw a social lift, an opportunity, and my place of socialisation, and I jumped into it. I didn't want to be a scientist, as such, from the very beginning. [...] I was basically scared of the idea of having to do scientific work. I had no idea what it entailed. [...] I became very interested, I was already motivated, I already wanted to do science."

A scientist who ended her scientific career

"And I actually, when I entered ecology at [name of university], it was by accident. It was not my vision from school because, unfortunately, there was no career guidance as a phenomenon at all when I was studying."

A scientist working in a state institution

"When I decided to go into biology, the question arose as to what to do with my knowledge of biology, chemistry, and the Ukrainian language in general. I needed to pass the external independent evaluation. I realised that the school level would not prepare me well enough to consider any, let's call them, "high" universities. So, I decided to hire tutors. It was difficult because I had almost no free time."

A scientist working in a state institution

Admission to a master`s degree programme

When talking about choosing a place and speciality of study for a master's degree, some informants said that **the factors important to them were somewhat different from those they considered when applying for a bachelor's degree.**

"When I started my master's degree, the full-scale invasion had already begun, and my goal was to write a paper related to drones and their search, geolocation. Or rather, without the absence of their geolocation. That's why I've connected my life to computer science, using mathematics."

Student of the master's programme

Some informants paid more attention to personal motives. For example, it was important for them to conduct research with practical implications for supporting Ukraine in the context of the war, while for others, the opportunity to find a better job was significant.

Researchers also paid more attention to finding a better-equipped laboratory to be able to carry out their planned research, and/or a **department and supervisor involved in the topic of interest to the future master's student.**

"That's why I went abroad for my master's degree because my ex was starting his postgraduate studies there, and I had this, you know, stereotypical idea that I was the wife of a Decembrist – he went, so I went."

A researcher working in a private institution

Family and other close people also **influenced the choice of the university and department for master's studies.**

"I can say for the master's programme that I liked that it was a UEE test, and then I had a test, in this case, in biology. And it was all as encrypted as possible. [...] This is confirmed by the fact that I applied to different universities and passed entrance exams there. And I got good grades everywhere. So if there were no such things, let's just say that boys are better, girls are worse, or vice versa."

Student of the master's programme

“And when I was choosing an educational programme for my master’s degree, I was guided by the laboratory level. That is, what kind of access I would have to this scientific component while studying for a master’s degree. That is, how high a level of scientific work would be, like this.”

Student of the master’s programme

For example, one informant said that she went to study abroad because her partner had entered a postgraduate programme there.

Several female researchers said that they **chose to pursue a master’s degree abroad because of the state of material and technical support in Ukrainian** STEM HEIs – particularly the lack of necessary research equipment. One informant noted that it was difficult for her to find a master’s programme in Ukraine in her preferred speciality, as most of the available options did not align with her chosen field of study.

Several women scholars spoke favourably of the introduction of the UEE (Unified Entrance Exam) regarding the process of applying for a master’s degree. In their opinion, the anonymised exam created equal conditions for male and female applicants.

“After [name of university], I went to study for my master’s degree in Sweden because I felt my previous programme at [name of university] lacked depth. Because if you study STEM, especially biology or chemistry, you need access to high-quality laboratory resources, which cost a lot of money. Unfortunately, this is not always the case in Ukraine for students. That’s why I went to study in Sweden.”

A scientist working in a state institution

2.3 SATISFACTION WITH THE QUALITY OF EDUCATION AND ENCOURAGEMENT TO PURSUE SCIENCE

During their studies at higher education institutions, female students, following the State Standards of Higher Education (Ministry of Education and Science, 2023), had to master the ability to apply scientific laws, theories and methods, as well as to collect and analyse data. It was during their studies that they gained their first systematic experience of scientific work[13]. Thus, the quality of higher education, according to the informants, significantly impacted the formation and strengthening of their desire to engage in science or abandon their plans for a scientific career.

Among the factors that positively or negatively influenced satisfaction with the quality of education in HEIs, the informants mentioned the following: the scientific environment in HEIs, material and technical support, the content of the educational programme, bureaucratic processes, additional scientific and educational opportunities (conferences, fieldwork, and industrial placements, etc.), personal experience of conducting research and the presence or absence of discriminatory attitudes towards female scientists.

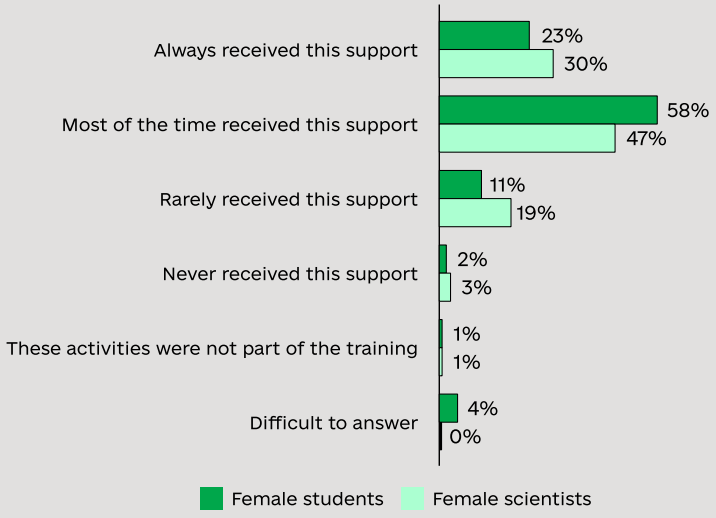
Factors influencing satisfaction with the quality of education

According to the informants, the following factors influenced their satisfaction with the quality of education and the decision to pursue a scientific career:

Academic environment. The study participants spoke about the significant role of teachers and supervisors in their educational experience. For the informants, the attitude of the teachers was important, including the absence of arrogance, communication with them on an equal footing, willingness to help, taking into account students' opinions when conducting research, and supporting students in their aspirations.

The survey results showed that among the respondents studying at Ukrainian universities at the time of the survey, 81% always or in most cases, could receive technical support during research,

WHETHER FEMALE STUDENTS AND SCIENTISTS RECEIVED SUFFICIENT SUPPORT DURING RESEARCH WORK, INTERNSHIPS AND PRACTICAL TRAINING



Graph 2.3.1. Question: "Did you receive enough 'technical' support during your research, internship, or practice as part of your studies?" Number of respondents: female students — 90, male researchers — 144.

13 Some study participants had experience of participating in the Junior Academy of Sciences during their secondary education.

> “I was lucky that I chose the department that I really like. And where the teachers treat each child — let’s call us all that — as if they were their own. If you have any questions, they won’t send you away or say, ‘Go figure it out yourself’. They will sit down, talk to you, and explain.”
>
> A scientist working in a state institution

> “At the bachelor’s level, what really stuck with me was that the head of the department started calling us colleagues at the first meeting. [...] He has this thing where we were somehow encouraged to go straight into science. We just kind of plunged right into it, where we are already somewhere on equal footing.”
>
> Student of the master’s programme

internships, and practice as part of their studies. Among the surveyed scientists, 76% had positive experiences and were able to receive support during their studies. On the other hand, 23% rarely or never received such support.

According to the survey, 55% of female students studying at Ukrainian universities at the time reported that most or about half of their teachers encouraged them to engage in research outside the educational process

> “Firstly, our supervisor was very cool. Then, in the third year, when we had already completed a substantial amount of experimental work, he said: ‘Girls, write your abstracts, you’re going to a conference. [...] He sent us to a student conference in Lviv. [...] We went there, which also contributed greatly to the desire to do research.”
>
> A scientist working in a state institution

> “A teacher of cell biology and genetic engineering suggested it. He says, ‘I have connections with the Institute of Cell Biology. So, if you are interested, I can connect you with a few places there. And through cooperation with our university, you will conduct research at that institute and do your diploma work.”
>
> A scientist who ended her scientific career

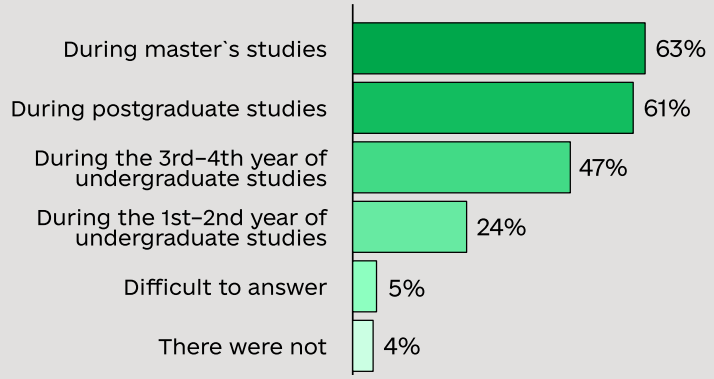
Some researchers also spoke about **the importance of teacher and supervisor support and proactive encouragement for further or additional research activities.** This could include invitations to participate in conferences, conducting joint research in laboratories, offering cooperation at institutes of the National Academy of Sciences of Ukraine, etc.

At the same time, the experience of female scientists shows that the share of such teachers varied across different stages of education. In particular, 24% of female researchers indicated that, during the 1st and 2nd years of their bachelor’s degree, their teachers encouraged them to engage in research outside the educational process. In contrast, more women reported having

DID PROFESSORS ENCOURAGE STUDENTS TO DO RESEARCH OUTSIDE OF EDUCATIONAL PROCESS

Graph 2.3.2. Question: “Do you have any teachers who encourage you to do research outside the educational process?” The number of female respondents (students) is 90.

WERE THERE ANY PROFESSORS WHO ENCOURAGED RESEARCH OUTSIDE OF EDUCATIONAL PROCESS



Graph 2.3.3 Question: "Were any of your teachers encouraging you to conduct research outside the educational process?" Selecting multiple options was possible. The number of female respondents (scientists) is 144.

such teachers during their master's and PhD programmes (63% and 61% respectively).

For some informants, the key influence came from **their teachers, who served as role models of scientists close to them.** In particular, they were proactive, immersed in current research, wrote popular science blogs, engaged in science journalism, and applied work outside the university.

However, some study participants did not have a positive experience of interacting with teachers during their studies and instead **encountered indifferent attitudes.** Among the aspects that concerned female students who were studying at Ukrainian universities at the time of the survey were the dismissive and devaluing attitude of their teachers — reported by 16% of respondents — and the lack of involvement from their supervisors — 16%

Among female researchers, 13% indicated that during their studies, they were significantly disturbed by the poor attitude of their teachers (13%) and the lack of involvement of their supervisor (14%).

Another factor of concern for both female students and female academics who had already completed their studies was violations of academic integrity by students and professors — reported by 17% of female students and 18% of female scientists.

Some informants spoke about senior colleagues' violations of research ethics. One researcher shared a negative experience of joint research with her supervisor: due to violations of the rules of the experiment, the informant was involved in the abuse of laboratory animals. This situation caused the research participant significant emotional stress. She also spoke about other cases that she considered violations: one colleague drank alcohol before conducting an animal experiment, the department studied biological samples of people without their written permission, and a laboratory animal was eaten. Another researcher spoke about a supervisor with successful experience

"Our head of the department runs his own YouTube channel. [...] And he is a scientific consultant and journalist [...] And precisely because he is in the know, and he knows the latest topics, the latest articles, my article is also written with him. He is the author of an article in which I am a co-author. [...] We are taught 50% of our time, we are taught new modern information. [...] We are taught the best methods for setting up a reaction, isolating a reaction."

Student of the master's programme

"And I was very lucky with my supervisor. She was super proactive, young, and she was detailing and explaining what, why, and how we were doing things, and that it's okay if we've done something there, but there are questions, and what's next - and we don't know what's next. And she's like, well, that's okay. And she was a figure whom I reached out to for a very long time."

A scientist who ended her scientific career

in the private sector, whom the informant admired but who did not share with students how to secure similar positions in financially rewarding projects. According to the scholar, the consequence of this situation is the lack of understanding among students of the prospects for employment after completing a master's degree, except in the teaching field.

The quality and content of the educational programme. The informants mentioned this factor negatively. They **believed** that **the curriculum was overloaded with non-core subjects** (in particular, they mentioned philosophy, pedagogy, and management). Some **were dissatisfied with the lack of subjects they considered necessary for their speciality and the outdated information** provided by teachers.

According to the survey, 37% were dissatisfied with the content of classes that did not correspond to the level of development of modern science (see Graph "What worried female students the most during their studies"). About a third of female respondents, among those who already work as scientists, indicated that during their studies, they were concerned about the content of the lecture, which did not correspond to the level of development of modern science (29%), and that they were taught outdated scientific methods (26%) (see Graph "What worried female scientists the most during their studies ").

"This disinterest was later manifested even in teachers' and supervisors' attitudes to our theses. Well, it was already evident at that stage when you arrived. It's not for nothing that this person is called a leader. They have to lead, they have to explain, they have to teach something. And there was none of that. That is why I didn't want to look for it."

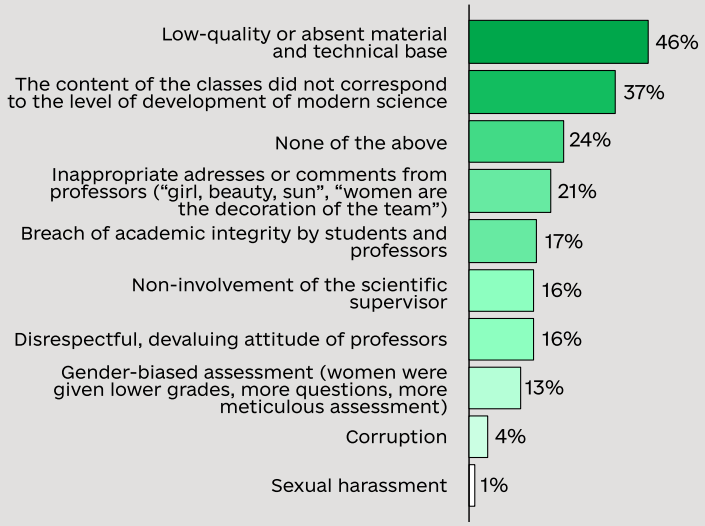
A scientist who ended her scientific career

The opportunity to conduct applied research independently or as part of a research team. According to some informants, this allowed them to gain practical skills and knowledge of various research tools. Several female researchers said that as part of their coursework or diploma work, they **could join research projects at NAS institutes** and were paid for their work and/or continued to work there. The informants described this experience as supportive and useful, as it helped them find a supervisor. According to the survey, 76% of female students studying at Ukrainian universities at the

"Moreover, at [name of university], although it is called 'astronomy', in fact, for the first 3 years we study only mathematics. Advanced mathematics and physics. We didn't actually study astronomy until almost the end of our bachelor's degree. And this added a lot to the burnout."

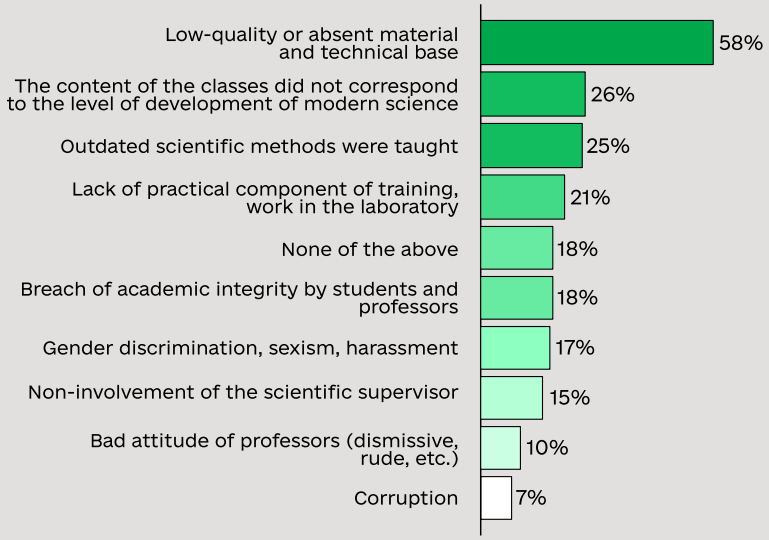
A scientist who ended her scientific career

WHAT WORRIED FEMALE STUDENTS THE MOST DURING THE STUDIES



Graph 2.3.4. Question: "What concerns you the most during your studies/displeases you the most?" The question allowed for a maximum of 5 answers. The number of female respondents was 90.

WHAT WORRIED FEMALE SCIENTISTS THE MOST DURING THE STUDIES



Graph 2.3.5. Question: "What bothered you the most during your studies/did you feel dissatisfied?" The question allowed for a maximum of 5 answers. The number of female respondents (scientists) is 144.

"In fact, the problem with modern education, and I'm talking about chemistry, the chemistry department, is that there are very old textbooks, outdated information. [...] Chemistry has been developing, is developing, and will continue to develop. [...] And 50% are, of course, very old programmes and textbooks that have really outlived their usefulness and are merely a piece of history."

Student of the master's programme

"It was interesting for me to study; we had good laboratories for chemistry, soil science and agrochemistry. So, we went to study at scientific institutes. We were also lucky to be among the last ones to be exempt from the exams, to go to real classes at scientific institutes. [...] And this was very supportive. That's how I found my first supervisor."

A researcher working in a private institution

time of the survey had the opportunity to do an internship or traineeship. However, this share is lower among female scientists: 50% had a chance to do an internship or traineeship, while 22% reported that they did not have such an opportunity.

One study participant mentioned that she **developed an interest in science during the field expeditions** she participated in. Another **saw field trips** and the first experience of applied research **as a way to determine her future specialisation** and to understand which field she liked best.

Although applied work in laboratories or on-site practices in a particular discipline was a mandatory element of the educational process, according to the researchers, **not all participants**

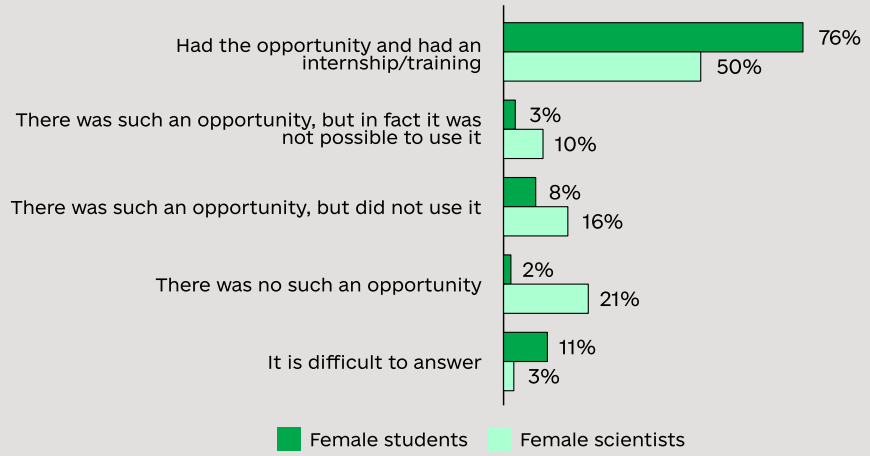
"First, I was given the tools, and I am very grateful. That is, I was taught the concepts themselves and provided with the tools I could use to implement my knowledge. Like the language, Python, using AutoCAD, and additionally learning some tools for visualising dynamic systems."

Student of the master's programme

"And in the 3rd year, we had our first work placement, which could be done at a company. Or we were offered to do it in academic institutes. And I got an internship in the laboratory at my [Institute 1], where I now work. [...] After the internship [...] we came once a week, it was also like a club, we were interested and did some science. [...] We were offered, I think, a quarter of a technician's salary [...] And we agreed, so they hired us as students."

A scientist working in a state institution

OPPORTUNITIES TO HAVE AN INTERNSHIP OR TRAINING OUTSIDE THE UNIVERSITY DURING STUDYING



Graph 2.3.6. Question: "During your studies, did you have the opportunity to intern or train outside the university — at a research institution/company?" Number of respondents: female students — 90, female scientists — 144.

"I started participating in field expeditions very early on. In fact, student work is often used in scientific expeditions, where you have to prepare samples, do something like that. [...] But this is what makes you fall in love with science because here you prepare samples, here you communicate with these people who actually analyse these samples, who create research, who develop the research concept."

A scientist working in a state institution

in the study had the opportunity to acquire practical skills.

According to the survey, in the disciplines that included laboratory work, 81% of female students who studied at Ukrainian universities were able to conduct experiments and use equipment, while 4% could only observe the work of teachers. In the case of 15% of respondents, their studies did not include laboratory work.

Among the female scientists surveyed, 21% indicated they were particularly concerned about the lack of practical training and laboratory work during their studies (see Graph "What concerned female scientists the most during their studies").

Some informants were **dissatisfied with the material and technical support of the educational process** despite the quality of theoretical knowledge they received from their teachers. Students had limited or no opportunity to conduct laboratory research

"Perhaps the only problem in our universities is outdated equipment. Sometimes, you want to do better research, but you simply run into the fact that there is no funding. You have a queue of 150 people waiting for a device, and you sit there until seven in the evening because there is only one."

A scientist who ended her scientific career

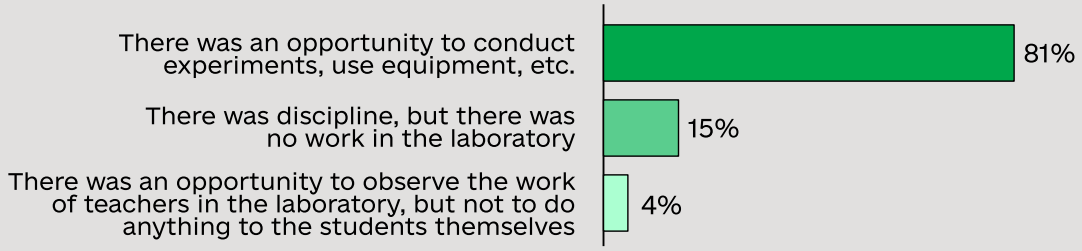
due to a lack of consumables, the condition of equipment or its absence. Researchers had to spend a lot of time travelling to laboratories in other institutions to conduct their research in several cases.

This is confirmed by the survey results: 46% of female students who studied at Ukrainian universities were most concerned about poor or missing material and technical facilities (e.g., laboratory equipment). This figure is also high among female scientists: 60% of female scientists indicated that insufficient material and

"We teach the theory well; our teachers tell us perfectly how this equipment works and how it can be used. We can go somewhere else and use this equipment, but we don't have it here."

Student of the master's programme

DID THE TRAINING INCLUDED LABORATORY WORK (AS A PART OF STUDYING DISCIPLINES THAT COULD INCLUDE LABORATORY WORK)



Graph 2.3.7. Question: "Does your current study programme include laboratory work (as part of the study of courses that involve laboratory work)?" Number of female respondents is 90.

technical facilities were one of the aspects that bothered them the most during their studies.

Bureaucratic obstacles in higher education institutions. Some informants encountered bureaucratic difficulties and a lack of training in networking skills. One informant said that due to the actions of the HEI management, she was deprived of the opportunity to do her diploma work at the university, as her department's laboratory space was taken away for use by other study programmes. This became one of the factors that led her to change her HEI after her bachelor's degree. The negative experience sometimes influenced the informants' desire to continue building a scientific career.

"Firstly, the moments of leadership [...] There were a lot of jokes about the fact that, firstly, they opened up education for foreigners, and they took away all our premises. [...] I had no place to do my diploma because of this. I had to do it in another educational institution. And the second thing is that, for example, our management made all sorts of fake patents."

A scientist who ended her scientific career

Sex discrimination and sexual harassment. According to the Strategy for Implementing Gender Equality in Education until 2030, individual research institutions and higher education institutions have their policies and strategies for preventing and combating discrimination.[14] However, some informants reported **instances of gender-based discrimination** by teachers during the educational process, which caused depression and other negative emotions for some women scientists.

"I was helped in writing my master's thesis with such tips and mentoring. Specialists from different fields, from completely different educational institutions, from institutions. [...] It's a lot of work if no one does it at the university. And when you do it yourself, it is extremely difficult. So the university has a huge gap in this regard, and it's just a kind of gap between education that doesn't give you any connection."

Student of the master's programme

According to the survey, 68% of female respondents studying at Ukrainian universities at the time of the survey and 75% of male respondents indicated that they or their classmates had experienced some form of sexism, gender discrimination or sexual harassment during their studies.

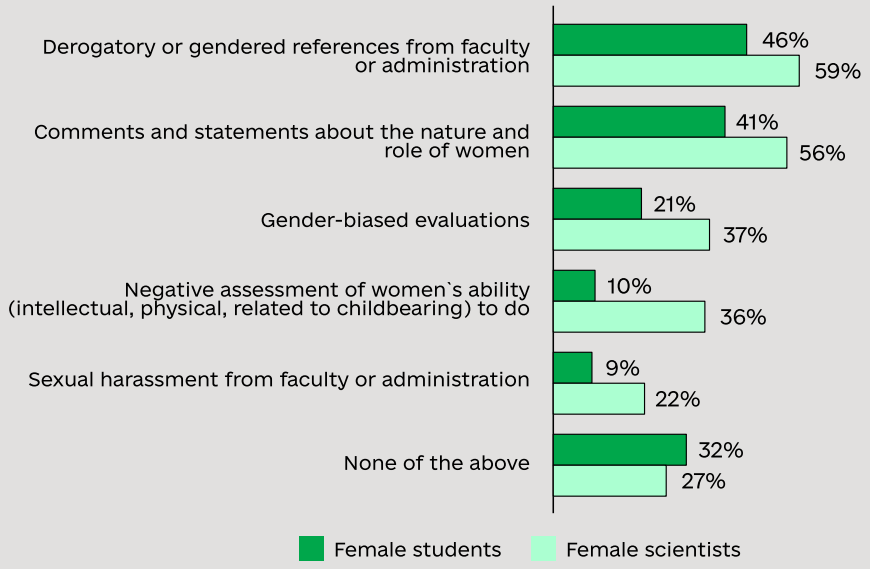
In cases of sexist attitudes, the informants described different reactions: some resorted to the strategy of ignoring it, while others focused more on their studies or research, believing that their success would change the teachers' opinion. Some informants also filed complaints against sexist teachers.

Several female informants shared instances where their teachers chose male students to work together in laboratories or collaborate on term papers and/or diploma papers, perceiving them as more capable or suitable for such tasks. The informants also mentioned **cases** when female students were given preference over male students, more support, and higher grades, which was related to the gender composition of the study group.

Some informants reported cases of **unprofessional communication with students at universities.**

14 More details are provided in Section 1.

CASES OF GENDER DISCRIMINATION AND SEXUAL HARASSMENT DURING STUDIES



Graph 2.3.8. Question: "Did any of these things happen to you or your classmates during your current programme?" — for female students; "Did any of these things happen to you or your classmates during your studies?" — for female scientists. The question allowed for multiple answers. Number of respondents: 90 female students and 144 female researchers.

Some lecturers commented on students' appearance, abilities and personal lives during their studies, using sexist remarks, inappropriate jokes and offensive nicknames.

"Of course, yes, there is a tendency that when there is, for example, a new intake of students, the heads of the labs sort out the boys. And yes, they will all tell you that 'it's because we work with a lot of substances, and you won't be able to lift anything, and we will have to do everything for you'. No. These are all excuses. Because the girls always manage with the quantities we work with."

Student of the master's programme

According to the survey, 46% of female students indicated that they or their classmates had experienced situations during their studies where teachers or university staff used diminutive or gendered forms of address. In addition, 41% reported hearing comments about the nature and role of women. 10% indicated that they or their classmates had encountered a negative assessment of women's ability to engage in scientific work (see Graph 2.3.8). Among the female scientists surveyed, a higher proportion indicated that they or their classmates had faced similar situations during their studies. Also, inappropriate treatment or comments were a major concern for female students — 21% of respondents indicated this (see Graph 2.3.4).

The women also reported cases of **sexual harassment during their studies,** including advances from male lecturers and situations where they initiated physical contact. In cases where such incidents became known outside the university, some lecturers were dismissed.

"I just had a situation [...] when girls were given higher grades for having beautiful eyes and also lower grades for having beautiful eyes. [...] I mean, it's a very ambivalent attitude, depending on the teacher. [...] When there were fewer girls, it was like: "Oh, they're the team's centrepiece, they'll be the group representatives". And when there were fewer boys: 'Take care of them, don't bother them'. It's very offensive."

