

---

# Is ICT the future for everyone?

---



Representation of women  
in the ICT sector in Latvia:  
Public perception and  
workplace adaptation  
to gender equality

10 tips how to  
increase the  
representation  
of women in  
the ICT sector

→ 6.lpp.

# On research

## RESEARCH AUTHORS:

Līga Stafecka, Center for  
Public Policy Providus  
Senior Researcher  
Sintija Tarasova, Center  
for Public Policy Providus  
Junior Researcher

## RESEARCH CONSULTANTS:

Agnese Lāce, Center for  
Public Policy Providus  
Leading Researcher  
Iveta Kažoka, Center for  
Public Policy Providus Head  
and Leading Researcher

**DESIGN:** Alexey Murashko

The research was  
implemented by the  
order of the IT Education  
Fund foundation  
and Accenture Latvia.





# Contents

**Summary** 4

**10 propositions to increase women representation in the ICT sector** 6

**Introduction** 12

**I Key conclusions from studies conducted in other countries** 15

Stereotypes about gender roles begin to form in early childhood and continue to develop throughout life 15

Different encouragement to take an interest in technical sciences and STEM subjects in childhood 16

In the teenage period, girls rapidly lose interest in STEM subjects 16

Women are highly self-critical, which hinders their readiness to pursue a career in the IT field 17

Difficulty in combining a professional career with caring for the family 17

Difficulty of fitting into the team, exclusion, sexism, sexual harassment 18

Unconscious prejudices against women 18

Lower salaries for women 18

**II Perceptions of society on the ICT sector and gender roles in it** 19

General stereotypes of gender roles and professions—self-assessment of the Latvian society 19

Would the residents of Latvia recommend a 15-year-old schoolgirl to consider a career in the ICT sector? 19

Would the residents of Latvia recommend a 35 to 45-year-old woman to consider a career in the ICT sector? 23

What do the residents of Latvia associate with the ICT sector? 26

Would residents of Latvia choose a woman to repair their computer? 29

Is it equally easy for both genders to acquire skills required in the ICT sector? 31

Conclusions and suggestions 33

**III The role of education and the impact of stereotypes** 35

The curriculum is fragmented and does not promote more interest in technologies 35

The participation of pre-teen girls in programming and robotics interest groups is significantly smaller 36

Young people do not have a sufficient understanding of the ICT sector and the topicality of the ICT skills 36

Boys are significantly more active in computer science lessons, and the approach to learning differs 38

Most of the young people participating in Olympiads of Computer Science (Programming) are boys 38

Girls perform better in the centralised exams 45

The lowest proportion of women in Bachelor's studies and the largest—Doctoral Studies 47

Conclusions and suggestions 53

**IV The main challenges in the work environment of the ICT sector** 55

Diversity management on the company agenda 55

The main challenges of the work environment 55

Conclusions and suggestions 71

## Summary

**THE GOAL OF THE STUDY** is to identify and analyse the main reasons why women in Latvia choose to pursue a career in the ICT sector significantly less often than men, and to offer solutions for the gradual improvement of the situation. It was concluded that women face a number of obstacles and that among those the most difficult to challenge are the stereotypes about gender roles that have become engrained in society. They affect the career choices of a person from an early age.

Stereotypes that exist in society regarding gender-appropriate occupations are pronounced, and they also have a significant impact on the technology sector, which is generally considered to be more suitable for men. The results of the public opinion poll demonstrate that women are being encouraged significantly less to take an interest in this sector from childhood, and the public would most definitely not suggest this field to women, who would like to change their profession at the age of 35–45, encouraging them to focus more on socially orientated occupations, such as social care, health care, education. Data reveal that the sector will be considered more suitable for women, if the public begins perceiving it as successfully compatible with family life.

When analysing the experience of the school students, the influence of both stereotypes and structural factors can be observed. In recent years, opportunities to develop technological knowledge and skills from an early age have increased significantly. Teachers of Informatics or the Basics of Programming, who were interviewed for the study, have noticed that boys are more interested in these study subjects. Although in the centralised exams of nature sciences, girls perform better than boys, only 4% of those participating in the National Olympiad in Informatics are girls, which reflects the proportion of young people more interested in the sector. In addition to the effects of the already mentioned stereotypes, there are also some structural explanations for this. Firstly, the education system as a whole only provides basic knowledge about applications, but a very limited number of schools provide the opportunity to acquire more in-depth knowledge, including programming skills. Thus the environment, in which motivated young people have the opportunity to acquire in-depth knowledge and to develop it, for example, in various competitions, is quite limited and inaccessible to a wider range of those interested. The second important structural factor is the lack of understanding that working in the field of technologies involves a much wider range of competencies than just programming or coding. The teachers have noticed that the interests of girls and boys differ in this respect; for example, girls are more interested in web design, while boys like programming. The industry should look for backing solutions to promote a comparatively supportive public attitude towards the sector as a career choice for young people, in order to stimulate both the overall interest in IT studies and the interest of girls in choosing the sector for their future careers.

There have been no significant improvements in gender representation in higher education over the last decade. In the Bachelor's level studies  $\frac{1}{3}$  of the students are

women, and a slightly better, however, still disproportionate scene can be observed in studies at the Master's and Doctoral level.

Women working in the IT sector have different experiences of the role of gender at work. Female IT professionals are motivated by the dynamic environment of this industry, which promotes growth and creates extensive opportunities to develop new skills in the industry. Remuneration, which on average is higher than in other sectors of similar responsibilities, is also an important motivation. At the same time, however, the female participants of the focus groups shared their experiences within this study regarding gender discrimination and unfavourable attitudes that make them unequal in competition with men. The figures speak for themselves—in the information technology sector in Latvia women receive 20–29% lower remuneration than men.

The long-term dominating state of men in the sector impacts the rules of the game. For example, women currently working in this sector admit that the biggest challenge was to convince their male colleagues of their professional skills exactly after starting their work in this profession. They had to prove that they have good professional skills, regardless of their gender, which is noticed due to the fact that the representation of women in the sector is low.

Paradoxically, this is also the main reason why women themselves are generally very sceptical about implementing extensive, targeted measures, which would increase the representation of women in the sector, even if they understand the purpose. The strong emphasis on the gender aspect seems to undermine their professional abilities and women are afraid of being recruited because of their gender, rather than their professional abilities.

Challenges to achieving a more balanced representation of genders in the ICT sector are also created, not only by the fact that women themselves are afraid of special measures or campaigns created for the specific purpose, but also the fact that both genders working in the sector do not currently see the benefits of diversity or a clear need for change.

This study has been implemented during the Covid-19 pandemic, when the public has the opportunity to appreciate the importance of information technology on a daily basis, starting with various mobile phone applications which help in the fight against the virus, or which provide the possibility of organising business meetings or even large-scale virtual conferences, private parties and distance learning. The data collected in this study demonstrate that young people have already assessed that the technology sector is very promising for their future careers, and that the interest is most likely to increase. It is a good opportunity for the industry to use this interest in order to demonstrate the importance of the technology sector in the future and to show that a more diverse team can deliver better results and meet a wider range of public needs.

# 10 propositions to increase women representation in the ICT sector

## PROBLEM

The reasons for the low representation of women in the ICT sector already emerge in childhood. Thus long-term solutions are required to eliminate the problem.

In general the public supports the career choices of girls in nature sciences/ICT, but girls are significantly less encouraged than boys to choose studies in this field. A generally stereotypical perception has emerged in society (evenly distributed across different socio-demographic groups) of ICT as a field of activity more appropriate for men.

## OBJECTIVE

It should be demonstrated that ICT/nature sciences are equally suitable for girls. Girls should receive additional encouragement to take an interest in the ICT sector.

# 1

**WHAT TO DO: The scope of the ICT sector should be explained: the sector covers a wider range of specialisations than just programming**

In the interviews with educators the representatives of the sector admit that there is a lack of understanding about the professions in the ICT industry, which is mostly associated with programming. However, it covers various fields—computer graphics, web design, analysis of IT systems, knowledge about data security, IT project management, website development and administration, and many other specialisations. On the other hand, according to the results of the focus groups of the study, the most typical stereotypes are about programming being a more suitable profession for men.

# 2

**WHAT TO DO: Cooperation should be established with mass media, that prepares segmented programmes for children of different ages, which already include activities that promote nature sciences, to achieve greater involvement of girls in them**

The industry should use existing entertainment programmes for children of different ages or establish new partnerships, not only to promote the different specialisations of the ICT sector, but also the suitability of it for both genders. For example, a programme for pre-school and primary school children (“Who’s here? I’m here!”) includes a section on experiments,

## 10 PROPOSITIONS TO INCREASE WOMEN REPRESENTATION IN THE ICT SECTOR

but the experiments are led by men and the role of children is also reserved for boys. It would be important for the children and their parents to see that women or girls, as well as men or boys, fit in equally well as the leaders and participants of the experiments. The content of public campaigns or programmes was not analysed within the study, but it would be desirable to examine the possibilities of using media popular among young people to change the perceptions of the industry. A study demonstrates that girls of pre-school age/first grade are four times less likely to receive a constructor as a gift—a gift that provides the possibility to discover how various mechanisms work and promotes interest in technical sciences. This shows that stereotypes about toys suitable for boys and girls from an early age give children an idea of what the most appropriate field of activity for their gender could be.

# 3

**WHAT TO DO: Communication about the involvement of girls in ICT should be promoted**

Existing communication (in mass media, advertising, video and audio) about the ICT sector usually portrays boys as industry specific. In order to promote the interest of girls in the sector, when seeing “positive role models” in the above-mentioned communication platforms, as well as by demonstrating successful female IT specialists more often, it is desirable to talk about this field more often from the girls’ perspective.

# 4

**WHAT TO DO: Special support measures should be organised for schoolgirls, so that girls can acquire equivalent ICT skills**

Parents usually choose to involve boys rather than girls in ICT activities from an early age, making it more difficult for girls to integrate into a boy-dominated environment over time, as well as reinforcing the boys’ stereotypes about ICT as an unsuitable environment for girls. This problem will potentially be addressed by the new curriculum (*Skola 2030*), which will integrate ICT skills into the learning process from the 1st grade and make ICT education equally accessible to both girls and boys. Access to this education will not depend only on parents.

**PROBLEM** Young people (and also the general public) do not have a sufficient understanding of ICT skills and their relevance, as well as career opportunities in the ICT sector.

**OBJECTIVE** The message intended for young people and the general public (including men) should raise awareness of the use and relevance of ICT skills on a wider scale than just the ICT sector.

5

**WHAT TO DO: Campaigns should be implemented that update and explain the demand for various skills (current ones and potential ones) in the labour market**

Information from interviews and online surveys suggests that part of the young people do not consider it necessary to acquire ICT skills, as they do not plan to pursue their careers in the ICT sector. Taking into account the fact that ICT skills are demanded in almost every field and in most positions, the general public should be educated about this field in various campaigns/messages. The Covid-19 crisis provides a background to demonstrate the importance of technologies in everyday life.

**PROBLEM** The public would not recommend the ICT sector as an area for retraining. When women consider the idea of professional changes, they lack the encouragement to choose this field.

**OBJECTIVE** Women should receive more encouragement from companies that their previous experience will benefit the company. When deciding to retrain in the ICT sector, women should receive more encouragement from others (or at least others should not be directed by stereotypes).

6

**WHAT TO DO: Convey and present the stories of positive retraining experiences**

The companies should continue their initiated practice, which involves promoting success stories of women's retraining experiences. Women working in the ICT sector are largely motivated by the dynamism of the industry, which allows one to avoid

routine, and also by higher wages than in other sectors. However, the female members of the focus group, who retrained in the ICT sector, acknowledged that they felt uncertain as to whether the company would value their past experience in positions not related to ICT or whether it would be of any value. In the message to women, who are encouraged to transfer to the ICT sector, it would be worth noting that although they are newcomers to the sector, they are joining it with other knowledge and skills that are important for a technology company.

7

**WHAT TO DO: With the help of the support persons women should be encouraged to choose the ICT sector for retraining**

The campaigns so far have mostly focused on women and they should be continued. At the same time, it is important that women also receive encouragement from those around them, who influence their decision in favour of a career or retraining, or at least that they do not face great resistance from those around them. Thus it would be worth addressing other target groups in such public campaigns. For example, by reaching out to young people to promote them to support the interest of their sister/mother in ICT training/retraining. Or by addressing parents with the stories of other parents' experiences—how they have supported their daughter's choice to study in the field of ICT or motivated her to attend robotics classes in childhood.

The data obtained in the study demonstrate that stereotypes about the ICT sector as a more suitable field for men have become more and more evenly distributed in the public in various socio-demographic groups, including, for example, young people. In order for women to be more encouraged to choose this sector, it is important that the attitudes of those around them change in favour of such a choice. In the focus groups women shared their experience that in several cases parents had discouraged them from studying computer science at university, substantiating it by the fact that it is not a profession that is suitable for women.

**PROBLEM** ICT professionals do not see the benefits or the need for gender balance in the company.

**OBJECTIVE** It should be demonstrated that the result of the work of a diverse team is of higher quality and better designed. Namely, the qualities and experience of those working in a team allow one to achieve better results and thus the company can benefit.

8

**WHAT TO DO:** In both internal and external communication, companies should emphasise an inclusive approach and the benefits of a diverse team

The data show that overall, women value the benefits of diversity more, but in general, both the focus group results and the survey demonstrate that employees will not be the initiators of diversity measures. The understanding of employees regarding diversity is a key factor in making it easier for women to integrate into the work environment.

**PROBLEM** Women fear the activities of positive discrimination, because they seem to emphasise the importance of gender rather than professional skills.

**OBJECTIVE** The message intended for women and the general public (including men), that the company is willing to promote greater gender balance in the sector, must equally include the message that professional skills also matter.

9

**WHAT TO DO:** Taking the significant gender disproportion in the ICT sector into account, it is important to implement diversity management measures aimed especially at increasing the interest of women in the careers of the sector, as well as to implement diversity policies in everyday working life. A balance must be found in the message between personal characteristics, such as gender, background and professional skills, not to form a misconception that professional abilities are less important than gender

The results of the focus groups demonstrated that women are concerned about the various activities aimed at the representation of women in the ICT sector, as they inevitably emphasise gender, but this gives women a contradictory feeling that their professional abilities are thus less important. These fears can have unintended consequences, for example, the impression that women do not support the company policy of increasing the representation of women among the employees.

**PROBLEM** The society in general associates the ICT sector as difficult to be combined with family life.

**OBJECTIVE** It must be demonstrated that work in the ICT sector can be successfully combined with family life and hobbies.

10

**WHAT TO DO:** To create such an image of the ICT sector, that the majority of the Latvian society would consider work in this sector to be not only well-paid and prospective, but also one that can be successfully combined with private life, family and hobbies

The data demonstrate that the public is more likely to recommend this sector to girls, if people are convinced that it can be successfully combined with family life. This aspect is also very important regarding the recommendation for women aged 35–45 to choose this field for retraining. In the public's perception this sector is not associated with one that can be combined well with family life, but employees in focus groups point to the exact opposite—they emphasise that work in this sector can be combined even better with family life. Thus the companies have the opportunity to use the employee evaluation process to change the public perception and to convince them that work in the ICT sector can be successfully combined with family life.

# Introduction

**THE IT SECTOR IN LATVIA** has experienced very rapid growth: during the last 10 years the number of employees in the ICT sector has almost doubled, but the number of companies has almost tripled.<sup>1</sup> According to Eurostat estimates, about 3.84% of the total number of employees work in the ICT sector in Latvia.<sup>2</sup> The growth rate is significantly higher than the market's ability to meet the demand for qualified ICT professionals.<sup>3</sup> More than half of the companies (56%) that have been recruiting have experienced difficulties in attracting good ICT professionals.<sup>4</sup> The significant shortage of employees is encouraging the growing sector to seek ways for increasing its skilled workforce by exploring cooperation with ICT training institutions, including ways to attract more women to the sector; a group that is significantly less represented in the sector due to various social reasons.

**TABLE 1.** Statistics of the Latvian ICT sector

	2008	2018	Δ
Number of employees in the companies of the ICT sector	18 900	36 956	+96%
Number of ICT companies	2560	6895	+169%
Personnel costs in ICT companies (million euros)	273	717	+163%
Corporate profit before taxes (million euros)	301	383	+27%
Turnover of enterprises in the ICT sector (million euros)	2625	3793	+45%
Added value created in ICT companies (million euros)	737	1252	+70%

SOURCE: Central Statistical Bureau

A common problem for many countries around the world is the typical gender segregation in the employment of this sector. On average in Europe, only 16.7% of female ICT professionals work in the ICT sector. In Latvia only every fifth employed ICT specialist is a woman. Data of 2017 demonstrate that approximately 4.4 thousand female ICT specialists (20.9%) and 16.7 thousand (79.1%) male ICT specialists were employed in the ICT sector.<sup>5</sup> The available data that would allow one to assess the dynamics of this problem unfortunately has varying degrees of reliability, but the overall trends suggest that the representation of women in this sector has deteriorated over the last nine years, both in Europe as a whole and in Latvia (see Diagram 1).