Student of the master's programme

However, **not all the research participants faced discriminatory attitudes or sexual harassment,** and some stated that they had not heard of such cases in their HEI. Some female researchers said they **did not feel any difference in how women and men were treated during their studies.** This, in their opinion, was due to the **gender-balanced composition of the department's student group and/or teaching staff and the possibility of complaining to the university administration.**

“Well, he, you know, that teacher said many things. He once said that… ‘I was here in the university’s main building, and you know, there are people who have just recently come down from the palm trees, studying medicine and computer science. And you can’t study quantum physics.’ Or another: ‘I saw this person and that person’. You know, from the previous year. ‘Look at these girls, they’ve really let themselves go! They’ve put on so much weight. Age really takes its toll on women’”

A scientist working in a state institution

“It’s clear that these are the same teachers who supported me, but at the same time, could make jokes like, ‘Whoever doesn’t pass chemistry, the boys will go to the army, and the girls will get married’. […] And for some people, such… like I know my classmate, she lived in a dormitory and was mocked. […] It was a traumatic experience for her”.

A researcher working in a private institution

Differences in the master`s programme

The researchers described several important aspects of the master’s programme that differed from their bachelor’s experience and influenced the quality of their education. The study participants mentioned that the **master’s programme was more focused on the speciality:** it included more specialised subjects and offered more opportunities for acquiring practical skills (they had more opportunities to conduct applied research in laboratories).

“There was a teacher from the Botany Department. He was accused of harassing girls during an internship in [name of city], and one of the girls reported it. […] There was an investigation, and he was dismissed as a result. […] When they brought up some correspondence of [Name of teacher], it turned out […] that he had intimate relations with them, and based on these relations, he promised them apartments and help in finding a job and in science.”

A scientist who ended her scientific career

“Our students are, in principle, a speciality that is half girls and half boys. If a girl is diligent, she is promoted and given scholarships. They give her development opportunities.”

A scientist working in a state institution

“I had the option to refuse to teach a person I disliked or abused his position. So again, [name of university] had such a problem, we solved it, and my faculty did not sign a contract with this person anymore. […] So flexibility in administrative matters is also very important here, in education, in my opinion.”

Student of the master’s programme

“I also like that most of the master’s programme is devoted to practical skills, for example. I came here intentionally. That is, to be able to do something hands-on. Well, it’s very gratifying that there are institutions based in Ukraine that focus on practice rather than just dry presentations of material.”

Student of the master’s programme

“At the master’s level, there was at least more astronomy as such or astrophysics. There were fewer subjects like physics or mathematics, they were minimal. In my opinion, it would be better if there were none at all. And for the master’s programme to be more practical. But compared to the bachelor’s degree, it was much better.”

A scientist who ended her scientific career

THE IMPACT OF COVID-19 AND THE WAR ON THE QUALITY OF UNIVERSITY EDUCATION

The quality of the informants’ education and their desire to continue studying science were also affected by COVID-19 and the Russian-Ukrainian war. Due to distance learning, students lost the opportunity to work in laboratories and acquire practical skills, which forced them to look

“Those were the good times when we were all studying remotely. And as I said before, I really wanted to study organic chemistry. [...] But we had a huge problem – we couldn’t do practical training. I mean, it’s the second year, when you’re sitting at home all day, your head is just full of theory. You don’t feel good about it anymore. And you want to work with your hands. But there’s nowhere to work with your hands because the faculty is closed.”

Student of the master’s programme

for additional opportunities to acquire them. In the frontline regions, students also faced difficulties with field research.

One of the academics also said that, in the context of the full-scale Russian invasion, university professors began to abandon Russian teaching materials and use those written in other foreign languages instead. However, the low level of proficiency in English or other languages among teachers and students did not allow for the complete replacement of old textbooks, while few textbooks are available in Ukrainian. In addition, due to the full-scale Russian invasion, some supervisors left the country, and students are forced to conduct research on their own without the support of senior colleagues.

At the same time, **distance learning, according to one of the participants, could reduce the risks of discrimination and harassment,** although it created new challenges in the virtual space. Another informant said that, in her opinion, **the full-scale Russian invasion had reduced the number of applicants.** As a result, she had an individual study plan and **closer contact** with teachers.

“I wanted to say that I had plans until 2022 [...] well, I only planned to go for an internship abroad. [...] And in fact, the full-scale invasion accelerated it because many foreign projects began offering support.”

Student of the master’s programme

Global support for Ukrainian women following the start of the full-scale Russian invasion opened broader access to international programmes and increased the number of internship opportunities, which in some cases contributed to the development of the scientific careers of some informants. Women scientists have more opportunities to participate in training, conferences, and summer schools abroad, as their male colleagues are restricted from travelling outside Ukraine under martial law.

“Before the full-scale invasion, the vast majority of sources were Soviet. [...] Now, since the full-scale invasion began, teachers realise that they cannot offer us Soviet or Russian literature as sources. And they switch to sources from Europe or America. [...] It needs to be in English, which is a kind of difficulty for both teachers and students. Unfortunately, there isn’t much available in Ukrainian.”

Student of the master’s programme

“And even before that, my supervisor was going on maternity leave. [...] Everyone left because of the war, including her. [...] And so it turned out that I was doing my bachelor’s degree full-time, here in Kyiv. My supervisor tried to help me with something from Germany, with some theory. [...] I just spent a year learning almost everything from scratch on my own.”

Student of the master’s programme

“But with remote work, well, no harassment, no, someone sent a picture. I don’t consider it harassment, it’s fun, I don’t know. I mean, it’s almost impossible to harass someone at a distance. Well, what kind of discrimination? Just gossip. Well, doesn’t it happen everywhere? This is not relevant to work, I think. It shouldn’t interfere with work.”

A scientist working in a state institution

“The first thing I like now is that I have already started my master’s degree. [...] There are very few of us — just three on the list. It’s such a small group that an individual plan is created for each student. [...] That’s why I like that more attention is paid to... well, you’re not afraid to ask questions anymore because you have some experience in asking questions.”

Student of the master’s programme

2.4 DECISION TO START A PROFESSIONAL RESEARCH CAREER

For many research participants, obtaining a PhD was an important step in building their academic careers.[15] The informants mentioned a number of different reasons for applying for postgraduate studies.

Personal aspirations and desires. For some researchers, **applying for postgraduate studies was associated with the desire for self-realisation,** while for others, it was important to be in a learning environment. For some research participants, postgraduate studies were more interesting than their current jobs.

> "And there was also a feeling when I came to school [to work after my master's degree]: "Is that all there is to it?" I mean, there is no personal development. And somehow, I managed to satisfy this thirst for personal growth by attending graduate school."
>
> A scientist working in a state institution

Invitation or assistance from a supervisor. Some informants said that they were invited to apply for PhD programmes by their professors or supervisors during their master's degree or after graduation. Teachers also sometimes provided support through their academic contacts, helping interested female researchers to enter PhD programmes.

> "Then, I graduated from the university, and during my master's degree, I met my future supervisor. [...] And she invited me to stay. At the same time, I stayed to teach at first, and then six months later, I enrolled in a part-time postgraduate programme. So I would say that I had support."
>
> A researcher working in a private institution

Suggestions from work colleagues. Several informants were offered postgraduate studies by their superiors or other colleagues at the enterprises or research institutions where they worked at the time.

> "Because, well, my bosses at [name of the research institute] told me I should go to postgraduate school anyway. And it's logical; I completely agree with this opinion because it's a recognised path to becoming a scientist."
>
> A scientist working in a state institution

Postgraduate studies were a logical continuation of the scientific path. For some informants who were employed in academic institutions and wanted to develop their careers, **postgraduate studies were perceived as a mandatory part of developing their scientific careers.**

> "Why did I apply for postgraduate study? Well, first of all, it was career development, as my workplace is a scientific institution, so I need to have a certain scientific status to move up a step further and become a scientific specialist, not just a laboratory assistant or biologist."
>
> A scientist working in a state institution

Going to postgraduate studies abroad was also a strategy of choice for some informants. The informants resorted to this strategy **because, in their opinion, other countries offered more opportunities to conduct research: better financial and logistical support.** The decision to pursue postgraduate studies abroad was also influenced by the full-scale **Russian** invasion: one researcher

> "The foreign academy was more attractive to me because you feel more dignified as a person there because you are still required to work for 40 hours. [...] But at least there you are paid a salary that you can live on and develop on. And, there is some kind of security. [...] And we most likely don't have it."
>
> A researcher working in a private institution

15 In 2016, the updated Law on Higher Education introduced a five-level education system in Ukraine: Junior Bachelor; Bachelor; Master; Doctor of Philosophy; Doctor of Science, while the Specialist and PhD degrees were abolished. The reform brought the Ukrainian education system closer to the European one and contributed to the improvement of academic mobility of Ukrainian students and researchers. It should be noted that the general requirements for obtaining the degrees of Candidate of Sciences and Doctor of Philosophy are similar, but the awarding procedure differs slightly. https://zakon.rada.gov.ua/laws/show/1556-18#Text.

was in Europe for her master's degree when the invasion took place, so she decided to continue her education in the same country but later returned to Ukraine. However, **some informants deliberately refused offers to pursue a PhD outside Ukraine,** as they considered the research school at their home institution a better choice.

Not all the informants considered postgraduate studies as part of their career path as scientists. **Some research participants doubted the necessity of obtaining a PhD,** postponed their postgraduate studies for a while, or completely abandoned the academic research career path after their master's degree. Doubts arose due to various factors, which we have further divided into several groups:

- **Low financial support for postgraduate students.** According to women scientists, small academic stipends and low salaries for employees without a degree in research institutions would not allow them to meet their needs and maintain a decent standard of living.

> "But postgraduate studies, the reason I refused was a trivial one – low financial support, and the understanding that you need to spend a lot of time there. When you're already there as a PhD student. [...] Instead, I found a job in a private research laboratory."
>
> A scientist who ended her scientific career

- **Difficulties with internal communication within the university or institute.** The informants' previous experiences, as well as those of their senior colleagues who had studied in postgraduate programmes, demonstrated that internal organisational relations in universities or institutes of the National Academy of Sciences of Ukraine made it difficult to conduct research. These difficulties included hostile relations between departments within institutions, or colleagues' obstructing research or grant applications.

> "And the third difficulty is political frictions within the academy, within the institutes. These are old academics with their visions and ambitions [...] And in general, the fervour fades very quickly when you work somewhere in the academy."
>
> A researcher working in a private institution

> "Given the circumstances in Ukraine, we have a law that if you are studying for a postgraduate degree, you are not drafted into the army. That's why many boys and men are now applying for postgraduate studies. There are limited places. Yes, of course, there are contract places. But I'm sorry, it's hard to study on a contract basis."
>
> Student of the master's programme

- **The need to compete with male applicants for state-funded places.** Several informants noted that women's chances of admission decreased due to the increase in the number of men entering postgraduate studies during the full-scale invasion. This, in turn, created an atmosphere of additional emotional pressure on the informants themselves.

POSTGRADUATE STUDIES

The informants associated the postgraduate education process with various aspects that influenced their future career plans, including the desire to stay in the public sector, move to the private sector or abandon further research.

- **Content and requirements of the educational programme.** Some informants considered the educational component of postgraduate studies inadequate to meet modern research requirements. In particular, this concerned the presence of non-core disciplines and the content of teaching materials. Also, some researchers considered the limited timeframe for writing dissertation research a problem, which does not allow for high-quality work.

> "And again, we now have rules that in postgraduate studies, you must prepare a finished work as quickly as possible. [...] Our time is very limited. You don't have time to do a good job, especially if you still need to establish some kind of personal connection with your supervisor. And I understand that I don't have such a person."
>
> Student of the master's programme

Several informants spoke about difficulties in meeting the requirements for their publication activity, as young researchers sometimes have to ask experienced colleagues to add their names to articles to make their work more visible in the scientific community.

Bureaucratic burden. Some female participants in the study said that postgraduate studies involved submitting numerous reports that had to be completed within a short time frame. This created significant inconvenience and additional stress for them, especially if the postgraduate student worked at the academic institution where she was studying.

"When I submitted my last report, four different people sent me corrections, and then after the report itself, you had to make corrections again. [...] Everyone submits reports at the same time, and well, these are some big documents, and in addition to that, there is reporting on publications, reporting on professional development, on various publications, conferences you spoke at or not."

Student of the PhD programme

Support from the environment. For some informants, their environment played an important role in their decision to apply for postgraduate studies and continue their studies. With the support of family, friends and colleagues, the researchers felt more motivated to choose a postgraduate programme for themselves.

"And I had a great team. And the principal, when I told her that if I successfully passed my postgraduate exams, I could leave you, she just supported my decision and said: 'Great, I'm all for it. If you need anything from me, if you need to go to the exams, just tell me, we'll transfer your classes, we'll do everything."

A scientist who ended her scientific career

Cooperation with the supervisor. The informants spoke about the importance of psycho-emotional support from the supervisor, their help in overcoming bureaucratic obstacles and implementing research ideas. One researcher said she was very proud to belong to her supervisor's school of thought. Another cited the example of her former supervisor and colleague as an inspiration to create opportunities for others in the scientific field

Financial support for postgraduate students. The small academic stipends and low salaries received by researchers during their postgraduate studies significantly affected their ability to maintain a comfortable standard of living and led to some of them leaving science.

"When we were applying for postgraduate studies, we had four state-funded places for postgraduate studies in one year. There were two girls and two boys. As a result, the girls stayed, and the boys left. They switched to the IT sector to earn more money. [...] Because they had to feed their three children."

A scientist working in a state institution

Some female researchers also **shared negative experiences of discriminatory attitudes towards them based on gender and age** during their postgraduate studies. **The experience of discrimination led to emotional burnout and negative emotions.** Some informants reacted to the inappropriate attitude by ignoring it, while some women tried to defend their rights actively.

"Because you are in a very unequal relationship with your supervisor, it is a codependent relationship. And where there is a codependent relationship, there is a certain probability of some kind of psychological violence. And I have friends who faced a completely unacceptable attitude from their supervisor during their postgraduate studies. That is, they faced direct, very unpleasant courtship, and after rejection, they faced very severe psychological violence and psychological humiliation."

A scientist working in a state institution

The informants spoke about **the considerable psychological pressure they experienced from their supervisors,** as well as their doubts about the ability of researchers to enter postgraduate studies or the appropriateness of the informant in the position of a researcher. The research participants also spoke about the mandatory but unenforced practice of adding the first name of a supervisor or

"I would say that probably the biggest difference is that at the university, you are actually [...] given more attention. I mean, at the institute, [...] there are basically a lot of laboratories or departments doing their own thing, and most people don't know who the PhD students are. [...] Since no one knows who you are and what you want from them, it is very difficult to reach someone to start this research."

Student of the PhD programme

other senior colleague with a degree to a publication, even though a PhD student carried out the article and research.

However, **some women informants said they did not face gender discrimination** and did not feel any difference in attitudes towards women and men in the institutions where they studied and worked. They attributed this situation to the predominance of women among their colleagues and teachers.

> "I am very pleased here because, first of all, I have way less interaction with some teachers, and the ones I have now are women, so there are no problems at all. No, everything is really great here."
>
> Student of the PhD programme

Some informants noted the **difference between conducting dissertation research at universities and institutes of the National Academy of Sciences of Ukraine.** In the opinion of the research participants, universities pay more attention to postgraduate students, while institutes require more effort to establish contacts with colleagues from other departments to get started.

> "Studying is different from what I studied at [name of university] and here at the National Academy of Sciences of Ukraine. First of all, I like the fact that here you really work on the materials on your own because, well, there are no proofreading sessions, and this rhythm suits me very well, I work at my own pace, and if necessary, I turn to teachers."
>
> Student of the PhD programme

> "But, well, I don't have any inspiration to teach, and I didn't leave the university to go to the research institute for that. If I wanted to teach, I would have stayed at the university, there are people to experiment on. Of course, there are no students at the institute, although I would have left the university not only for this reason."
>
> Student of the PhD programme

However, **for some researchers, studying at research institutes has given them the opportunity to work at their own pace, which they feel they would not have been able to do at university.** Another important difference is that the NAS of Ukraine does not require students to teach, which, for some informants, was a factor in choosing institutes for postgraduate studies.

> "But you still have an interest in the surrounding environment. I think this is an innate trait. The second is the desire to leave something behind. Well, some humanistic tendencies as well. The third thing is probably, well, the team — of course, it's being surrounded by smart people, for the most part. That is, you can constantly expand your horizons."
>
> Student of the master's programme

> "I would like to work in a research institution, a state research institution. Because I also see the potential for development there. And career growth prospects, right? [...] And of course, with the opportunity to attend some international conferences, international internships, in this regard."
>
> Student of the master's programme

EXPECTATION FROM A SCIENTIFIC CAREER

The ideas and prospects for further scientific careers were formed during their studies at all educational levels. The informants considered employment options in universities, state research institutions, the private and public sectors, or perceived science as a hobby.

The positive choice to continue or return to **a scientific career was influenced by** many factors, including **the informants' perception of their own identity as scientists, the desire to contribute to science, the opportunity to communicate with other scientists, the aspiration to constantly learn, and the desire to attract more young people to the scientific field.**

According to the survey, the above factors are among the most common influences on female students' decision to start a scientific career. However, many respondents also mentioned high income and material and technical working conditions:

59% the opportunity to receive a high salary;

34% the opportunity to receive grant support/ scholarships;

34% having the material and technical resources to conduct research on the topic that interests me;

34% the desire for research to be useful and have an impact.

Doubts about future prospects were mostly associated with the lack of state funding for science, instability of employment and salaries, the attitudes of senior colleagues, in particular at academic councils, when presenting research results, and a **lack of understanding of employment prospects.**

In some cases, the decision to leave science was linked to discriminatory attitudes within the scientific community. Among female students studying at Ukrainian universities at the time of the survey, the most common fear about potential work in science was low salaries – 80% of respondents indicated this. Other common concerns included:

46% they will have to secure funding on their own;

43% they will work in unsatisfactory conditions, such as without a personal desk or in a poorly maintained room, etc.;

30% they will deal with a lot of paperwork and bureaucratic obstacles;

27% they will face a heavy workload;

26% they will have irregular working hours – 26%.

> "I already anticipate all these moments at academic councils, where I will report on my results. And because they may not be familiar with the methods because they are not from the Institute, or they may not know some other things, it already begins: "What is this, and why is this? Where did you get the idea that this could be the case?" Well, it's all very aggressive and harsh. [...] And you don't have the opportunity to set your boundaries, which is very unpleasant."
>
> A researcher working in a private institution

WHAT FACTORS AND CONDITIONS COULD MOST INFLUENCE THE DECISION TO START A SCIENTIFIC CAREER

Opportunity to earn a high salary	59%
Opportunity to receive grant support/scholarship	34%
Material and technical opportunity to conduct research on topics that are interesting to female students	34%
Desire for female students' research to be beneficial and have an impact	32%
Availability of support from a scientific supervisor/professor	30%
Desire to contribute to research that will contribute to the development of Ukraine	20%
Availability of financial support (e.g., from family)	11%
Availability of female scientists who are engaged in female students' topics	11%
Desire to contribute to the development of female students' scientific fields	11%
Ability to establish connections with scientists abroad	10%
Ability to get into a scientific or educational institution where female students would like to work	8%
Desire to make history in science	8%
None of the above	3%

Graph 2.4.1 Question: "What factors and conditions are most likely to influence your decision to start a research career?". Respondents were allowed to select up to three answers. The number of female respondents (students) was 90.

WHAT FEARS/CONCERNS DID FEMALE STUDENTS HAVE ABOUT POTENTIAL WORK IN SCIENCE

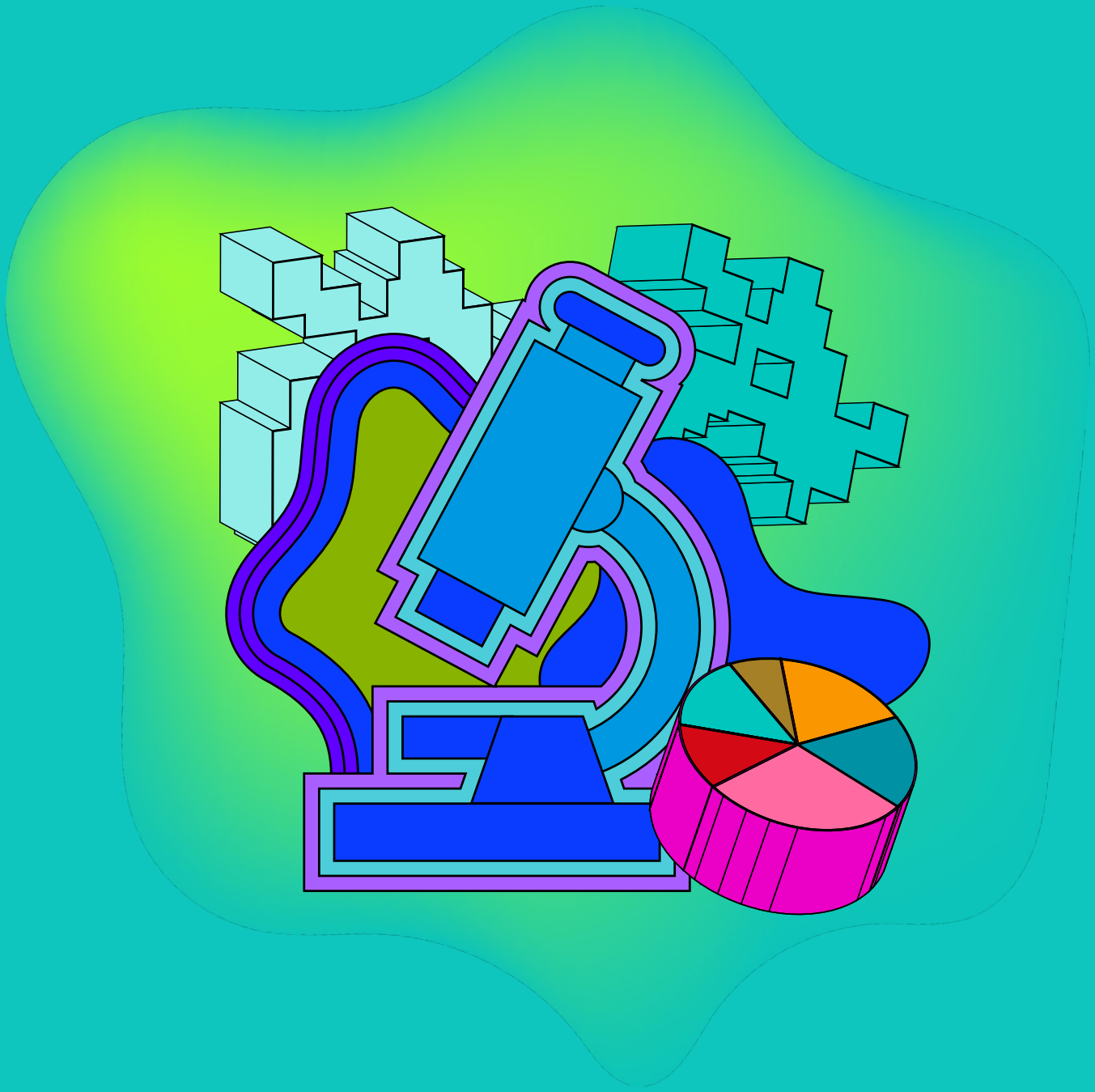
Will have low salaries	80%
Will have to find funding for their research themselves	46%
Will work in unsatisfactory conditions	43%
Will have too much workload	27%
Will have a lot of "paperwork" and bureaucratic obstacles	30%
Will have irregular working hours	26%
Will not understand what professional development and opportunities can be in the long term	23%
Will not cope because they lack the necessary skills	22%
Will face a bad attitude from colleagues and management	22%
Will not be able to choose research topics and methods	19%
Working in science involves a high level of stress and can lead to professional burnout	19%
Have insufficient knowledge of English	18%
Will have no one to discuss the topic of their research, ideas and thoughts, and the results of their work	14%
In the scientific environment in their field, women face negative attitudes, prejudices, and discrimination	9%
In the scientific environment in their field, there is a high level of competition	4%
It is difficult for a woman to succeed in science in their field	3%
None of the above	2%

Table 2.4.2. Question: "Which of the following fears/concerns do you have about potentially working in the field of science?". The question allowed a maximum of 5 answers. The number of respondents was 90.

"Yes, I thought about whether I would continue my academic career. Well, at first, when I started my master's degree, it was definitely yes. [...] And then you face problems like financial support, the lack of certain materials, right? [...] And then the question arises, do you need [...] a bit of bureaucracy, it also hinders you from progressing, in my opinion. [...] I am now thinking about whether to stay in science or not."

Student of the master's programme

SECTION 3



WORKING CONDITIONS AND PROFESSIONAL DEVELOPMENT OF FEMALE SCIENTISTS IN STEM

3.1 WORKING WITH INNOVATION

During in-depth interviews, focus group discussions, and a survey, we asked scientists what types of research they conduct, whether they integrate innovation into their work, and what obstacles they encounter when comparing basic and applied research.

The researchers who took part in the survey were engaged **in different types of research:** both **fundamental** research, aimed at expanding theoretical knowledge, and **applied research,** aimed at using knowledge to solve current problems. At the same time, the majority (68%) worked on both types of research, to varying degrees, with a preference for applied or fundamental research.

According to the survey results, **66% of female scientists** working at Ukrainian institutions were engaged in **research that included an innovative component** (see Graph 3.1.1). Only 5% of respondents indicated that they did not see the need to integrate an innovative component into their research (see Graph 3.1.3).

To conduct innovative research, it was important for scientists to have the **right conditions.** The most common need was **participation in international research projects,** mentioned by 74% of scientists working in Ukrainian institutions. Other common conditions that would enable innovative research were related to **logistical and financial support:**

71% – new material and technical capabilities;

69% – additional grant funding opportunities;

61% – increase in basic state funding by 61%.

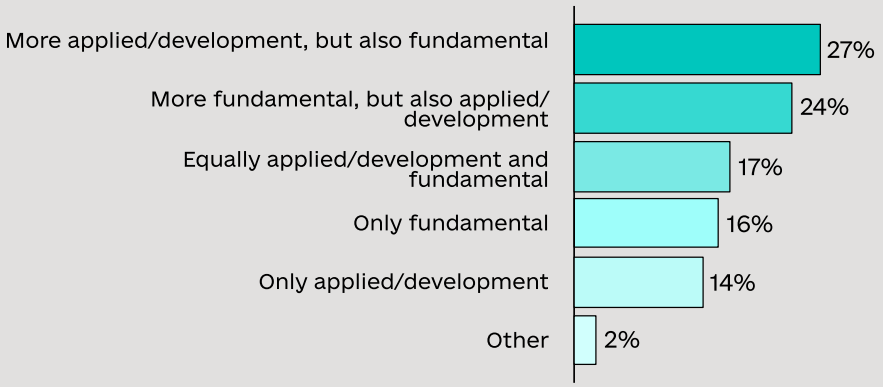
According to the experience of researchers who have worked on both applied and basic research, there **is no significant difference between working on these types of research.** Most of the challenges faced by the informants were common to both, such as lack of equipment and supplies due to insufficient funding, heavy workload, and unstable work schedules. However, the situation may vary depending on the institution, research area, and topic. Below are the key differences in working on applied and basic research that the informants discussed:

Funding. Research addressing applied issues, particularly during a full-scale war — topics related to the military sphere — may have a better chance of receiving funding. Researchers said that research on thesetopics has more opportunities to receive grant support from Ukrainian government agencies and foundations. In addition, researchers spoke about the possibility of obtaining public or private contracts for applied research, which is also associated with better and faster funding.

Research planning. The researchers spoke about the differences in planning basic and applied research. Research aimed at solving certain issues involves creating a clearer plan of activities and has deadlines, especially if the study is commissioned.

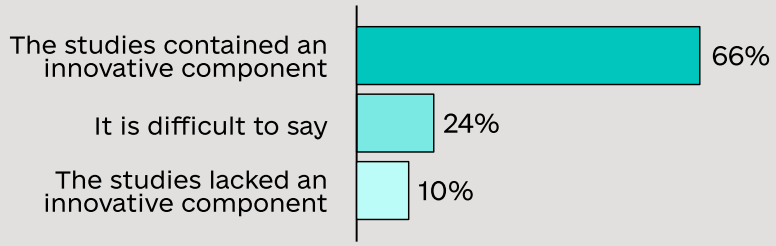
The need for logistical support. Applied research may require more logistical support than basic research, such as more reagents and equipment for conducting experiments. The survey data confirm the importance of this aspect, particularly for innovative research (see Graph 3.1.3). Some informants emphasised that strong logistical support is essential to conducting competitive research at the global level.

RESEARCHES CONDUCTED BY SCIENTISTS AT THE TIME OF THE SURVEY



Graph 3.1.1. Question:"What kind of research do you conduct". Respondents were asked to choose one answer. The number of respondents was 144.

WHETHER THE RESEARCH OF FEMALE SCIENTISTS WERE INNOVATIVE



Graph 3.1.2. Question: "Is your research innovative". Respondents were asked to select one answer. The number of respondents was 131.

"If you are doing biological research, you must work in a laboratory, sometimes get costly reagents to remain competitive with the high-quality research conducted abroad."

A scientist working in a state institution

"It's really important to have practical results and to understand where you're going to put it right now, not when someone opens it somewhere by tearing off a piece of tape or something at room temperature."

A scientist working in a state institution

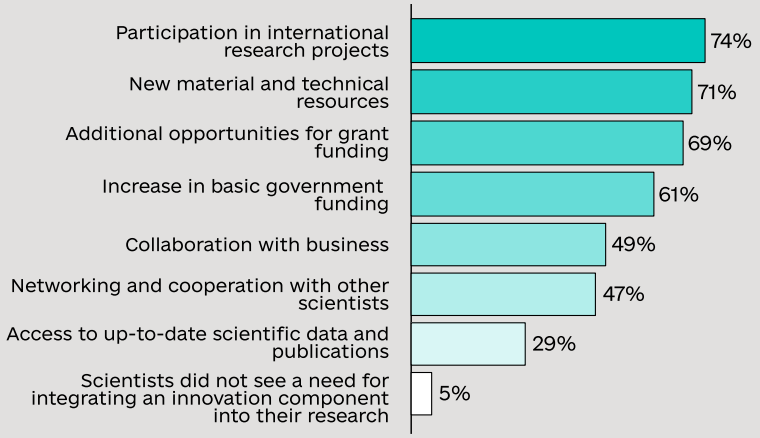
"We have more applied tasks as the urgency dictates them. Well, there is a need to develop such tools and research them. So... we certainly have fundamental topics, but the applied ones are more in focus."

A scientist working in a state institution

In addition to the differences in funding, planning and technical needs, a specific aspect of working with applied research is **the opportunity to obtain practical results and contribute to solving current problems.** For some scientists, this was the key factor in deciding what kind of research to pursue. They wanted to see the result of their work immediately. In contrast, basic research has a less defined timeframe, can last longer, and does not allow for quick results.

Some scientists said that it was after the start of the full-scale Russian invasion that they felt the need to conduct research that would be useful for Ukraine and society – in particular, due to the necessity of developing certain tools and instruments.

NEEDS FOR CONDUCTING FUNDAMENTAL RESEARCH BY SCIENTISTS



Graph 3.1.3. Question: "If you wanted to conduct innovative research, what would you need". Respondents could select up to five answers. The number of respondents was 144.

“So, for the most part, we are engaged in basic science at the department. This would probably have continued if it had not been for the COVID-19 pandemic and the war. Because, for some reason, it is at such a time that you feel the desire to be useful to society and for your work to contribute and possibly solve some pressing issues that the present times dictate.”

A scientist working in a state institution

“But now I’m mostly engaged in applied research, and I can also say that life itself, let’s say, has led me to this path. [...] But I understand that, well... [fundamental research] is not quite my thing, so to speak. In some ways, it’s even a bit difficult for me. I don’t know; it’s probably a bit difficult. Because the motivation is different, so to speak. I want to do something more, to see the result immediately.”

A scientist working in a state institution

3.2 WORK ORGANISATION AND INSTITUTIONAL CULTURE

Institutional culture and interactions with colleagues and management are part of the working conditions of female scientists and, according to the survey participants, influenced their professional experience and motivation.

It is worth noting that the vast majority of scientists who took part in the survey had spent most of their scientific careers at a single institution, indicating that their main place of work remained consistent over the years. Therefore, it can be assumed that the professional environment and institutional culture are stable for some scientists.

During the in-depth interviews, some informants described spending their entire careers at a single research or educational institution. Among the reasons for this career pattern was a **high degree of specialisation** – certain fields or topics are researched exclusively within specific institutions, making it difficult or impossible for some scientists to change jobs without altering their research focus. Another reason was the network of formal and informal social connections at their workplace – with colleagues and management. These connections enabled researchers to effectively address professional challenges such as sourcing equipment and consumables, establishing scientific collaborations, and organising the defence of accreditation work, among other tasks.

In the survey, we asked female scientists to assess the workplace atmosphere, particularly regarding team interactions. Overall, more than half of the respondents rated the interactions in their professional life positively. 76% of the female scientists surveyed always or often felt supported and understood by their colleagues, while 58% reported the same from their supervisors. In addition, 66% of respondents stated that they always or often felt comfortable and safe among their colleagues.

> “Here, my entire scientific career is connected to this institute; I have not changed my place of work. [...] I currently hold the position of Senior Researcher and manage a small group of young researchers. My colleagues and the head of our department have fully supported this path. In other words, my scientific career, my scientific life, are closely tied to this institute.”
>
> A scientist working in a state institution

Also, 15% of the female scientists surveyed identified conflicts and competition in the professional environment as one of the most significant difficulties in working as a scientist (see Graph 3.3.1). For 16% of respondents, internal conflicts and competition within the scientific institution/educational institution were among the obstacles preventing them from carrying out research.

PSYCHOLOGICAL ATMOSPHERE AT THE WORKPLACE

Felt support and understanding from colleagues	76%
Were able to receive professional advice and mentoring when needed	67%
Felt comfortable and safe in the team	66%
Experienced significant stress when immediate societal benefits were expected from their fundamental research	59%
Felt support and understanding from management	58%
Felt that their work was valued and recognised	58%
Felt very stressed when they had to seek funding for their research independently	57%
Felt that management listened to their ideas and suggestions	52%
Could get help with the administrative and legal side of their work	48%
Existing conflicts and competition among colleagues negatively affected the team's ability to conduct research and its quality	38%
Existing conflicts and competition negatively affected the motivation of female scientists to work	38%
Felt devalued/heard inappropriate jokes directed at them or other women	26%

Table 3.2.1. Question: “How would you describe the psychological atmosphere at your workplace?” Each statement in the list could be answered with “Always”, “Often”, “Sometimes” or “Never”. The figures provided represent the combined total of responses for “Always” and “Often”. The number of respondents is 144.

CASES OF DISCRIMINATION DURING POSTGRADUATE STUDIES OR WORK IN SCIENCE

Were assigned unwanted administrative or "paperwork" tasks that others avoided	49%
People who were listed as co-authors on publications to which the female scientist had contributed were not involved in the research	38%
Did not consider the female scientist's candidacy for a certain position, including leadership roles	28%
Were not nominated for awards, competitions, or honours	28%
Were not sent to internships, conferences, or other events	24%
Were not involved in research projects	20%
Not listed as a co-author on scientific publications to which the female scientist contributed	19%
Did not recognise the female scientist's contribution to the research she participated in	18%
Not allowed to participate in certain types of research work	17%
Not included / rarely included in field expeditions	7%
None of the above occurred	25%

Table 3.2.2. Question: "Have any of the following situations occurred during your postgraduate studies or work in science?" Respondents were allowed to select multiple answers. The total number of respondents is 144.

Beyond the workplace atmosphere, including relationships with colleagues and supervisors, some study participants also mentioned more broadly negative experiences related to their professional responsibilities as employees. Nearly half (49%) of respondents reported being occasionally assigned undesirable administrative tasks that others avoided at their primary workplace. Additionally, 38% indicated that individuals who had not contributed to the work were sometimes included as co-authors on their publications, while 19% reported having been excluded as co-authors from publications to which they had actively contributed. Around a quarter of the respondents also shared experiences of being overlooked as candidates for positions or awards, or being excluded from scientific events.

RELATIONSHIPS WITH COLLEAGUES

Positive interactions with other employees of the scientific or educational institution where the participants worked were mentioned among the factors that influenced their professional experience. The scientists described collaboration with colleagues across different hierarchical levels — whether as a supervisor, peer, or subordinate — and emphasised qualities such as respect, friendliness, and mutual support in these relationships.

According to the informants, the psychological atmosphere was an important factor in their decision to start a scientific career in a specific laboratory or department. Also, those informants who had experience selecting candidates for scientific projects focused not only on qualifications in this process — an important factor was also the person's ability to maintain healthy working relationships.

> "I really liked the atmosphere there. One of the main factors is probably the human factor, the team you find yourself in, and the people you work with. [...] It's this kind of factor — working with people you know will support you, who won't be plotting anything behind your back or creating drama. That's very important."
>
> Scientist working in a state institution

Some informants described their relationships with colleagues as close and emotionally rich, often characterising them as friendly or comparing them to family. Within a supportive psychological atmosphere at the workplace, they reported receiving not only professional guidance, consultations, and mentoring, but also various forms of emotional and practical support. One informant described the practice of

> "Sometimes you don't want to, for example, bring someone onto a project... You need a specialist for something, and you find that specialist, but you don't want to work with someone unpleasant. So you start asking around, trying to find out who might know this person, and just ask them personally."
>
> Scientist working in a state institution

"So if there's a close-knit team, passionate about their work and supportive, then yes, it plays a significant role. I think if it were a different team, if they didn't accept me, I probably wouldn't have been able to stay."

Scientist working in a state institution

"There were also many colleagues who were underqualified, which caused a lot of problems. [...] I would come home, and even if I had plenty of time, it took so much effort just to recover. Essentially, to regenerate. I didn't want to do anything. I developed a deep sense of apathy."

Scientist who left her scientific career

collecting funds in her team to support other colleagues financially, for example, in case of illness or after the birth of a child.

Another positive aspect of interacting with colleagues is the direct transfer of experience. Informants noted that mastering new methods, features of working with equipment, etc. was faster and easier when experienced colleagues demonstrated and explained them in practice.

The informants also highlighter the important and positive role of scientists from other institutions and educational establishments. Cooperation with them enabled the formation of interdisciplinary research teams in cases where necessary expertise was lacking within their primary workplace. This cooperation also broadened research perspectives by incorporating approaches and methods from other disciplines or sectors. A separate category of colleagues with whom the informants collaborated were scientists from other countries. They shared professional experience and information about career and financial opportunities, such as grant offers.

One type of support female scientists received from colleagues was help with childcare while they worked. For example, one informant reported that thanks to her help, a colleague could participate in a scientific conference and give a presentation while the informant took care of her baby.

At the same time, for some informants, interaction with colleagues was a source of difficulty and demotivation in their scientific work. According to the scientists, the reasons for this include the inability to receive the necessary support and/or the low level of qualification of some colleagues, favouritism, lack of a meritocratic approach in evaluating work and career advancement, and conflicts between colleagues or management.

According to the informants, the low qualification levels of other team members created difficulties during

"In my department, with my specific research focus, I didn't see anyone who could mentor me. And if even my department head can't be that person, then who can? Everyone around me didn't specialise in my field. And those who did had left for work abroad just a few months before I joined."

Scientist who left her scientific career

the research and negatively affected the workplace's psychological atmosphere, contributing to feelings of apathy and professional burnout.

Based on the study participants' responses, it can be assumed that the lack of opportunities to receive mentoring support or professional advice was not widespread – 67% of respondents answered that they could always or often receive it (see Table 3.2.1). In contrast, among the remaining 7% of respondents said they could never receive such support, and 26% said they could only receive it occasionally. However, informants who faced the lack or absence of such support mentioned it among the reasons for considering a workplace change or even leaving their field of activity.

RELATIONSHIPS WITH MANAGEMENT

More than half (58%) of the female scientists who participated in the survey reported always or often feeling supported by their management (see Table 3.2.1). Only 6% said they never felt supported. During in-depth interviews and focus group discussions, some informants described their relationships with managers at various levels regarding support, understanding,and assistance.

Support could take the form of, for example, help navigating the specifics of an institution or organisation's

"Older colleagues really helped here. And the director, too. When I first started, I didn't understand or know about grant opportunities for young scientists or these kinds of projects. But thanks to the support of senior researchers and the administration, I overcame this."

Scientist who works in a state institution

"Well, the management... how shall I put it? It's not that they distance themselves. They are supportive. Their approach is like: do whatever you want, as long as you're satisfied. If you're unhappy, you'll come and complain, and then we'll figure out what to do."

Scientist who works in a state institution

"It's clear that in Ukraine, it's a bit easier to do research because, despite everything, there's less hierarchy and less... I mean, I have a supervisor, but basically, I can conduct my research as I see fit."

Scientist who left her scientific career

"If you are in the academician's favour, they allow you to apply for awards. If not, it's a one-year contract, and every year, you must prove why you deserve to hold the lead engineer position for so long."

Scientist working in a private institution

work or assistance in finding opportunities for grant funding for research.

For some informants, interaction with management was characterised by non-interference in their research, giving scientists autonomy over the content and organisation of their work. One informant emphasised that the lack of meticulous control and freedom of action provided by management were an advantage of working in Ukraine.

The participants in the study described manifestations of biased attitudes from management that affected their careers. According to the informants, loyalty could be rewarded with better working conditions, while refusal to comply with management's demands or to carry out assignments could lead – or was perceived to lead – to difficulties in extending employment contracts and in career advancement more broadly.

Conflicts with colleagues and management, according to the study participants, also negatively affected the quality of research and their motivation to work. According to the survey results, 38% of respondents always or often encountered these problems in their work. One of the informants said that female scientists faced limited access to equipment and funding due to competition among representatives of her scientific institution for a leadership position and decision-making.

"At the institute where I wanted to work, problems started to arise: 'Which department are you from? Who are you working with?' And these people started to face much stricter scrutiny and were denied access to grants."

Scientist who left her scientific career

"I grew up in a team where any new specialist is seen as a competitor. So, no, all my male colleagues are lone wolves. Self-taught, sharing their knowledge with someone else? No way! That's competition. And when this competition starts to pit everyone against each other, like cockroaches in a jar... Well, I'm not interested in that."

Scientist working in a private institution

DISCRIMINATION

Some participants in the study reported that they or their colleagues had experienced harassment and discrimination. Such situations could make it difficult for female scientists to fulfil their professional duties and reduce their motivation to work in general.The participants in the study faced biased attitudes and career obstacles due to their gender, as well as sexual harassment during their studies and professional activities. More than half of the respondents had encountered sexist statements – hearing derogatory or patronising remarks about themselves or their colleagues,

"I haven't personally faced refusals [due to gender stereotypes or discrimination]. Why? Because I would never want to work with such people. Who I work with is more important than what I do."

Scientist working in a state institution

Diminutive or gendered addresses from colleagues/management (“girls, beauty, sun”, etc.)	55%
Comments and statements about the nature and role of women ("women are the adornment of the team", "women are more tidy at work, responsible")	53%
Negative assessments of women's ability (intellectual, physical, due to childbirth) to do scientific work	53%
Biased distribution of tasks based on gender (women are more likely to receive monotonous/paper tasks, and women are denied certain types of work due to physiological characteristics)	31%
Sexual harassment from colleagues/management (sexual touches, sexual offers and hints, including in exchange for assistance in obtaining a higher position, etc.)	13%
None of the above	32%

Table 3.2.3. Question: “Has any of this happened to you or your colleagues at work?” The question allowed for multiple responses. The number of respondents is 144.

> “My colleagues started making all sorts of jokes, so vulgar that I was just shocked. I’d never heard anything like it. Jokes about female PhD students, women in general, etc. [...] I don’t spread this around, but if someone asks me, for example, what I think about working with a particular person — if someone is considering inviting them to a project — I don’t hide it, because, for me, it was pure shock content, it was really disgusting.”
>
> Scientist working in a state institution

comments about the nature and role of women, as well as expressions of doubt regarding women’s ability to carry out scientific work, either in general or in specific fields (see Table 3.2.3).

Also, 31% of the respondents had experienced or witnessed biased distribution of tasks based on gender, and 13% had experienced sexual harassment in the workplace or witnessed it in relation to other colleagues. Among female respondents, 26% said they always or often heard such statements — inappropriate jokes, denigrating comments, etc. — about themselves or other women (see Table 3.2.1).

The impact of the described phenomena on the study participants varied depending on their personal experience and worldview. Some informants described sexist statements directed at them in emotionally neutral terms and noted that such a style of communication or statement did not negatively affect the performance

> “At the institute, there’s this mindset that for certain positions — ‘Oh, she’s unreliable, she could go on maternity leave at any moment.’ Or for a position that requires two or three years, they ask, ‘Are you planning to...?’ before even considering you.”
>
> Scientist working in a state institution

of their professional duties, career advancement, and psychological atmosphere at the workplace. They either did not consider it harmful to themselves or other women, or assessed the discomfort as minimal.

For another part of the informants, sexist statements created discomfort and caused negative emotions and experiences. Although, according to some of them, the experience of sexism in the workplace was familiar to them personally, in general, such cases were unacceptable, and sexist attitudes towards women were inappropriate and unfair. Negative assessments of the role of women in science, their ability to engage in scientific activity, for some informants, became a reason to avoid interaction or cooperation with colleagues who held similar views.

Some informants perceived and described their experiences of sexism and gender discrimination as critically negative. During in-depth interviews, one of the scientists said that the refusal to consider her candidacy for a management position because of her gender was the impetus for her to change jobs and move from the public

to the private sector. In the survey, 7% of respondents identified negative attitudes, prejudice, and gender-based discrimination as the biggest problems they faced working as scientists (see Figure 3.3.1). In addition, more than half of the respondents reported experiences in which they or their colleagues were spoken to in a derogatory manner, had comments about their character or role, or were subjected to negative statements about women's ability to carry out scientific work (see Table 3.2.2).

Some informants were not assigned work involving significant physical exertion, complex logistics, etc., or were assigned it reluctantly. In some cases, this was due to negative gender stereotypes – doubts about women's physical, emotional, or cognitive ability to cope with the work. In others, it stemmed from positive sexism, emphasising a friendly, caring attitude. Some informants noted that gender stereotypes and sexism encountered during their studies and careers (spanning up to 15–20 years) had started to appear less frequently and less prominently. Female scientists attributed this to a general decline in prejudiced attitudes towards women in science and towards women in general, both within the scientific community and in society at large.

> "Our department head until this year was [Name]; she is a woman, and therefore, she always seemed to support us at every stage. She also seemed to monitor everything at the directorate [...]. I used to hear from my senior colleagues that when there was a different directorate, there was a certain attitude towards girls on the academic councils, that they could do less, less... well, like, 'they are girls'."
>
> Scientist working in a state institution

Some female scientists also faced questions and comments about their reproductive plans and marital status. In in-depth interviews and focus group discussions, informants noted that the potential birth of a child and the possibility of taking maternity leave influenced decisions regarding their eligibility for management positions.

One informant described a case where she avoided pressure to accept an administrative position she did not want by telling her management that she might take maternity leave, although she had no actual plans to do so.

Some informants emphasised that they had not encountered gender discrimination or sexism or did not consider them to be issues in their case – particularly due to the high level of female representation in their field or in the institution/unit where they worked. Professional environments with a high proportion of women were described as safer and more comfortable regarding gender equality. Informants noted that women felt supported when they headed the institution or unit and experienced no discrimination.

3.3 MATERIAL AND TECHNICAL CONDITIONS OF RESEARCH ACTIVITIES

During the in-depth interviews, focus group discussions, and the survey, we asked the researchers about obstacles they faced in their research activities and what primarily prevented them from doing their work. In this subsection, we describe research activities' material and technical conditions, as these were among the main factors affecting the participants' ability to conduct research. Within this aspect of working in science, researchers mainly talked about material aspects, namely the arrangement of the workspace, such as heating in the room and safety at the workplace, and the provision of necessary equipment and supplies.

CONDITIONS AT THE WORKPLACE

Some scientists, when describing the conditions in which they conducted their research, specifically mentioned the unsatisfactory state of their workplaces. This was more common in public institutions but also occurred in private enterprises.

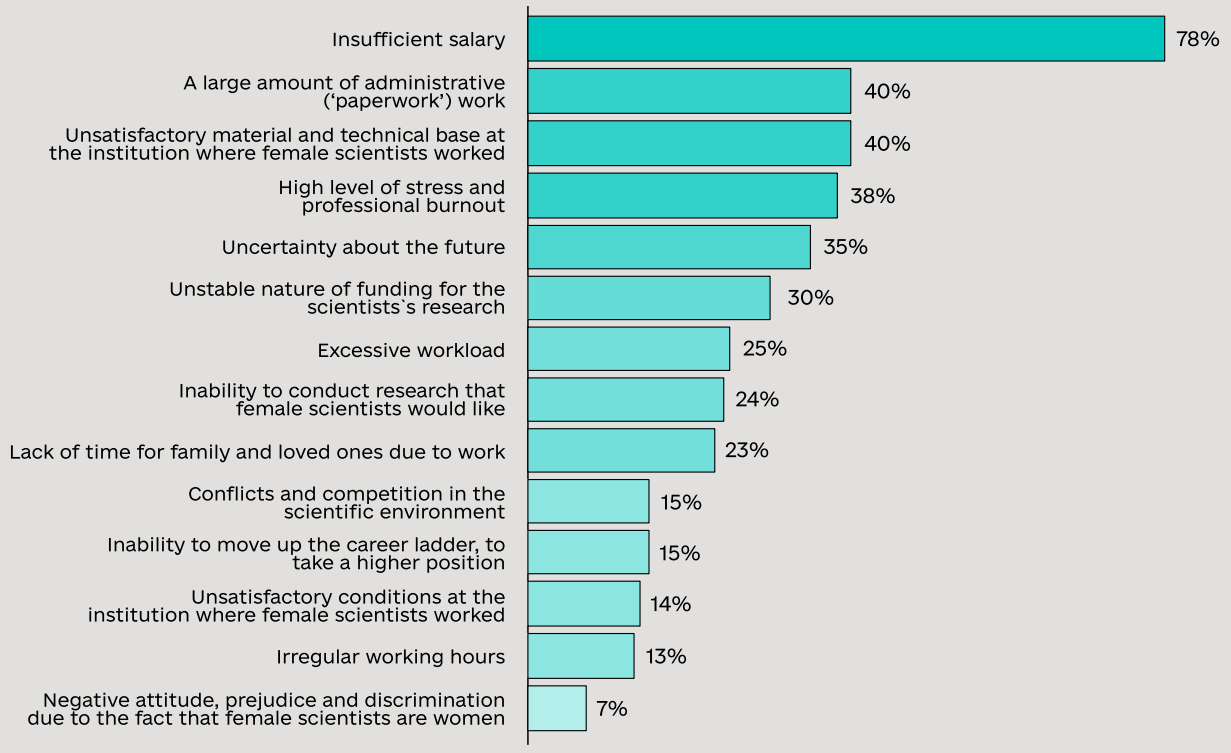
One question in the questionnaire asked about the biggest difficulties women scientists face in their work. Poor conditions in the institution were not the most common problem, but they were reported by 14% of respondents.

We also asked female scientists about the obstacles preventing them from doing their work. Among the various options, **23% of respondents** mentioned **the unsatisfactory condition of their workplace premises as one of the biggest obstacles** to their scientific work.

A common problem cited by participants in focus group discussions and in-depth interviews **was the lack of heating during the cold season.** This made it impossible to work indoors and prevented them from conducting experiments that required controlled temperature conditions.

This problem was due to **insufficient funding to improve working conditions in scientific institutions.**

Among the survey participants working in Ukrainian institutions, **47% of respondents** mentioned **the lack of**



Graph 3.3.1. Question: "What are the biggest challenges you face working as a scientist?". Respondents could select up to five answers. The number of respondents was 144.

institutional funding as one of the biggest obstacles to their work (see Graph 3.3.2).

> "We definitely need to repair the buildings, but I understand that this funding comes from the National Academy of Sciences. That is, it is not in the plans for basic funding because, in fact, over the last five to eight years, the National Academy of Sciences has not provided us with any funds for purchasing equipment or capital expenditures in general."
>
> A scientist working in a state institution

> "I would like to continue working at [the academic institution where I currently work]. Under certain conditions. I would like to have basic normal conditions, which do not exist. [...] this is a problem in almost all academic institutions. [...] If it's +32 in the lab in summer, like outside, and +12 in winter, almost like outside, it's a lack of proper conditions."
>
> A scientist working in a state institution

Informants also noted that the conditions attached to grant funding sometimes made it difficult to use these funds for specific studies and did not allow for creating or improving research facilities.

In some cases, scientists' work was dangerous due to the **employer's neglect of safety rules, such as the lack of proper ventilation in the room and the lack of basic protective equipment like masks and gloves.**

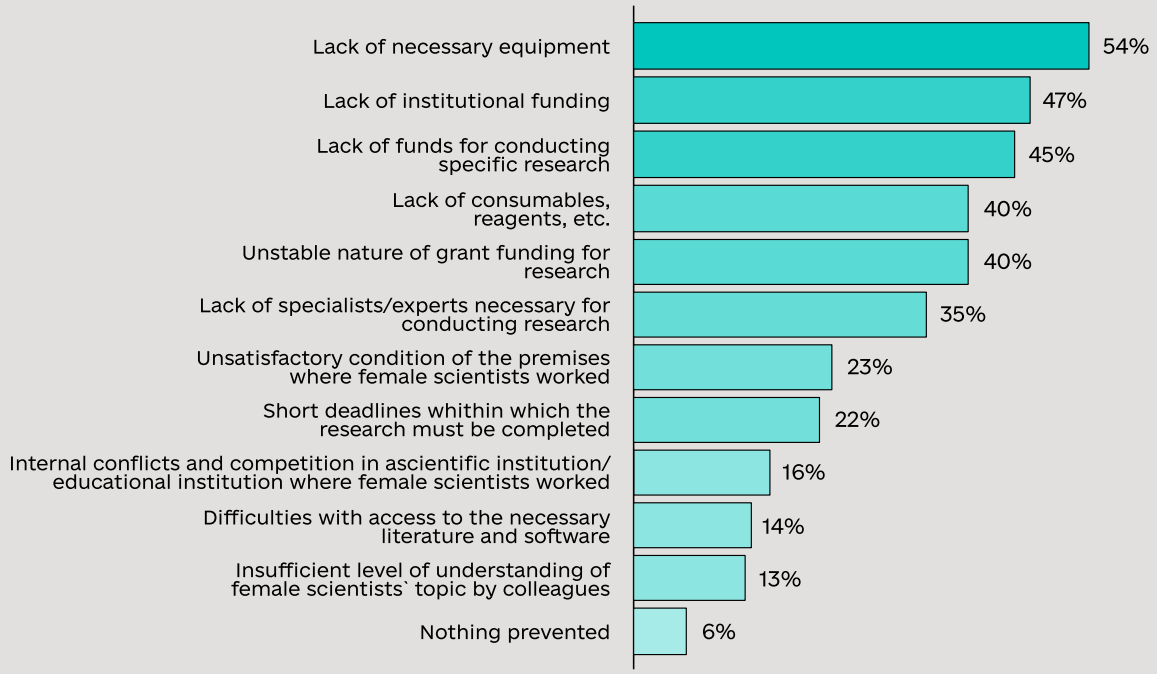
EQUIPMENT AND CONSUMABLES

Most of the informants who worked or had experience working in a state institution spoke about **the lack of equipment and supplies** for research.

According to the survey results, **40% of female scientists** working in Ukrainian institutions indicated that **the institution's poor material and technical base** was one of the biggest challenges (see Graph 3.3.2). Among the obstacles related to material and technical support, the following were most frequently mentioned by researchers working in Ukrainian institutions:

- **Lack of necessary equipment** – mentioned by 54% of respondents.
- **Lack of consumables, reagents, etc.** – mentioned by 40% of scientists.

OBSTACLES THAT PREVENTED CONDUCTING RESEARCH



Graph 3.3.2. Question: "What are the main obstacles that prevent you from doing your work and conducting research?". Respondents could select up to five answers. The number of respondents was 144.

Difficulties accessing necessary literature and software – selected by 14% of researchers (see Graph 3.3.2).

The experiences shared by informants show that the prevalence of difficulties with access to equipment and supplies **varied depending on the funding of the research institution or institute and the organisation of work in general.**

FUNDING OF A RESEARCH INSTITUTION

Institutions or individual laboratories **with a well-established funding mechanism** for acquiring necessary instruments and consumables through grant support or cooperation with businesses **provided scientists with everything they needed to** conduct their research.

> "I had a very vivid experience in 2023. I was invited to a conference at [name of university]. [...] And their laboratory was like a fairy tale. [...] Big companies such as Schlumberger, Shell, Siemens, Ukrgasvydobuvannya [gas producer], and Ukrnafta [oil and natural gas extracting company] had created dedicated rooms with their laboratories. They had the latest equipment and various simulators."
>
> A scientist working in a state institution

If **sufficient funding was not available,** researchers **could not purchase the necessary materials** and conduct research. **45% of female respondents** working in Ukrainian institutions identified a lack of funds for specific research projects as one of the biggest obstacles (see Graph 3.3.2).