1 The designation "ICT sector" is used in the study according to the definition of the Organisation for Economic Co-operation and Development (OECD), which includes the following types of economic activity: ICT manufacturing (NACE classes: 26.11; 26.12; 26.20; 26.30; 26.40; 26.80); ICT wholesale (NACE classes: 46.51; 46.52); ICT service provision (issuing of computer software (NACE classes: 58.21; 58.29); telecommunications (NACE classes: 61.10; 61.20; 61.30; 61.90); computer programming, consulting and related activities (NACE classes: 62.01; 62.02; 62.03; 62.09); data processing, hosting and related activities, operation of internet portals (NACE classes: 63.11; 63.12); repair of computers and peripheral equipment (NACE classes: 95.11; 95.12)

2 Eurostat data for 2017: [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc\\_bde15ap&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_bde15ap&lang=en) (Last viewed on 28.04.2020)

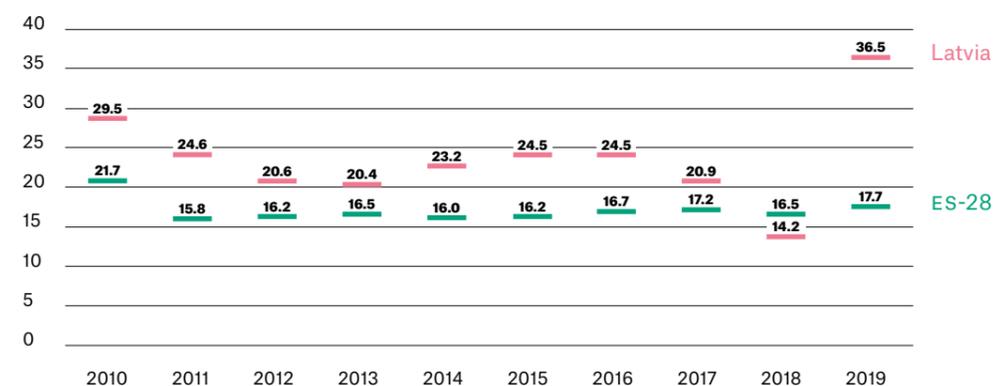
3 ICT specialists or IT specialists are people, the main activity of whom is related to ICT or IT. Their work usually involves the design, development, provision of operation and maintenance of ICT and IT systems, as well as the provision of support (definition used by the Central Statistical Bureau).

4 Eurostat data compiled in December 2018: "ICT specialists — statistics on hard-to-fill vacancies in enterprises" Available here: [https://ec.europa.eu/eurostat/statistics-explained/index.php/ICT\\_specialists\\_-\\_statistics\\_on\\_hard-to-fill\\_vacancies\\_in\\_enterprises](https://ec.europa.eu/eurostat/statistics-explained/index.php/ICT_specialists_-_statistics_on_hard-to-fill_vacancies_in_enterprises) (Last viewed on 28.04.2020)

5 Eurostat data of 2017. Available here: <https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do> (Last viewed on 28.04.2020)

## INTRODUCTION

**DIAGRAM 1.** Female ICT specialists (%): Comparison of Latvia and the EU-28 (2010–2019)



SOURCE: Eurostat database: [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc\\_sks\\_itps&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_sks_itps&lang=en) Data about Latvia for 2018 are of low reliability, but for 2019 — Eurostat estimate.

### The goal of the study

The goal of the study is to identify and analyse the main reasons why women in Latvia choose to pursue a career in the ICT sector significantly less often, and to offer solutions for the gradual improvement of the situation.

This study was conducted in 3 main directions: **1)** evaluating the public perception of gender roles in society and the extent to which they encourage women to pursue a career in the IT sector; **2)** identifying, what motivates the students to acquire ICT skills in-depth at different ages, whether there are differences between the interests of boys and girls and the motivation in this process, as well as later, when choosing a study programme at the higher education institution; **3)** analysing the current work environment, identifying the barriers that female ICT professionals are facing currently and the solving of which could make the sector more attractive to promote the more extensive involvement of women.

### Study methods

— Public opinion poll conducted by the research centre SKDS, surveying 1 014 permanent residents of Latvia aged 18 to 75. Stratified random sampling was used for the survey, and interviews were conducted at the places of residence of the respondents in all regions of Latvia (at 123 selection points). The survey took place from 07.02.2020 till 18.02.2020.

— The focus groups of female IT specialists. In total 3 focus groups were organised, with 17 female IT specialists working in the industry, representing companies of

different sizes and different work experience (the shortest—half a year, the longest—more than 20 years). The focus groups were led by Providus researchers.

- The focus group of male IT specialists. Male IT specialists from 5 companies of different sizes with different levels of work experience took part in it (the shortest—2 years, the longest—more than 36 years). The focus group was led by Providus researchers.
- 2 anonymous surveys on Google forms platform: a survey of female IT specialists, 51 female IT specialists participated; anonymous survey of male IT specialists, 67 male IT specialists participated. Both surveys were used to obtain additional information and an in-depth understanding of the situation. The number of respondents and the applied selection method do not allow one to consider these surveys as being representative; this limitation has been recognised in their results.
- Anonymous online survey for school students of grades 7–12 on the Google forms platform. 388 students from different schools of Latvia participated in it: 244 girls and 144 boys. The survey is not considered representative, but it allows one to draw general conclusions.
- 12 interviews with teachers, who represent schools of general education, non-formal education and higher education programmes.
- 3 interviews with human resource development specialists of companies in the ICT sector.
- Data collection and analysis.
- Summarising of the findings of studies conducted in other countries.

## I Key conclusions from studies conducted in other countries

**MANY STUDIES HAVE BEEN DEVOTED** to the typical problem of gender inequality in the field of information technologies, trying to understand the causal relations both at the stage of obtaining education and in the development of a professional career.

Studies demonstrate that there are different levels of obstacles to the more extensive representation of women in the ICT sector. The most complex of these are public stereotypes about gender-appropriate roles, which significantly influence future career choices. The situation is also affected by various internal barriers, such as the psychological differences of genders regarding self-esteem and internal competition, the approaches to work, as well as factors such as gender discrimination, difficulties of combining work and private life, family roles or a lack of apparent success stories, etc. Next a summary of the most frequently mentioned findings from various studies is provided.

### **Stereotypes about gender roles begin to form in early childhood and continue to develop throughout life**

Stereotypes about gender roles (gender stereotypical belief that women and men have certain character traits) are one of the influencing factors that determine the goals and ambitions that women set for themselves. While not all researchers agree on how significantly the stereotypes impact gender specific behaviour, in most cases it is acknowledged that we as individuals gain an understanding and idea of gender roles early in life through observational learning, which influences stereotypical beliefs and may consequently encourage stereotypical behaviour. I.e., by observing the environment around themselves, individuals learn at an early age to associate certain characteristics with specific genders (for example, when a boy plays with cars, the following pattern of thought develops: “Cars are for boys. I’m a boy. So cars are appropriate for me.”<sup>6</sup>

This early experience also influences how people rationalise existing gender inequalities by justifying them with gender specific characteristics. For example, by observing the fact that women are more likely to take care of other people (in positions such as nurses, social workers, educators, etc.), women are generally perceived as caring and affectionate (when compared to men); and by observing that men are more likely to hold positions related to development and management positions; they are generally perceived as more convincing, logical, dominant (when compared to women). As a result women and men themselves may consciously and/or unconsciously accept and take over such stereotypical thinking about their own gender and the opposite gender, which further influences the actions of these individuals.<sup>7</sup>

<sup>6</sup> Olsson, M., & Martiny, S.E. (2018). Does Exposure to Counterstereotypical Role Models Influence Girls' and Women's Gender Stereotypes and Career Choices? A Review of Social Psychological Research. *Frontiers in psychology*, 9, 2264. <https://doi.org/10.3389/fpsyg.2018.02264>. (Last viewed on 05.05.2020)

<sup>7</sup> Olsson, M., & Martiny, S.E. (2018). Does Exposure to Counterstereotypical Role Models Influence Girls' and Women's Gender Stereotypes and Career Choices? A Review of Social Psychological Research. *Frontiers in psychology*, 9, 2264. <https://doi.org/10.3389/fpsyg.2018.02264> (Last viewed on 05.05.2020)

### Different encouragement to take an interest in technical sciences and STEM subjects in childhood

According to studies analysing the offer of toys, as well as the labelling of toys on the market (distribution into toys intended for girls and boys) it has been concluded that girls and boys have a different interest in the STEM industry from an early age—boys are more interested in technical sciences and through toys they are constantly encouraged to develop this interest.<sup>8</sup> Toys for boys are usually related to technical solutions, construction, contain changeable parts, mechanisms, will be controllable, hence focused on technical skills, regularities and spatial thinking. Girls will usually be stimulated to develop social skills, communication, emotions, empathy (such as caring for children, animals) and beauty care, but the incentive to take an interest in STEM subjects will be significantly lower.<sup>9</sup> The advertising market and the media reinforce these stereotypes.<sup>10</sup> Social perceptions affect not only the people around children, but also how children perceive themselves.

### In the teenage period, girls rapidly lose interest in STEM subjects

In recent years, reviews of the topic are often based on the 2017 Microsoft survey of the interest of school-age girls in STEM subjects in Europe. The study was conducted in 12 European countries, but Latvia was not among them. In a study based on focus groups and the survey of 11.5 thousand girls it was concluded that the interest of girls in STEM subjects occurs at the age of about 11–12, but rapidly decreases at the age of 15–16. The interest in humanitarian subjects also decreases. Later, the interest in STEM subjects returns, but in comparison to humanitarian subjects it renews to a lesser extent. 3–4 years between these ages is crucial for promoting the interest of girls in technologies. In the study it was concluded that 5 main driving forces, that increase the interest of girls in STEM subjects, are: **1)** visible, inspiring examples of women; **2)** practical experience in the school and outside it and the creative learning process; **3)** encouragement to girls provided by teachers (also family members, friends); **4)** greater understanding of the practical applicability and usefulness of this knowledge in the future; **5)** the belief that girls will be treated equally in this sector (the impression that inequalities exist in STEM discourages girls from choosing future studies in this field).<sup>11</sup>

<sup>8</sup> Inmann J., Cardella M. "Gender Bias in the Purchase of STEM-Related Toys (Fundamental)", June 2015, ASEE Annual Conference & Exposition, American Society for Engineering Education, Seattle, Washington. Auster J.C.; Mansbach C.S. "The Gender Marketing of Toys: An Analysis of Color and Type of Toy on the Disney Store Website", June 2012. Sex Roles, 67:375–388.

<sup>9</sup> Caleb, L. "Design Technology: Learning how girls learn best". Equity & Excellence, 2000. Vol.33, Issue 1.

<sup>10</sup> A study by the UK-based Institution for Engineering and Technology in 2016 stated that STEM related toys intended for boys were three times more common than those intended for girls. An analysis of the distribution of toys for boys and girls on the websites of the 10 largest toy retailers, as well as the results of the major search engines (Google, Yahoo, Bing) for boys' and girls' toys demonstrated that STEM related toys were labelled as toys for boys in 31% of cases, while they were only included in 11% of the cases in the section intended for girls. Source: The Institution of Engineering and Technology: "Parents, retailers and search engines urged to 're-think the pink' next Christmas" 06 December 2016. Available here: <https://www.theiet.org/media/press-releases/press-releases-2016/06-december-2016-parents-retailers-and-search-engines-urged-to-re-think-the-pink-next-christmas/> (Last viewed on 28.04.2020)

<sup>11</sup> "Why Europe's girls aren't studying STEM", Microsoft. 2017. The study was conducted in 12 European countries, interviewing 11 500 girls and organising focus groups for 54 girls in 9 countries. The study is available here: <https://www.yumpu.com/en/document/read/57225034/why-europes-girls-arent-studying-stem> (Last viewed on 05.05.2020)

### Women are highly self-critical, which hinders their readiness to pursue a career in the IT field

A number of studies on the subject focus on the differences between the self-esteem of women and men regarding the implementation of work, their readiness to take risks and to engage in discussions that are closely related to stereotypes that exist in the society—what is expected of women and what is expected of men.<sup>12</sup> Women are more likely to be influenced by the fear of making mistakes, therefore women will be much more cautious in their job responsibilities, when facing problems, and will more likely look for their own mistakes, while men will more likely explain them through external circumstances.<sup>13</sup> The main reasons for such differences are related to the perceptions in society that girls behave significantly better, observe the rules and are accurate. There are no such expectations regarding boys. When analysing this issue, many authors rely on a study conducted internally by US information technology company Hewlett-Packard, which states that women apply for vacancies, if they meet 100% of the qualification requirements, while men apply, if they meet about 60% of the qualification requirements.<sup>14</sup> This observation is also reflected in the study conducted in the US on recruitment or promotion; hence, that women are more likely to be judged by their work experience, past performance, while men—by their potential.<sup>15</sup> Women are more likely to emphasise where they lack experience, while men will emphasise what they can do.<sup>16</sup>

### Difficulty in combining a professional career with caring for the family

In a study concluded in the UK, the goal of which was to understand the reasons why women leave the ICT sector, it was concluded that one of the main reasons was the excessive stress of combining professional development created in the dynamic IT environment with a well-executed social role in the family—caring for children and the household, which society and also women themselves consider to be mainly the responsibility of women.<sup>17</sup> It is estimated that women in Europe spend an average of 30 hours a week caring for children and the household; hence, for so-called unpaid work, while men spend half the time on it—16 hours. At the same time men perform more paid work than women—on average 39 hours a week, but women—30 hours.<sup>18</sup> In the mentioned study women point out<sup>19</sup>, that working in this sector is associated with overtime, a high readiness to respond to problem situations outside working hours, business trips—other circumstances that significantly hinder their ability to combine it with family life. Thus in companies, where the internal culture is not supportive regarding families with children, women are more likely to decide on leaving the company.

<sup>12</sup> Bertrand M. "New Perspectives on Gender". Booth School of Business, Handbook of Labor Economics, 2010. Volume 4b. University of Chicago, NBER, CEPR and IZA.

<sup>13</sup> Koch S.C., Müller S.M., Sieverding M. "Women and computers. Effects of stereotype threat on attribution of failure", Computers & Education, Volume 51, Issue 4, December 2008, Pages 1795–180

<sup>14</sup> Tara Sophia Mohr: "Why Women Don't Apply for Jobs Unless they're 100% Qualified?", August 24, 2014, Harvard Business Review [<https://hbr.org/2014/08/why-women-dont-apply-for-jobs-unless-theyre-100-qualified>]

<sup>15</sup> Barsh J, Yee L. "Unlocking the full potential of women in the US economy", McKinsey and Company, 2011. <https://www.mckinsey.com/business-functions/organization/our-insights/unlocking-the-full-potential-of-women>

<sup>16</sup> Women Active in the ICT Sector. Final Report. A study prepared for the European Commission. DG Communications Networks, Content & Technology by Iclaves S.L., European Union, 2013.

<sup>17</sup> Griffiths M., Karenza M "Disappearing Women: A Study of Women Who Left the UK ICT Sector" Journal of Technology, Management and Innovation. 2010., Vol.5, Issue 1.

<sup>18</sup> 6th European Working Conditions Survey, Eurofound 2015. Available here: [https://ec.europa.eu/info/sites/info/files/factsheet-gender\\_pay\\_gap-2019.pdf](https://ec.europa.eu/info/sites/info/files/factsheet-gender_pay_gap-2019.pdf) (Last viewed on 28.04.2020)

<sup>19</sup> Griffiths M., Karenza M. "Disappearing Women: A Study of Women Who Left the UK ICT Sector" Journal of Technology, Management and Innovation. 2010., Vol.5, Issue 1.

### Difficulty of fitting into the team, exclusion, sexism, sexual harassment

In a study conducted in the UK, women who have left the IT sector share their reasons for leaving, among which they mention the experience that the significant predominance of men in the team leads to various unpleasant situations, such as a difficulty fitting into the male collective, the inability of women to accept the men's humour, different approaches to solving conflict situations (women are less likely to be aggressive), more often the achievements of women (such as career advancements) will be associated with attractive looks rather than professional abilities, offensive jokes and remarks being made about appearance or clothing, the rejection of which tends to translate into the inability to fit into the team. Women have also experienced sexual harassment at work.<sup>20</sup>

### Unconscious prejudices against women

In most developed countries discrimination is prohibited, but the experience of women shows that in sectors where there is significant gender disproportion, so-called unconscious bias or discrimination is experienced based on society stereotypes regarding particular groups of people. Such prejudices affect the assessment of the suitability of one or the other gender for certain professions. For example, unintentional prejudices can negatively affect the chances of a woman being recruited for a higher and better paid position or a profession dominated by men.<sup>21</sup> In the ICT sector women are questioned regarding their skills and abilities in the technical sciences, which in general has a significant impact on the willingness of girls to study STEM sciences.<sup>22</sup> It also affects employers, who have different views on the importance of the studies of women and men in these sciences.

### Lower salaries for women

In general women in the ICT sector earn more than for responsibilities of a similar level in other sectors. However, measurements of inequality in salaries demonstrate that the professional abilities of women are significantly underestimated in the information technology sector. The indicators demonstrate that the pay gap between women and men—ICT entrepreneurs—in European countries has increased from 20% (2010) to 30% (2015), but the pay gap at the level of ICT professionals has decreased to around 12%.<sup>23</sup> In this case ICT entrepreneurs mean either persons, who have founded a company or are self-employed persons.

<sup>20</sup> Griffiths M., Karenza M. "Disappearing Women: A Study of Women Who Left the UK ICT Sector" *Journal of Technology, Management and Innovation*. 2010, Vol.5, Issue 1. Similar problems have also been outlined within this study: *Women Active in the ICT Sector. Final Report. A study prepared for the European Commission DG Communications Networks, Content & Technology by Iclaves S.L., European Union, 2013.*

<sup>21</sup> Coffman K.B., Exley C.L., Niederle M. "The Role of Beliefs in Driving Gender Discrimination", Working Paper, Harvard Business School, December 11, 2019.