> "In fact, we're not at the forefront in terms of laboratory equipment development. It is clear that to have the latest equipment, you need to live somewhere in Sweden. But we are not inferior to those laboratories. We have international partners, we have the same level of salaries [...]."
>
> A scientist working in a state institution

Some informants had to make additional efforts to support their work, for example, by applying for grants themselves to buy the necessary equipment and supplies. However, due to the restrictions and conditions of some grants, they could not always buy the necessary items, even with grant support.

In addition, according to the informants' experience, grant funding was often unstable. **Survey results showed**

> "And now there was also an impetus that we were given [...] an American scholarship. [...] At the same time, they said that we could do whatever we wanted with this money. My colleague and I, a like-minded person in everything, [...] bought some equipment and just started having fun, because we didn't even have that at the university, you know?"
>
> A scientist working in a state institution

that the unstable and volatile nature of research funding – whether from grants or the state – was one of the biggest challenges for **30% of the respondents** working in Ukrainian institutions (see Graph 3.3.2). The section "Working hours, workload and salary" provides more detailed information on other shortcomings and limitations of grant funding.

> "After [Russia's invasion of Ukraine in 2014], it was forbidden to spend money on repairs in institutions. Plus, many grants prohibited us from buying equipment. Even a small centrifuge. [...] it was a stage when there were no reagents at all, roughly speaking."
>
> A scientist working in a state institution

Some researchers used **other methods to obtain the necessary equipment and materials:** they bought them at their own expense, used pirated software, or sought support from other research institutions.

According to some informants, the lack of funding for equipment was, in particular, due to the fact that a significant portion of the available funds was used for other needs of educational institutions or research institutions. In most cases, according to the informants, they did not contribute to actual research activities.

> "But, you know, there were obstacles because we lack equipment. For example, I had a dissertation [name of dissertation]. And to complete it, I had to visit more than one university. There were obstacles due to the material and technical base—a lack of laboratories. You may have an idea but can't always implement it."
>
> A researcher working in a private institution

ORGANISATION OF WORK IN AN INSTITUTION OR INSTITUTE

In some institutions, **equipment and supplies were purchased centrally.** One of the informants said that

their institute had a laboratory for collective use, where necessary equipment was regularly purchased. Researchers who had worked or studied abroad also shared this experience: their laboratories had significantly better logistical support for research during their studies than those in Ukraine. This included the free provision of all necessary consumables and the centralised procurement of materials and equipment.

> "Over the last year, it has been really hard to stay in Ukraine, to stay in my institution and want to work. I really want to leave [...]. Because I understand that I will be doing science there, not scraping together money. All my equipment, [...] these are all from my colleagues and partners. [...] And we have a startup school with T-shirts from people who don't understand what startups are [...]."
>
> A scientist working in a state institution

In other institutions, **procurement was not centralised,** in particular because there was no designated person responsible for this part of the work. In this case, researchers had to purchase equipment and supplies themselves. The informants assessed this situation negatively, as it created an additional workload for them.

> "You communicate fully with everyone, you can ask for permission, you can request any technical equipment you need, and they will provide it. As for consumables, if we take my spectrum, there are different flasks, just like chemists use, for example. So you don't need to cover all this at your own expense in any way. It's all free. It's all covered by the lab's budget."
>
> A scientist working in a state institution

The data obtained during the survey show that researchers were more or less likely to report certain obstacles depending on the type of institution they worked for. These included obstacles related to funding for research, lack of necessary equipment and supplies, and the condition of the premises where researchers worked. Such obstacles were reported **more frequently by respondents working in research or higher education institutions** than by those employed in private enterprises.[16]

THE IMPACT OF THE FULL-SCALE RUSSIAN INVASION

The full-scale Russian invasion significantly affected workplace conditions, especially for scientists whose research required laboratory work. The main challenges included damage to or destruction of scientific or educational institutions' buildings, a deteriorated security situation, power outages, movement restrictions at certain times and in certain areas, and changes in project funding.

> "For example, I needed special aluminium oxide coasters [...]. I couldn't find them, they are not sold in Ukraine [...]. So I just contacted the person who sells the tubes on OLX and asked him to cut the tube in two so that they would be like boats for me. [...] Well, it really annoys me in this regard, that I have to look for materials myself, like a storekeeper."
>
> A PhD student, a researcher working in a state institution

The destruction or damage to buildings further exacerbated the heating situation or, in some cases, made it entirely impossible to work on certain premises. This issue was most acute for universities and research institutions located near the frontline. In some places, laboratories remained in the occupied territories or were under occupation for a period, and as a result, they may have been damaged or destroyed.

> "My work is experimental, and unfortunately, we were unable to carry it out for a long time. [...] But this year, we have already started working in the laboratory again. Still, it's much more difficult. Because in winter, in the cold, you can't work there anymore, because there is no heating. Back in Kharkiv, the Institute was shelled many times. And we have a lot of damage there; it is constantly being repaired [...]. And the installations also require specific operating conditions. If it is very cold and there is a leak somewhere, the wind blows, it can affect the operation of the sedimentation and so on."
>
> A scientist working in a state institution

The security situation and power outages imposed limitations on long-term research and experiments in laboratories, and led to difficulties with the storage of reagents. Informants noted that some experiments were quite lengthy, requiring stable conditions and electricity. Due to the lack of laboratories located in shelters and power outages, it was sometimes difficult for informants to plan an experiment, or they were forced to interrupt the process. In some cases, this resulted in the loss

16 The data obtained allowed us to identify a trend, but the number of groups was insufficient to allow for quantitative analysis and comparison between groups. Therefore, percentage distributions are not presented.

"And the fact that there is a power outage, and you depend on your device working, and if it is switched off mid-process, you just have to start from scratch. And this is not only time but also a lot of money. [...] We have lost a lot of reagents. And reagents are expensive. My colleague lost transformed cells she had been getting there for years, inserting her own constructs."

A scientist working in a state institution

"I went to the laboratory for the last time, turned off the devices and froze what could be frozen at the end of February 2022. [...] But I know that when there were blackouts, it all thawed. And since I work with proteins, it all went bad. My colleagues were directly affected by this."

A scientist working in a state institution

of already collected data and additional costs. Some informants lost some reagents due to power outages.

"Curfew, you are much more restricted in your movements. Not because [...] I'm not allowed to go somewhere. It's really not allowed to go somewhere if there is a training ground or some kind of exercise, but again, you can't move around at night, for example, and at night, it is very convenient for me to catch my targets."

Male Scientist

Restrictions on movement at certain times of the day posed a challenge for researchers whose work involved collecting materials in the field. This included the ability to travel at night or conduct research in areas close to the frontline. Both female and male scientists highlighted this issue.

The increased relevance of topics related to enhancing Ukraine's defence capabilities and the impact of the war has led to changes in funding for other projects. Some researchers observed that research on these topics had more opportunities for grant support. This improved logistical backing for their work.

In some cases, informants mentioned other problems:

"Next year, we will have a review, which means that certain projects are coming to an end, and we have to submit new proposals. Indeed, all new grants, all new competition terms and conditions are either related to defence or to something that should be beneficial for Ukraine during this time of war."

A scientist working in a state institution

Difficulties related to their place of residence and work location: for example, challenges in commuting and planning research or experiments due to transport stoppages in Kyiv during air raids or the need to travel to another location.

Loss of access to international software: one researcher said that the international company supplying their software suspended access for security reasons, citing the ongoing war in Ukraine.

Slowdown in the supply of consumables at the private institution where one researcher worked: this affected the ability to perform her work at the beginning of the full-scale Russian invasion.

For scientists who were able to work remotely, either temporarily or permanently, the changes brought by the full-scale invasion were less impactful.

"I was actually so lucky at the beginning of the full-scale war because I switched to online work within just a month or two. And it saved me. Because I had work to do, and I had time to do it. And I was not tied to a specific place."

A researcher working in a private institution

"I was researching graphene structures, connected nanotubes, which really exist only at low temperatures. But my research aimed precisely to develop the conditions for them to be stable at room temperature. And theoretically, it works for me in that incredible matrix. That is, the work is purely theoretical; there can be no experiment in Ukraine. There is no equipment. No one can do it. They are trying to do it abroad."

A scientist working in a state institution

CONSEQUENCES OF INADEQUATE MATERIAL AND TECHNICAL CONDITIONS

Overall, the lack of proper material and technical support **prevented the informants from fully implementing their research ideas and complicated the research process.** As a result, they were not always able to confirm their theoretical findings through practical work. Some faced such challenges during their studies and postgraduate training.

The inability to fully perform research work **prompted some informants to leave their positions at the state institution.** The alternatives they considered included pursuing research careers abroad or moving to the private sector. The experience of many informants shows that conditions for research work were better in private institutions. Female researchers, in particular, reported a more positive experience when private companies showed interest in their research ideas.

More details about the career trajectories of female scientists and the reasons for leaving the scientific field are described in Section 2.

> "So the company is very close to science, in principle. That's why I feel very comfortable here. And they provide a lot of opportunities. Need to research something? At university, it's difficult because there is no budget. Here, you get help to buy a reagent or set up an experiment."
>
> A researcher working in a private institution

> "The differences were enormous. There were reagents; there was equipment. That is, whatever we needed to use, whatever methods we needed to use, we could. Sometimes, we had to invent a bicycle from the equipment at hand, but still, these were exceptional cases."
>
> A scientist who ended her scientific career

3.4 WORKING HOURS, WORKLOAD AND SALARY

Through in-depth interviews, focus group discussions, and a survey, we explored scientists' satisfaction with their working conditions, including their work schedule, workload, and salary, and what role these factors play in their desire to pursue a career in science. We also asked them how these aspects affect their personal lives.

WORKLOAD OF SCIENTISTS

Most informants **had additional activities** beyond their primary research work, **regardless of whether they worked in private or public institutions.** They combined several jobs and engaged in other activities for various reasons, with three key motivations emerging:

The desire to develop science. Scientists said they disseminated scientific knowledge because they wanted to change the scientific field and address challenges at multiple levels. For example, they promoted STEM among children and joined the work of government agencies in the education sector.

> "In 2022, I also realised my dream and earned a degree in psychology and paediatrics. And I run a club from the Regional Ecology and Nature Centre. I lead the [name of the club], a research club. We implement STEM education there. I work with teenagers, and in general, this is the second part of my work where I see my future; it is civil science."
>
> A scientist working in a state institution

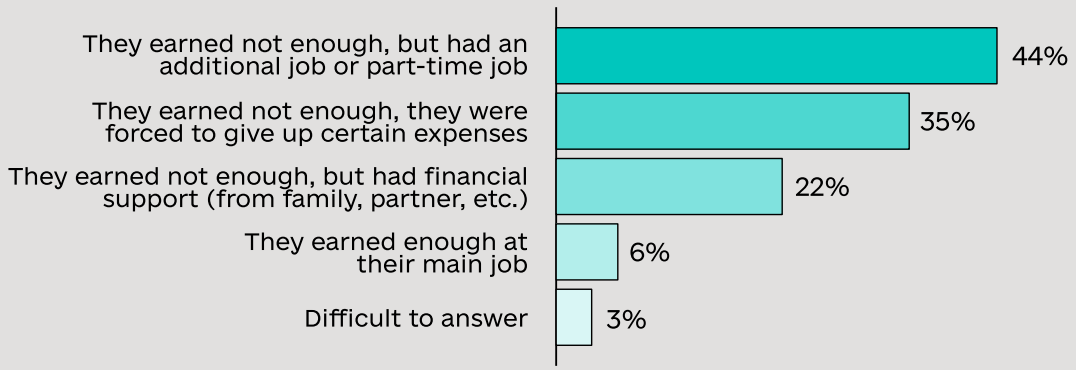
> "I even applied to be an expert [at the Ministry of Education and Science], which is free, unpaid, volunteer work. It's fun, it's cool, you can try yourself in a different role, see things from a different perspective."
>
> A scientist working in a state institution

Sometimes, this motivation was intertwined with personal interests: scientists engaged in activities they enjoyed, which allowed for their professional growth.

The need for additional funding. Some female researchers working in state institutions had to look for additional sources of income due to a lack of funds to ensure decent living conditions. In particular, one of the expenses for which the informants needed additional funds was the payment of rent.

44% of the surveyed female scientists employed in Ukrainian institutions indicated that their primary job did not provide sufficient income, prompting them to take on additional jobs or part-time work.

WHETHER FEMALE SCIENTISTS EARNED ENOUGH TO LIVE COMFORTABLY



Graph 3.4.1 Question: "Do you earn enough to live comfortably as a researcher?". Respondents were allowed to select all answers that applied. The total number of respondents was 144.

"I think, if you look at my friends who stayed in science, [...] they don't have enough of this 'scientific' money that they have at institutes or universities. They have to have some other income that allows them to exist. That's why they all work more than 12 hours a day. Because they have one job for money and another job for science."

A scientist who ended her scientific career

Other informants' jobs included both scientific activities in the business sector, as well as work entirely unrelated to scientific activity. Some informants had 2–3 jobs at the same time. This practice was also common among postgraduate students. More detailed information about salaries and funding issues in the scientific sector is provided in the section on Salaries.

"I had an expert activity for [the organisation implementing the scholarship programme], where they paid me to analyse these student papers. Well, it's not much money, but at the same time, it's a way to contribute to the fact that there might be a little more chemists - why not?"

A scientist working in a state institution

"Colleagues called to say that the girl has gone on maternity leave and asked if I could step in for four months to help out. Because they needed someone experienced. [...] I was given subjects that are closer to me, and I teach more, of course, according to the standard curriculum, but I improve it, for example, [...] what practices to implement, which, in my opinion, will be more useful to students in the present day."

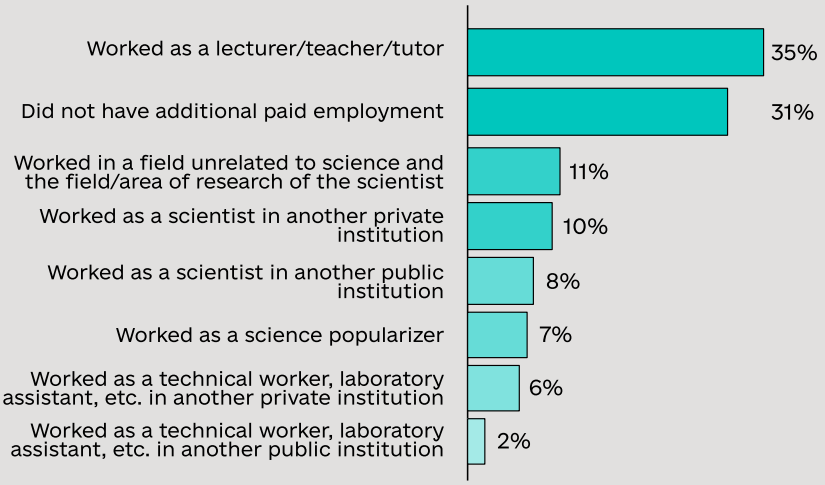
A researcher working in a private institution

Due to contractual requirements. Women academics working at universities were required to teach alongside their academic work due to contractual requirements. Further details about this requirement, other motivations for researchers to take on teaching roles, and the specific workload of female educators are discussed in the section "The workload of scientists teaching at universities".

The results of the survey showed that **69% of respondents** working in Ukrainian institutions had additional paid work beyond their primary research activities.[17]

This share **varied depending on the type of institution:** respondents working in research and educational institutions were more likely to report having additional paid activities than those employed in private institutions.[18]

AVAILABILITY OF PAID WORK BY THE SCIENTISTS IN ADDITION TO SCIENTIFIC ACTIVITIES



Graph 3.4.2. Question: "Do you have a paid job besides your research activities?". Respondents were allowed to select all applicable answers. The number of respondents was 144.

17 This question differs from the previous one presented in Graph 3.4.1, as here respondents indicate that they have additional paid work, regardless of their motivation. Instead, the question in Graph 3.4.1 details the motivation for having an additional job or part-time work, namely the lack of money for a comfortable life.

18 The data obtained allowed us to identify a trend, but the number of groups was insufficient for quantitative analysis and comparison between groups, so we do not provide percentage distributions.

Researchers whose primary employment was in **state institutions** often held **additional positions both within their organisation and externally.** For example, while working in a higher education institution, some informants could teach or work in the admissions office. Informants who worked in the private sector sometimes taught at the HEI as guest lecturers or had part-time jobs. Some worked for **other state research institutions,** for example, on a separate research project.

> "Many people teach at universities [...] Mostly young scientists, they lead seminars, workshops, and work on projects that follow a plan and a programme. And there are conditions".
>
> A scientist working in a state institution

Other additional jobs mentioned by women scientists were **in private companies,** where they performed both scientific work, such as **commercial research,** and teaching, such as **delivering courses for teenagers.** Some of them were involved **as experts** in the work of state institutions (such as the Ministry of Education and Science, the National Research Foundation of Ukraine), non-governmental organisations, including NGOs, and in journal reviewing.

> "I also said [during the first conversation with my future employer] that I needed to stay in touch with science, so I would attend some conferences. Plus, I am engaged in science popularisation. So, let's just say I'm quite public, and I like it. It is important for me to continue this."
>
> A researcher working in a private institution

In some cases, the researchers had part-time jobs in areas unrelated to their academic work, such as translation and SMM. Some informants also worked in the service sector during their postgraduate studies, for example, at the airport in passenger services.

Some informants were engaged in science promotion outside their main job. They worked **as teachers in educational clubs** for children and teenagers, gave public lectures, gave comments and interviews to the media, and gave interviews to the media.

In some cases, female informants noted that, when choosing a company for employment in the private sector, an important factor for them was the opportunity to be active outside their main job and support for additional activities from their employer.

> "The fact that we are currently facing a major staffing crisis is a hindrance, because a lot of people are leaving Ukraine, a lot of talented scientists are leaving. And so, the people who stay are forced to do the work for themselves, and for someone else, and for someone else, and for someone else."
>
> A scientist working in a state institution

> "Many colleagues went to war. In science, some things are tied to this, and some projects are tied to this, such as the opportunity to work with some equipment. Only this person knows how to work with an electronic microscope, and he is off to the front. What does this mean? The electron microscope doesn't work. It means that some part of the research comes to a halt for someone. [...] Of course, this slows down any work."
>
> A researcher working in a private institution

According to the survey, the **most common** job of female respondents working in Ukrainian institutions was **as a lecturer, teacher, or tutor** — indicated by **35% of the surveyed female informants.** This was often their only additional activity. Other activities of female scientists in Ukrainian institutions included the popularisation of science, working as a technician, laboratory assistant, etc. in a public or private institution, working as a researcher in a private or public institution, working in a field unrelated to science or the researcher's area of expertise (see Graph 3.4.1). In some cases, women scientists also reported working in NGOs and as jury members at student competitions.

Additional employment in addition to the main job could be **either paid** — such as teaching, working in private companies, participating in grant projects — **or unpaid,** such as some expert work for governmental and non-governmental organisations. Both informants working in private institutions who did not face financial difficulties, and those in public institutions who reported a lack of funds to meet their needs, were involved in unpaid activities. In this case, the informants were motivated by their personal interest and the opportunity to bring changes in the scientific field.

According to the informants' experience, **the full-scale Russian invasion had varying impacts on researchers' workloads.** For example, in grant-funded projects, changes in workload **depended on the terms of the grant itself and the grantors.**

> “Plus, as a result of this combination of the two jobs, [...] my health problems began to worsen. I have a chronic thyroid condition, and I had to increase my [hormone] dosage dramatically. I even had doctors tell me I should reduce my stress levels because it could lead to infertility.”
>
> A scientist who ended her scientific career

During the early period of the full-scale Russian invasion, some projects were frozen, and **funders either terminated, suspended, or reduced funding,** which affected the researchers’ workloads. Some informants cited the example of funding being withdrawn by the National Research Foundation of Ukraine (NRFU) due to the redirection of funds to military needs. However, some projects retained funding, for example, when it came from a foreign funder and the team had already collected data and completed all experimental work at the time of the invasion. According to some informants, as of 2024 – 2025, grant funding has become more stable or even increased, and workloads have returned to pre-invasion levels.

Some scientists in both the business and public sectors have experienced **an increased workload due to a lack of staff caused by** team members either going abroad or joining the Defence Forces. In such situations, those who remained had to take on the additional tasks of colleagues who had left or suspended their work. These changes were especially noticeable when colleagues with unique expertise left the team. According to the survey results, **35% of researchers** working in Ukrainian institutions indicated that **the lack of specialists required for research** was one of the biggest obstacles preventing them from carrying out their work (see Graph 3.3.2).

According to the survey results, **excessive workload was one of the biggest challenges for 25% of female respondents** working in institutions in Ukraine (see Graph 3.3.1). Combining the main research work with other activities and the need to take on part-time jobs and, as a result, a heavy workload **affected the personal lives of some informants.** Some scientists said they **did not always have time to relax and spend with family and friends.** Among the survey participants, 23% of female respondents working in Ukrainian institutions indicated that lack of time for family and friends due to work was one of the biggest challenges they faced (see Graph 3.3.1).

In some cases, the lack of free time to take care of themselves and rest led to a deterioration in their health.

At the same time, some scientists considered it normal to combine several jobs or activities and work overtime.

> “I reduced the number of jobs to three when I had [daughter’s name]. I reduced them to two when [daughter’s name] turned one. Only because I wanted to spend more time with my child, [...]. My initial desire was to start working at least 8 hours, not 14–20 hours a day, as it sometimes happened.”
>
> A researcher working in a private institution

They perceived fatigue and overwork as an integral part of the job.

THE WORKLOAD OF SCIENTISTS TEACHING AT UNIVERSITIES

Many informants taught at a university or research institute besides their main job in a private company or government agency. Teaching was mandatory for those engaged in research activities at educational institutions. When choosing a job, they took this aspect into account – if they did not want to teach, they chose not to work at a university. Some researchers who did not work in educational institutions expressed a desire to teach or received an invitation from a university.

The scientists gave **different reasons for taking on teaching roles:**

- **Financial stability.** Informants working in state institutions noted that a stable salary was important to them. Teaching provided this stability, even though the pay was low. While they might have had grant support, they also chose teaching as a form of financial security in case of unforeseen circumstances.
- **Interest in teaching.** Some academics said they were interested in trying to teach, wanted to share interesting information, and saw it as an opportunity for personal development. They enjoyed interacting with students.

> “I defended my thesis and received my PhD. But I still stayed at [name of university] because all girls understand that there are always students and there is always a job. But in science, it is difficult, and I had a grant at [name of research institution], and then I didn’t have a grant, and then I had money, and then I didn’t. But I could always teach.”
>
> A scientist working in a state institution

"Because if there is something new, some research and new projects, it is, on the contrary, stimulating, a kind of development. [...] And if you share this with children, students, then in general you... when they see you talking and their eyes light up. And they realise, 'Wow, I need to study — this is a great speciality, I have a future here.'"

A scientist working in a state institution

- **The desire to develop the field of science education and improve the quality of teaching.** Some scientists wanted to introduce positive changes in teaching and contribute to the formation of new generations of scientists. In some cases, this motivation influenced the choice of an educational institution to teach at: the openness of the institution's management to change was important to the scientists.

"That's why my motivation for this [teaching] is not the salary. Not even an associate professorship, even though I would like to get one. It's more about the opportunity to train an adequate replacement for myself."

A researcher working in a private institution

Despite the motivation and desire to teach, and the satisfaction gained from this activity, academics often experienced a heavy teaching load. Because of this and the low pay for such work, some chose to stop teaching altogether. In some cases, female informants who did not teach also said they had given up the idea for these reasons.

The reasons for the high teaching workload included the following aspects:

- A large number of teaching hours.

"For example, I recently received an offer to teach at a university. I refused it. I understand that they are looking for young, ambitious and responsible teachers, and they want to create an entire course, to update it. But it's a lot of work. I can't afford to spend that much time [...]. It's interesting, yes, very interesting, but I have to weigh up what I will spend my working time on, first of all."

A scientist working in a state institution

"As for teaching, it's more of a hobby. It is more about my development."

A scientist working in a state institution

- High expectations placed on lecturers, including the number of their publications.
- The need to engage in various activities to improve their teacher ratings.[19]
- Constant updates to work requirements and additional activities.
- The need to invest more resources and time in developing assignments and tests due to the possibility of students using artificial intelligence.
- The need for ongoing communication with students.

Due to the COVID-19 pandemic and the onset of the full-scale Russian invasion, some academics engaged in teaching **faced an additional workload** because they needed to work remotely.

In particular, the **departure of some students abroad** was a problem, affecting the need for some to study remotely

"Today, the rector, the acting rector, turned 35, right? She seems to be young, as young as possible. And she's trying to change everything there, to set up some laboratories for students and postgraduates. Again, they want to be a cool technical university [...]. So I agreed to teach one course for now, and we'll see."

A researcher working in a private institution

"But when you work at a university, you have an individual plan, and you are fitted with time norms like a horse, I'm sorry, they fit you in. You have to teach for hours, and then you have to publish in Scopus and publish in professional journals. And it should be more than one publication in a professional journal."

A scientist working in a state institution

19 The official definition of a teacher's rating can be found in the regulations of higher education institutions. Typically, a rating is a systematic assessment of a teacher's professional performance over a set period based on certain criteria. These criteria may include teaching, research, organisational and educational work, and professional development. Specific criteria and evaluation methods may vary between institutions.

"It's not that you are a teacher or a researcher. You have to be both a teacher and a scientist. You have to play the flute and the guitar, you know. And if you're a good teacher, you don't have time. [...] I mean, when do you find time to do your main job? When to work with students? I mean, it's endless tasks, reports, reports, reports. Report after report, and that's it. That's what I don't like."

A scientist working in a state institution

"For many years now, there has been a teacher rating system. In addition to classes, you must publish scientific papers and research with students. [...] These ratings include everything from playing sports to participating in some cultural events. You have to get these points so that you have a rating and are not fired for having a low rating and for dragging the department down."

A researcher working in a private institution

"Students are mostly either abroad or just online. And it's still not the same. It's still not the same. It really interferes with the learning process."

Male Scientist

and reducing the overall number of female students. This caused additional difficulties in teaching and assessment.

In the case of one of the academics, due to the HEI's inability to enrol enough students, the lecturers have to develop and teach numerous courses to fulfil their work-load. Whereas, with full enrolment, they could teach one course to a large group of students.

"In particular, there are different communications with students, additional problems that need to be solved, including students themselves and their relatives who find themselves in war-related situations. Parents serve or are wounded and require support. In working with students, I feel even more aware of my role and the need for such communications, support and search, and solving problems that would never have arisen otherwise."

A scientist working in a state institution

"I had bosses with favourite phrases like 'beat the dog before the lion'. So a lot of work, no days off, work on weekends, work at night. A lot of work at night - this is the motto of the laboratory where I worked for 14 years."

A researcher working in a private institution

The informants also noted that the forced displacement of students within Ukraine and abroad as a result of the full-scale Russian invasion has led to **an uneven distribution of students across educational institutions in different regions of the country.** According to their observations, there are significantly more students in safer regions compared to less secure ones located closer to the active hostilities areas.

"Our work is tied to the duration of the experiment. This can be two hours, eight hours, 24 hours, or two weeks. And we adjust our lives to the needs of our experiments, so to speak."

A researcher working in a private institution

"The downside of academic work is very big because you have a flexible schedule, but not in the sense that it is convenient for you. It means sometimes you have periods when you do almost nothing, and don't know what to do because there's no work. And other times you're like, 'We're working 24/7, here's the power box.' Because there's a conference, an experiment, a deadline, whatever."

A researcher working in a private institution

One academic staff member shared that she began **to feel the need to communicate more often with students and provide them with more emotional support,** especially if students or their families were affected by the war.

WORK SCHEDULE

The informants' schedules were often **irregular.** They could work more than 8 hours a day and outside of working hours, including at home and on weekends. This was influenced by **informal work rules in their institutions** and the **nature of research** in certain fields. For example, according to the informants, overtime was a common unofficial norm in some institutions. The workload's variation depending on the specifics of scientific activity was due to the research cycle and the conduct of particular experiments. The implementation of certain studies and experiments involved an uneven workload, with some periods demanding significantly more effort than others.

> "And in fact, science is very interesting and [...] there is a peculiarity that the work does not stay at the workplace. You always end up taking it home with you. Sometimes you can, and sometimes you need to work at night. But it depends on self-organisation and priorities. If, for example, I am very interested in something, it will not be difficult for me to do it."
>
> A scientist working in a state institution

In addition, researchers were limited by time and had to meet grant requirements or follow the institution's work plan. Among the female respondents working in Ukrainian research institutions, **22%** indicated that the **tight deadlines for research** (e.g. due to the institution's work plan or grant conditions) **were one of the biggest obstacles in their work** (see Graph 3.3.2).

> "For example, I try not to work on Saturdays or Sundays because I have other things to do, and honestly, I avoid it because I've noticed my productivity drops afterwards. [...] that's why I honestly don't work on Saturdays and Sundays unless I have to."
>
> A scientist working in a state institution

Some scientists **did not view the unstable schedule as problematic.** They described it as flexible, allowing them to plan their time independently and decide when to complete certain tasks. Often, flexible working hours included the possibility of working remotely.

> "[In academia] you get used to overtime, to burnout. You get used to the fact that we are working today and until the end. But when you move into business, you are not asked to do that much."
>
> A researcher working in a private institution

For some informants, flexibility in working hours was **an important factor in choosing a research career in a public institution** over an office job with fixed hours.

> "At first, when I was working at my new job [in business], I was confused on weekends because I didn't understand what it was like to have a weekend when you don't have to do anything. I guess at first, I was shocked by it. But then I realised that I could fill it with something else. [...] I like it, I was able to devote more time to myself and my health."
>
> A scientist who ended her scientific career

Flexibility of schedule was also important for female researchers who were mothers or planning to have a child, as well as for those caring for elderly relatives.

Some researchers said they were willing to work longer hours or outside regular working hours if the topic was interesting and important to them.

Some informants **assessed the irregular schedule negatively.** Due to such a schedule, they were overworked and lacked free time either consistently or during certain periods, which **could lead to fatigue and burnout.** According to the survey results, **irregular working hours** were one of the biggest challenges in the workplace for **14% of female respondents** who worked in Ukrainian institutions (see Graph 3.3.1).

> "But I enjoyed working at [the company where the scientist worked] more than at the Academy, for example. Because there is the completion of projects. I mean, I've done it, I've finished it, and I have this, 'Oh, I've finished it, I've handed it in'. Research work in institutes almost never ends. It's very time-consuming, and there is no 'well, we've done it, we're good.'"
>
> A scientist who ended her scientific career

"Well, it's such an iconic company. And besides, there were heavy workloads. That is, I could often work for 30 days in a row without days off. I would start at 7 am and finish very late. For example, it could be until 11 pm, just to make it home on time, and so on. That is, a very heavy workload on top of everything else. So I decided that I wanted to try something else."

A scientist who ended her scientific career

Some scientists **tried to cope with this on their own:** if their institution or team did not have stable working hours, they tried to introduce rules and working hours for themselves, taking into account their own needs. For example, they created a work schedule, introduced a rule not to work on weekends, unless there was a really urgent need.

"I have a certain amount of time to experiment, a certain amount of time to describe the results. When it's limited — when the lights are turned off — we work on Saturday while there is light, and let's turn on something for the night. Maybe I'll stay there until 8 or 10 in the evening, and you come in the morning at 6."

A researcher working in a private institution

For some scientists, the unstable work schedule in a public institution **was one of the reasons for transitioning to the private sector,** where they perceived the work schedule to be more regular. Women scientists with experience in business said that a more stable schedule helped them avoid overwork and gave them more free time. Also, a sense of boundaries and clear deadlines helped them to complete their work on time and feel a sense of accomplishment.

However, some informants also reported experiencing overwork in the business sector. Despite having a more structured and stable work schedule, the intensity of the workload could still be overwhelming. This may have led to their decision to leave their science careers.

The full-scale Russian invasion complicated the situation with work schedules for some informants. For example, during the blackouts caused by Russia's attacks on Ukrainian energy infrastructure, the informants were restricted from conducting experiments and generally being at their workplaces. Work had to be planned around the availability of electricity. In addition, they were not always able to continue working during air raids for security reasons. In some cases, even commuting between home and the workplace became challenging.

"For example, I have the opportunity to work at the institute on weekends, or rather a need, because the experiment is in progress. I have to go and write a note asking to be allowed to go to the institute on weekends. To make sure that this mister, the watchman, doesn't bother you. [...] You have to bring that paper to the director. The director would sign it or not, depending on his mood. And you're sitting there thinking, 'What the heck?'"

A researcher working in a private institution

As a result, some informants had to work outside working hours and on weekends more often.

At the same time, some scientific institutions had limited access to their premises, and employees had to go through additional bureaucratic procedures to use them outside working hours. For example, one informant said she had to obtain a separate signed document to work on a day off. This also made it difficult to plan the research.

In addition, the scientists were not always able to carry out the planned work due to their challenging emotional state.

"Very strong moral... I'm already very exhausted. And it is very difficult to get up in the morning and force myself to do something. And since there is no normalised schedule in scientific activity, except for classes, it is a little easier. Because you know, yes, you have to pull yourself together. I don't know; the last year has been very difficult for me personally in terms of psychological well-being."

A scientist working in a state institution

SALARY

Salary was an important factor for the informants that influenced their **job satisfaction, motivation to continue developing their careers** in general, and their decisions to remain in or leave a particular workplace or field. In particular, they considered this factor when deciding on employment after completing their postgraduate studies.

According to the survey, **insufficient pay was one of the most common challenges** for female scientists: **78% of respondents working in Ukrainian institutions** indicated this (see Graph 3.4.1). Only 6% of female respondents in Ukrainian institutions believed they earned enough at their primary job. The salary level **depended on whether the researcher worked in a public or private institution.** Informants employed by private

"After the PhD, since young people need a little more money, living in a dormitory is fine, but I want my place. So, I partially retired from science; I stayed on 0.25 of a full-time job. But at that time, I went to work for [company name]. I also got a job as a biotechnology analyst, which is my speciality. And I supported research topics on a half-time basis until they ended."

A researcher working in a private institution

companies were satisfied with the level of their salary. This factor was one of the most important motivations for starting work in a private institution or moving there from the public sector. The data obtained during the survey also revealed the following trend: female respondents working in private enterprises were more likely to state that they earned enough in their main job. On the other hand, there were fewer of them among those employed in research and higher education institutions.[20]

"There are very few good specialists left. Those who are willing to work for a salary. For example, teaching children takes a lot of time. You have to be inspired. For what? For 8 000 hryvnias a month? No. Not at all. It's the same with science. When there are projects with salaries and reagents and everything else covered, it's one thing. And it is very significant."

A researcher working in a private institution

Some informants who had work experience or worked in state institutions **were dissatisfied with their salaries.** In their opinion, their pay was insufficient and unfair. Sometimes, it was not enough to ensure a decent standard of living; for example, they could not afford housing. This issue was also raised by female postgraduate students, particularly those in an intermediate period – no longer receiving a scholarship but not yet defending their dissertation. In addition, institutions were not always able to provide funding for comprehensive research activities, such as publications in top-rated scientific journals and travel to conferences. In some cases, women researchers also spoke about the difficulty of increasing salaries for young women researchers who have just started working. According to the informants, this is due to the dependence of wages on the length of service in a public institution.

"The salary hasn't changed much since 2021, but the value of money has changed. It has fallen by at least half. That's why many people face the fact that they simply can't make their ends meet."

A scientist working in a state institution

Some female informants believed that **research in public institutions involves self-sacrifice.** They emphasised the instability of funding and the inability to earn a sufficient income by working in the public sector alone. Instead, some of them believed that better financial support should be sought in private companies. As mentioned in previous parts of the report, some informants were forced to take on additional employment due to low salaries at their main job in a state institution. This also applied to postgraduate students. The combination of research and additional work increased their workload. Male scientists who took part in our study also referred to this issue.

"It is no secret that it is very difficult to survive on the salary paid by the state, especially if you come from another city and rent a place. So it just wouldn't be enough if I were alone, getting only a net salary without grants, I wouldn't be able to live on that. I would have to leave. Simply because I have no place to live, and living in a dormitory all the time, well, that's also a problem."

A scientist working in a state institution

Some informants working in public institutions **were satisfied with their salaries** because their institution, laboratory or project received grant support or worked on a contract basis with other organisations and businesses. This allowed them to conduct research, attend conferences, and be involved in international science.

"Of course, I take on various part-time jobs, and I help my husband with his work so that he can support me financially a little. It's just a given. Because you can't get far on a teacher's salary. Yes. I am constantly looking for something, taking some courses like SMM."

A scientist working in a state institution

20 The data obtained allowed us to identify a trend, but the number of groups was insufficient for quantitative analysis and comparison between groups, so we do not provide percentage distributions.

"I finished my PhD in 2018. Shortly afterwards, a few months later, we received a large grant, and we conducted research. I mean, I was fine. I did my job; I did what was required of me and a little bit more. I was earning a good salary at that point in time."

A scientist working in a state institution

"Right now, well, I feel, on the contrary, that my work is being paid for, because we've secured certain grants, we are implementing them, and so there is funding, there is a salary, and I think that, well, the salary is decent."

A scientist working in a state institution

"And when we received this grant, it was very cool. Firstly, we could do something, buy reagents without using our own money. We could go to conferences without covering the costs ourselves."

A scientist who ended her scientific career

The informants described various procedures for securing grant funding. In some cases, they prepared and submitted applications independently, while in others, this was done by the institutions employing them.

Despite the benefits of grant funding, scientists have encountered certain challenges and limitations of this type of funding:

- **The need for grant application and reporting skills.** Writing an application requires additional knowledge and skills that researchers often had to acquire during the application process, particularly with help from experienced colleagues, if available. Some informants spoke about the complexity of the reporting process.
- **The need for dedicated staff to deal with grant applications.** Writing an application and reporting on the project often took a lot of time. The informants' experience was positive when these tasks were handled by a designated person responsible for them.
- **Bureaucratic restrictions.** The informants spoke about difficulties with the actual process of obtaining grant funds, especially when receiving a grant from state funds, and with the payment of grant funds to university staff. In some projects, due to the terms of the grant, funds could be received only at the end of the study or after its completion, which also created inconvenience.
- **Instability of grant funding.** To receive grant support, researchers had to look for such opportunities continuously. In addition, the continuation of grants that had already been awarded often depended on certain conditions that were not always realistic to fulfil. As a result, some scientists did not have a sense of personal and scientific stability. The survey results showed that **40% of female respondents** working in Ukrainian institutions indicated that the **unstable nature of grant funding was one of the biggest obstacles** hindering their ability to do their jobs (see Graph 3.3.2).
- **Restrictions on the ability to receive grant support depending on the characteristics of the project and the grantee.** According to the researchers' experience, projects focused on certain topics, including applied research, tended to have greater access to funding. Some grants were available only to young scientists.
- **High requirements for grantees.** Some researchers faced too high requirements that made it difficult or impossible for them to apply for a grant, such as a high citation index, vigorous scientific activity, recommendations from colleagues, a certain number of publications, and already developed project results.
- **Restrictions on the use of grants.** Grantors imposed certain restrictions on the use of funds, so researchers could not always purchase everything they needed for their research. In addition, the funds were sometimes insufficient to cover all expenses.

Women scientists also mentioned **other sources of financial support, particularly those provided by the state for young scientists.**[21] For example, among the informants, some received a Presidential Scholarship or awards from local authorities, namely the mayor's award. One of the informants spoke about the possibility of receiving a scholarship from the university where she worked.

However, these sources also had **several limitations:**

- **Suspension of payments** if a woman went on maternity leave – in such cases, payments were halted.

21 More information about additional sources of state financial support for scientists is provided in Section 1.

"And again, I had, let's say, minimal support from my parents in the sense that I could continue living at home, and they continued to provide food. This made it possible for me to attend university and try to pursue an academic career there."

A researcher working in a private institution

- **Additional burden** due to scholarship requirements (e.g., in the case of the Presidential Scholarship).
- **Non-transparent selection criteria** – the possibility of third-party influence on the outcome.
- **Limited availability** of scholarships from HEIs and local governments – this option is not available in all cities or HEIs.

"And I realise that it was only thanks to my husband, who essentially supported my education and enabled me to continue, that I could finish. Because it would have been complicated if I had been alone then. Financially, I could have quit when I failed to defend my thesis during my postgraduate studies because my salary was low at that time."

A scientist working in a state institution

"Well, basically, I say that since we do not have a grant system, we have microscopic salaries. And it turns out that science is either for women whose husbands earn enough so they don't have to worry about how the children will be fed, so to speak. Or now it is for guys who avoid mobilisation."

A scientist working in a state institution

Some informants shared that they were able to continue their scientific work **only thanks to financial and housing support from their families.** According to the survey, **22% of female scientists** working in Ukrainian institutions indicated that they **did not earn enough to live comfortably but had financial support from family, partner,** etc.

In some cases, women scientists expressed the opinion that the opportunity to engage in scientific work is a privilege available only to women who have financial support from someone close to them. At the same time, some informants believed that men were more likely than women to leave science due to low salaries.

"At our university, yes, we often hear that when you bring a project for submission, I'm sad, but I often hear this: 'What, is this your project? But you're a woman. How can you do it?'"

A scientist working in a state institution

"There was a social event for women, non-binary people, and others, I think, just underrepresented minorities. And the organisers' message was clear: you are here just because you are an underrepresented minority. And it was very offensive. Because you come there as a professional woman, and you leave feeling like a discriminated minority."

A researcher working in a private institution

Some academics **have faced gender discrimination regarding remuneration when applying for grant projects and participating in certain research programmes.** In particular, this included cases when men were paid for participating in lectures while women were not. One informant encountered difficulties when applying for a grant: the academic council made sexist comments and questioned her ability to complete the planned project.

"At the start of the full-scale invasion, all projects funded by the National Research Foundation were frozen. All the money was redirected to the war effort to support the Armed Forces of Ukraine."

A scientist working in a state institution

Another informant described feeling uncomfortable when participating in an international scholarship programme and attending a conference for women in science. She experienced negative attitudes from the conference participants and felt that her value as a scientist was perceived solely through the prism of her gender.

The start of the full-scale Russian invasion **had a different impact on the financial situation of the informants.** For scientists receiving grant funding, some projects

"[After the start of the full-scale invasion], I had an internship. And unlike the others I crossed the border with, I had specific plans. That is, I was going to a place where I would have a job, housing, and a salary. In fact, that was the main reason I left."

A scientist working in a state institution

were frozen, and funding was reduced, suspended, or terminated, which negatively affected their salaries. This prompted some informants to change their professional plans, with some choosing to move abroad to provide financial support for their families.

"Now, all of us — absolutely all postgraduate students, and many teachers — are actively travelling. Because when the war started, people started paying attention to Ukraine, and we intensified our cooperation with several foreign universities. [...] We even had people going for internships lasting a few months, and the conditions were excellent."

Male Scientist

Funding for other projects continued, which allowed salaries to be maintained. In particular, the likelihood of a project continuing depended on its subject, and the grant provider — grants funded by the state were often reduced due to the redirection of resources to military needs. According to some informants, military-related research had a higher chance of retaining funding. In some cases, continued support for the project was provided because the research team had already completed a significant part of the work and had collected data.

"But full-scale invasion not only forced me to stay at home, it took away my salary for the first months, and it's good that there was a company, and it was able to survive. There are still people here."

A researcher working in a private institution

Some informants observed that some time after the start of the full-scale Russian invasion, interest in Ukraine increased, leading to more opportunities for cooperation abroad, and scientists were more often invited to do internships abroad. This created more opportunities for scientists to earn higher salaries.

Some academics working in the private sector spoke about **the tangible impact of the invasion on their business,** which resulted in the inability to receive salaries. In one instance, foreign clients were unwilling to invest in a company in Ukraine because of the hostilities. This negatively affected the informants' wages for a certain period. However, in that case, the business managed to relocate part of its operations abroad and retain funding.

"When the full-scale invasion started, and you realise that you have absolutely nothing, and if someone hadn't helped you, it's not clear what you would have done. Because you have nothing, and that's it. Absolutely nothing. Even though you've been working all your life, and you wonder what for?"

A scientist who ended her scientific career

Insufficient salaries, financial difficulties, and a lack of funds to meet their needs were the main reasons **why scientists had doubts about choosing a scientific career,** particularly after postgraduate studies. Some eventually left public institutions and joined private companies. In some cases, research income in the private sector was also low, or, to earn a higher salary, researchers had to take on a heavy additional workload. Among the informants who left research altogether, the financial aspect was often the reason. The full-scale invasion **has further exacerbated the problems and financial insecurity of female scientists** working in state institutions. One of them shared that she rethought her values and priorities, as she saw that she was not receiving the desired reward and fulfilment from her scientific work.

COMBINING THE ROLES OF MOTHER AND SCIENTIST

When discussing the specific challenges faced by women in science, almost all the informants mentioned the issue of combining motherhood and a scientific career. They considered **planning the birth of a child as something that had to be integrated into the broader planning of their scientific development.** According to the informants, compared to male scientists, women need to make more efforts and consider more factors.

Time to obtain a degree and the status of a young scientist. When planning to have a child, scientists are guided by their age, as the status of a young scientist in Ukraine is limited to 35 years. If a woman decides to give birth and takes maternity leave during this period, she may

"Well, if you have a child and go on maternity leave, how long do you have? About two years. And to get back on track, you need to publish. It's either not going on maternity leave, which is also very difficult. And at 35, that's it, you're not a young scientist anymore. Therefore, it seems to me that this is just not fair for a woman. Even compared to men. Because rarely any of them go to look after a child."

A scientist working in a state institution

"Science changes quite rapidly, and I even thought that if I went on maternity leave for 3 years, it might be a bit difficult to get back into things – to understand the current state of affairs, what's new in science – if I spent those three years, for example, entirely focused on my child, with no time for my personal development. You could fall behind a little."

Student of the master's programme

"You can take a sabbatical, [...] and keep your state-funded place, but what you have been working on for two or three years, or even a year, will be lost. Because by the time you return from your sabbatical, all that research might be irrelevant."

Student of the PhD programme

be unable to take full advantage of the years available under this status.

The possibility of returning to their research career after a break and the future relevance of their research topic. In addition, according to some informants, returning to research after maternity leave can be challenging, particularly because the topics they had previously worked on may become irrelevant or lose their novelty, which creates additional barriers to continuing work. The informants also spoke about the possible loss of a state-funded PhD place, which would further complicate their return to academia.

"I have certain health problems. I understand that it will not be easy [to get pregnant], and I most likely will not be able to study at the same time."

Student of the PhD programme

"The institute promotes... the institute I worked at promoted the idea that if a woman gets married, she'll get pregnant straight away. If she gets pregnant, she will go on maternity leave. That's seen as the loss of a staff member—so they try to get as much out of her as possible before that happens."

A researcher working in a private institution

"I used to come home tired and think: 'Oh my God, what if I also had a child?' And there you go. And the same way... I mean, science requires quite a lot of involvement, actually."

Student of the master's programme

Their health status and the potential impact of research work on pregnancy. When planning to have a child, researchers must consider that pregnancy may limit their ability to continue working – particularly if their research involves certain chemicals or if they have existing health conditions that require closer attention during pregnancy. In addition, not everyone is able to combine caregiving responsibilities with active research after the birth of a child.

In addition, female researchers may encounter difficulties if their supervisors or colleagues suspect they are planning to become pregnant or are aware of such plans: they may feel pressured to complete their research before the start of maternity leave, or have a heavier workload if their supervisors seek to make the most of their contributions before the break.

"And most of the time, well, a woman who is very involved in science – at least for a certain period – chooses to either stay single or not start a family. Because the project becomes like your other child. You devote all your time to it."

Student of the master's programme

At the same time, some informants faced **a choice: either to have a child or to pursue science.** They did not see the possibility of combining these roles due to lack of time and insufficient income to support a child. For example, female students who participated in focus group discussions expressed concern about the impossibility or difficulty of **combining motherhood and work,** particularly because science requires constant physical and emotional involvement to keep up with developments and engage in continuous study. At the same time, caring for and raising a child also requires a lot of time and emotional resources.

"Before the war, I had no such problems at all because my husband was very supportive. I went to Antarctica and left my child with my husband for three months, and he calmly managed everything — the kindergarten, meals, and everything else. He was very supportive in this."

A scientist working in a state institution

"Today, I have three sons, three kids. And I continue to work, to fulfil the grant obligations. And I think that now the effectiveness of my scientific work is at the peak of my career. And perhaps it's because, as a mother of three, I've become a skilled time and task manager, able to switch between responsibilities."

A scientist working in a state institution

Some scientists shared that they **successfully combined motherhood and science,** in particular, thanks to the support of their families and self-organisation.

The informants who described their own **difficulties in balancing the roles of scientist and mother had to make considerable efforts** to continue their research.

"At first, when I was working, I gave everything I earned from my part-time job to my nanny. And for me, it was a moment when I realised that I was giving my entire salary to another person. But she helps me there with the child when I need it. I have the opportunity to switch and do what I'm interested in. It gives me strength; it gives me a resource."

A researcher working in a private institution

For example, they sacrificed sleep and personal time and spent a lot of money on childcare to be able to work.

Some informants had to combine work and caring for a small child. For example, one informant shared that she returned from maternity leave earlier than planned due to the heavy workload in her team.

"I went on maternity leave for a while, for eight months. Then I got a call from work asking me to return because everything was falling apart. [...] I live right next to the university, and I just remember the chaos – how I was running home three times a day to feed the baby and then rushing back to work."

A scientist working in a state institution

According to the informants' experiences, mother scientists **were not always able to engage in their work at the same level as they had before having children.** This affected their ability to take on additional work and spend more time at work, as they had childcare duties.

"In many cases, for example, you can't work longer hours because you have to pick up your child from school, you have to do something at home, etc. So you could probably take on a 1.5 position or do extra hours – but it often just doesn't work out."

Male Scientist

In addition, some informants with children had **limited opportunities to attend conferences, training events or internships.** These events often took place abroad, lasted a considerable amount of time, and required the active involvement of the researcher. At the same time, not all of them provided for the possibility of taking children with them and ensuring their comfortable stay and leisure. In some cases, certain conditions were created, such as providing babysitters, paying for accommodation and transportation for the child. In other instances, researchers had to find alternative solutions, such as asking their colleagues for support.

"Children come after school, even to the institute. [...] they will spend an hour with their mum in the lab, sit and draw, or do their homework, and their mum goes home with them."

A scientist working in a state institution

"I'm in Japan with a colleague, and we came with her child. Her husband has been in the army for three years. She's trying to defend her doctorate and do a lot of work. She has grandmothers who help her, but they can't keep up with the pace either. So we brought the kid with us to Japan. Because there was nowhere to leave him. And we all take turns taking care of him."

A researcher working in a private institution

The situation of scientists who were mothers was shaped by both **internal factors** related to their specific workplace and broader **social norms, as well as the overall financial support available within the scientific sphere.**

An important internal factor that scientists mentioned in this context was **the attitude and support of the team.**

"It is difficult to combine [a scientific career and a family], especially for those with young children — or several children [...] I hear this from my colleagues all the time, especially now. Because some of my colleagues have husbands at war, so they simply have no one to leave their children with. And this directly hinders them a lot. Because they can't do anything there, they can't do the same internships. It tends to be only those who are alone, whose children are already grown, or who have reliable support, who are able to go."

Male Scientist

Since teamwork is a fundamental aspect of scientific work, having support in the workplace was crucial for them.

Some of them did not always feel understood by the team and felt the need to create better working conditions and a schedule that would be more convenient and help them fulfil their roles as mothers and scientists with less difficulty.

"I liked this job because I had such an almost free schedule. You can work at night, in the evening, during the day, whenever you want, as long as you deliver results. It's not an office job from 8 to 5, where you must stick to hours. [...] And really, now that I'm a mother myself, I can combine my child's online learning with my work [...]."

A scientist working in a state institution

"Well, I think this is probably where problems can arise the most if a woman has a family, which needs some attention. And here, again, you need help and an adequate attitude from the team."

A scientist working in a state institution

Some mother scientists had experiences of **understanding and support from their institution or company,** such as flexible working hours, the ability to take sick leave or a day off when needed, or to finish the workday sooner.

"Children's rooms are a big plus when you can come to the university and leave your 3-year-old child to be looked after for a while. There are some changing tables. I remember very well how we went to university with our baby, and there were none, nowhere in any of the buildings. Even though we have part-time students there."

A researcher working in a private institution

"I'm lucky, my husband is very involved in everything to do with our child. I mean, we share everything about our life and childcare equally, but not everyone has this situation. I understand that this is not the case for everyone, and of course, this leads to women losing opportunities."

A researcher working in a private institution

In addition, some researchers emphasised the importance of creating **childcare facilities at their institutions,** such as changing tables and dedicated spaces where children could stay. In some cases, researchers referred to examples of such support abroad, like the establishment of kindergartens within universities.[22]

External factors affecting the situation of female scientists with children **included society's general attitudes towards women's roles in caregiving and domestic work,** often viewed as exclusively or predominantly female responsibilities. Some informants

22 Such initiatives in Ukraine are described in Section 1.

“When you come, they understand that a small child, well... yes, you have to go to work. But they understand the situation. If she is sick, you take a sick leave. Or you work from home. I mean, there is no problem with that, that you just go and that’s it. No, they understand; they are people, too. So they hire that specialist, and the attitude is loyal.”

A researcher working in a private institution

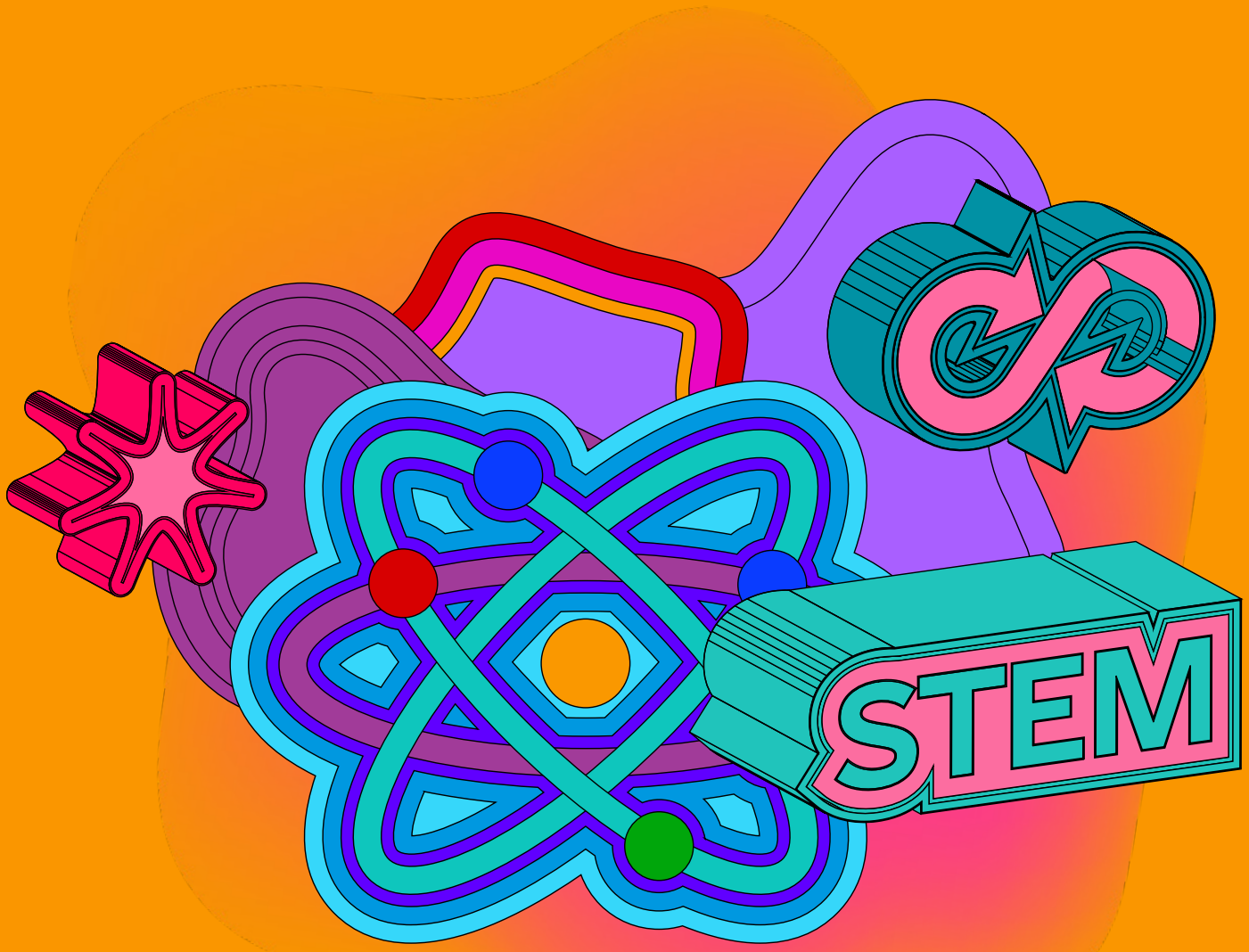
“Allow remote work if the job permits it. But all this still requires some kind of, well, adequate remuneration. You simply can’t manage if the money you get only covers nappies and feeding yourself and your child, and nothing else. So, well, it feels like we keep hitting this wall.”