<sup>22</sup> One of the conclusions about what prevents the teenage girls from choosing STEM studies, which is provided in this study: "Why Europe's girls aren't studying STEM", Microsoft. 2017.

<sup>23</sup> "Women in the Digital Age" Final Report. A study prepared for the European Commission. DG Communications Networks, Content & Technology by: Iclaves, S.L. in cooperation with the Universitat Oberta de Catalunya (UOC), European Union, 2018, p.75.

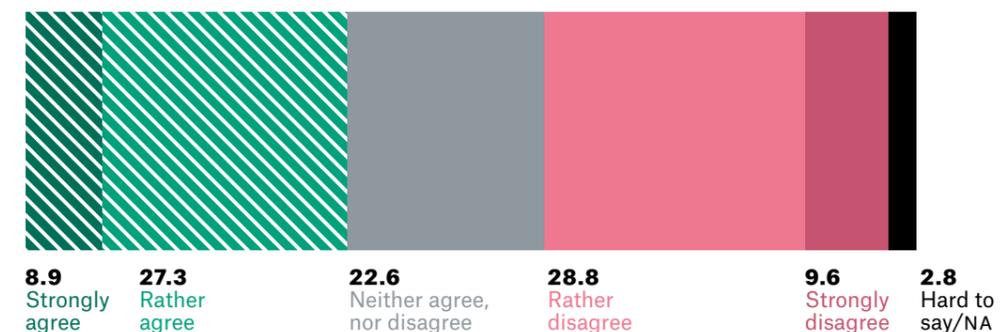
## II Perceptions of society on the ICT sector and gender roles in it

**FOR THE PURPOSES OF THIS STUDY**, a public opinion poll was conducted<sup>24</sup> to find out whether the low representation of women in the ICT sector is related to gender stereotypes in the society of Latvia. In this section the results of the survey are analysed.

### General stereotypes of gender roles and professions—self-assessment of the Latvian society

As is apparent in Diagram 2, opinions in the society of Latvia regarding the fact of whether both genders can perform all professions equally well are divided. Only one in five people have a strict opinion regarding this issue; 9% clearly support the idea of both women and men being equally successful in all professions, and 10% are absolutely convinced that women and men cannot be equally successful. The rest of the residents in Latvia either have more moderate views or they do not have their own views on this issue.

**DIAGRAM 2.** Can both genders work equally well in all professions? (%)



SOURCE: SKDS survey, 2020. n=1014

### Would the residents of Latvia recommend a 15-year-old schoolgirl to consider a career in the ICT sector?

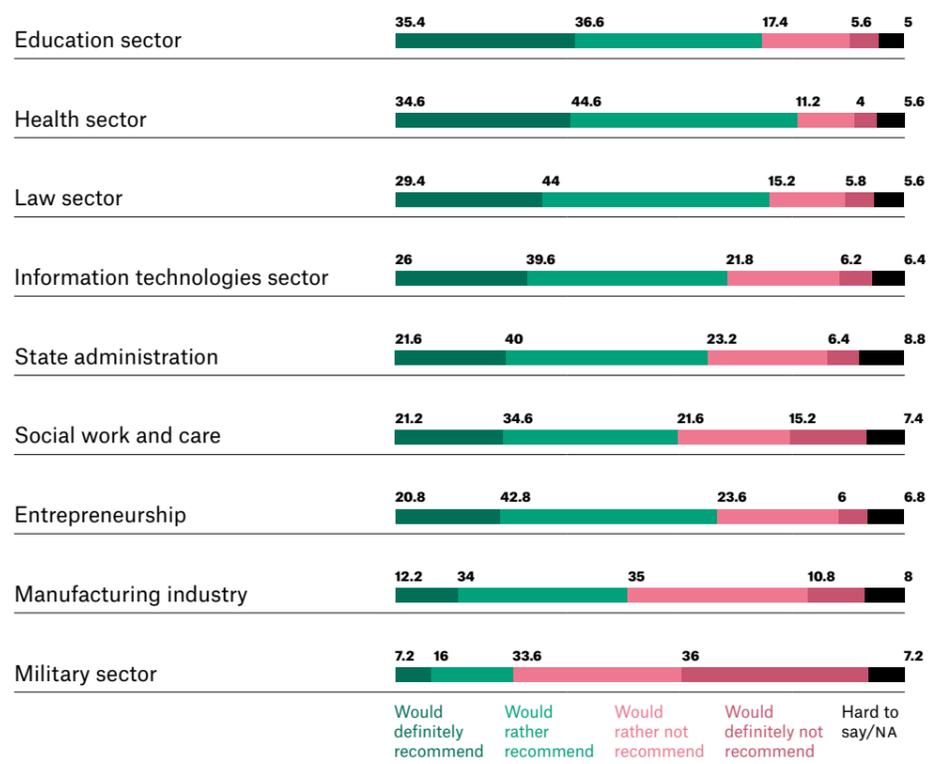
Taking the 2017 Microsoft survey on the interest of teenage girls in exact subjects and the conclusion that the interest in them significantly decreases at around the age of 15 into account, the survey included questions<sup>25</sup> to find out the extent of encouragement that teenagers in Latvia receive in pursuing their interest in this field. The respondents were divided into two groups, where approximately half were asked about career advice for a 15-year-old girl and the other half about career advice for a 15-year-old boy. The respondents were offered to choose from 8 industry options. Diagram 3 shows that the society in Latvia would comparatively often be ready to suggest that girls consider a profession in the ICT sector—this is one of the most popular choices.

<sup>24</sup> The survey was conducted by the research centre SKDS, surveying 1 014 residents of Latvia aged from 18 to 75. Stratified random sampling was used for the survey, and interviews were conducted at the places of residence of the respondents in all regions of Latvia (at 123 selection points). The survey took place from 07.02.2020 till 18.02.2020.

<sup>25</sup> "Why Europe's girls aren't studying STEM", Microsoft. 2017. The study was conducted in 12 European countries, interviewing 11 500 girls and organising focus groups for 54 girls in 9 countries. The study is available here: <https://www.yumpu.com/en/document/read/57225034/why-europes-girls-arent-studying-stem> (Last viewed on 05.05.2020)

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

**DIAGRAM 3.** Advice on choosing a profession for a 15-year-old girl (%)



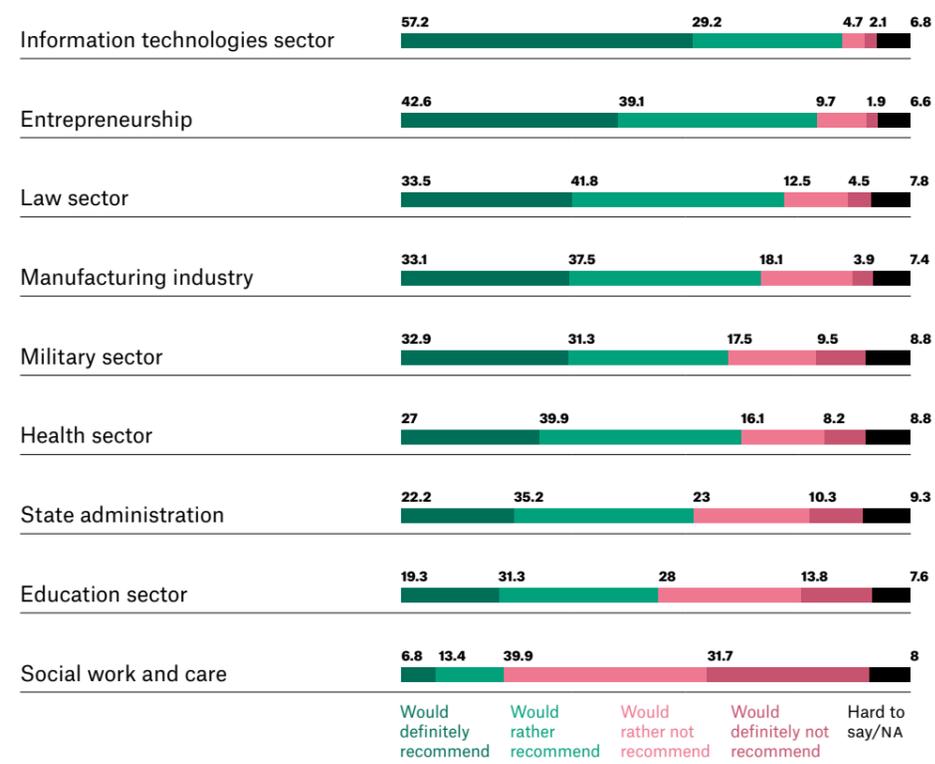
SOURCE: SKDS survey, 2020. n=500

At the same time, it is interesting that the ICT sector for girls competes with comparatively similar support in the fields of education, health, law, public administration, social work and entrepreneurship. If we compare these indicators with the career choices offered to 15-year-old boys (Diagram 4), it can be observed that the choices recommended by the society of Latvia for girls and boys significantly differ. For boys the ICT sector is recommended as a priority and its main competitor is entrepreneurship.

SURVEY QUESTION: What industries would you recommend, and which ones would you not recommend to a 15-year-old girl, who is considering her future profession before entering high school?

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

**DIAGRAM 4.** Profesijas ieteikumi 15 gadus veciem zēniem (%)



SOURCE: SKDS survey, 2020. n=514

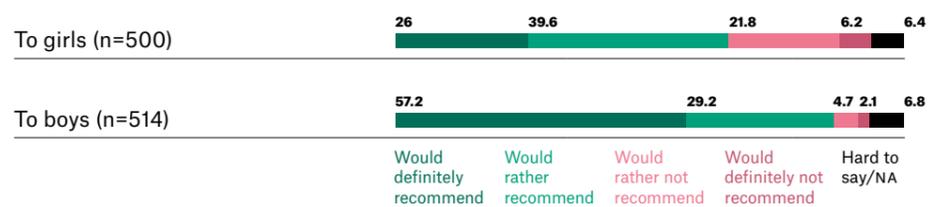
Significant differences can also be observed, when comparing the recommendations of the ICT sector in-depth for girls and boys (Diagram 5). 57% of the society in Latvia believe that the ICT sector is definitely a good choice for boys, while only half of this number of respondents have the same clarity towards girls.

The data in Diagram 5 demonstrate a positive trend that there are very few people in the Latvian society (about 6%), who strongly believe that 15-year-old girls should not consider a career in the ICT sector at all. At the same time, 22% are questioning such choice. This shows that the gender differences in the social encouragement of students for choosing the ICT sector actually do exist, i.e., the girls will find it more difficult than the boys to justify such a choice to society, the encouragement of society regarding this choice will not be as great, but the differences are also not profound. Society in Latvia generally supports the choice of the ICT sector of the future female students.

SURVEY QUESTION: What industries would you recommend, and which ones would you not recommend to a 15-year-old boy, who is considering his future profession before entering high school?

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

**DIAGRAM 5.** Recommendations of the ICT sector occupation for boys and girls: a comparison (%)



SOURCE: SKDS survey, 2020

Interestingly, the encouragement for girls to consider the ICT sector is not closely related to the respondent’s gender, age (see Diagram 6) or nationality. It is not the case, for example, that younger residents of Latvia would more often encourage girls to decide in favour of the ICT sector.

**DIAGRAM 6.** Recommendation of the ICT sector to a 15-year-old girl depending on the age of the respondent (%)

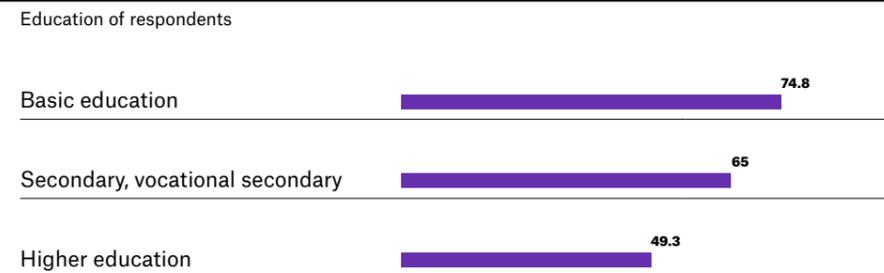


SOURCE: SKDS survey, 2020

The only consistent and pronounced connection—the education of the respondents. The higher the education of the respondent, the more likely he/she is to recommend a 15-year-old girl to consider the ICT sector (Diagram 7).

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

**DIAGRAM 7.** Recommendation of the ICT sector to a 15-year-old girl depending on the education of the respondent (%)



SOURCE: SKDS survey, 2020

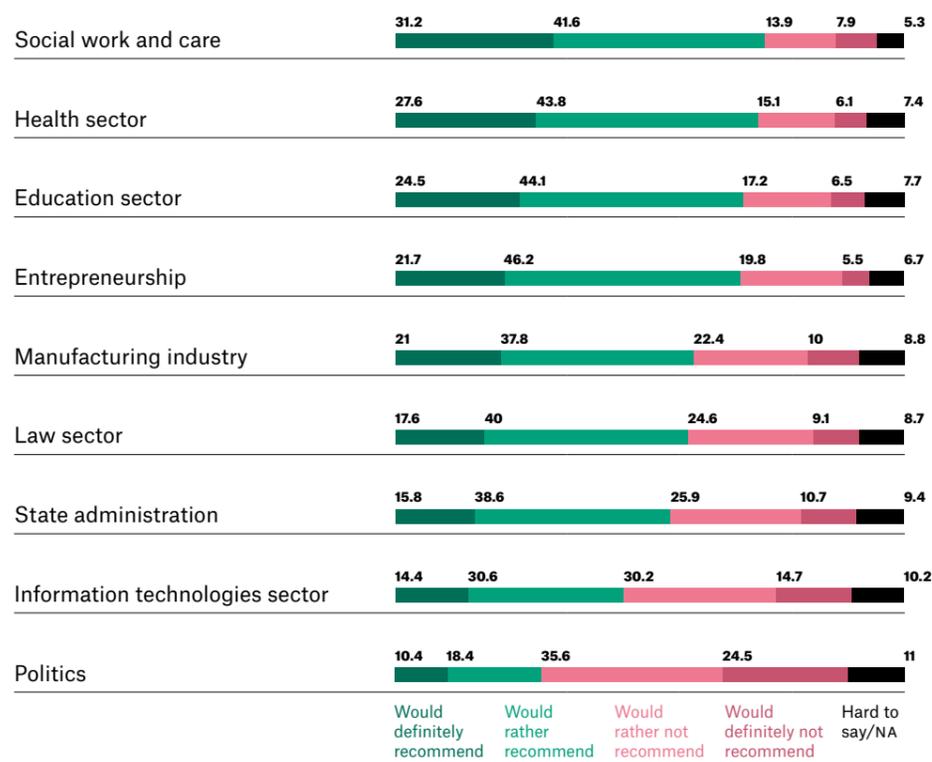
It is worth mentioning that regarding boys, these correlations cannot be observed. Namely, people with different levels of education are equally ready to recommend the ICT sector to a 15-year-old boy. Also, in comparison to the recommendations for girls, there is also a small age difference— young people are more often ready to recommend the ICT sector to 15-year-old boys.

**Would the residents of Latvia recommend a 35 to 45-year-old woman to consider a career in the ICT sector?**

Diagram 8 shows that in contrast to the recommendations for 15-year-old girls, society in Latvia is more sceptical about recommending the ICT sector to women, who would like to retrain and change their profession within their careers. Less than half of the residents in Latvia would recommend such career changes. The same number would not support such a change of profession or would be sceptical about it.

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

**DIAGRAM 8.** The recommended sectors for women aged 35–45 (%)



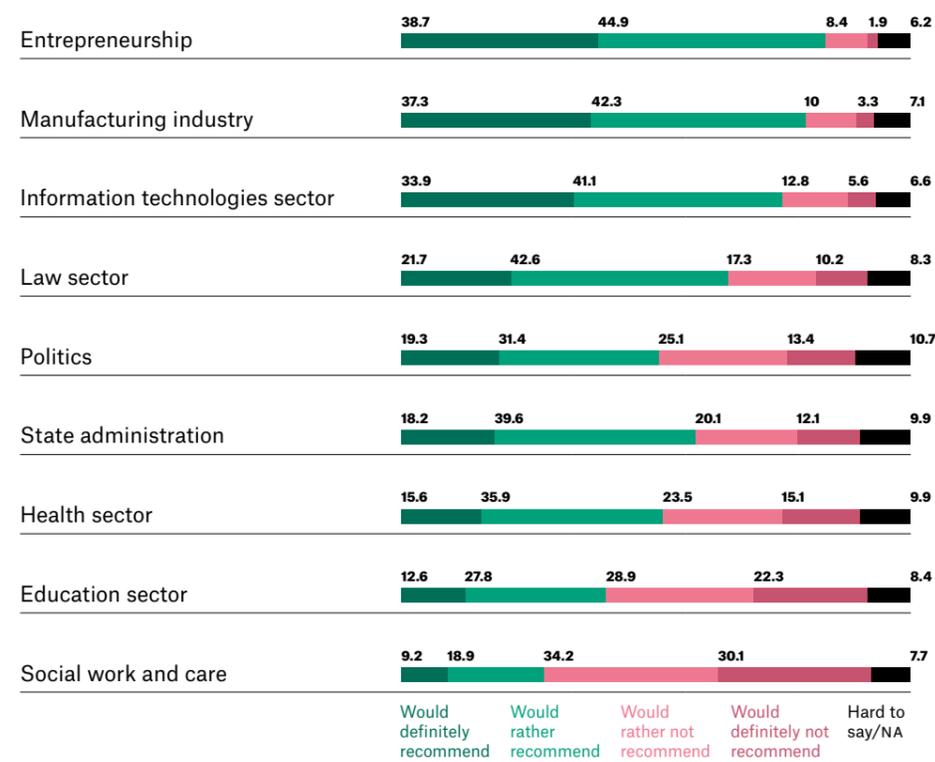
SOURCE: SKDS survey, 2020

The decline, although not nearly as pronounced, can also be observed regarding the retraining opportunities of men aged 35–45 (Diagram 9). ICT is no longer the most popular sector—entrepreneurship and production sectors are exceeding it.