A researcher working in a private institution

suggested that encouraging paternity leave would be a positive step forward.

Another external factor influencing women in public institutions was **the level of financial support available during maternity leave.** Female scientists working in the public sector with low wages reported that the maternity benefit they received was insufficient to meet their needs. Both men and women mentioned this aspect.

SECTION 4



MOTIVATION TO BUILD A SCIENTIFIC CAREER IN STEM AND REASONS FOR NOT PURSUING IT

4.1 MOTIVATION TO BUILD A SCIENTIFIC CAREER

The experiences shared by informants reveal that pursuing a scientific career demands a high level of qualification, self-organisation, and motivation, while being accompanied by systemic challenges such as heavy workloads, low salaries, poor working conditions, and lack of equipment and supplies. Women conducting research in STEM fields also face gender bias and discrimination. When analysing the career trajectories of women scientists in STEM, it is important to consider what attracts them to this profession and why they choose it despite possible difficulties. This section focuses on women's motivations for pursuing a career in science and the benefits they associate with being scientists.

In the survey, scientists were asked what they valued most about their profession. The most common responses related to **academic freedom** – the creative nature of the work (58%) and the autonomy to determine research areas, topics, and methods (53%); **involvement in the scientific community** – communication with an inspired, interesting, active scientific community (57%); **research results** – satisfaction from a scientific discovery, confirmation of a hypothesis, gaining new knowledge (55%), the opportunity to see the practical results of work (47%). 49% of respondents valued contributing to research that supports Ukraine's development.

Comparing the answers of female researchers to this question with the answers to the question about the factors and conditions that most influenced the decision to start a research career, we can see a difference in the frequency of choosing identical or similar factors. The most frequent factor that influenced the decision to start a research career was the desire to make research useful and have an impact. This option was chosen by 49% of female respondents, compared to 38% who consider this factor valuable in their profession. The desire to contribute to the development of their scientific field motivated 35% of female respondents to choose a scientific career, which is 5% less than those who chose this option as valuable in the profession of a scientist. The opportunity to choose an interesting topic for research was mentioned by 9% of respondents as the factor that most influenced their decision to become a scientist. Instead, academic freedom is one of the most frequent choices when answering the question about the value of science as a profession – 53%.

In-depth interviews and focus group discussions revealed two broad categories of motivation for engaging in science: **self-realisation and social benefit.**

For the women scientists, their profession was desirable and valuable because of the sense of personal and professional fulfilment it provides. This category includes the following motivation factors:

WHAT SCIENTISTS VALUED IN THEIR PROFESSION

Creative nature of the work	58%
Communicating with an inspired, interesting, active scientific community	58%
The satisfaction of a scientific discovery, confirmation of a hypothesis, and gaining new knowledge	55%
Freedom to determine areas of work, topics, and research methods	55%
Opportunity to contribute to research that will contribute to the development of Ukraine	52%
Opportunity to see the practical results of a scientist's work	50%
Opportunity to visit other countries as part of academic activities	40%
An opportunity for a scientist to contribute to the development of the scientific field	40%
Research by scientists is useful/impactful	37%
Opportunity to contribute to research that will bring Ukraine's victory in the war closer	12%
An opportunity to go down in the history of science	8%
None of the above	2%

Table 1: Question: "What is valuable for you in the profession of a scientist". Respondents could select all applicable options. The number of respondents was 144.

Curiosity and love for the object of research. The informants described their field of research interests as something fascinating, unique and unusual. As an example, they cited the opportunity to observe animals in their natural environment. The study participants said that they chose scientific research in their field as a profession because of their deep interest. Some informants described their work as exciting, uplifting, festive, reminiscent of a hobby or a vocation. Thus, they perceive science as a value rather than a way to earn a living.

For the informants, interest and enthusiasm reduced the criticality of the perception of difficulties that may accompany their professional activities. Some informants framed their commitment to science as an act of "self-sacrifice" or "altruism," expressing readiness to continue their work despite obstacles and perceived inadequate rewards. The scientists perceived difficulties as an inevitable part of their careers, which they had to endure in order to be able to do research.

"Back then, I really saw it as self-sacrifice. Otherwise, I didn't understand how to manage it when you're young, lacking experience, either dependent on someone or dealing with some shady stuff, and still trying to do science."

A scientist who ended her scientific career

"Because I love biology very much, so... maybe I was still, as they say, young and stupid at that time; I did not fully understand that money was more important. That's why I... well, I loved biology very much, I was passionate about it, I just... I couldn't imagine myself anywhere without biology."

A scientist working in a state institution

The creative nature of science. For the informants, scientific research was a creative process associated with freedom, inspiration, joy of learning and creating something new. In this capacity, science was seen as a vocation "for the soul", a way to achieve self-realisation, rather than a profession for earning money or climbing the career ladder.

"I just really love the sea, I really love ships, I really love sailing on a ship and watching the sea."

A scientist working in a state institution

"[What I like most about science] is the creativity. I think it's about how to perceive an idea. Basically, everything is born from an idea. So, it has to start with inspiration. And then, when you look at the situation from a different angle, you're like, 'Wow. It's cool; it has to be done. And how do you do it?' It's just a feeling - you like, and you do it."

A scientist working in a state institution

"It's more of a creative job. There are many growth points and many directions. You can choose, or... somehow it just happens when you start getting interested in something or something doesn't work out for you, you begin to figure it out, and you get taken somewhere new. And you're there, and it's interesting."

A scientist working in a state institution

Emotional refuge. The informants described science as a vocation, a favourite activity, and a way to improve their psycho-emotional well-being. This stemmed from the satisfaction of solving long-standing scientific problems and the joy of discovery. Science served as a psychological resource: according to the scientists, the research they were interested in sparked additional energy and resilience. In addition, due to the deep focus and immersion often required, science could act as a form of escapism, offering a mental refuge from external hardships — particularly from the

"Because I can't even imagine what would have to happen for me to leave science. It's something that burns inside me. It's not like I'm doing it because I get paid or because I have to show up for work and then go home. No, it just burns inside me, and I live with it."

A scientist working in a state institution

"When I am really interested in something and see the point in it, I can live at work. I mean, I'm not the kind of person who has a perfect work-life balance. [...] If I'm truly into it, even if I'm tired, I'll keep going — and somehow, I'll find more strength and inspiration. I might be physically tired, but I'll feel great."

A scientist who ended her scientific career

distress and challenges brought on by Russia's full-scale invasion of Ukraine.

Autonomy. The informants emphasised that autonomy was a very important factor motivating them to do science. They valued the opportunity to choose or come up with a research topic, to decide what exactly they wanted to do. This referred to the process of generating ideas, enjoying scientific freedom without external restrictions, having the opportunity to demonstrate and implement their own initiative, and working independently and organising workflows for themselves. Thus, according to the informants, professional success depended on their efforts and how proactive, focused and effective they were. This sense of self-sufficiency was perceived positively.

"Freedom, freedom of action. There are, of course, certain studies that we conduct there under contract, under agreements, on certain topics of our department. But at the same time, they are based on our interests and capabilities. That is, I can independently influence the area of work in which I engage."

A scientist working in a state institution

Some informants said that public research institutions offered more autonomy because, in private ones, the company's management determines the goals and objectives that the research should focus on. However, other informants said that they had more freedom in private companies, as they were not limited in topics and research methods by a systematic lack of resources.

"Well, your success most often depends on you and your proactivity. And, of course, there are times when supervisors don't give you freedom. This is generally bad. I mean, if a person has no freedom and only follows instructions, then I wouldn't work in such conditions."

A researcher working in a private institution

Continuous self-development and novelty. The informants described science as a dynamic profession that required continuous development: mastering new methods, topics, learning something new, adapting to the evolving requirements of scientific progress. Engaging in science gave them a sense of being part of innovation and transformation.

"I don't like to do monotonous, identical work. Because if there is something new, some research and new projects, it is, on the contrary, like stimulation, it is some kind of development. I wouldn't say it's very tiring. I mean, you know, some people live for this and are energised by it. So I probably belong to those people who... discover something new."

A researcher working in a private institution

As a counterbalance to science, the informants called monotonous, predictable work of the same type. Instead, they characterised research as creating a sense of unlimited possibilities, as they said there was a wide range of unexplored topics from which they could choose. The informants were interested in learning something previously unknown, filling in the gaps in their knowledge in a particular area, and growing professionally and personally.

"It's not about the salary; it's about wanting to be part of this flow of knowledge and information, and to be involved in modern, exciting, and innovative projects. I want to be part of that."

A researcher working in a private institution

"I feel comfortable; I'm interested. There are a lot of new projects here, including scientific ones, that keep up with the times. [...] That is, there is a new project every day. You realise that this is not only a growing company, but you are also growing at the same time."

A researcher working in a private institution

Professional ambitions. For the informants, science as a profession offered a strong sense of achievement, victory, and success. Its features – the opportunity to make a discovery, scientific breakthrough, contribution to humankind's scientific and technological progress, and to see data or phenomena no one had ever observed before - served as powerful motivators, even in the face of difficult working conditions. The informants emphasised that they were motivated by recognition, especially in the form of publication of their work in top-ranked scientific journals, as well as citations of their work.

"I'd like to show that it actually works, and only then decide what to do next. I want to see it through. I could hand it over to others now, say: 'Do what you want with it; here's my data, just include me in the publication— goodbye.' I could go work for [large international corporations in the relevant scientific field]. But this pride, this greed, it won't let me rest."

A scientist working in a state institution

An important factor was the sense of personal role in achieving significant scientific results, a sense of ownership over their research: one of the informants said that the desire to complete her research and receive recognition as its author, rather than handing it over to other colleagues for revision, kept her from ending her research career, which she often thought about.

"It's also, you know, a kind of inner satisfaction when you see your work published in a journal. And even more amazing – really, just pure joy – is when I see other authors, from Australia or the Netherlands, quoting my work. [...] And then I see my name in someone else's work, it really boosts my internal motivation, and I want to do more."

A scientist working in a state institution

Belonging to a community. The informants felt a sense of belonging to a scientific community – at the level of a research team, institution or enterprise, country or internationally. This sense of belonging was supportive and motivating for several reasons. For some, it meant being part of a group of like-minded individuals who understood their interests, passions, and needs, even though they may seem irrational to outsiders. Another argument is the opportunity to be around interesting, creative people who inspire with their enthusiasm (young researchers or students were mentioned as an example). The community was also valuable to the informants because it provided role models, professional advice, and emotional support.

"I met a lot of new people, interesting and diverse people. That's another big part of it. They're all incredible – each unique in their own way. I know everyone is different, but maybe it's because some people outside ask, 'Why are you doing this?' And here, you find your people – those who get it and are genuinely interested."

A scientist working in a state institution

"And then you're in a community with people on the same wavelength. You see these people – some are young scientists, some are postgraduates, others are already well-known – and you understand what to aspire to. That's why participating in conferences, especially international ones, is so important."

A scientist working in a state institution

Alongside self-realisation, the informants were motivated by the benefits their work could bring to individuals or groups of people, the country, or humanity. Based on their answers, the following motivation factors were identified, all linked to the practical usefulness of scientific research:

Improving the quality of life. It was important to the informants for their research to bring practical benefits to people, make their lives safer, easier and more comfortable. Working in science gave them a sense of direct, visible and obvious impact on the world and people. The informants said that they perceived the practical application of the results of their work as a reward for their efforts.

"I am still helping people, just like I wanted to when I was a teenager – and I still do. Yes, it's not medicine, but it's a little bit... Well, in my opinion, a step higher. Because I can give people this awareness of what to eat, what not to eat, which cosmetics to use or avoid."

A scientist working in a state institution

Development of science and education. The informants were motivated by the opportunity to be involved in the development of science, enter its history, thus contributing to the progress of humanity. It was important for the scientists to improve the world (or their research institution or educational establishment) and contribute to their improvement and development. For example, one of the informants decided to start a scientific career to do a better job, which she believed one of her teachers was doing poorly. The informants were willing to overcome difficulties and work in less-than-ideal conditions because they wanted to contribute to changes for the better.

"I mean, no one will give me a Nobel for this. But this is what I'm enjoying right now. Because I understand why I'm doing it, it's practical, I can benefit from it, and it will come fast. So, yes, after my PhD, it's really important to have practical outcomes and know exactly where and how they'll be applied."

A scientist working in a state institution

"Why do women go into science? Because they have an interest in science. They want to dive deep, make discoveries, breakthroughs, develop the world, and improve aspects of life."

A scientist who ended her scientific career

"A friend of mine who promotes science talked me into it. He came and said, 'Come teach.' He told me there wouldn't be money, no perks — you know how it is — but it would be interesting. Irresistible, you know? An offer you can't refuse. [...] And you go, because you want to support. We can sit around and say everything's bad— or we can say that and try to change it."

A researcher working in a private institution

Promotion of Ukraine. The informants sought to achieve recognition not only for themselves but also for Ukraine through their research. For instance, one informant expressed the importance of continuing her work to preserve a specific field of research that no one else in Ukraine was pursuing — thus maintaining the country's capacity to benefit from it in the future. For some informants, the opportunity to conduct research in Ukraine was valuable.

"I just feel driven to try to change something. It's not working out that well. But maybe not for me, maybe not even for my future children — but for the next generations. Maybe I'll succeed, and it'll change in some way."

A scientist working in a state institution

"Today, I am proud to be a scientist in Ukraine. To have the opportunity to work here, to be in contact with other people in the same context and situation. And somehow, in small steps, but, well... to support science and its development."

A researcher working in a private institution

Contribution to the victory and overcoming the negative impact of the Russian-Ukrainian war. A separate dimension of the public benefit of the research that motivated the scientists is the opportunity to contribute to the study of the impact of the war, for example, its environmental consequences, or to the rehabilitation of the wounded.

"Actually, we are carrying most of the responsibility for Ukraine's involvement in the whole European programme in this area. If we stop, Ukraine will entirely vanish from the programme. And when it comes time for implementation, where will we be? We'll lose our chance to participate and to keep developing. That would be a very unwise thing to do. So, of course, it gives meaning to continue."

A scientist working in a state institution

"But, I don't know, it's a kind of pull — I want to be at home. I can't quite explain it. You keep coming back anyway. [...] But there's something about being here, knowing that what you're doing matters."

A scientist working in a state institution

In addition to the factors described above, some informants were motivated to work in science by the practical benefits of this profession. These included flexible working hours that allowed them to combine work with motherhood or have a second job; regular, albeit low, salaries; and stable employment. For some informants, their position as a scientist represented a set of skills and abilities that could be successfully monetised on the labour market.

An analysis of the informants' responses reveals a recurring theme: their motivation to engage in scientific work is often framed in terms of strong personal and professional values that persist despite significant obstacles and unsatisfactory working conditions. The motivational factors listed above are strong enough not only for women to choose this profession, but also for them to continue working despite the difficulties they face. However, certain circumstances — external to work and/or related to professional life — have outweighed for some scientists, and they have decided to leave their scientific careers. The circumstances and reasons for this decision are discussed in the following section.

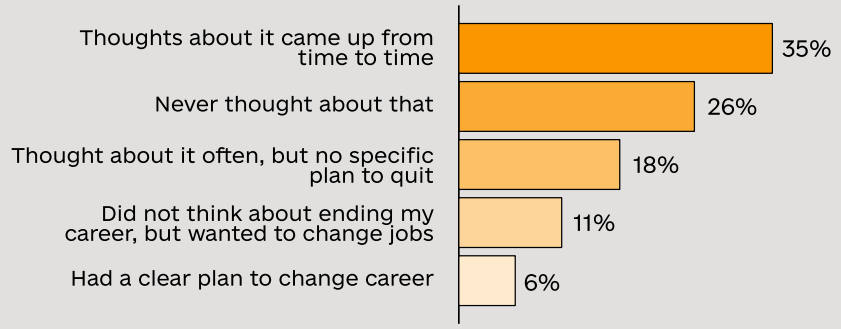
4.2 REASONS FOR LEAVING AN ACADEMIC CAREER

As part of the study, we also asked scientists whether they had doubts about continuing their scientific careers, which could have influenced their decision to leave their current jobs or leave the field.

According to the survey, half of the respondents (53%) considered ending their academic careers to varying degrees: occasionally (35%) or often, but without a specific plan (18%). At the same time, 6% of respondents had a clear plan to change their field of activity. On the other hand, a quarter of female respondents did not think about leaving their careers as scientists (26%).

Based on the responses of the research participants, it can be concluded that some women scientists,

THOUGHTS OF FEMALE SCIENTISTS ON LEAVING THEIR CAREERS



Graph 4.2.1. Question: "Do you consider leaving your career as a scientist?". The number of respondents is 144. 1% of respondents chose the option "Other".

FACTORS THAT INFLUENCED OR COULD INFLUENCE THE DECISION TO LEAVE A SCIENTIFIC CAREER

The need to earn more money	76%
Family circumstances (e.g., birth of a child, caring for a sick family member)	38%
Difficulties in relationships with colleagues or management (conflicts, competition, disrespectful attitude)	37%
Difficulties in securing funding for research	33%
Low social status of scientists, lack of public recognition	31%
Difficulties in conducting research for a researcher (lack of equipment, specialists, power outages, shelling, etc.)	27%
The need for researchers to seek funding for research on their own (e.g., apply for grants)	26%
Moving to another city or country	24%
Mobilisation to the Armed Forces of Ukraine or other structures of the Defence Forces of Ukraine	17%
Unsatisfactory conditions in the institution where the researcher worked (for example, lack of a personal desk, poor condition of the premises, etc.)	16%
Inability to get a higher position	14%
Lack of expected research results for the researcher (for example, the hypothesis was not confirmed)	6%
Difficulty getting a position in a research institution after graduate school	2%
Loss of the opportunity to continue studying at public expense	2%
None of the above	6%

Table 4.2.1. Question: "What influenced or could have influenced your decision to leave your career as a scientist?" The question allowed respondents to select multiple answers. The number of respondents is 144.

along with strong internal motivation and interest in science, experienced feelings of exhaustion, frustration, and doubts about continuing their scientific activities – either in general or at their current workplace. These thoughts were driven by both internal, personal factors and external ones, such as the overall challenging conditions for science in Ukraine and poor working environments at their institutions.

"There is an understanding that you are doing this for the public good more... well, in my case... than for yourself. At least for the moment, it's like this sometimes: "What's the point?".

Student of the master's programme

According to the survey, **the most common reason that prompted women scientists to think about or plan to leave their scientific careers was the need for higher income,** cited by 76% of respondents. At the same time, **only 6% of the respondents believed they earned enough as scientists at their primary job,** while the rest relied on financial support from relatives or took on additional work[23].

"I have been officially working in a state research institution for almost 2.5 years. And I have a great team, everything is great, but I don't like the conditions I work in. I'm now actively in the process of leaving this job. Because the salary does not meet expectations, for one thing. Secondly, the Institute is hardly heated in winter, it is very cold. There are few reagents, or they are outdated, and some instruments are just not usable anymore, there are no new ones."

Student of the master's programme

"Another factor that can ruin a scientific career is money. We understand that salaries in science are low."

A scientist working in a state institution

Another third of respondents were affected by family circumstances, such as the birth of a child or the need to care for a sick relative (38%), difficulties in relationships with colleagues or supervisors (37%), challenges in securing funding for research (33%), and the lack of public recognition and low social status of scientists (31%).

"We often have an attitude towards science as if scientists are just playing with their own obscure toys instead of doing something practical. So when I have to explain this, when I write some report for the hundredth time, – when I'm writing some report for the hundredth time that asks for 'the applied value of the result obtained in the last month', or something like that, some leftover Soviet-style thinking that still lingers – I just can't help but think: 'Oh my God, what am I doing?'"

A scientist working in a state institution

"I've seen research conducted purely for the sake of ratings – just to meet indicators. Unfortunately, I'm still encountering this today."

A scientist working in a state institution

"Overall, I started to feel frustrated with my work at the university, with academic work in general. I was tired of it being more about appearances. I don't know... I just didn't feel any meaning in the actual content."

Student of the master's programme

The reflections of female researchers on leaving or ending their research careers, expressed during interviews and focus groups, allowed us to identify and describe several groups of reasons, described below:

Lack of stability and remuneration. Some participants described their work as socially beneficial but felt they did not receive sufficient benefits or rewards from it. In particular, they did not feel secure about their future employment and considered their income insufficient. At the same time, some informants compared research to other fields that may be less demanding but offer higher salaries.

Poor working conditions in some state institutions. Some female informants were **disappointed with the working conditions in the state** sector, which influenced their decision to move to the private sector. Among the main factors in such cases were **unsatisfactory**

23 For more details, see subsection 3.4 Working hours, workload and salary

salaries, poor workplace conditions[24] and logistical support (e.g. insufficient heating of the institution, lack of reagents and consumables, outdated equipment).

"The last straw for me, when I left one university, was when they started buying Scopus articles. For the sake of ranking. I spend a year writing an article, and then we wait another year for it to be accepted. And we have a team. And then they say to me, 'Oh, you don't care about the ranking.' [...] Meanwhile, others — my colleagues — paid money for articles. I was shocked. [...] It was a huge disappointment until I met my current colleagues."

A scientist working in a state institution

"I continue to work at the university because I cannot leave the students I teach. I still don't have the moral strength to leave them because I love them. But, honestly, over the last year and a half, I have been thinking more often that perhaps my career development will be separate from my university activities."

A scientist working in a state institution

The need to regularly prove the value of scientific work. Some informants doubted about continuing to develop their careers because they felt that scientific work was misunderstood and underestimated in society. This perception was reinforced by bureaucratic reporting requirements, such as the need to regularly demonstrate the applied value of research.

The dominance of formal indicators over research content. Some informants working at universities had doubts about their research activities due to the perceived lack of value and practical impact — either in their colleagues' work or their own. For example, some researchers described the work at the university, including research, as being driven by metrics and the demonstration of formal achievements rather than by the substance of the study or the practical application of its results.

"They decided to deliberately fail students so they wouldn't have to refund their tuition fees. And when they offered us to give them failing grades [for the exam] [...] I said, 'You know, my reputation as a teacher is probably the most important thing to me. Students respect me'. [...] And we just left. They told us: 'Either you do this and keep working, or you leave'. And we said, 'If that's the case, then please — adios, amigos.'"

A scientist working in a state institution

"To be honest, when the war started, I even made a list of countries that I refused to be their scientist. But now, for some reason, it has been really hard for the past year to stay in Ukraine, to stay in my institution and want to work. I really want to go and do research elsewhere. Because I understand that I will be doing science there, not scraping together money. All my equipment, [...] these are all from my colleagues and partners. [...]"

A scientist working in a state institution

Violations of academic integrity. The prevalence of academic dishonesty within teams or institutions where the informants worked was another factor contributing to doubts about continuing their careers or decisions to leave, as mentioned by some participants. One example cited was researchers purchasing Scopus articles to boost their rankings without having contributed to the preparation of those articles. Informants considered such practices deeply unfair, especially in light of the significant effort and time they personally invested in writing and awaiting the publication of their work.

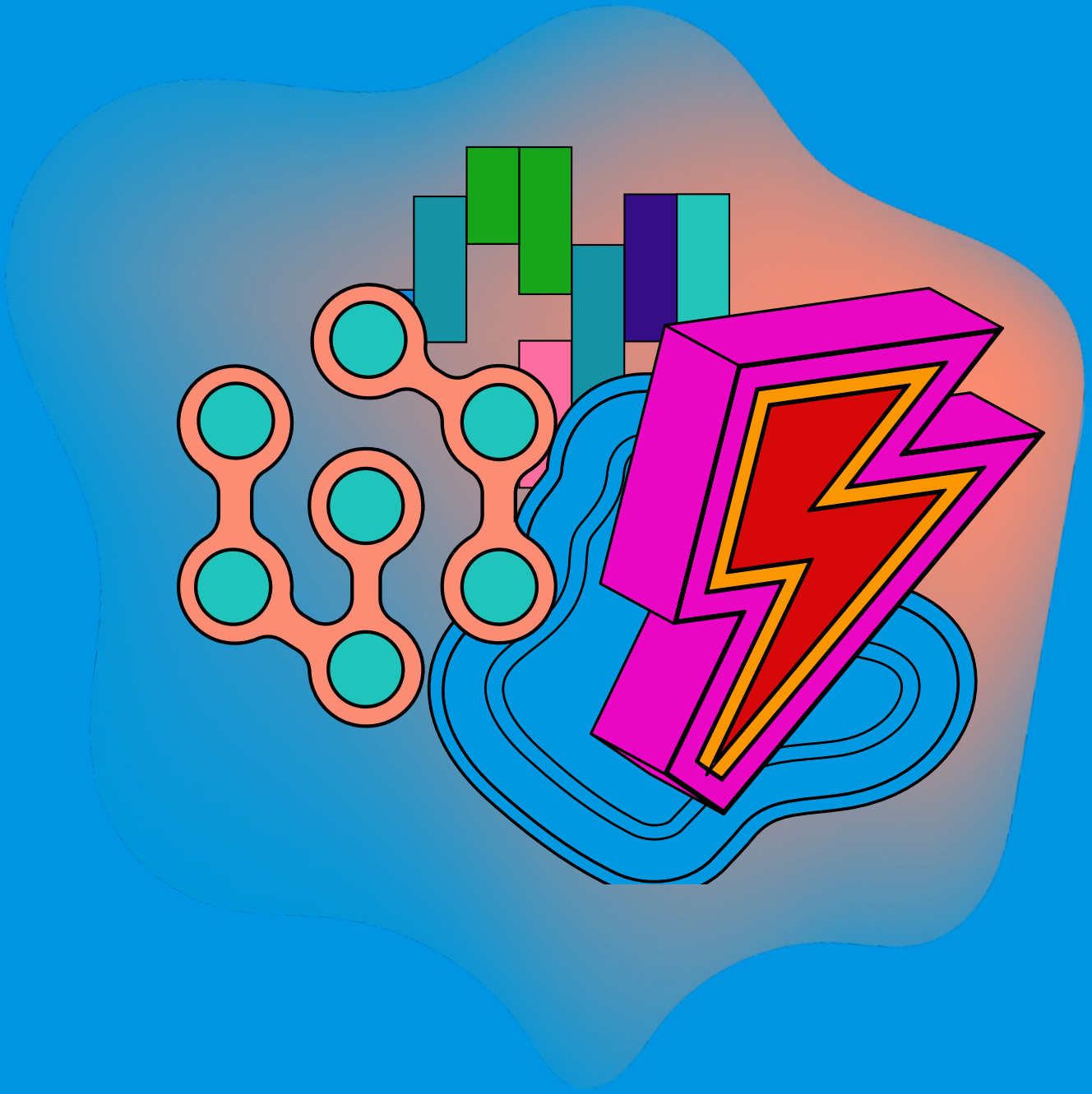
One of the informants also said that her decision to leave a private university was influenced by instances of corruption within the administration — she did not want to be involved in dishonest practices.Some academics who had doubts about continuing to work at the university explained their decision to stay by maintaining good relations with students and a sense of responsibility towards them. According to the informants, they felt they could change the unsatisfactory conditions but **lacked like-minded colleagues who were also interested in change.**

In both focus group discussions and in-depth interviews, some scientists expressed doubts about continuing their research careers in Ukraine. In particular, this was due to the need to seek external funding for research, which, according to some informants, has become more difficult since the start of the full-scale war. Other reasons

24 For more details, see subsection 3.4 Material and technical conditions of research activities.

included the challenges of resuming work at certain institutions due to the war's impact, and the need to adapt to new working conditions. For example, researchers mentioned the necessity of equipping their institutions with additional infrastructure — such as solar panels — to enable work during blackout conditions.

SECTION 5



SYSTEMIC CHALLENGES AND OPPORTUNITIES TO SUPPORT WOMEN IN STEM (BASED ON EXPERT INTERVIEWS)

During the expert interviews, we asked representatives of government agencies, business sector, universities, research institutions, NGOs, and media about their views on the current situation and barriers for women in STEM, as well as possible ways to overcome them and improve the conditions for building a scientific career in general.