**SURVEY QUESTION:**  
What sectors would you recommend, and which would you not recommend for a woman aged 35–45, who is willing to change her profession and is ready to acquire a new qualification?

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

**DIAGRAM 9.** The recommended sectors for men aged 35–45 (%)



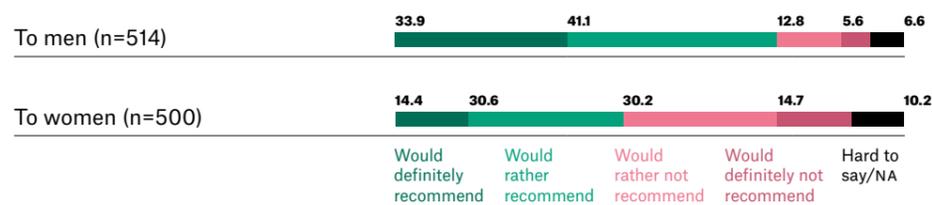
SOURCE: SKDS survey, 2020

Diagram 10 shows that women, who are considering a career change at the age of 35–45 in favour of the ICT sector, will have to face stronger opposition than men—almost half of the residents of Latvia believe that the transition to the ICT sector is no longer suitable for women at this age. Comparatively—only every fifth resident of Latvia thinks similarly about men.

**SURVEY QUESTION:**  
What sectors would you recommend, and which would you not recommend for a man aged 35–45, who is willing to change his profession and is ready to acquire a new qualification?

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

**DIAGRAM 10.** ICT as the recommended retraining sector for women and men aged 35–45: a comparison (%)



SOURCE: SKDS survey, 2020

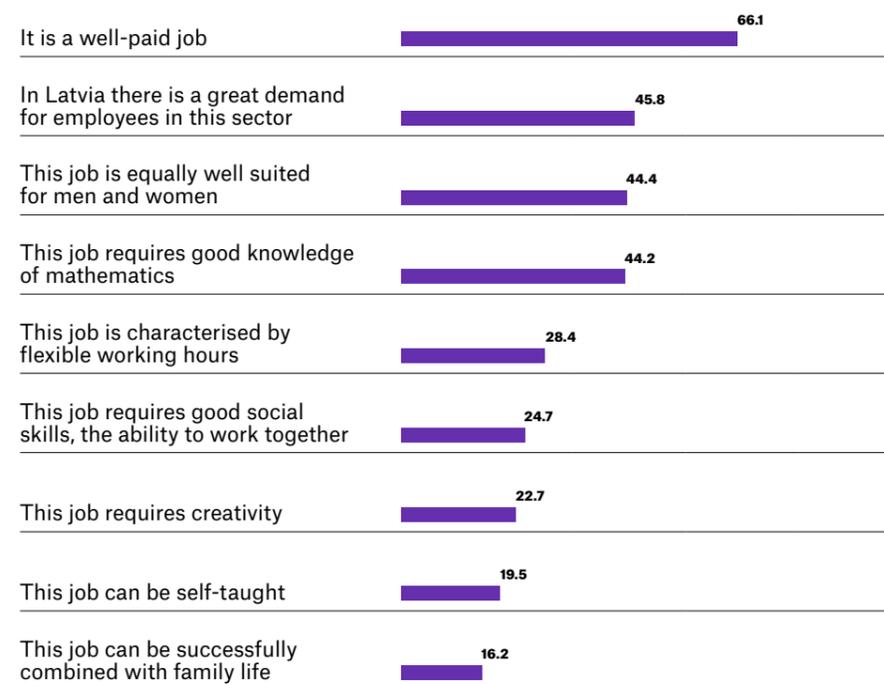
Interestingly no clear differences in the age, gender, nationality, and education levels in the answers of the respondents can be observed regarding the retraining opportunities for women in the ICT sector at the age of 35–45. Regarding the retraining opportunities for men, there are differences in education level (the higher the education, the more positive the attitude), and it is also unusual that the greatest scepticism regarding the retraining opportunities for men can be observed in the age group, to which it is applied, namely respondents aged 35–45.

**What do the residents of Latvia associate with the ICT sector?**

In order to find out the assumptions of Latvian society about working in the ICT sector, the respondents were asked to mark all the statements about this sector which they agree with (Diagram 11).

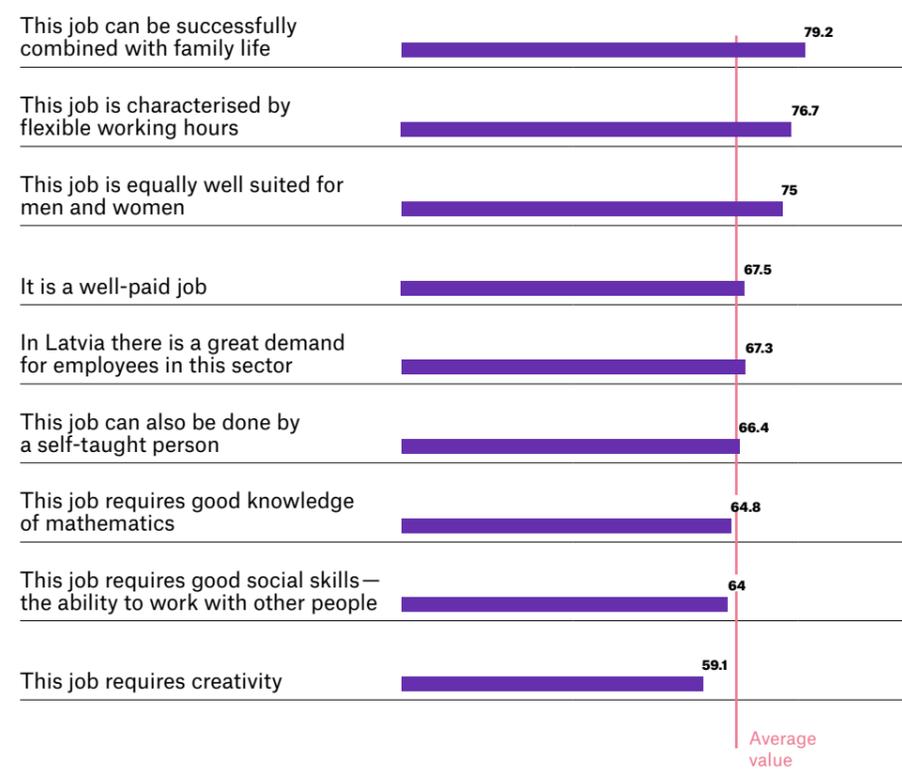
II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

**DIAGRAM 11.** Associations of the Latvian society regarding the ICT sector (%)



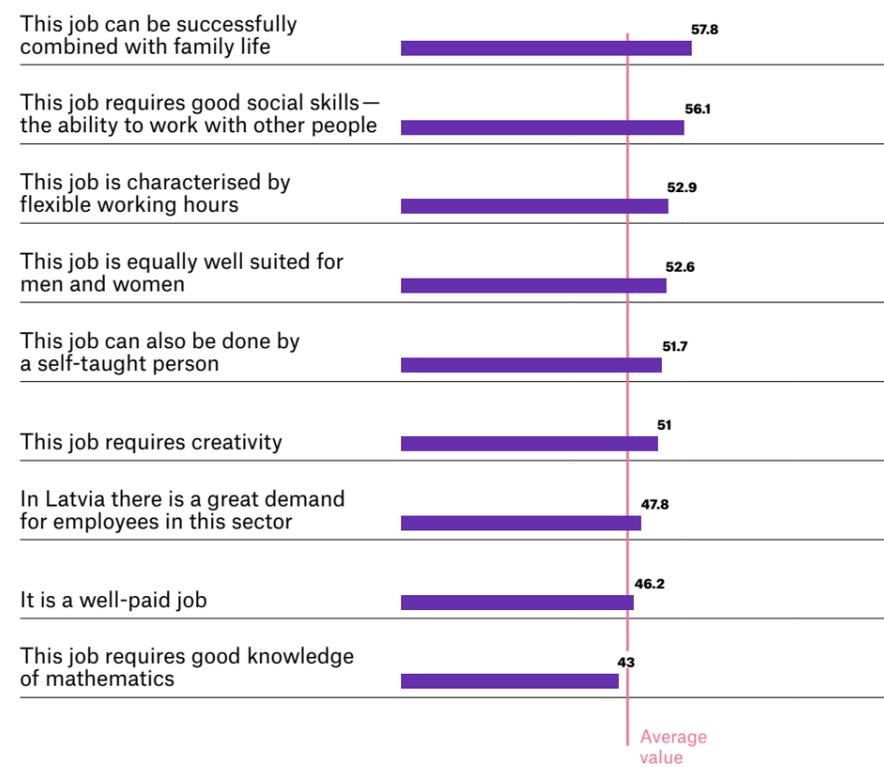
SOURCE: SKDS survey, 2020

As it can be observed in the previous diagram, many Latvians have noticed that the ICT sector offers good salaries. About half believe that this job requires good knowledge of mathematics, that it is suitable for both genders and that there is a high demand for employees in this sector. At the same time, society in Latvia is very sceptical about the fact that working in the ICT sector can be successfully combined with family life, that it can be self-taught, that it is a creative job, that good social skills are useful for the implementation of it and that it is characterised by flexible working hours. A deeper analysis of the data demonstrated that these assumptions of the Latvian society about working in the ICT sector are related to the relatively small representation of women in the sector. Diagram 12 demonstrates that a 15-year-old girl will more likely receive a recommendation to consider a career in the ICT sector from people, who consider (more often than on average) that working in this sector can be successfully combined with family life and offers flexible working hours, as well as are convinced that both men and women can work equally well in the ICT sector.

II PERCEPTIONS OF SOCIETY ON THE ICT  
SECTOR AND GENDER ROLES IN IT**DIAGRAM 12.** What associations do those, who are willing to recommend the sector to a 15-year-old girl, have with the ICT sector? (%)

SOURCE: SKDS survey, 2020

A similar trend is demonstrated in Diagram 13 regarding the retraining recommendations for women aged 35–45. Such recommendations will be made more often by people, who consider that working in the ICT sector can be successfully combined with family life, also requires social skills, is flexible and equally well suited for both genders.

II PERCEPTIONS OF SOCIETY ON THE ICT  
SECTOR AND GENDER ROLES IN IT**DIAGRAM 13.** What associations do those, who are willing to recommend retraining option to a 35 to 45-year-old woman, have with the ICT sector? (%)

SOURCE: SKDS survey, 2020

Interestingly, the successful compatibility with family life and work in the ICT sector is an option relatively rarely selected regarding career choices for 15-year-old boys and 35 to 45-year-old men. The most prominent associations here regarding work in the ICT sector are the high demand in the sector, the ability to acquire self-taught skills and flexible working hours.

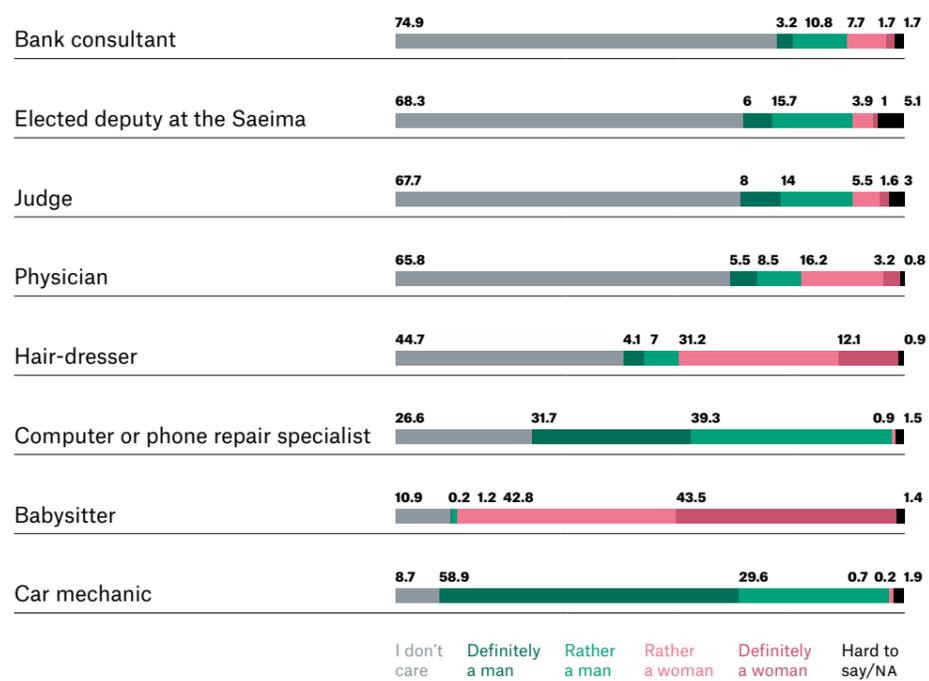
**Would residents of Latvia choose a woman to repair their computer?**

Diagram 2 that is reviewed at the beginning of this analysis, demonstrated that approximately 35–40% of the residents in Latvia believe that women and men can do all jobs equally well; a similar proportion of the society of Latvia believes that they cannot, and the rest do not have a clear opinion. However, is such self-assessment of the Latvian

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

society reliable? To clarify this, the respondents were asked to answer the question of whether they would choose a woman or a man for implementing a particular job, or they would find this choice the same. According to Diagram 14 the responses of the Latvian society regarding the professional equality of genders are much more complicated than the society itself considers. Public perceptions of some professions truly are gender neutral (e.g., consultants at banks), while others demonstrate varying degrees of gender stereotypes, ranging from extreme (e.g., car mechanic as a male profession and babysitter as a female profession) to less pronounced (e.g., judge as a more suitable profession for men and a hairdresser as a more suitable profession for women).

**DIAGRAM 14.** Professional equality of genders, when asking about choices regarding a particular profession (%)

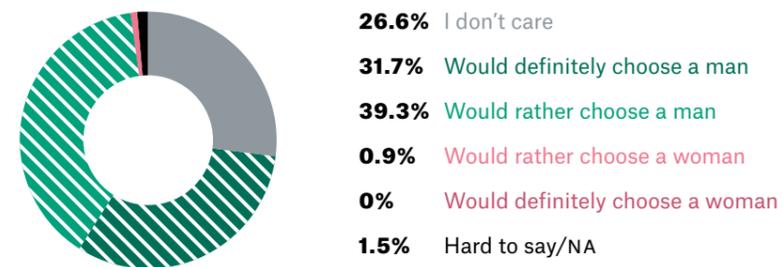


SOURCE: SKDS survey, 2020. n=1014

Diagram 15 demonstrates that only every fourth resident of Latvia feels the same about who will fix his/her computer or phone—a man or a woman. Almost everyone would prefer a man for this job. It is interesting that regarding this choice the respondents in Latvia all share similar choices, regardless of their gender, age, nationality. This result means that it would be much more difficult for women than men to convince their clients of their competence in at least some areas of the ICT sector.

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

**DIAGRAM 15.** Whom would the residents of Latvia choose for repairing their phone or computer?



SOURCE: SKDS survey, 2020. n=1014

**Is it equally easy for both genders to acquire skills required in the ICT sector?**

One of the possible explanations to the data demonstrated in Diagram 15 (almost no resident in Latvia would choose a woman for repairing his/her computer/phone, if they had the opportunity to choose an equally qualified man) is that there are few women working in the computer repair sector and therefore the consumers have not had the opportunity to cooperate with highly professional female employees.

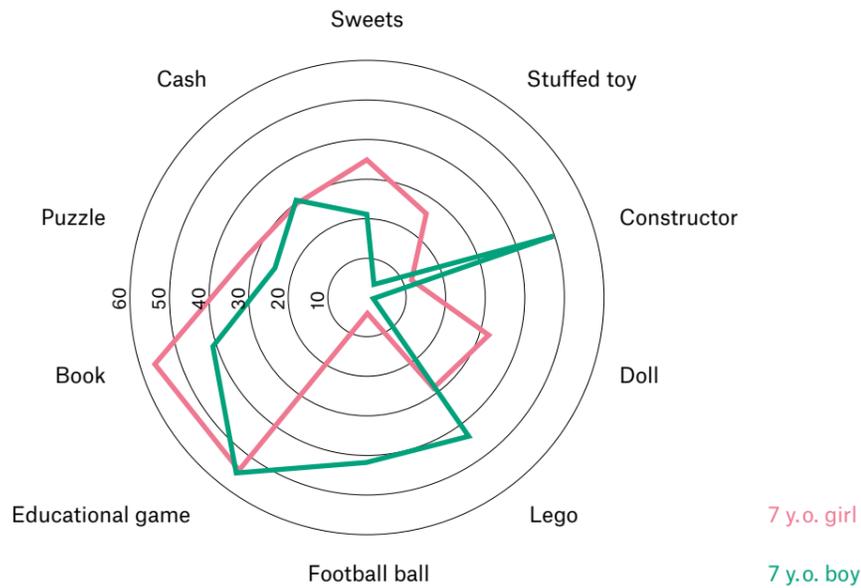
One of the hypothetical reasons for why there are more men is that it is easier for boys to develop the skills required for this job from an early age. In studies elsewhere in the world it has been stated that girls and boys receive very different levels of encouragement to choose technical professions in their childhood.<sup>26</sup> In order to state the extent to which this can be observed in Latvia, the participants of the survey were divided into 2 groups, where one group was asked what gifts they would give to a 7-year-old girl, the other group—to a 7-year-old boy.

Diagram 16 demonstrates that the society in Latvia likes to give educational gifts to children, especially educational games, books and Lego. There are gender differences regarding such gifts, but they are not very pronounced.

<sup>26</sup> The findings of the studies on children's toy choices for girls and boys are described in the study section "The key findings from studies implemented in other countries".

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

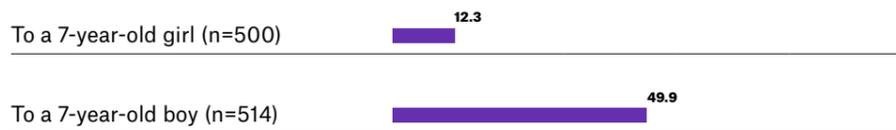
**DIAGRAM 16.** What would the residents of Latvia give as gifts to a 7-year-old child?



SOURCE: SKDS survey, 2020

A clear dimension of gender differences is demonstrated for a gift such as a constructor, which could be the most important childhood gift for potential computer and telephone repair specialists, and the representatives of technical professions. Half of the residents of Latvia would buy such a gift for boys, but only 12% would buy it for girls. There is no clear link between this choice of gifts and the gender, nor the age, education or nationality of the giver.

**DIAGRAM 17.** Whom would the residents of Latvia give a constructor as a gift? (%)



SOURCE: SKDS survey, 2020

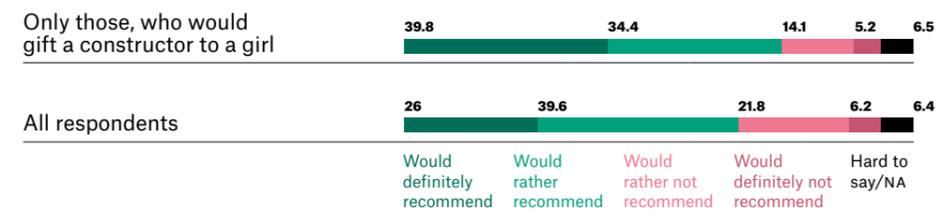
The results of this survey support the assumption that one of the reasons for the low representation of women in the ICT sector, especially regarding computer

II PERCEPTIONS OF SOCIETY ON THE ICT SECTOR AND GENDER ROLES IN IT

repair, lies in childhood, when girls have been significantly less able to explore the operation of different mechanisms than boys.

Diagram 18 demonstrates another noteworthy connection: those in Latvia, who are ready to give constructors to girls as gifts, are also ready to recommend them to work in the ICT sector more often.

**DIAGRAM 18.** The link between the willingness to give girls constructors as gifts and advising girls to pursue a career in the ICT sector (%)



SOURCE: SKDS survey, 2020

**Conclusions and suggestions**

- 1 When comparing girls to boys, girls require additional encouragement to choose studies in the ICT sector; this choice is much more clearly supported for boys and much less questioned by society. At the same time, the majority of Latvian society is ready to accept and support a girl's choice to pursue a career in the ICT sector. This means that in schools, the invitations to choose ICT study profiles or interest groups should be addressed more intensively exactly to girls.
- 2 When comparing women to men, women need additional encouragement to retrain for a job in the ICT sector. Less than half of the residents in Latvia would support such a career change at the age of 35–45. Such a transition would be significantly easier for men from the point of view of the public attitude. It also means that the residents of Latvia have not heard enough success stories about women, who have successfully mastered a new profession and are currently working in the ICT sector. Such stories should be promoted more.
- 3 The society in Latvia has not heard or does not believe that working in the ICT sector can be successfully combined with family life and offers flexible working hours. Such perceptions of the ICT sector are an obstacle for women's employment in this sector. The survey data demonstrate that the more often people think that working in the ICT sector can be successfully combined with family life and offers flexible working

hours, the more often they will recommend the ICT sector to girls and women for developing their careers. In order to change the understanding, it would be useful to tell society more about the ICT employees, who have successful family lives and are able to work flexible hours.

- 4 When compared to men, it is particularly difficult for women to overcome society prejudices, when working in the IT sector or phone repair field. Only every fourth resident of Latvia feels the same about who will fix his/her computer or phone—a man or a woman, almost all other residents of Latvia would prefer a man for this job, and nearly no one would choose a woman. Publicly available stories of women, who successfully work with ICT mechanisms, especially—in customer service, would be desirable.
- 5 Latvians are mostly ready to give educational gifts to children, but there are significant gender differences regarding one of the gift types—constructors are given to boys four times more often than to girls. This enforces the assumption that one of the reasons for the low representation of women in the ICT sector lies in childhood, when girls have been significantly less able to explore the operation of different mechanisms than boys. It would be desirable to use educational programmes for children, which are aimed at promoting nature sciences, involving girls and women in the visible roles. For example, the TV show of the channel LTV1 for pre-school/primary school children “Who’s here? I’m here!”, in which the experiments are both led and studied by male characters. It would also be desirable to promote constructors and robots as gifts, not only for boys, but also for girls.

### III The role of education and the impact of stereotypes

**THE GOAL OF THE THIRD PART** of the study is to identify what motivates students to acquire ICT skills in depth at different ages (pre-school, primary school, elementary school, secondary school, university), what the main obstacles are, whether there are already differences between the interest and involvement of boys and girls in ICT activities during school ages, as well as—what motivates young people after graduating from secondary school to study ICT programmes exactly at university. The findings are based on data acquired from twelve individual interviews with ICT educators, representatives of non-formal and higher education, anonymous online surveys for school students of grades 7 to 12, as well as from anonymous online surveys of ICT students.

#### **The curriculum is fragmented and does not promote more interest in technologies**

The goal of this study is not to evaluate the education system in Latvia, but almost all of the interviewed educators indicated that the current curriculum does not provide sufficient basic knowledge and thus does not provide motivation regarding the technologies sector. In the current education system, IT education is divided into two different subjects: most young people learn Informatics, in which school students from grades 5 to 7 are taught computer skills and applications such as Microsoft Word, Microsoft Excel, Microsoft PowerPoint. In a very small part of the schools of Latvia students have the opportunity to learn the Basics of Programming.<sup>27</sup> During recent years, the subject “Computer Science” is also being implemented in test mode in more than 100 schools. Most students graduate from secondary school without an understanding of what programming is or what skills it requires. The interviewed educators believe that the current curriculum of the Informatics subject is outdated, therefore it does not create an interest in studying in the ICT sector in the future.

It is expected that the new curriculum developed by School 2030 will address the problem of fragmentation, as the previously separated subjects in the new curriculum will be integrated—all students will learn the introduction and basics of computer science, including programming and informatics, therefore all students will learn more about technologies, and thus also girls. In the new model the acquisition of ICT skills will not depend on the choice of the parents to involve the children in a programming interest group or on the teachers, who choose or do not choose to work in depth with the specific students. All students will have equal opportunities to acquire these skills.

<sup>27</sup> To a relatively small extent it is possible to acquire these skills in the Informatics programme of secondary school by learning how to create and use databases, but even in this case the curriculum is not developed so that it promotes programming skills.

### The participation of girls of pre-school/primary school age in programming and robotics interest groups is significantly smaller

During recent years the opportunities to acquire knowledge about technologies such as robotics, basics of programming, non-formal education programmes at pre-school and primary school age have significantly expanded, and the service providers are cooperating with pre-school institutions and schools both in Riga and in the regions. In the interviews the providers of these programmes point out that the abilities of girls and boys do not differ, but boys are significantly more represented in these classes than girls—about 1/5 of all participants are girls.<sup>28</sup>

In a survey conducted by Providus, about 17% of young people confirmed that they attend (or have attended) programming or robotics classes outside school lessons. Most of these young people are boys (53 out of 67 respondents, who attend such classes). The interviewed educators have observed that the motivation of boys is more diverse, while girls are relatively more likely to be associated with parental influence, hence, the girls who learn programming are more likely to come from families, where one or both parents are involved in the information technology sector. Sometimes educators have also observed situations where fathers—programmers—actively try to involve their daughters in programming, regardless of the interests of girls themselves. The fact that young people are significantly influenced by their family members has also been confirmed in the study. When summarising the responses of the students to the online survey, family members (parents), teachers and friends can also be identified as the main sources of influence of the students.<sup>29</sup>

### Young people do not have a sufficient understanding of the ICT sector and the topicality of the ICT skills

The educators that were interviewed within the study mention the lack of the students' understanding of the ICT sector in general as one of the problems. The educators point out that the lessons of Informatics, Programming or Computer Science are often spent explaining to young people, why ICT skills have to be acquired and that they are useful in every field, as young people themselves often do not see their practical application in life. Educators have also observed that students often have prejudices that a career in the ICT sector will be one where all working time has to be spent coding, i.e., young people lack an understanding about the extensiveness and diversity of the ICT sector:

—— “Yes, I have noticed that students have no understanding at all of how extensive the ICT sector is, how much there is to do. But even in many

<sup>28</sup> Kolāte, S. «Ieprogrammēt iespējas.» Laikraksts «Diena» (13.10.2019.). Accessed at <https://www.diena.lv/raksts/sestdiena/pieredze/ieprogrammet-iespejas-14228230> (Last viewed on 02.05.2020)

<sup>29</sup> Within the study think tank Providus questioned school students of grades 7 to 12 in an anonymous online survey. 388 students from different schools of Latvia participated in it.

jobs, people still do not understand how to accomplish something better by applying ICT skills. People are not sufficiently familiar with ICT skills. And this ignorance goes on: from parents to children.” — PROGRAMMING TEACHER AT SECONDARY SCHOOL

—— “Students have no overall understanding of what people are doing in this [ICT] field. Young people often think that they will sit down at a computer and will become expert specialists and game programmers after a few lessons. To reduce this uncertainty, the specific professions have to be somehow explained, so that students understand their future prospects. An explanation could be included, because students find it quite unclear “So what do people do exactly in the IT sector?” When they are told in more detail, there have been cases when interest disappears, and also on the contrary—when interest appears. Young people in general need to be educated about career opportunities. (...) The second big problem is not so much mathematics, as logical thinking. It is difficult for students to understand how to put everything together in small steps and to divide a large task into smaller ones. Logical thinking and the lack of logical thinking skills of the students are something we face a lot in the secondary school period.” — PROGRAMMING TEACHER AT SECONDARY SCHOOL AND UNIVERSITY

A similar attitude can be observed in some of the responses to the student survey<sup>30</sup>.

—— “I'm not interested in Programming and Informatics, because currently I do not feel that it is required in life, and I'm unlikely to need them [the study subjects], while I study.” — 11TH GRADE MALE STUDENT

—— “Matemātika, fizika, ķīmija, informātika, programmēšana un datorika man nepatīk, jo nav jēgas mācīties šos priekšmetus, — tāpat gandrīz neviens šos priekšmetus nekur dzīvē neizmantos.” — 10TH GRADE MALE STUDENT

—— “Physics, Chemistry, Mathematics, Informatics, Programming and Computer Science... I don't see the point in learning them for an ordinary person. As I said, getting to know people and language skills provides a lot more to people, who are social beings by nature (unless, of course, someone wants to work as a doctor.” — 11TH GRADE FEMALE STUDENT

—— “I am not interested in programming and informatics, as I am not planning

<sup>30</sup> Online student survey implemented by Providus, 2020

to relate my future with these subjects. But, of course, I am aware that technologies will also be required for further education.” — 12TH GRADE FEMALE STUDENT

### Boys are significantly more active in computer science lessons, and the approach to learning differs

Some of the educators interviewed in the study have observed that the activity of boys and girls in lessons differs significantly. Boys show more interest and activity, while girls work more carefully and cautiously. Girls are more often *perfectionists*.<sup>31</sup> In the lessons girls only engage in class discussions if they are confident about their questions and comments, while boys freely lead the overall group discussion regardless of the issues to be discussed. Educators point out that those, who acquire most of this gender gap are the boys, as they are not afraid to experiment or ask questions themselves during the class and thus can learn more new skills than the girls.

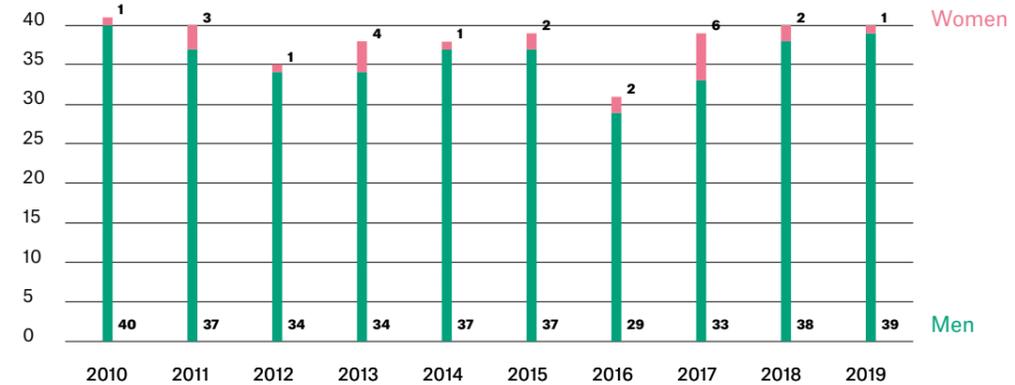
From the interviews with teachers, 5 main differences can be highlighted in the approach of boys and girls to learning: **1)** girls more often than boys prefer the model, where a ready-made code is provided in the lesson; **2)** girls like to program in an already known platform without changing the working language and platform used; **3)** girls more often like to implement the visual part of the project along with the coding, creating a design, choosing colours and other design elements; **4)** in a group of girls the girls like to communicate with each other more often than it is observed in a group of boys or a mixed group; **5)** girls prefer to cooperate with teachers in the learning process, as well as tend to ask for help in completing the task more often than boys.

### Most of the young people participating in Olympiads of Computer Science (Programming) are boys

Within the study it was assumed that participation in the Olympiads indicates a greater interest of the student in the subject. Olympiads of Informatics are organised in Latvia from 8 to 10 October in the group of 11th to 12th grade students. When summarising the information on the results of the 3rd stage (national level) in the Latvian Olympiads of Informatics during the last 10 years, it can be concluded that in the group of 8th–10th grade students on average only 2.3% of all participants are women (see Diagram 19).

<sup>31</sup> ERDA Career study among 8th grade students. (2016) Research statistics: 1528 Survey of 8th grade students in 45 schools of Riga. Gender distribution in the study: 50.6% women, 49.9% men.

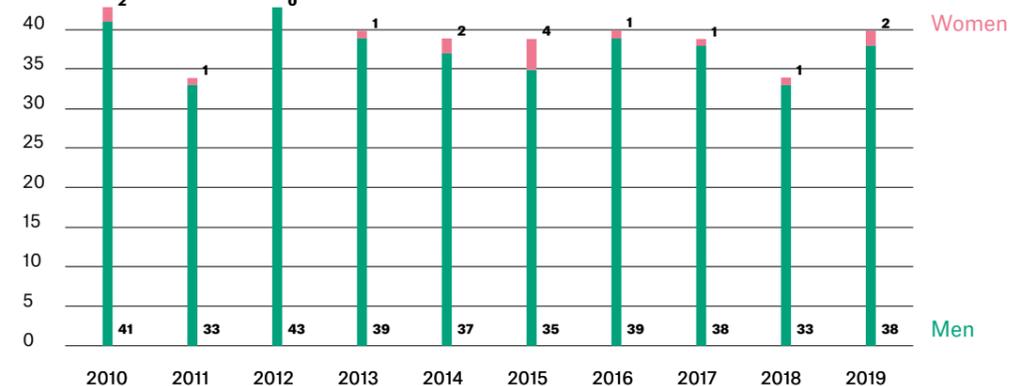
**DIAGRAM 19.** Distribution of 8th-10th grade student participants by gender in LOI stage III (2010–2019)



SOURCE: Summary of the results of the Latvian Olympiads in Informatics (LOI): <http://lio.lv/panakumi/panakumi.htm>

The representation of girls is also very low in the group of 11th–12th grade students<sup>32</sup>—on average in this age group only 4% of all participants of the Olympiads in Informatics are girls (see Diagram 20).