The experts largely confirmed the trends and difficulties identified during the in-depth interviews with scientists. They mentioned financial difficulties and excessive workload faced by women scientists due to low salaries, difficulty of combining motherhood with a scientific career, poor material and technical working conditions in scientific institutions, and the widespread presence of sexism and harassment in both workplaces and educational institutions. The experts agreed that work to overcome these problems is key to increasing women's involvement in scientific work. They also noted that many of these challenges are not exclusive to women but are symptomatic of the scientific sector in general. An expert from the non-governmental sector emphasised the importance of **making scientific work as inclusive as possible,** so that individuals — regardless of age, gender, or life circumstances — can choose and successfully pursue a career in science.

In the context of selecting a research career, an expert from the non-governmental sector mentioned that these decisions are currently quite difficult. She attributed this to a lack of accessible information about successful examples of building a scientific career, as well as a lack of guidance on where to seek employment if one decides to leave academia or research. In addition to the lack of information, there is a shortage of workplaces where people who decide to end their scientific careers can apply all their acquired competencies. In her opinion, knowledge of such an alternative would greatly facilitate the decision to pursue a scientific career. It would reduce the sense that the choice is absolute or irreversible and would allow individuals to explore science with the reassurance that, if they later pick a different path, they can still successfully apply their skills and thrive in another field.

In addition, experts raised the issue of the image of scientific work in society. In this context, they talked about the importance of promoting information in society about the benefits of scientific work to the country. They also emphasised the need for greater involvement of scientists in the country's economic recovery and the development of defence technologies. The challenges identified by the experts will be explored in more detail in the following subsections.

5.1 GENDER SEGREGATION IN SCIENCE AND WIDESPREAD STEREOTYPES IN SOCIETY

According to experts, vertical and horizontal gender segregation still exists in Ukrainian science. Women are less likely than men to hold senior positions and attain high academic titles, especially in STEM fields. For example, the number of women among directors of academic institutions within the National Academy of Sciences, as well as in other senior roles, remains low. One expert noted that men have a better chance of being elected to high-ranking positions, even if their professional characteristics are equivalent to those of female candidates. She attributed this to social stereotypes about women.

> "I think that from school education [gender segregation in education start], because, you know, boys are somehow... even parents tend to involve them more in exact sciences or technical fields."
>
> Expert from a higher education institution

A female expert working in a higher education institution also pointed out that a gender-based division continues to exist across academic disciplines, including within STEM. Certain subjects are statistically more likely to be chosen by men or by women. The expert attributes this situation to social stereotypes, which, in particular, affect parents' support and encouragement of their sons and daughters to various activities.

In general, experts often emphasised the significant impact of stereotypes about women in science on their position. Among the most common were the beliefs that women play a secondary role in science, or that scientific fields are simply "not for women". Additionally, women are affected by the widespread societal stereotype that caregiving responsibilities should fall to them.

> "And we have to work, because, unfortunately, our society is still conservative. Although we say that we have absolutely equal conditions, in reality, at the everyday level, this is not fully recognised. Especially by the older generation. [...] There is still a perception that a girl must be a caretaker, she must be a mother."
>
> Business sector expert

Experts emphasise the importance of addressing gender stereotypes and preconceived ideas about the role of women and men in society, starting from the earliest age – from preschool education.

Some experts raised the issue of biased attitudes towards women in science, which can be expressed, in particular, in the following ways:

- superior attitudes towards women, dismissive communication from senior colleagues;
- giving junior female colleagues – in particular, students, or graduate students – administrative tasks or roles, or more routine tasks that senior colleagues do not want to perform.

At the same time, according to the experts, women may feel powerless when faced with discriminatory behaviour by colleagues, supervisors, or teachers. In the absence of developed policies or mechanisms for responding to such cases, and given the inefficiency of the judicial system, they may keep silent about such situations because they do not believe that they can make a difference.

An expert representing a civil society organisation identified the lack of regulations or documents that would officially outline the steps and measures that the NAS would take to overcome and protect against discrimination as one of the critical problems of the National Academy of Sciences of Ukraine.

Among the key recommendations for improving the system of support for researchers, the experts named the following:

- **Development of anti-discrimination policies and implementation of systematic training** in educational institutions and the private sector to prevent biased attitudes and discriminatory practices.
- **Introduction of monitoring and response systems for cases of discrimination or conflict situations** in educational institutions, enabling timely identification of problems and ensuring proper handling of complaints.
- **Establishment of effective mechanisms for resolving conflicts and misunderstandings** between students and educators, based on the principles of respect, ethics, and academic integrity.

5.2 DIFFERENCES IN CAREER TRAJECTORIES OF MEN AND WOMEN IN SCIENCE

Experts often mentioned the difference in the career trajectories of women and men in science. Although their professional situations may not differ formally, a significant disparity arises when it comes to balancing career and family responsibilities. This is largely because women typically undertake the majority of care work for children and other relatives. Therefore, women often have to find a way to combine these two aspects of their lives or make a choice in favour of only one of them.

A representative of a non-governmental organisation that promotes science among women shared the results of her own research, which show that women's careers are often non-linear. They are characterised by early academic success, followed by a return to research in later adulthood, when care responsibilities tend to lessen. In contrast, men tend to follow a linear career trajectory with a predictable peak. This difference is largely due to the fact that women often need to take a career break to have and raise children.

According to the experts, women who take a break from their scientific careers due to maternity leave often face the following difficulties:

- It is often difficult for them to combine scientific work with childcare, as research requires deep focus and a significant time commitment.
- Returning to work after maternity leave can be difficult.
- They may lose their 'young scientist' status, which affects their ability to participate in competitions and apply for grants restricted to those holding this status.

One of the experts notes that the situation is complicated by the fact that not all educational and research institutions offer flexible working conditions that support women scientists with children.

The representative of the educational institution also believes that the trajectories of men and women differ, but attributes this more to the choice of study fields at higher levels of education. For example, she mentioned that after completing a bachelor's degree in mathematics, women are much more likely than men to choose to continue their studies in pedagogy.

Given these challenges, the experts highlighted the following recommendations:

- **Creation of state support programmes for women scientists who take career breaks due to maternity leave.** Such programmes could include financial assistance, the introduction of flexible work schedules for women with children, and a revision of the ''young scientist'' status. For example, implementing a mechanism to extend the age limit for young women scientists who are mothers to ensure equal participation in grant and scholarship competitions. According to the experts, this issue is also relevant for women who take breaks for other reasons, such as military mobilisation or caregiving responsibilities for other family members.
- **Opportunities for remote work and flexible schedules, taking into account the needs of department staff with children.** This helps create conditions that may encourage women to return to work after maternity leave.
- **Development of support programmes within companies and public institutions.** These programmes should focus on helping women reintegrate into the workforce after maternity leave.

5.3 CHALLENGES IN HIGHER AND SECONDARY EDUCATION

CHALLENGES IN HIGHER EDUCATION

During the interviews, the experts also spoke about the challenges of higher education. One expert, who is actively involved with both private and public higher education institutions (HEIs), highlighted that the current system for training scientists is outdated and in need of reform. For example, learning does not take place through research: science is concentrated in research institutions that are separate from universities. The expert also believes that the lack of developed research centres with modern equipment at universities is a pressing issue. She cited the university where she works as an example of how changes can be implemented.

> "Unfortunately, the situation in our country, also a legacy of the Soviet era, is that universities were built without science, and science, which was concentrated in the academies, existed without students. In other words, they were separated. The system currently implemented at [name of university] includes only two levels of education: master's and PhD. However, departments are structured in a way that they are tied to research universities. The educational programme is designed so that the majority of credits are awarded for research work."
>
> Expert from a higher education institution

One of the major issues related to higher education, according to the experts, is the lack of female teaching staff and supporting research personnel at universities. This particularly applies to lecturers who are expected to maintain an active scientific career while also possessing the necessary teaching skills and experience. Another important point raised by the experts was the ability of a lecturer to provide all the necessary support and guidance to students — something they believe is not always consistently offered by all educators. The experts linked this to several factors:

- The emigration of women scientists who previously taught at universities, driven by better opportunities for scientific development abroad, including the potential for higher salaries.
- A significant workload on lecturers makes it difficult to combine a scientific career with full-time teaching. According to the experts' experience, professionals actively engaged in research — such as those working in private institutions or conducting intensive scientific work — often have time constraints and tight schedules that prevent them from teaching.

> "As a rule, if people choose science because they understand that this is what they want to do, then they realise that it is advisable to go abroad in the first years of study. First and foremost, because it is abroad that they have the opportunity to use their skills and knowledge. In Ukraine, there are very few such opportunities. And together, this explains why so few people pursue a career in science".
>
> Expert from the business sector

Experts emphasise that an important factor that affects the quality and organisation of the educational process at a university is the composition of the leadership of departments, faculties and the educational institution itself. These positions should be held by people who not only have a good understanding of the academic environment, but also have developed management and leadership skills.

In some cases, due to insufficient control and monitoring, decisions made in HEIs and research institutions may depend on the attitude and position of the institution's management. As a result, such decisions may not always align with the principles of gender equality, support the development of science, or encourage young people to pursue scientific careers.

In light of these challenges, the experts offered the following recommendations:

- **Implement research-based learning.** In particular, this approach would involve increasing interaction between research institutions and higher education institutions.
- **Introduce and develop a system in which lecturers are primarily employed part-time.** This would help reduce workload and create opportunities for lecturers to engage in other professional activities while earning a sufficient income.
- **Ensure opportunities for remote work and flexible schedules for all teaching staff.**

This would help attract professionals who require more flexibility in organizing their working hours.

Carry out systematic efforts to strengthen cooperation with Ukrainian scientists who have emigrated. One expert emphasised the importance of maintaining contact with scientists abroad to foster collaboration. This could help improve the quality of research in Ukraine and partially address the shortage of teaching staff by involving these scientists in work with students.

Develop a national policy aimed at supporting and cultivating a new generation of teachers and lecturers in STEM. Such a policy could include the creation of additional incentives to encourage scientists to engage in teaching and STEM education. According to one expert, improving the quality of teaching could, in the long term, influence the number of young people choosing STEM fields for their studies.

Continue working on optimizing university governance, particularly through the introduction of corporate governance and supervisory boards. This will contribute to more effective staffing decisions, modernization of teaching approaches, and encourage departmental reform and contemporary hiring practices – all of which are critically important given the current shortage of scientific personnel.

Develop effective tools for monitoring, oversight, and independent evaluation of managerial decisions made in higher education institutions and research organisations, while respecting their autonomy. Despite the positive outcomes of decentralisation and expanded autonomy, which granted institutional leadership greater flexibility in decision-making, there is a pressing need to implement mechanisms that ensure the quality of governance. This is especially important in cases where institutional leadership does not meet current standards of scientific leadership, ethics, or transparency.

CHALLENGES IN SECONDARY EDUCATION

The results of interviews with female scientists indicate that some developed an interest in science during their school years. An education expert working with the MES believes that a **common problem in secondary education is the failure to comply with all principles of gender equality,** which directly affects the extent to which the system encourages and creates conditions for girls to engage in STEM and continue to choose these areas for their education and careers.

This observation is supported by the experience of a secondary school teacher interviewed for this study. According to him, **stereotypical views about STEM being more suited for boys are still common** among students' parents. This impacts their willingness to support their children's interest in STEM fields. As a result, some parents do not support their daughters' desire to enrol in classes or educational institutions with an advanced focus on physics and mathematics. At the same time, as noted by an education policy expert, parents often play the most important role in their child's choice of specialisation or educational institution after school.

The education policy expert also emphasised the importance of the educational environment for developing students' interests and providing career guidance. A secondary education expert shared that girls in educational institutions or in advanced physics and mathematics classes often face inappropriate jokes about women's participation in science.

According to an expert working in a secondary education institution, attracting girls to STEM requires efforts to overcome stereotypical perceptions in society and within the education system regarding the relationship between gender and aptitude for particular fields of study. The education expert notes that despite the NUS initiatives incorporating gender principles, the reform has not yet covered all classes. At the same time, research shows that most teachers are aware of the principles of gender equality, but lack the professional competencies to implement them in practice. Teachers also often do not adhere to the provisions of the Gender Strategy of Ukraine until 2030, a framework document that envisages the implementation of gender equality in all social spheres, including education. The expert further highlighted the absence of gender audits[25] in secondary education and the lack of research that would help assess gender equality in STEM education. In particular, such research should go beyond quantitative indicators, like enrolment rates in specific subjects, and also consider factors such as students' motivation for choosing particular fields of study. Such an approach would help to better understand the motivation of students and the main challenges that prevent students from pursuing STEM fields.

Experts also highlighted the importance of promoting science among schoolchildren. An expert working in a secondary education institution mentioned that there are some **activities to promote STEM among female students,** such as hackathons. However, such events are rather isolated and **involve only a small number of female students.** He also said that the Junior Academy of Sciences holds a fairly large number of events and

25 A gender audit is a procedure designed to help an organization create a supportive working environment for both women and men, in particular by assessing the current state of gender equality. More details: https://mon.gov.ua/news/u-mon-bude-provedeno-hendernyi-audyt-iak-dlia-koho-i-navishcho.

competitions that could become a space for students to implement their first research projects. Nevertheless, such events are not accessible to all, as many schools lack teachers able to support children's interests in these areas. Another factor limiting access is the low level of awareness among children about these opportunities. An expert from the Ministry of Education and Science also agreed that secondary education institutions lack widespread activities to engage students in science.

Another way to support girls and promote STEM could be to support them during the admission process to higher education institutions. One expert working with state institutions in the education sector does not endorse the use of admission quotas, but instead believes that the state can use the recently introduced grant system to provide girls entering certain specialities with more financial support.

Experts also raised concerns about the quality of secondary education. An expert working in a secondary education institution expressed worry that students in advanced physics and mathematics classes may **not receive enough knowledge of other subjects.** This is partly due to the tendency to regard humanities subjects as less important in such classes. Instead, he emphasised **the importance of children's all-round development.** His second concern related to the **problems with teaching computer science** in secondary education. According to him, many schools do not have dedicated computer science teachers, and the subject is often taught part-time. There are also issues stemming from the perception of computer science as a secondary subject. However, according to the expert, knowledge of computer science is essential for successful higher education in STEM. The education policy expert also mentioned the impact of school location on the quality of STEM teaching and the resources available for it. In rural schools and frontline areas, the quality of STEM education is lower due to a lack of material and technical support and qualified teachers, as mentioned by the previous expert. Furthermore, in frontline areas, the quality of education is also affected by the use of distance learning.

The education expert noted that the systemic problem of STEM development in secondary education is insufficient support from the Ministry of Education and Science. In her opinion, international and non-governmental organisations are key stakeholders in promoting STEM among schoolchildren.

The experts made the following recommendations that could help address the challenges in secondary education:

Introduce a systematic gender audits in secondary education. Regular audits will help identify barriers and track progress.

Develop teachers' competencies in the field of gender equality. Despite general awareness, teachers lack practical skills and understanding of institutional requirements. Targeted training, methodological materials, and monitoring of the implementation of the provisions of the Gender Strategy of Ukraine until 2030 are needed.

Introduce large-scale STEM initiatives in schools. Single projects do not have a systemic effect. Comprehensive initiatives should be introduced to engage female students in STEM, supported by adequate resources, technical infrastructure, and mentoring by female students and scientists.

Ensure that STEM promotion activities are inclusive. While promotional events should be open to all, it is crucial to clearly communicate that girls are welcome participants. This will help to dismantle hidden barriers and challenge stereotypical views about certain professions.

Organise career and education events for parents. As parents often play a decisive role in their child's career choices, it is important to engage with them through guides, workshops, and public events. Such events should aim to help parents of students to dispel stereotypes about vocational education and different professions, and to help them understand how to support their children in developing their interests, including STEM, regardless of their gender.

Improve the student career guidance system. Career guidance should take into account the principles of inclusiveness and gender sensitivity. It should involve universities, students, and researchers to change perceptions of typical representatives of technical professions.

Conduct more research on STEM and gender equality in education. Such research could focus on students' motivations, barriers to choosing professions, and the impact of career guidance and the educationalenvironment on the choice of education, including STEM studies.

Strengthening the coordination and methodological role of the Ministry of Education and Science. Currently, key initiatives to promote STEM are funded and implemented by NGOs and international organisations. The Ministry should play a proactive role by coordinating actions, creating methodological materials, and supporting relevant initiatives.

5.4 TOOLS TO SUPPORT WOMEN SCIENTISTS AND POPULARISE SCIENCE

One of the strategies for supporting women in science and encouraging them is **scholarships and awards across various categories and for specific achievements.** In an interview, an expert involved in the award for women under the L'Oréal-UNESCO programme 'For Women in Science' noted **a noticeable decline in the number of applications.** In her opinion, this could be due to several factors specific to women in science:

- **Lack of self-confidence among some female scientists,** doubts about the value of their achievements and compliance with the requirements of the award.

> "[Some girls don't apply for the L'Oréal award] because they are afraid that they are not worthy. I've heard it many times, even from jury members: "I tell my girls: 'Apply, apply!' They say: "What have we done, like, we... what are we going to say? We're just girls who work in laboratories, we can't tell you anything." That is, this inferiority syndrome is also very much present."
>
> Expert from the business sector

- **Migration of female scientists abroad.** According to an expert, many female scientists have left Ukraine and are now working at research institutes in other countries. However, there is currently no available data on the exact number of women scientists who have emigrated.

  According to the expert, girls who are involved in science in Ukraine, for example, in the Junior Academy of Sciences or participate in international competitions, often express a desire to study abroad from an early age. In her view, this may also reflect the attitudes of their parents.

> "We also spoke to the Ministry of Education and Science, but unfortunately, they do not have information on exactly how many women have left Ukraine. This is because for quite a long time, their main focus was education, not science. Now they are just starting to focus more on this as well."
>
> Expert from the business sector

- An expert from a state institution highlighted an issue with age restrictions in various programmes to support women scientists, as the conditions of some programmes exclude older scientists who also need such activities.

- At the same time, an expert from the business sector who works on involving female scientists in science communication and outreach noted that engaging women scientists in promotional activities can be challenging. The main obstacle is often a lack of time. For example, she mentioned that scientists often work several jobs at the same time due to the generally low salaries in the scientific field or have irregular working hours. Due to the excessive workload, scientists cannot devote time to science promotion activities. In her opinion, to overcome this problem, a radical rethinking of salaries in the scientific sector is needed.

According to several experts, providing additional support for women scientists is both important and effective; however, it is essential to address systemic issues – including the general obsolescence of Ukraine's scientific system, the low prioritisation of scientific development in state policy, and the insufficient funding allocated to science. Among the key recommendations for improving the system of support for researchers, the experts named the following:

- **Continue introducing awards and initiatives to support women scientists.** An example is the L'Oréal Award for Young Women in Science, which shows that such initiatives provide substantial support. Participation in the award programme helps increase the visibility of female scientists, leading to greater attention from institutions, collaboration opportunities, and access to additional grants.

- **Address systemic issues.** For example, outdated institutional systems, lack of support for female scientists, and low salaries.

- **Create communities of female scientists to consolidate efforts and support communication.** One expert emphasised the importance of building a community of female scientists to unite the efforts of active researchers and initiate joint projects, particularly to promote science and the role of women in science.

5.5 DIFFICULTIES WITH THE REPRESENTATION OF FEMALE SCIENTISTS IN THE MEDIA

The issue of female scientists' representation in the media is a significant aspect of the broader problem of gender inequality in science. According to an expert from a civil society organisation conducting media monitoring, some progress was made during the 2010s – including an increase in expert commentary from women and greater male involvement in events focused on gender issues. However, the full-scale Russian invasion has negatively impacted the situation. Overall, the expert notes that both male and female scientists have become less visible in the media, largely due to a narrowing of media coverage topics overall.

> "There is no communication culture among female scientists. They don't understand why they need it. They believe that journalists should be the ones reaching out to them. But that's not how it works, especially now, in the context of a staffing and financial crisis in the media."
>
> Expert from the non-governmental sector

Another reason for the insufficient media coverage of female scientists, mentioned by several experts, is the low level of public engagement by the scientists themselves. Women in science often do not devote enough time to media-related activities. According to the experts, this is due to a lack of understanding of the benefits of such engagement, unfamiliarity with how media operate, especially during wartime, as well as a general lack of time.

The situation is especially difficult in large mainstream media outlets that do not specialise in science-related topics. According to one expert, coverage of women scientists in such media is hindered by the fact that many women scientists lack the skills to adapt their scientific texts and research for broader audiences. At the same time, journalists often lack the resources or motivation to do this work themselves.

The experts highlighted the following recommendations they believe would help improve the representation of women scientists in the media:

- **Encourage women scientists to be more active in the media space,** including by pitching their materials to media outlets and running their own blogs. This would increase visibility, generate discourse around women scientists, and inspire young girls to pursue scientific careers.
- **Develop training programmes for women scientists** that teach media communication, self-representation, and understanding how the media operates.
- **Adapt information about content and female scientists** to formats that are accessible to the general public.
- **Create and actively disseminate directories of women scientists with their contact information and areas of expertise.**
- **Foster active collaboration between journalists and women scientists, particularly through partnerships.** Having an organisational bridge between journalists and experts makes it easier to access verified information and helps facilitate science coverage. Similar cooperation models already exist in certain sectors, such as ecology.
- **Introduce financial incentives and other support mechanisms for the media** – such as grants, contests, awards, and projects focused on science coverage. This would motivate media outlets and create conditions for more consistent and systematic engagement with science topics.
- **Support media outlets that commit to covering scientific topics,** particularly those that feature female scientists.

5.6 INSUFFICIENT FINANCIAL SUPPORT FOR WOMEN SCIENTISTS

Experts from government institutions and authorities raised the issue of **financial factors** as a significant influence on female scientists' decisions to either remain in or leave their scientific careers.

"Most people understand that if I go into science, I'm unlikely to have a decent standard of living or earn a proper income. For girls, there's a lack of confidence in the future, especially if you want to stay in Ukraine."

Expert from the business sector

An expert from the business sector spoke about the significant shortage of personnel in science, including in the private sector, and linked this issue to financial factors as well.

According to the experts, the main challenges related to the financial support of female scientists include:

Low salaries. Despite their desire to pursue scientific work, many young women scientists leave the field due to low wages and a lack of financial resources to support their livelihoods. This especially applies to female PhD students, who often receive very limited or no financial support from research institutions or universities.

The view of this expert echoes the experiences shared by several informants — that family support can be crucial for women scientists, enabling them to continue their scientific careers.

"All of my PhD students are not affiliated with the university. [...] They had the motivation, for example, to carry out research. But they're not employed by the university, and they have to support their families through entirely different sources of income. One of my female PhD students, who ended up without a flat, had to move in with her mother due to the war, rather than the other way around. If everything were fine, her mother would have moved back. But instead, she had to move to her mother's because she simply had nowhere to live. And as a result, she left science."

Expert from a government institution

"Basically, given the salary and career prospects, the woman who goes into science is most often the one who has a husband who can provide them with a decent life. That's it."

Expert from a government institution

Lack of sufficient support for female scientists from the state. Experts also raised concerns about the lack of social support. One expert from a government institution emphasised that this issue affects both women and men in science. For instance, while there are state programs aimed at providing housing for young scientists, these programs are ineffective and fail to cover a large number of people.

"As a member of the regional council, I was aware of the state programme for housing young scientists and submitted a formal inquiry to the Cabinet of Ministers about how many scientists had actually received housing through this programme. And guess what the answer was? One."

Expert from a government institution

Reduction of funding for science in Ukraine from foreign companies and the decline in international projects. One expert sees such companies and projects as an important source of support for female scientists in Ukraine. However, since the beginning of the

"Before the war, we had a representative from a pharmaceutical company who was interested in the field; he was developing and selling products related to allergology. He provided us with significant financial support. We were able to make purchases; he even bought me four devices. Each of them costs €4,000 and more. [...] But now, with the war, even that's gone. And there are no more international projects."

Expert from a government institution

full-scale invasion, funding from some of these sources has either ceased or decreased. Experts also mentioned the shutdown of certain international organisations or programmes that had previously provided grant support in the field of science.

Insufficient state funding for science. Experts representing government authorities also raised the issue of inadequate state support for science, particularly financial.

Experts noted that despite the efforts of the National Research Foundation of Ukraine (NRFU) and its positive impact on science in Ukraine, it accounts for only a small portion of overall science funding. Moreover, this funding is limited and targeted; for example, female scientists may receive grants for only 2–3 years and nothing beyond that. This creates a situation where adequate funding for female scientists is directly dependent on external grants.

According to experts from government authorities, the primary reason for insufficient funding is the lack of resources in the state budget. They also noted that they are trying to address this issue through cooperation with other countries, the development of scholarship and grant programmes, and opportunities for temporary research placements abroad. However, they pointed out that these support measures do not allow for improving the overall material and technical conditions in research institutions. Additionally, most foreign partner organisations are unwilling to transfer funds to the accounts of legal entities in Ukraine. Therefore, from the experts' perspective, improving the working conditions of women scientists remains a significant challenge for the state.

In light of these issues, the experts identified a number of measures necessary to improve the state of science in Ukraine.

Increasing state support for both women and men in science. Scientists face financial and other difficulties, so establishing a support system is essential for the development of science in Ukraine. One expert emphasised this as a priority, arguing that basic conditions must first be created for all scientists, which will also positively impact the situation of women.

A comprehensive approach to supporting women in science. An expert noted the need to develop a comprehensive approach to supporting women scientists. It is important to understand the specific challenges women face, but at the same time, their professional qualifications should be the primary consideration, for example, when awarding grants.

Expanding the number of potential funding sources for science. According to the experts, this would reduce the dependence of scientific projects on the financial stability of donor organisations or budget cuts.

5.7 THE IMPACT OF THE RUSSIA-UKRAINE WAR ON WORK IN THE FIELD OF SCIENCE

Experts paid particular attention to how the full-scale Russia-Ukraine war has affected scientific work. They agreed that the impact of the war has been significant and largely negative. The following aspects were highlighted:

Loss of access to infrastructure. Experts noted that due to the occupation of territories and the destruction of infrastructure, women scientists have lost access to the laboratories and natural sites they need for their research.

Reduced access to funding. An expert from the non-governmental sector explained that science in Ukraine is primarily funded through the state budget. Consequently, with the outbreak of the full-scale war, the amount of funding available for science has significantly diminished. The expert mentioned grants and scholarships from other countries but pointed out that these are often limited and not accessible to most female scientists. This reduction also affected access to academic literature, as educational and research institutions could no longer afford subscriptions to leading scientific journals.

Deterioration of material and technical working conditions was also caused by destruction and cuts in funding.

Forced displacement. According to experts, some female scientists were forced to change their place of residence, either internally or moving abroad. In some cases, this led them to decide to leave their scientific careers.

Worsening emotional and psychological well-being. Experts spoke about the significant decline in emotional and psychological well-being due to the war, particularly among female scientists. At the same time, scientific work requires focus and creativity, which are difficult to maintain under such conditions.

Disbanding of research teams. Some research teams were disbanded for various reasons, including individuals joining the defence forces, forced displacement, deteriorating emotional well-being, and loss of funding.

Conclusions and recommendation

1. EDUCATION AND CHOICE OF A SCIENTIFIC CAREER

FACTORS THAT MOTIVATED WOMEN TO CHOOSE A CAREER IN STEM

Women's interest in STEM and science in general often begins in childhood or adolescence and is fostered by family, teachers, or access to quality education. At the same time, some study participants mentioned the lack of career guidance, which made choosing a profession more difficult. Other informants became interested in STEM and science at university. At the same time, in cases where informants had made a largely random choice of institution, the educational environment and individual teachers could still have sparked an interest in science.

The data collected in this study demonstrate that the start and development of women's scientific careers in STEM in Ukraine result from a complex interaction of personal motivations, surroundings, and barriers at different levels. Most women scientists who participated in in-depth interviews, focus group discussions, or surveys reported having doubts or developing plans to leave their careers at various stages — and some eventually chose to change their career paths.

Among the **factors that motivated** women to choose and develop a career in STEM, the key ones are **interest in science** formed in childhood or adolescence, **support from teachers and family,** and **positive experience of interaction in higher education institutions,** including the presence of role models and mentors among teachers. **Access to scientific events, the opportunity to engage in practical work,** such as working in laboratories, participating in conferences and research, played an important role. Some female scientists were **highly motivated** by the desire for self-fulfilment, contributing to science, advancing Ukrainian society, and encouraging more people to engage with science. In particular, for these reasons, some research participants were engaged in popularising science in parallel with their main research activities.

THE INFLUENCE OF EDUCATION ON THE CHOICE OF A SCIENTIFIC CAREER

Studying at a university on a bachelor's or master's degree programme was an important stage in the career path of women scientists. While obtaining higher education, the research participants **formed or strengthened their desire to engage in science,** conduct research on a particular topic, choose a further scientific career or abandon it. This process was influenced both negatively and positively by various factors: **the scientific environment** in higher education institutions, **the material and technical condition of laboratories, additional scientific and educational opportunities** (conferences, field trips, etc.), and personal experience of **conducting the first scientific research.** The quality of education has also been significantly affected by COVID-19, the Russian-Ukrainian war since 2014, and higher education reforms.