**DIAGRAM 20.** Distribution of 11th-12th grade student participants by gender in LOI stage III (2010–2019)



SOURCE: Summary of the results of the Latvian Olympiads in Informatics (LOI): <http://lio.lv/panakumi/panakumi.htm>

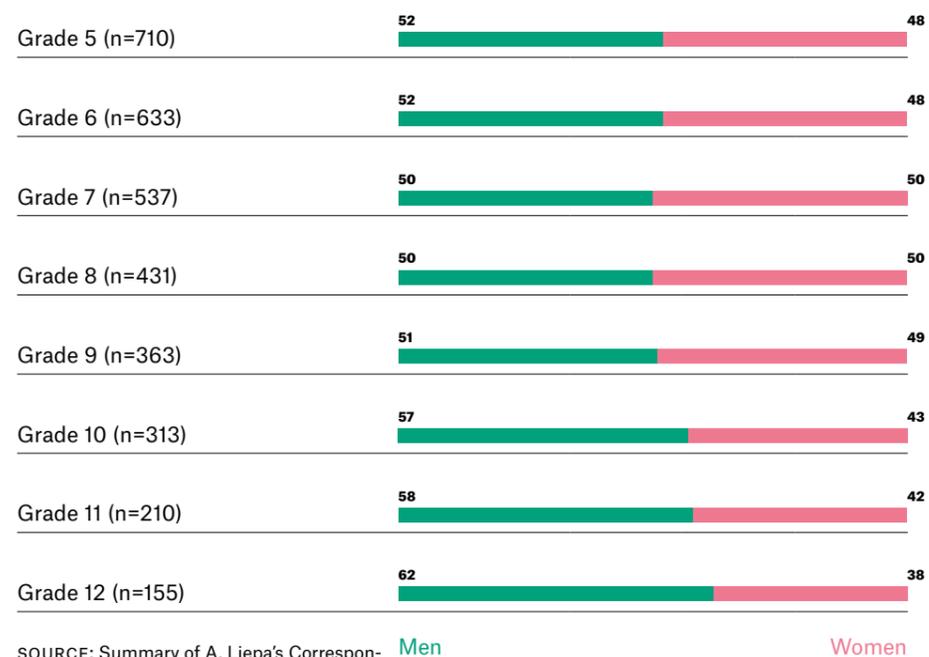
The significant predominance of boys in the Olympiads also gives young people themselves the impression that this area is more suitable for boys. In a student survey a young woman indicated that she considers that girls are not good at programming, because simply no girls participate in the Olympiads of Programming. A similar belief is expressed by 10% of boys, who participated in the survey. The interviewed educators

<sup>32</sup> The website of the Latvian Olympiad in Informatics [www.lio.lv](http://www.lio.lv), information on the results of stage III in the Latvian Olympiads in Informatics from 2010 to 2019 (starting with the 23rd Latvian Olympiad in Informatics in 2010 and ending with the 32nd Latvian Olympiad in Informatics in 2019).

III THE ROLE OF EDUCATION AND THE IMPACT OF STEREOTYPES

have also reached such a conclusion: the fact that girls are significantly less represented in Olympiads of the STEM subjects strengthens the impression that this field is less suitable for girls. The interviewed educators admit that it is not possible to identify any specific reasons why girls choose to study programming in depth in the primary and secondary school period. In different interviews educators point to different situations and different motivations. In a particular situation the girls wanted to better understand the subject taught in the lessons, therefore they attended consultations, during which, after individual work with the teacher, an in-depth interest in programming had appeared, which resulted in repeated participation in Olympiad in Informatics, and further, also in studying the ICT sector in the university period. In other cases female students have individually approached the subject teacher to express their desire to acquire knowledge about creating websites during consultations. Later the teacher has also managed to generate interest in the Olympiads. Both of these individual examples suggest that it may be easier for girls to study such types of subjects by working individually with a teacher. Unlike the open Olympiads in Programming, where the majority of participants are boys, in another STEM subject—the open Olympiads of Mathematics—the number of girls and boys is similar<sup>33</sup> (see Diagram 21).

**DIAGRAM 21.** Participation of 5th–12th grade students in the open Olympiad of Mathematics by gender (2016–2019, %)



SOURCE: Summary of A. Liepa's Correspondence Mathematics School (NMS) Olympiad results: <http://nms.lu.lv/>

Men

Women

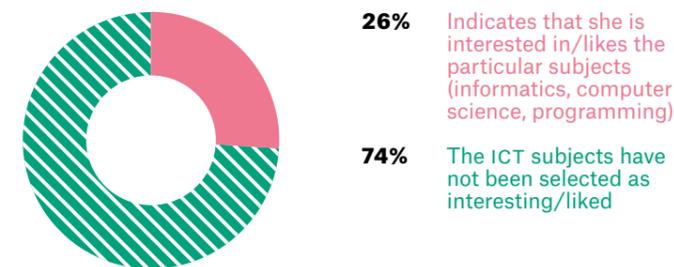
<sup>33</sup> This study summarises the results of the 43rd, 44th, 45th, 46th open Olympiads in Mathematics of one indicator in each group of grades.

III THE ROLE OF EDUCATION AND THE IMPACT OF STEREOTYPES

According to Diagram 21 the gender ratio is similar till grade 9, but in secondary school the participation of girls decreases by about 10 percentage points. The data show that the interest of girls and boys in the STEM sector and, more specifically, in mathematics is similar, therefore other causes that are not related to knowledge must be sought for the significant disproportion of the Olympiads in Programming.

When seeking reasons as to why girls are interested in the ICT subjects at school (Informatics, Computer Science, Programming) we also interviewed school students. Of the 244 girls, who participated in this survey, 63 female students, when answering the question “Which of these subjects do you like/are interested in?” answered that they were interested in one or more of the ICT subjects: Informatics, Programming, Computer Science (see Diagram 22).

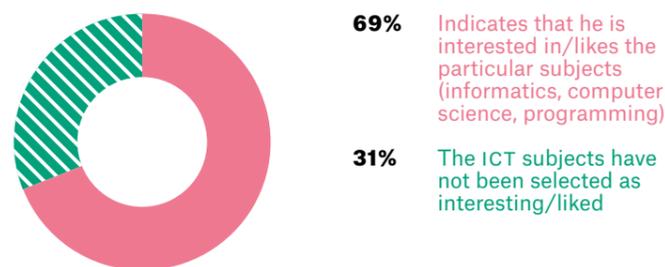
**DIAGRAM 22.** The interest of girls (7th–12th grade female students) in the ICT subjects at school



SOURCE: Online student survey implemented by Providus, 2020

The reasons most often mentioned by girls for their interest in these subjects are the following: they find the study subject interesting, because they succeed in it; these skills will be useful in the future; programming is challenging, there is no single solution available—it is possible to look for different problem solutions; these subjects are taught by a good teacher.

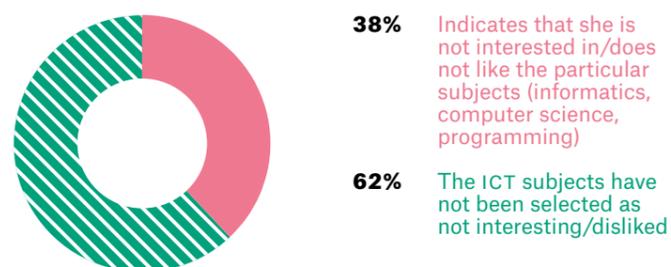
However, when compared to boys, girls are much less interested in the ICT subjects (see Diagram 23).

**DIAGRAM 23.** The interest of boys (7th–12th grade male students) in the ICT subjects at school

SOURCE: Online student survey implemented by Providus, 2020

The boys point out that they are interested in the ICT subjects (Informatics, Computer Science, Programming) because they succeed in them, they will be useful in the future, as well as they are taught by good teachers. In addition, boys also explain their interest in the ICT subjects with an interest in various technologies, computer games, as well as the opportunity to acquire better paid jobs in the labour market. In comparison, the surveyed female students did not express such reasons for their interest in the ICT sector.

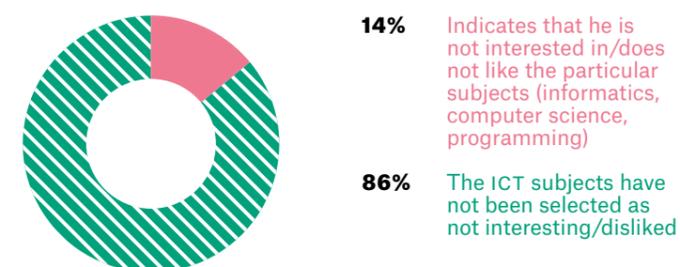
Also, in order to understand the reasons why young people do not like the ICT subjects, we asked the question “Which of these subjects you do not like/are not interested in?” (See Diagram 24)

**DIAGRAM 24.** The dislike/lack of interest of girls (7th–12th grade female students) in the ICT subjects at school

SOURCE: Online student survey implemented by Providus, 2020

As the main reasons for disliking the ICT subjects, the girls most often point out that they simply do not succeed in them/do not understand the subject matter, lack interest in studying them in more depth. It is also mentioned comparatively often that

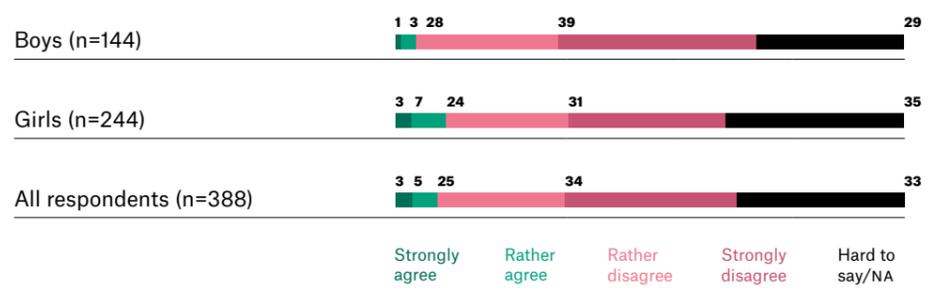
these skills will not be useful in life, their meaning is not clear, as well as the fact that the teacher does not know how to teach them (the young women who have provided such an explanation also add that they are acquiring ICT skills applying self-taught methods, for example, work with post-processing programs). Boys respond comparatively less often than girls that they do not like/are not interested in the ICT subjects (see Diagram 25).

**DIAGRAM 25.** The dislike/lack of interest of boys (7th–12th grade male students) in the ICT subjects at school

SOURCE: Online student survey implemented by Providus, 2020

As the main reasons for disliking the ICT subjects the surveyed boys most often state the fact that the ICT subjects will not be required in the future and/or that they do not succeed in them.

Also, in order to understand the perceptions of young people about who succeeds and who doesn't in the ICT subjects, we asked young people to rate the statement “In my opinion girls succeed better than boys in subjects such as Informatics and Programming”. From the obtained answers it can be concluded that the surveyed young people convincingly assess the abilities of girls in the ICT subjects as being worse in comparison with the boys (see Diagram 26).

III THE ROLE OF EDUCATION AND  
THE IMPACT OF STEREOTYPES**DIAGRAM 26.** Responses to the statement “In my opinion girls succeed better than boys in subjects such as Informatics and Programming” (%)

SOURCE: Online student survey implemented by Providus, 2020

In order to understand the assessment of young people of the girls' skills in Mathematics, Physics and Chemistry, we asked to rate the statement “In my opinion boys succeed better than girls in subjects such as Mathematics, Physics and Chemistry” (see Diagram 27).

**DIAGRAM 27.** Responses to the statement “In my opinion boys succeed better than girls in subjects such as Mathematics, Physics and Chemistry” (%)

SOURCE: Online student survey implemented by Providus, 2020

In general boys rate their skills in hard sciences better than those of the girls. This assumption is disproven in the next chapter of the study, as the data demonstrate that girls perform better in the centralised examinations (hereinafter—CE) of Mathematics and Physics, while boys only show better results in CE of Chemistry.

In order to understand the assessment of young people of the girls' skills in humanitarian sciences, we asked to rate the statement “In my opinion girls succeed

III THE ROLE OF EDUCATION AND  
THE IMPACT OF STEREOTYPES

better than boys in subjects such as Latvian Language, English Language and History” (see Diagram 28).

**DIAGRAM 28.** Responses to the statement “In my opinion girls succeed better than boys in subjects such as Latvian Language, English Language and History” (%)

SOURCE: Online student survey implemented by Providus, 2020

As in the previous statements, also in this case 35% of the respondents cannot provide a certain opinion, and in general girls rate their skills better (36% of girls agree with the statement). In the next chapter we conclude that, in general, girls perform better in language exams (CEs of Latvian Language and English Language).

When assessing the received answers, it can be concluded that the students themselves (both boys and girls) very convincingly assess boys as more knowledgeable in the ICT subjects, when compared to girls—an opinion that is not as obvious regarding the skills of girls in other subjects.

**Girls perform better in the centralised exams**

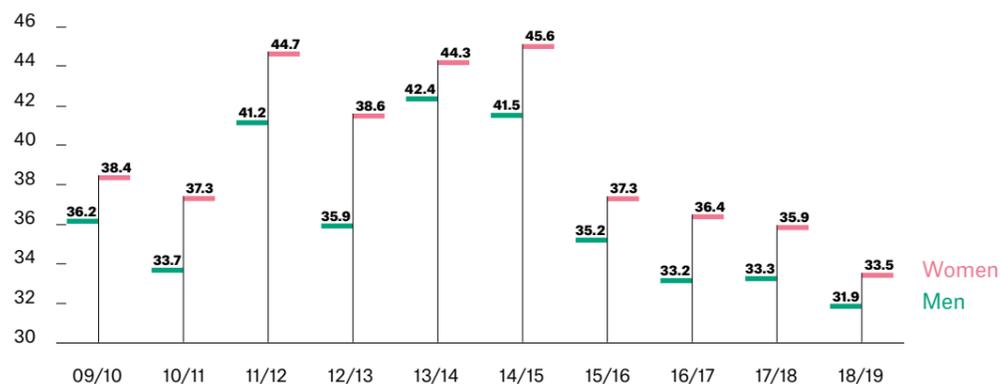
In order to check whether there are gender differences in the knowledge of the students, the study summarised and evaluated the results of the 12th grade centralised examinations from the school year 2009/2010 till 2018/2019. The main attention was paid to the exams, the results of which are required for future ICT students at Riga Technical University<sup>34</sup> and the Faculty of Computer Sciences of the University of Latvia<sup>35</sup>, namely, the exam results of Mathematics, Latvian Language and English Language. The results of the last 10 years demonstrate that girls have better knowledge than boys after graduating from secondary school. In Mathematics girls score on average 2.5 percentage points better (see Diagram 29).

<sup>34</sup> Riga Technical University website: [www.rtu.lv](http://www.rtu.lv). Centralised examinations and entrance examinations. Accessed at <https://www.rtu.lv/lv/studijas/uznemsana/pieteiksanabakalaura-limena-studijam-centralizetie-eksameni-un-iestajparbaudijumi>. (Last viewed on 02.05.2020)

<sup>35</sup> The University of Latvia website: [www.lu.lv](http://www.lu.lv). Computer Science—Bachelor's Study Programme. Accessed at <https://www.lu.lv/studijas/fakultates/datorikas-fakultate/bakalaura-limena-studijas/datorzinatnes/>. (Last viewed on 02.05.2020)

III THE ROLE OF EDUCATION AND THE IMPACT OF STEREOTYPES

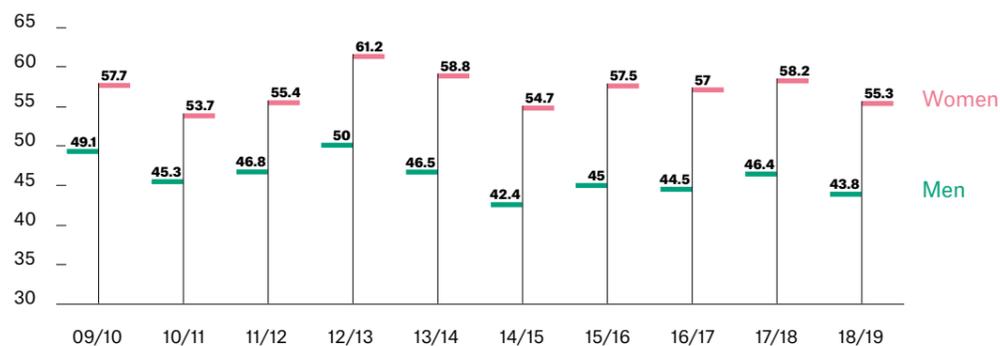
**DIAGRAM 29.** Results of the CE of 12th grade students (%) in Mathematics from the school year 2009/2010 till 2018/2019 by gender



SOURCE: Summary of the State Education Content Centre on CE results: <https://visc.gov.lv>

In the Latvian Language exam—on average by 11 percentage points (see Diagram 30).

**DIAGRAM 30.** Results of CE of 12th grade students (%) in Latvian Language from the school year 2009/2010 till 2018/2019 by gender

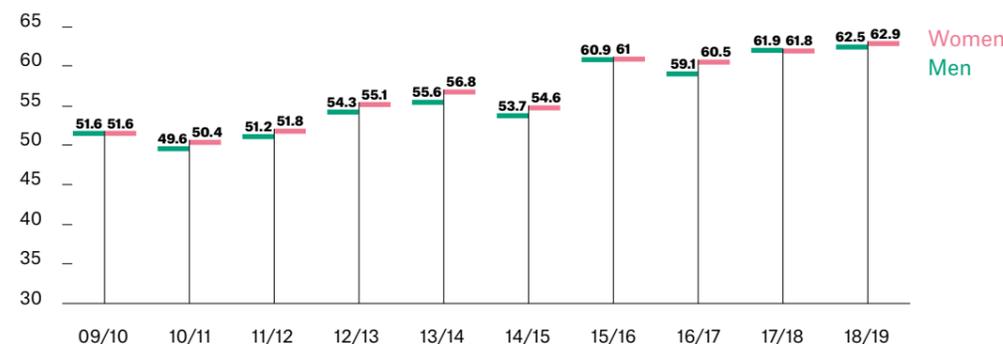


SOURCE: Summary of the State Education Content Centre on CE results: <https://visc.gov.lv>

The graduates of secondary school demonstrate almost equal results by gender in the English Language exam (see Diagram 31).