The study participants often spoke about the significant role of the department staff, lecturers, and supervisors in their scientific path. **For the informants, the attitude of the department staff where they studied was important, in particular, the absence of arrogance, treatment as colleagues, paying enough attention, willingness to help and explain, and taking their opinions into account in research.**

FACTORS INFLUENCING THE CHOICE OF SPECIALITY

The choice of speciality and educational institution for bachelor's degree study among future scientists depended on several key factors: **high grades or thorough knowledge of school subjects, influence of the environment** (recommendations of parents, teachers), **the need for tuition-free education due to financial constraints in the family, and their own aspirations to realise their ambitions in science.** At the same time, the choice of where to apply was complicated by **a lack of awareness about educational opportunities and application procedures, as well as insufficient career guidance at school.** This led to confusion in the face of a wide choice of majors. At the stage of choosing an HEI for a master's degree, the informants additionally paid attention to the department's **material and technical support, the availability of a supervisor** who works in the topic of interest. The lack of these elements in some cases motivated researchers to choose to study abroad.

MOTIVATION TO TAKE THE FIRST STEPS IN RESEARCH CAREER DURING POSTGRADUATE STUDIES/ PHD PROGRAMME

The decision to embark on a research career was made at different stages of education: some informants made this choice while pursuing their bachelor's or master's degrees, while others had previously worked in the private or public sector before opting for postgraduate studies as the first step in their scientific career. The scientists associated obtaining the degree of Doctor of Philosophy (formerly —

Candidate of Sciences) with the desire for self-realisation, support from the environment (scientific environment, family, partners), and opportunities that open up for young scientists. Doubts about such a step arose due to low financial support, discriminatory practices, negative experience of cooperation with supervisors, and problems with internal communication in institutions. **Some scientists chose to study abroad, citing better logistical and financial support as a reason for this decision.**

The informants reflected on their expectations for a future academic career and their willingness to pursue it, considering a range of factors. These included a desire to make a meaningful contribution to science or to help prevent the brain drain from Ukraine, as well as external factors, including limited funding for academic research, employment instability, and the quality of relationships with colleagues.

2. WORKING CONDITIONS IN SCIENCE

CONDITIONS FOR SCIENTISTS' INNOVATIVE ACTIVITIES

The majority of the survey participants were engaged in both fundamental and applied research, often combining both components. A significant share of research had an innovative component. Researchers noted that conducting innovative research required enabling conditions, such as opportunities to participate in international projects, access to financial support (through grants and increased baselinestate funding), and adequate material and technical resources. The main challenges were common to both basic and applied research: lack of funding, overworked researchers, and insufficient logistics. At the same time, applied research often had a better chance of being funded, involved clearer planning and shorter implementation timelines, and may have a greater need for logistical support. For many scientists, the ability to quickly see practical results of their work was an important motivator to engage in applied research, especially after the outbreak of full-scale Russia-Ukraine war.

MATERIAL AND TECHNICAL WORKING CONDITIONS

The material and technical conditions of research activities were an important factor that influenced the work of researchers. Informants who had experience working in a state institution often faced challenges related to this aspect. **The lack of necessary equipment and supplies and problems with workplace arrangements, such as a lack of heating in the cold season, affected the ability of researchers to implement their research ideas and the process of conducting research in general.**

Difficulties with access to equipment varied depending on the funding of the research institution/institute and the organisation of work in general. **In some cases, the full-scale Russia-Ukraine invasion exacerbated these problems.** Poor working conditions prompted some informants to leave their positions in the public sector, either to join the private sector or to consider relocation or move to another country. In some cases, unsatisfactory material and technical conditions of research activities, together with other factors, were the reason for leaving the scientific field.

The material and technical conditions of research activities were one of the main factors that **influenced the possibility of research activities of female informants.** Within this question, researchers mostly talked about the material aspects of research activities, namely the arrangement of the workspace, such as **the availability of heating in the room and safety at the workplace, as well as the provision of the necessary equipment and supplies.** Informants reported numerous challenges related to their working conditions, including unheated rooms and a shortage of necessary equipment and materials, largely due to inadequate funding. These difficulties were further exacerbated by the full-scale invasion, which resulted in unstable electricity supplies and damage to facilities caused by shelling. These circumstances significantly disrupted research planning and created serious issues with the proper storage of reagents.

WORKING CONDITIONS RELATED TO IRREGULAR HOURS AND PART-TIME WORK

Some researchers **reported an excessive workload.** This was mainly due to the fact that they combined employment in different institutions or organisations. Some of them were forced to do so **because they were unable to receive a sufficient salary for a comfortable life for their research activities.** Additional employment could also be the result of other reasons or motivations. In addition to their main job in academia, some women held one or more additional jobs, sometimes in the same field or in a field not related to academia at all, in start-ups or universities, NGOs, and also engaged in volunteer work.

Along with the workload, scientists **faced irregular schedules,** in particular due to informal rules of work in institutions and the specifics of scientific work. For some, such a schedule was an advantage, as it allowed them to plan their time independently, while others assessed it negatively.

The heavy workload and irregular schedule **affected scientists' personal lives: they did not have enough time to relax or spend time with family and friends.** At the same time, some scientists considered a heavy workload to be the norm for their field of work.

THE IMPACT OF THE FULL-SCALE RUSSIA-UKRAINE INVASION ON THE CONDITIONS OF SCIENTIFIC ACTIVITY

The full-scale Russia-Ukraine invasion has affected the workload, schedule, and salaries of researchers. Changes in funding, colleagues joining the Armed Forces, or some of them moving abroad have led to an increase in workload. In the case of female teachers, the need to work remotely increased. Unstable schedules were further complicated by frequent blackouts, which disrupted work planning. The extent to which salaries were affected varied depending on changes to the funding of the projects or institutions where the researchers were employed. Overall, the invasion has underscored the financial insecurity faced by female scientists working within state institutions.

3. MOTIVATION AND BARRIERS

SUPPORTING MOTIVATION TO PURSUE A CAREER IN SCIENCE

Institutional culture played an important role in maintaining motivation to engage in research. The study found that for many female researchers, **the psychological atmosphere, established professional relationships and mutual support in the team** were key when they described their satisfaction with the conditions in which they worked. Some examples of interaction with colleagues were also important to them, for example, colleagues who played the role of mentors, helping both with research and with "paperwork" (in the informants' experience, such work was often an integral part of seeking funding or organising research).

For some informants, **having autonomy in their work,** the ability to influence working conditions and the responsiveness of the team or institution's management to their requests, were critical in their research activities.

FACTORS STIMULATING CONSIDERATION OF QUITTING RESEARCH

In contrast, a significant number of female scientists faced **factors that reduced their motivation and could influence their thinking or even their decision to end their research career.** These factors were often related to **low salaries,** especially in the public sector. This sometimes led to the need to combine several jobs, as well as to **overwork and irregular schedules,** making it difficult to balance personal life. Researchers also had a heavy workload due to the specifics of their scientific activities, which required them to work overtime on research and general work. However, some scientists did not see this as a problem; they perceived overwork as a necessary and integral part of their careers.

A significant number of participants emphasised the **insufficient material and technical support,** including the lack of heating in laboratories, shortages of consumables, outdated equipment and, in some cases, violations of basic security conditions. Such circumstances forced some scientists to leave state institutions or to leave their field of work altogether.

Relationships within the team also had different manifestations. While many informants described a positive atmosphere, some faced **conflicts, favouritism, and unequal conditions for career advancement.** In particular, some informants described situations where refusing personal requests or unfavourable position in relation to the management caused obstacles to contract renewal or hindered career development.

BARRIERS RELATED TO REMUNERATION

An important aspect for female scientists was the level of remuneration for their work, which directly influenced job satisfaction and motivation to continue in the scientific field. Insufficient salary was one of the biggest challenges for female researchers, but the prevalence of this problem depended on the type of institution where the researchers worked and the funding of the institution. Informants who worked in public institutions were satisfied with their salaries if they or their institution received grant support, but this could also have its limitations. Some informants could only do science thanks to family support. **Low income from scientific work was one of the most common reasons for doubts about a scientific career and reasons to leave it or move to a private company.**

BARRIERS RELATED TO GENDER DISCRIMINATION AND SEXISM

Systemic discrimination and sexism were part of the experience of some informants. In particular, women scientists talked about sexist remarks or comments about their professional competence from colleagues or management, biased task distribution based on gender, and cases of sexual harassment — against them or other colleagues. For some informants, this experience seemed commonplace, and they were not critical of such cases, while others described it as **emotionally draining, demotivating** and stimulating them to distance themselves from colleagues or leave the institution altogether.

CHALLENGES ASSOCIATED WITH COMBINING MOTHERHOOD AND RESEARCH

Workload, work schedule, and salary were related to the possibility of combining motherhood and a scientific career. This aspect was mentioned by most of the informants. They considered planning for childbirth as part of career planning, and also emphasised the difficulties faced by women working in science who want to become mothers. In particular, they talked about the need to take into account many factors, such as age, the relevance of the topics they work on in the future, and their health. Women scientists who had already had children had to make considerable efforts to continue working in science — they could not always engage in work at the same level as before they had children, or attend certain events. Their situation was influenced by the working conditions in a particular institution, as well as by social norms and the overall financial support for science.

RECOMMENDATIONS FOR STAKEHOLDERS

GOVERNMENT INSTITUTIONS

Recommendation 1

Increase the salaries of female scientists, as well as academic scholarships for students of bachelor's, master's and PhD programmes.

Recommendation 2

Develop and promote awards and events that enhance the visibility and recognition of female scientists.

Recommendation 3

Strengthen and support systematic work to address gender stereotypes and prejudices about the roles of women and men in society, including in science, starting from pre-school education.

Recommendation 4

Develop tools for monitoring, oversight, and independent evaluation of management decisions in higher education and research institutions, while respecting institutional autonomy, particularly concerning ethical standards and transparency.

Recommendation 5

Ensure that women taking maternity leave can return to their positions and engage in scientific work, including job retention and the option to resume research activities earlier if desired. Additionally, encourage male scientists to take paternity leave.

Recommendation 6

Revise the criteria for granting the status of young scientists, in particular, to create opportunities for returning to this status regardless of age after maternity leave or mobilisation to the Defence Forces.

Recommendation 7

Increase the number of science clubs for school and pre-school children, in particular to promote science among children and support their interest in a particular field. If it is not possible to create such clubs in small communities, consider expanding the practice of creating clubs in an online format.

Recommendation 8

Expand career guidance events for schoolchildren, inviting scientists from various fields to speak. When promoting scientific careers, emphasise the potential for a satisfactory income to counteract the widespread perception of low salaries in the field.

Recommendation 9

Increase financial support to educational and research institutions to improve their working conditions.

Recommendation 10

Enhance funding for publications in leading scientific journals, particularly those offering open access, to raise the visibility of Ukrainian scientists' work in the international scientific community.

Recommendation 11

Conduct systematic efforts to foster collaboration with Ukrainian women scientists who have emigrated abroad.

Recommendation 12

Introduce a systematic gender audit in secondary education and continue developing the gender equality competencies of teaching staff.

Recommendation 13

Implement large-scale STEM initiatives in schools, ensuring the inclusivity of such activities.

Recommendation 14

Conduct more research in the field of STEM and gender equality in education.

NON-GOVERNMENTAL ORGANISATIONS AND MEDIA

Recommendation 1

Continue to popularise science, especially among female students in secondary education, portraying it as an interesting, valuable, and "trendy" field.

Recommendation 2

Create and develop communities of scientists to consolidate efforts and support communication.

Recommendation 3

Create modern educational programmes for women scientists as a complement to academic studies.

Recommendation 4

Conduct communication campaigns to increase the visibility of women in science and to reduce gender bias in the scientific profession.

Recommendation 5

Encourage women scientists to be more active in the media space, including by pitching their materials to media outlets and running blogs.

Recommendation 6

Develop training programs and events for women scientists that focus on building media communication and self-representation skills and providing information about how the media sector operates.

HIGHER EDUCATION INSTITUTIONS AND RESEARCH INSTITUTIONS

Recommendation 1

Provide students with more opportunities to conduct research during their education, in particular through the development of cooperation with research institutions.

Recommendation 2

When accounting for teaching workload, consider not only classroom teaching but also other forms of educational interaction, including student supervision.

Recommendation 3

Conduct detailed studies and monitoring of the interaction styles among institution employees, and develop internal policies and codes of conduct that promote a comfortable, safe atmosphere and mutual support within teams.

Recommendation 4

Expand activities for the exchange of experience among the institution's or agency's staff. This includes both regular scientific conferences and less formal activities, such as internal seminars to discuss a particular topic, approaches to work organisation, etc.

Recommendation 5

Improve material and technical working conditions by, for example, ensuring research laboratories have autonomous power supplies, adequate consumables, necessary equipment, and heating during the colder months.

Recommendation 6

Ease bureaucratic procedures for obtaining permission to stay in the laboratory outside working hours when conducting an experiment.

Recommendation 7

Consider establishing the role of a grants manager within scientific institutions to facilitate the process of securing funding and managing awarded grants.

Recommendation 8

Provide facilities that allow employees and students to bring their children to the workplace (e.g., baby rooms in buildings, changing tables).

Recommendation 9

Expand the implementation of anti-discrimination policies and systematic training in educational institutions and research organisations to prevent biased attitudes and discriminatory practices.

Recommendation 10

Introduce monitoring and response mechanisms for cases of discrimination or conflict, including the development of effective mechanisms for resolving such situations based on the principles of respect, ethics, and academic integrity.

INTERNATIONAL ORGANISATIONS AND DONORS

Recommendation 1

Support initiatives aimed at overcoming gender stereotypes and prejudices about the roles of women and men in society, including in science.

Recommendation 2

Expand support for women scientists working in Ukraine, including increasing the number of grants for research by women scientists.

Recommendation 3

Increase the number of grants that allow for the purchase of necessary equipment, consumables, and other logistical aspects of work.

Recommendation 4

Establish scholarships for contractual STEM education.

Recommendation 5

Promote a more detailed study of the working conditions and needs of scientists living and working in Ukraine during the full-scale Russian invasion.

Recommendation 6

Support research in the field of STEM and gender equality in education in Ukraine.

Recommendation 7

Support media outlets dedicated to scientific topics, particularly those involving female scientists. For example, introduce financial incentives and other forms of media support such as grants, competitions, awards, and projects aimed at promoting science coverage.

BUSINESS SECTOR

Recommendation 1

Promote the creation of platforms that bring together representatives of the public sector, higher education, academia, business, and government.

Recommendation 2

Provide facilities that enable employees to attend the workplace with their children (e.g., organise baby rooms, have changing tables). In particular, encourage male employees to bring their children to work with them.

Recommendation 3

Maintain and develop corporate ethics, taking into account the need for more tolerant communication in the context of Russia's full-scale war against Ukraine (in particular in small companies). This includes responding empathetically to employees' health and well-being during nighttime alarms and shellings, and offering lectures or training with psychologists on communicating effectively with military personnel and veterans.

Recommendation 4

Expand the implementation of anti-discrimination policies and systematic training in the private sector to prevent biased attitudes and discriminatory practices.

Recommendation 5

Introduce monitoring and response systems for cases of discrimination or conflict, including the development of effective mechanisms for resolving such situations based on the principles of respect, ethics, and academic integrity.

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LIST OF ABBREVIATIONS

HEI Higher education institution	UEE The Unified Entrance Exam
IT Information technology	JAS Junior Academy of Sciences
NASU National Academy of Sciences of Ukraine	NRFU National Research Foundation of Ukraine
UN United Nations Organization	PhD Doctor of Philosophy
STEM Science, Technology, Engineering and Mathematics	

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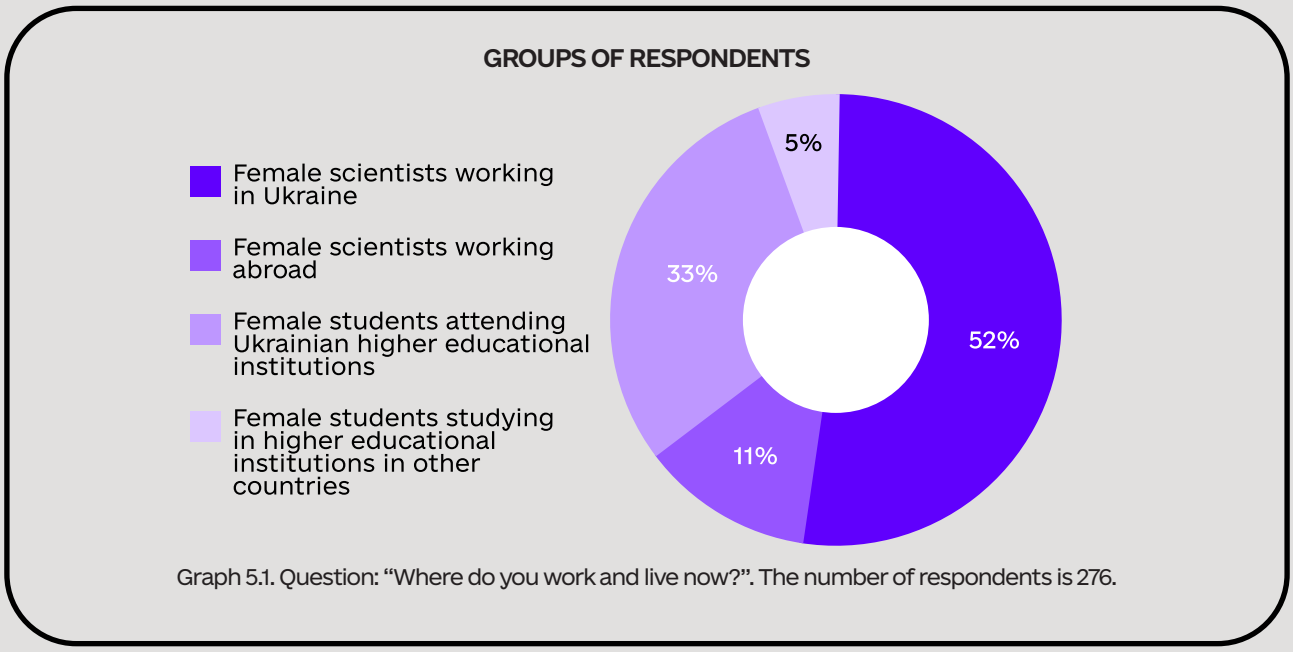
ANNEX 1.
PORTRAIT OF THE RESPONDENTS

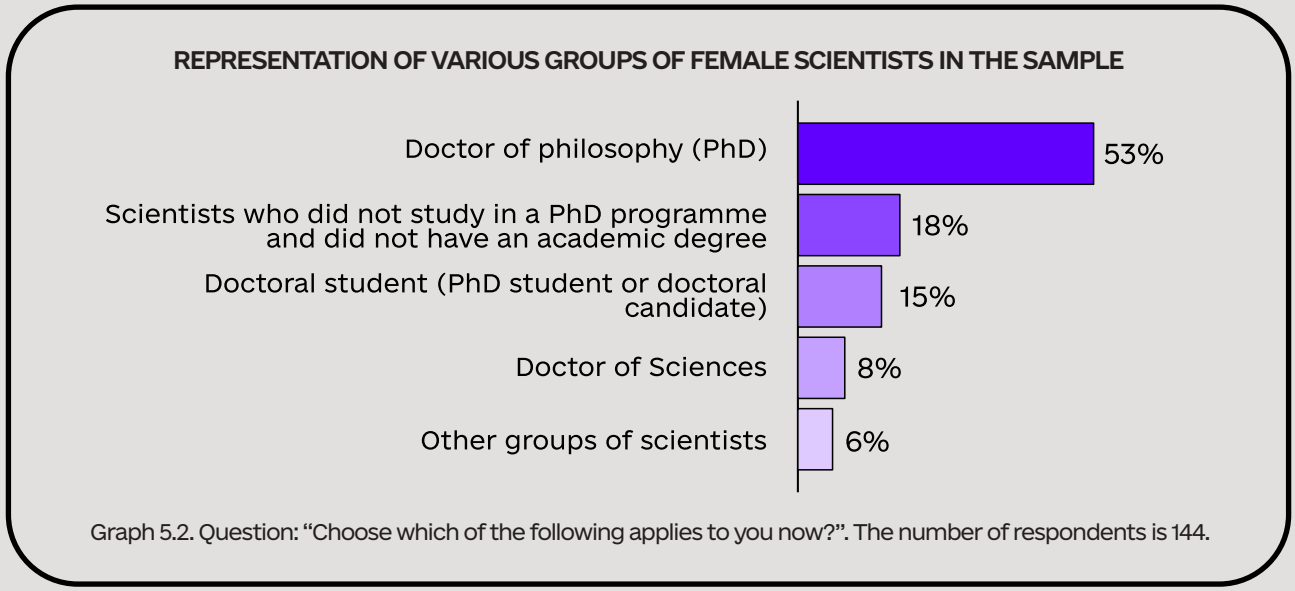


Graph 5.1. Question: "Where do you work and live now?". The number of respondents is 276.

PROFESSIONAL CHARACTERISTICS OF THE RESPONDENTS

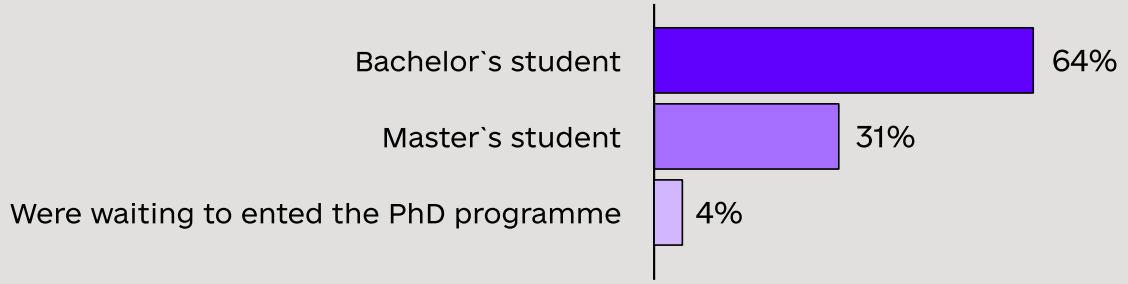
The quantitative survey involved 267 female respondents, including individuals working in the scientific field and students. Approximately half of the respondents (52%) were scientists working in Ukraine at the time of the survey, while one third (33%) were students studying at Ukrainian higher education institutions when they completed the questionnaire. The experiences of female scientists and students working and studying in other countries are much less represented – 11% and 5% respectively. Due to the insufficient number of female respondents who have studied/worked in other countries for statistical analysis, their answers were not analysed in this report. Below is a portrait of the respondents who were 1) researchers working in Ukrainian institutions and 2) students studying in Ukrainian universities.

Among the female scientists who participated in the survey, the largest share had a PhD or a doctorate – 53% of respondents had one of these degrees. 18% of the respondents did not have a degree and were not enrolled in a PhD programme at the time of the survey but worked in the field of science. 15% were students of PhD programmes or doctoral students, 8% held a doctorate.



Graph 5.2. Question: "Choose which of the following applies to you now?". The number of respondents is 144.

REPRESENTATION OF VARIOUS GROUPS OF FEMALE STUDENTS IN THE SAMPLE



Graph 5.3. Question: "Choose which of the following applies to you now?". The number of respondents is 90.

About half of the women scientists who completed the questionnaire worked as researchers — 46%. An additional 19% held senior researcher positions, and 16% were junior researchers. The survey also included engineers (11%) and heads of structural units (15%). Representatives of other positions were represented only once.

Most women scientists worked in the natural sciences — 69% of the women surveyed. Far fewer were engaged in other fields: 6% in mathematics and statistics, 6% in mechanical engineering, and 5% in information technology. Other STEM fields were also rarely mentioned among the respondents' answers.

The female students who participated in the survey were mostly students enrolled in bachelor's programmes — 64%. The remaining 31% were studying in master's programmes, and 4% had completed their master's degree and were waiting for the start of the PhD programme.

Half of the female students surveyed studied natural sciences, while chemical engineering and bioengineering (16%) and information technology (11%) were less common. Other fields were represented sparsely.

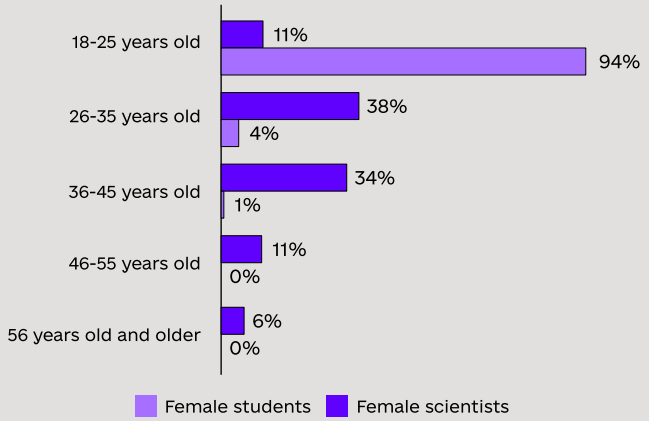
SOCIAL AND DEMOGRAPHIC PROFILE OF THE RESPONDENTS

Most survey participants, both students and researchers, worked and studied in large cities of regional centres — Kyiv, Lviv, Kharkiv. Cities such as Zhytomyr, Zaporizhzhia, Odesa, Rivne, Vinnytsia, Lutsk, Mykolaiv, Ternopil, Chernivtsi were somewhat less common.

All the survey participants are women. Women aged 26–35 and 36–45 prevailed among the scientists — 38% and 34%, respectively. The share of women scientists with the status of "young scientist" was 49%. Among female students, the vast majority of respondents (94%) were aged 18–25.

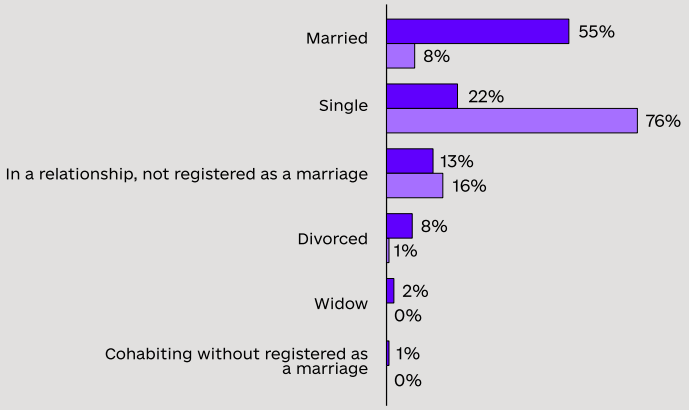
The marital status of female and male scientists differed. Among scientists, the majority were married (55%), whereas among students, the majority were unmarried (92%).

AGE OF RESPONDENTS



Graph 5.4. Question: "How old are you in full?". The number of respondents: scientists — 144, students — 90.

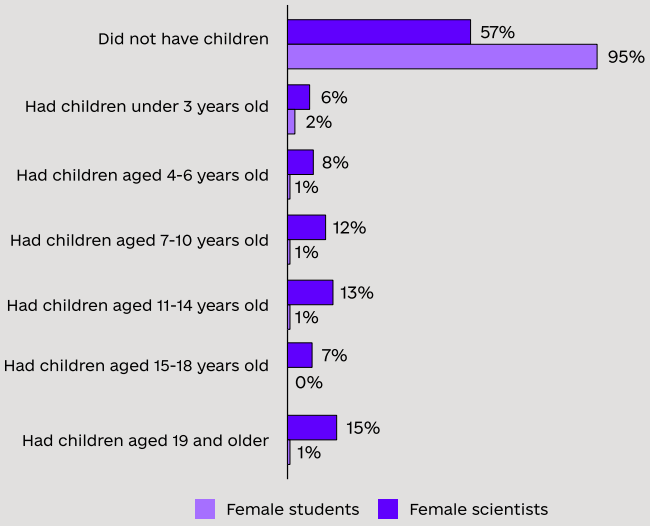
MARITAL STATUS OF RESPONDENTS



Graph 5.5. Question: "Please indicate your marital status". Number of respondents: scientists — 173, students — 103

The majority of respondents said they did not have children. Among female scientists, 55% of them did, and among female students — 94%.

CHILDREN`S PRESENCE AND AGE



Graph 5.6. Question: "If you have children, please indicate their age". The question allowed for the selection of all applicable answers. Number of respondents: 144 female scientists and 90 students.