III THE ROLE OF EDUCATION AND THE IMPACT OF STEREOTYPES

**DIAGRAM 31.** Results of CE of 12th grade students (%) in English Language from the school year 2009/2010 till 2018/2019 by gender



SOURCE: Summary of the State Education Content Centre on CE results: <https://visc.gov.lv>

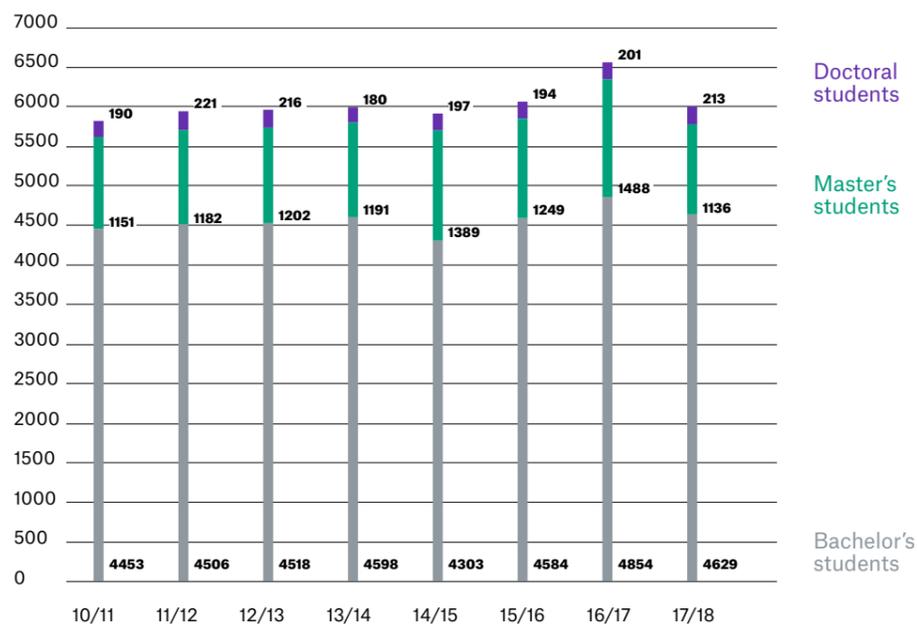
These results allow one to assert that knowledge in subjects such as Mathematics is not the main reason why girls are much less likely to choose studies in the ICT field.

**The lowest proportion of women in Bachelor’s studies and the largest—Doctoral Studies**

In total approximately 6 000 students are currently studying in the ICT programmes (basic and advanced level studies). The majority of the ICT students in Latvia study at Riga Technical University, the Institute of Transport and Communications and the University of Latvia.

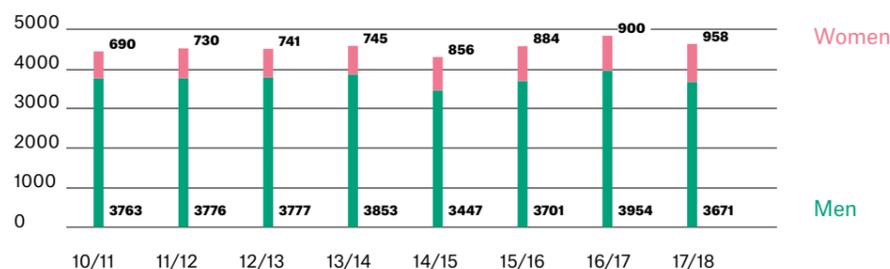
III THE ROLE OF EDUCATION AND THE IMPACT OF STEREOTYPES

**DIAGRAM 32.** Changes in the number of students in ICT Bachelor's, Master's and Doctoral programmes in the higher education institutions of Latvia (2010–2018)



SOURCE: Informatics Europe summarisation on the ICT statistics in Europe: <https://www.informatics-europe.org>

**DIAGRAM 33.** Changes in the number of students in ICT Bachelor's programmes in the higher education institutions of Latvia (2010–2018)



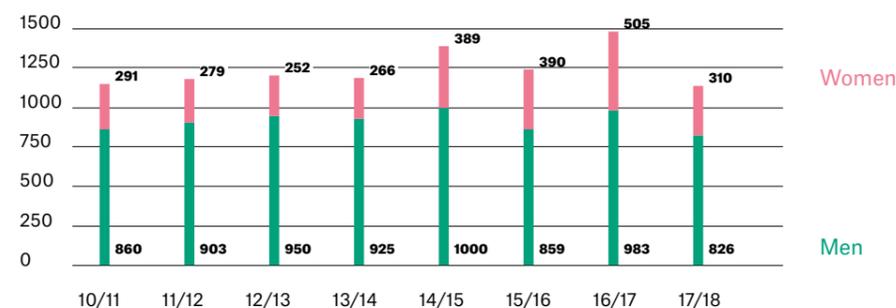
SOURCE: Informatics Europe summarisation on the ICT statistics in Europe: <https://www.informatics-europe.org>

In the academic year 2010/2011 approximately 1/5 of all students in Bachelor's programmes were women, but in the academic year 2017/2018—1/3 of all students in Bachelor's programmes. The proportion of women in Master's study programmes is slightly higher than in Bachelor's programmes, hence, on average 1/3 of all students

III THE ROLE OF EDUCATION AND THE IMPACT OF STEREOTYPES

are women. It can also be observed that the number of women in Master's programmes has increased proportionally within recent years (see Diagram 34).

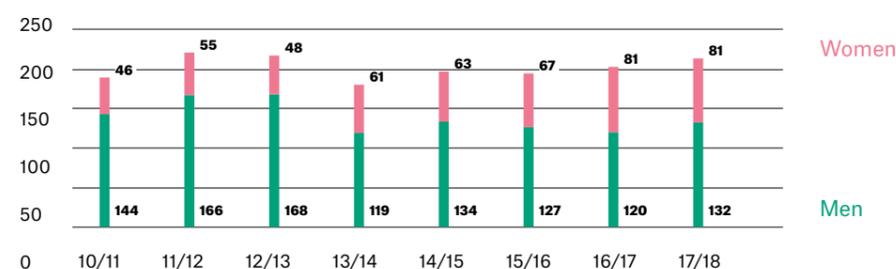
**DIAGRAM 34.** Changes in the number of students in ICT Master's programmes in the higher education institutions of Latvia (2010–2018)



SOURCE: Informatics Europe summarisation on the ICT statistics in Europe: <https://www.informatics-europe.org>

Comparatively the most equal gender ratio can be observed among students in Doctoral programmes, where approximately 2/5 of all students are women. As in the Master's programmes, the number of women—female Doctoral students—has increased in recent years in relation to all Doctoral students (see Diagram 35).

**DIAGRAM 35.** Changes in the number of students in ICT Doctoral programmes in the higher education institutions of Latvia (2010–2018)



SOURCE: Informatics Europe summarisation on the ICT statistics in Europe: <https://www.informatics-europe.org>

III THE ROLE OF EDUCATION AND  
THE IMPACT OF STEREOTYPES

Within the study, the current students, as well as women, who had recently graduated from ICT programmes (basic studies and advanced level studies) were interviewed, and within the focus groups the female IT specialists working in the sector were interviewed. The female participants of the focus groups were asked, to what extent their choice to study in this field was influenced by family members and friends, and what the role and influence of their educators was. In the focus groups some women said that they received quite different attitudes regarding the surrounding people and their support in their choice of studying computer sciences. Some have encountered a neutral attitude, some have chosen to study precisely because relatives or friends were already studying in the field or were professionally involved in it, and women had developed an idea about the studies, as well as basic information about what it means.

**FEMALE ICT SPECIALISTS IN THE FOCUS GROUP:**

- “There was no pressure from the family, I could choose what I wanted, but I was leaning towards IT, because my cousin was studying there and she told me what the possibilities were, that it was cool and when I was considering what to study, I chose it because I already had a lot of information about it.”
- “My choice was greatly influenced by my family. Dad was working at Lattelecom and I spent a lot of time with him, and therefore it is logical that I chose engineering sciences.”
- “I have an older brother, who obtained an IT education; I watched what he was doing and it seemed interesting to me.”
- “I was supported by my husband, who also works in the IT industry, and he helped me and helps on a daily basis, especially after retraining.”
- (Regarding the influence of the family) “(...) my boyfriend is a programmer. I became more interested, I wanted to create something myself, as well as save money. I wanted to develop my own app.”

Several of the women admitted that their family did not support their choice.

**For example, one of the female programmers said:**

- “My parents were against it, I can’t even understand why. The day I went to apply for university, I heard a discussion on the radio that in 3 years this would be a very promising profession, and I saw it as a sign. Why did my

 III THE ROLE OF EDUCATION AND  
THE IMPACT OF STEREOTYPES

parents talk me out of it? They said that there would be too many men, that I wouldn’t have any friends on the course, that I did not know what programming was, etc.”

**Another member of the female focus group said:**

- “Definitely not family, and not friends. In the countryside, many thought they had to go to vocational schools. I don’t know. I was influenced by my own determination.”

Similarly, women did not receive convincing encouragement from their teachers in secondary school. Only a small number of the focus group participants had received such encouragement.

**For example, a female IT specialist in a focus group said:**

- “We had Programming, a really great female teacher, it was exciting, and I think it made a big impact.”

However, it should be noted that negative experiences often recur, when teachers demotivate or do not know how to explain the subject matter in a sufficiently attractive way.

**The female ICT specialists in the focus groups:**

- “I somehow felt stubborn regarding it. My female Informatics teacher thought that girls were not capable of it, let alone speaking about getting a better grade.”
- “We had compulsory Programming in secondary school as well, and it was taught by the Physics teacher. He had given up in recent years, as he didn’t seem to be able to succeed in it. This created additional motivation — to prove that I could. Similar topics were introduced at Riga Technical University, which I didn’t understand when I was taught by the Physics teacher in secondary school, and they were very interesting.”
- “The period of secondary school rather demotivated me, as Informatics was something incomprehensible; the female teacher didn’t really explain the subject. The majority of the students were unsuccessful. At the time I didn’t like to do anything at all, just use the internet.”
- “I didn’t have any programming in Informatics. But ironically, when I was

an intern, I had a curriculum in which we taught teachers to program, and in my group there was my female Informatics teacher, who I taught to program.”

From the survey results it can be concluded that, in general, the low representation of women is not really considered a problem, and the existing proportion is explained with different interests, i. e., demonstrating that in general women are less interested in the ICT sector (we have analysed this argument in the section about the identified gender stereotypes). When assessing the study environment and its suitability for women, the surveyed female ICT specialists state that the environment is inclusive and supportive for both women and men, but in some cases it is indicated that teachers tend to make sexist comments.

Higher education in the ICT sector is no exception, when speaking about students who drop out before graduating. However, it can be observed that proportionally, women drop out of ICT studies less often than men.<sup>36</sup> Comparing the number of students enrolled in Bachelor’s programmes with the number of students with a Bachelor’s degree, on average 35% of women and 27% of men obtain a Bachelor’s degree.

The interviewed representatives of higher education point out that in general the environment for women in the higher education institutions of Latvia can be assessed as “woman-friendly”. In some cases there have been situations where, for example, a male student has refused to take the instructions of a female lecturer into account, basing his choice precisely on the fact that the lecturer is a woman and the male student should not listen to a woman. This particular case was resolved by informing the particular male student that such treatment was not acceptable and, if repeated, the male student would be expelled from the university. However, according to the interviewed persons, such cases are very rare. Representatives of other higher education institutions point out that educators cannot always confidently state that there is no gender inequality or, for example, sexism in the higher education environment. Unless the university has successfully developed communication channels for this type of information exchange, there is a possibility that students simply have not informed the university about this type of problem.

In order to promote the ICT environment being more attractive to women, higher education institutions, such as the University of Latvia in cooperation with Riga TechGirls<sup>37</sup>, are implementing a set of measures to address more women regarding studies in the ICT sector. However, as the interviewed persons have pointed out, events that are specifically targeted at women often tend to be condemned, i.e., positive discrimination and its goal of reducing, for example, gender inequality in certain areas, is perceived in Latvia more negatively than positively.

<sup>36</sup> Website of the Republic of Latvia Ministry of Education and Science: [www.izm.lv](http://www.izm.lv). <https://www.izm.gov.lv/lv/publikacijas-un-statistika/statistika-par-izglitiba/statistika-par-augstako-izglitiba> (Last viewed on 02.05.2020); Informatics Europe. Accessed at <https://www.informatics-europe.org/data/higher-education/statistics> (Last viewed on 02.05.2020)

<sup>37</sup> The goal of Riga TechGirls is to educate, inspire and help girls build contacts for a more balanced future with the representation of both genders in the business of technologies.

### Conclusions and suggestions

- 1 From an early age parents decide (consciously and unconsciously) that the ICT sector is more suitable for boys than for girls. It is recommended that the ICT companies and non-formal education institutions develop advertising campaigns that promote the image of a girl programmer, both to reduce gender stereotypes and to reach new potential target audiences. For example, to include photographs of both boys and girls in the ICT educational promotional materials or to involve both boys and girls in various educational activities as the child character in educational activities in order to reduce the stereotypes of children and parents about the suitability of some sectors for children of a particular gender.
- 2 School students have poor knowledge of both the ICT sector and the use of ICT skills in real life. In some selective cases it was identified that both boys and girls did not see the point in studying subjects such as Informatics, Computer Science and Programming, substantiating their opinions with the fact that these skills would not be needed in the future. The fact that young people sometimes have this confident idea is also confirmed by educators, who explain that it is often necessary to spend a significant amount of lessons on explaining to the students how ICT skills are and will be useful in most professions and how they will help young people themselves to be competitive. In order to promote the general understanding and interest of young people, it is advisable to talk to a wider extent about the ICT sector and its skills, which are useful in different professions, not just the programmer’s profession.
- 3 Young people have poor knowledge of the ICT career opportunities. As indicated by the interviewed educators, young people are often convinced that after studying in the ICT curriculums, they will have to spend their entire lives coding. Often this prejudice also discourages young people from choosing in-depth studies of ICT subjects, as they do not want to spend the rest of their lives as this imagined ICT specialist.
- 4 There are unfounded prejudices among students that girls do not succeed in various hard sciences in relation to the ICT sector. The results of the exams allow one to conclude that girls have equally good and/or better results. In schools, teachers need to involve girls more in various types of Olympiads and activities in the field of hard sciences, in order to reduce the stereotypes among young people themselves, which are often based on the assumption that, if there are few girls in the field, they are not successful in it.
- 5 It would be worth educators taking into account the fact that girls and boys tend to

have different choices in the study process. If, for example, girls prefer to learn programming from an existing sample, it is desirable to provide it. The teacher should be a mentor, who is aware of and informs young people about the extensiveness of the ICT sector and the different opportunities it provides.

- 6 The new Latvian curriculum, which provides the integration of computer science skills from the 1st grade, can potentially improve the interest of women in the ICT sector, as in the new model the opportunities of the girls to participate in the programming activities will not depend on parental decisions; the girls will have equal opportunities to start acquiring ICT skills at an early age.

## IV The main challenges in the work environment of the ICT sector

**THE GOAL OF THE FOURTH CHAPTER** of the study is to identify what motivates women to pursue a career and what the main challenges are that make it difficult to work in this sector. The conclusions are based on data obtained from 3 focus groups of women working in the sector, as well as of one focus group of men<sup>38</sup>, and two electronic surveys were also conducted to verify the trends—for women and men working in the IT sector. Thus an even more extensive range of assessments was acquired.<sup>39</sup> In order to obtain the opinions of the companies, 3 interviews were also conducted with the representatives of the largest IT companies, whose job responsibilities are related to recruitment and personnel development.

### Diversity management on the company agenda

In many parts of the world companies increasingly see diversity management as the driving force of innovation and growth, and the impact of it also reflects in better financial performance.<sup>40</sup> With diversity management we usually understood the purposeful work of the companies (strategy, values, communication, management processes) to use the diversity and differences of the employees (gender, age, nationality, sexual orientation, etc.) for the development of the company's potential. It usually focuses on 3 main areas: **1)** recruiting and employing people from different society groups with different skills and abilities; **2)** creating a work environment, in which employees feel respected and which promotes employee productivity, including creativity, innovation; **3)** getting to know the customers and creating services that meet their different needs.<sup>41</sup>

In Latvia companies are gradually starting to pay attention to diversity management issues, but they are mostly subsidiaries of international companies, and not those of local origin.<sup>42</sup> Companies established in Latvia only implement certain diversity management measures, which are not specifically defined in separate company policy documents. The majority of companies (73%) admit that they do not pay special attention to age, gender, disability or other aspects, and only 9% of companies implement diversity management measures for a more gender-balanced representation in the company.<sup>43</sup> From the interviews with human resource development specialists of three large IT companies, only one acknowledged that diversity management issues are an important part of company policy. The other two companies do not pay special attention to these issues, the same as to more balanced gender representation.

### The main challenges of the work environment

The analysis of the female focus group survey results working in the sector, as well as the survey of the employees working in the accomplishing sector, allows one to conclude that the main problems faced by women, when working in this sector are

<sup>38</sup> The focus groups were organised in February 2020 in Riga under the management of Providus researchers. 17 women participated in the focus groups with different work experience: the shortest work experience—half a year, the longest work experience—more than 20 years. Women represented ICT companies of different sizes. The focus group of men was organised in March 2020 and was attended by 5 men representing ICT companies of different sizes: the shortest work experience in the ICT sector was 2 years and the longest—36 years.

<sup>39</sup> Providus researchers conducted 2 anonymous electronic surveys: one for women working in the sector (51 responses were received), the other for men working in the sector (67 responses were received), both on the Google forms platform.

<sup>40</sup> McKinsey has researched this issue for several years and has found that companies with at least one or more women on their boards have a 4% higher return on equity (ROE) than companies that have only men on their boards. In general, the financial performance of companies is much more successful, if they employ women in their management structures,—about 21% are more likely to outperform the national industry median. Source: McKinsey: "Delivering through Diversity" 2018, [https://www.mckinsey.com/-/media/mckinsey/business%20functions/organization/our%20insights/delivering%20through%20diversity/delivering-through-diversity\_full-report.ashx] (Last viewed on 25.04.2020)

<sup>41</sup> Golubeva, M., Zankovska-Odiņa, S., Felsbergs, I.: "Dažādības vadības situācijas izspēle uzņēmumos Latvijā. Pētījuma ziņojums" (Inspecting of the diversity management situation in the companies of Latvia. Study report), 2015, Riga, Society Integration Foundation.

discrimination regarding professional issues, which is more pronounced in the field of programming, inequality of salary, different work style, responsibilities in the family as a career obstacle and fear of exaggerated positive discrimination. Those working in the sector do not generally see a significant necessity and benefits from a more balanced gender representation in the sector, while, contrary to the public perceptions of the sector, they consider this sector as family friendly due to the flexible working hours. This chapter provides more detailed conclusions, as well as quotes from the answers provided by the respondents to illustrate the conclusions.

#### GENDER DISCRIMINATION IN PROFESSIONAL ISSUES

When asked directly about their experiences of discrimination, women rarely want to share specific stories of discriminating situations, but both the results of the focus groups and the survey of female IT professionals show that discrimination against women is a serious problem in the sector. In the survey, 20 out of 51 women have experienced unfavourable treatment due to gender. The experience of women demonstrates that they have felt discriminated against in different ways: through indirectly or directly entrusting more important tasks to male colleagues; through lower professional expectations regarding women; through offensive comments/remarks, including of sexual content; through offensive jokes; as well as through sexual harassment. Women in this profession have experienced a discriminatory attitude not only from colleagues, but also from the customers. It should be noted that in some cases women have pointed to an improvement in the situation, namely that they faced discrimination 10–15 years ago, but now the situation is much better.

#### The female ICT specialists in focus groups and surveys:

——— “I have a real life example: a man, 40 years old, a former soldier, who was my subordinate. We worked in a group of 3 people. When my older colleague was on holiday and I had to also supervise this man, he did everything he could to demonstrate that I was not giving him advice, not helping him, and was ignoring him. And on the next day, he attempted ‘to undermine me’ several times, making comments such as ‘how could I know, that she was not aware of this subject?’, but other colleagues understood it, and he was assigned to another project.”

——— “I have had customers saying that they would not talk to a woman about computers. However, it was 15 years ago. There are currently colleagues, who feel that a woman is not equal to a man in the IS field, which makes it more difficult for me to prove and substantiate various work-related issues. There have also been cases of mobbing directly from men.”

——— “(...) I have also encountered very strange and offensive attitudes at times. My male colleagues tend to cross boundaries, thinking that as a woman I will act and behave like a naive, helpless creature... For example, there has been a case that an unfamiliar colleague confesses being in love with me or someone asks me to put a pepper plaster on his back, which I find completely unethical and incorrect.”

——— “Very often there are situations, when I arrive at the customer together with my male colleague and the client asks, why he has brought the secretary with him. Or at other times, in the case of disagreements, offensive derogative comments are made about gender.”

——— “Customers don’t demonstrate as much trust as with male colleagues, they think that I am lying. It once happened to my female colleague that the customer ‘waited’ for a specialist to arrive, even though she is a specialist herself. Sometimes it seems that customers think that because we are women, we do not understand the ICT sector as well as men do. Some relatives were surprised to learn about my profession.”

——— “I faced the first cases of direct discrimination a year ago, when the new Product Manager joined our team. He kept assigning his own duties to me, I was being ignored in meetings on technical issues, and my opinion, even if it was obviously correct, had to be confirmed by at least a few male colleagues and I had to write a reasoned review. Other colleagues have never had such strange situations. When I tried to talk openly with this colleague, everything just grew even further out of proportion. Unfortunately, the situation could only be resolved with the help of the manager.”

——— “There are colleagues at work, who are my ‘pals’ and joking with them about gender is a normal thing. But then there are a couple of executives, with whom the situation is not that good. There are small comments, in which you are sexualised out of the blue. At least I can see that it seems strange to the other guys and it helps. There has been physical harassment.”

——— “There was one job interview in the field of electronics. The interview was led by a person, who questioned that girls could be engineers, and also questioned my abilities. But since my hobby was karate, which I had mentioned in my CV, he said that because of my hobby, they would still hire me.”

42 Such conclusion has been made within two studies: Golubeva, M., Zankovska-Odiņa, S., Felsbergs, I. “Dažādības vadības situācijas izpēle uzņēmumos Latvijā. Pētījuma ziņojums” (Inspecting of diversity management situation in the companies of Latvia. Study report), 2015, Rīga, Society Integration Fund. And the team of authors, editor A. Gaigala: “Sieviešu un vīriešu situācijas izpēte Latvijas lielajos uzņēmumos” (Study of the situation of women and men in the large companies of Latvia), Rīga, 2014, Society Integration Foundation.

43 A study conducted by Turn, Kantar and the Institute of Corporate Sustainability and Responsibility “Iekļaujošas darba vietas un dažādības vadības principu ieviešana darbavietās Latvijā. Darba devēju aptaujas galarezultātu apkopojums.” (Implementation of Inclusive Work Environment and Diversity Management Principles in Workplaces in Latvia. Summary of the final results of the employer survey), Rīga, 2017, Society Integration Foundation.

## IV THE MAIN CHALLENGES IN THE WORK ENVIRONMENT OF THE ICT SECTOR

—— “The manager liked to express flirtatious comments. I tried to answer by joking. Sometimes it was unpleasant. In the form of jokes, we tried to show that we could do without it.”

—— “(...) Often people expect much less at work due to gender (and age) — which is a disadvantage, but sometimes it is also an opportunity to demonstrate more, to impress, if the opposite gender (which is more represented in the ICT sector), who often likes to teach everything, does not know something.”

—— “It is easier to get a job in some companies, as the recruitment of women has been brought forward as a strategy for providing gender balance among the employees. There may be lower demands towards work (which can act as an example of both an unfavourable and favourable attitude).”

The fact that women face a discriminatory attitude, including sexual harassment, was also confirmed by men in the focus group: “But I have seen that exaggerated attention is paid [to female colleagues]. The guys also say: “Let’s go to lunch, let’s go to lunch!” She is not going, but they keep asking her. I have seen it in several places. Sexual interest.”

**THE BIGGEST PREJUDICES AGAINST FEMALE PROGRAMMERS**

Both the results of the focus groups and the surveys of men and women—ICT professionals—demonstrated a strong tendency of the discrimination problem to be particularly pronounced in relation to specific IT responsibilities, and namely programming. Female programmers have experienced their professional abilities being doubted, and men report that they have had little or no experience with female programmers, and repeatedly referred to programming as a male job within the focus group, as opposed to, for example, testing, which is much more often performed by women.

**Female ICT specialists:**

—— “Various comments have been heard that there are programmers and there are women (meaning that women cannot be programmers).”

—— “I had a stereotype that a programmer is a bit chubby, not very good-looking, wears glasses—the stereotypes were very scary. But my godfather reassured me, he works in the IT sector and he said that it is quite to the contrary; the guys are communicative, sporty.”

## IV THE MAIN CHALLENGES IN THE WORK ENVIRONMENT OF THE ICT SECTOR

**Male ICT specialists:**

—— “Communication [with female colleagues] is, and was also in the previous jobs, divided by hierarchy into different positions—managers, subordinates. They do not differ by hierarchy, but rather by specifics: engineers, programmers, which are mostly guys. Basic knowledge of IT, working with customers, IT sales, support, business planning—this field is mostly dominated by women.”

—— “In my experience in the team, where I work, programmers are usually guys. Women usually occupy less technical positions. If the team is variegated, it doesn’t matter [if a female colleague joins]. If we are eight male programmers in the team, the girls are “sitting in support” around us. We knew, that if a girl joined our team, it would be completely different [the atmosphere would have been disturbed]. A lot of men question your abilities, if you are a girl. In my experience, there have been cases, when girls are asked in an interview, why they are learning programming, if it is a male profession. There are many such cases.”

—— “I have experienced a situation, where a team leader, who is a woman, believes that programmers can only be men. There has been a situation, where guys also believe that the testers are dumb. Discrimination already exists. But it exists not just towards women. For example, if you have worked at Hesburger, you cannot work in the IT industry.”

—— “A female colleague started to work at [company name] as a programmer, went to lunch and all the guys went silent, as they didn’t know what to talk about when the girl was sitting next to them and listening. Programmers are more introverted; the presence of girls changes their behaviour. She passes the guys, who are playing table tennis and speaking freely with some swear words as well. They will immediately fall silent, because a girl is passing by.”

**LOWER SALARY**

Taking the fact that remuneration in companies is mostly confidential information into account, the participants of the focus group were reluctant to provide extensive comments, but women have noticed that they are paid less than men. Some women shared their experiences.

**Female ICT specialists:**

—— “I teach all new employees within my project the programming language I work in, but I earn the least in the office (I am the only girl) (...).”

“Of course it is a problem. This is a general problem, that exists not only in the IT industry. I don’t know whether it is related to experience or gender, it is probably all of it together, but I recently realised that there is a difference when it comes to salary.”

The focus groups and interviews with company personnel development specialists confirm the above mentioned; that in the recruitment process and career development women are more often assessed according to their work experience, the results achieved in the past, while men—according to their potential. Greater self-control also manifests in career development, hence, women are less demanding than men regarding a rapid increase of salary or career raise—this has been observed both by the members of the focus groups—the IT specialists and the human resource specialists of the companies, who confirmed it in the interviews.

#### Female ICT specialists in the focus group:

“Sometimes women don’t ask for a salary raise themselves, but not due to the fact that they could not get it.”

“Maybe the difference is in the people themselves—maybe at the very beginning a woman asks for less, chooses a lower starting position. She knows that her female friend has a lower salary, and it seems OK to her.”

“(…) I still see that women are often paid less than men for similar duties.”

“(…) Unfortunately, the work of women is still paid less than the work of men. This is a terrible injustice, that must be combatted. In my opinion this issue must be addressed regardless of the employee’s gender.”

#### Male ICT specialists in the focus group:

“The opportunities are definitely there [for women to receive equal pay], but I don’t think that men will be afraid to go and ask, to jump a little higher than expected. A woman will get scared and will not ask.”

“I agree, that men tend to get bored of their work quite quickly, while women stay in one position for longer, therefore men usually tend to have a higher salary.”

The observation expressed by women about lower pay is also reflected in the data. On average in the European Union women are paid 16% less than men.<sup>44</sup> In Latvia

<sup>44</sup> The Gender Pay Gap in Latvia, Eurostat, 2016 un 2017. Available here: [https://ec.europa.eu/info/sites/info/files/aid\\_development\\_cooperation\\_fundamental\\_rights\\_equalpayday\\_factsheets\\_2018\\_country\\_files\\_latvia\\_en.pdf](https://ec.europa.eu/info/sites/info/files/aid_development_cooperation_fundamental_rights_equalpayday_factsheets_2018_country_files_latvia_en.pdf) (Last viewed on 30.03.2020)

the indicators in general are at the average level of the EU (17%). Data from the Central Statistical Bureau demonstrate that the situation has deteriorated over the last decade and the pay gap has widened from 15.2% in 2008 to 16% in the 1st quarter of 2019. Data on the pay gap demonstrate that inequality of salary in the ICT sector is the second largest immediately after the financial and insurance sector, hence, in the 1st quarter of 2019 it was 27.9% in the ICT sector.<sup>45</sup>

The data obtained for this study from the State Revenue Service on the average hourly rate in the field of information technology (group of professions in the field of information and communication technologies by occupational classification: senior specialists and managers) by gender in the last two years demonstrate that the pay gap is approximately 20% and that the salaries of men grow faster than those of women (see Table 2).

**TABLE 2.** Information on the average hourly rate in the professions of information technology by gender in 2018 and 2019 (euro, data as of 26.03.2020)

Subgroup of occupations/small group of occupations	Woman		Man	
	2018	2019	2018	2019
25 senior specialists of the ICT field	12.82	13.56	15.83	16.97
133 managers of the ICT field	20.57	20.83	23.02	24.58

SOURCE: Information collected by the State Revenue Service for the purposes of the study. The collected data on jobs, for which the profession, income and hours worked have been provided in the analysed period. The summarised information may change in accordance with the adjusted reports submitted by the taxpayers, which are determined by Section 16 of the Law “On Taxes and Duties”, providing the tax payers the opportunity to submit the tax administration an application for a review of the payment of duties, a correction of or adjustment to a tax declaration (of the taxable object) within three years from the term of payment laid down in the specific laws. In addition, the collected information may also be altered by the data of the reports submitted with a delay.

#### THE ROLE OF WOMEN IN THE FAMILY AS AN OBSTACLE TO CAREER

Although the attitudes of the employers towards the family needs of the employees are improving, women still face unfavourable attitudes resulting from the perception that exists in society that women are the main caregivers of children and the household in the family. Women working in the ICT sector revealed that during their experience they have felt that their role in the family has negatively affected their career prospects. For example, in job interviews, they have been directly or indirectly asked about planning the family, how often their children get ill, and women have also experienced situations, when this has affected the content of responsibilities assigned to them.

<sup>45</sup> Central Statistical Bureau: Changes in work salary in the 4th quarter of 2019 and in 2019. Informative review 2020/1.

**Female ICT specialists:**

- “I had an example, when I was asked about children. And I had two little ones. Immediately a question followed, about how often they get ill.”
- “It was a person recruited as a high level manager. I was working in the position of Development Manager, and I had ideas I wanted to suggest. He looked at me and said: “Oh no, I will not assign these responsibilities to you, because you will get married and have children. I told this to the management. This person no longer works in the company.”
- “In the interview for the position of IT Project Manager, there was a lot of emphasis on the pace of work, and a joke was made ‘you’d better not plan any children at this time, ok?!’”
- “A comment was made to me by the management: ‘Well, how long are you planning to work until you have the next child?’, which definitely is not company policy, but rather the concern of the manager expressed through a joke.”
- “New mothers are a problematic group. A big problem for women here is their children getting ill, as it results in one week being present, and the next one not being present. It depends on the role, especially if you are the team leader or if the customer is expecting a prepared document every Friday, then it is difficult. There are women, who are leaving and saying that they will come back when their children are a little bit older.”

**Male ICT specialists:**

- “But you see, a woman has children, two or three, and also a man, who still acts like a child. Actually it turns out that a woman takes on a responsible position, children become sick, she is absent and various jobs are delayed.”
- “I have inquired about this subject regarding the recruitment of my female students [provides training in the IT field]. Sometimes you are not asked directly during the interview, but it is very much taken into account. But there are also opposite examples, when women are especially required, as women work for longer periods, while men are often looking for changes.”

This problem is also reflected in the data. It has already been mentioned in the introduction of the study, that women in Europe spend twice as much time caring for children and the household (the so-called unpaid work) as men. At the same time,

men work more paid work than women—for an average of 39 hours a week, but women—30 hours.<sup>46</sup>

The 2019 data on the Gender Equality Index of Latvia show that the situation in Latvia has significantly improved over the last 15 years. However, data still demonstrate that women spend significantly more time doing unpaid work than men: 40% of women engage in daily care work (children, household, family members with special needs) and 38% of men are also involved in it; men prepare significantly less meals for their families on a daily basis—only every second man, but 82% of women do it, and when compared to women, men are able to engage in sports, cultural or other recreational activities more often.<sup>47</sup>

At the same time, it must be admitted that the situation in Latvia is slightly better than the average situation in Europe. Part-time working hours, i.e., less than 40 hours per week, in 2019 was performed by one tenth (11.9%) of employed women and half less by employed men (6.4%). But in the EU countries—one third (31.9%) of women and one tenth (9.7%) of men. The reasons for part-time employment are not only related to the inability to find a full-time job. In the survey of the Central Statistical Bureau 22% of women in Latvia admitted that part-time work is not exactly their choice, but is related to family circumstances (child, adult care). In comparison, 14% of men have provided this as a justification.<sup>48</sup> These data, as well as the experience of women, show that career development is a greater challenge for women than it is for men in general, and that it applies to the majority of economy sectors, not just the ICT sector.

**THE DIFFERENT APPROACH OF WOMEN: PERFECTIONISM, FEAR OF TAKING RISKS**

Both women and men, as well as the interviewed company representatives agreed that there is a difference in the performance of work duties. Women will act much more cautiously in situations where men will not be afraid to take risks, and women will demonstrate more willingness to carry out the task more carefully than their male colleagues. Men tend to perceive this gender difference as a disadvantage of women—as a sign of lower professional abilities or simply as an annoying character trait.

When joining a male-dominated team, women feel that their professional abilities are not trusted and often feel uncomfortable having to ask their male colleagues work-related questions, because they are aware that this will increase their distrust of the woman’s professional abilities.

**Female ICT specialists:**

- (ABOUT APPLYING FOR A VACANCY) “I had a situation, when a male colleague looked at an advertisement and said, oh, looks like this is for me, but I thought to myself, that I most probably would not apply for it.”

<sup>46</sup> 6th European Working Conditions Survey, Eurofound 2015, published at [https://ec.europa.eu/info/sites/info/files/factsheet-gender\\_pay\\_gap-2019.pdf](https://ec.europa.eu/info/sites/info/files/factsheet-gender_pay_gap-2019.pdf) (Last viewed on 25.04.2020)

<sup>47</sup> Gender Equality Index indicators for Latvia for 2019: <https://eige.europa.eu/gender-equality-index/2019/LV> (Last viewed on 29.04.2020)

<sup>48</sup> Data compiled by the Central Statistical Bureau for 2019. Available here: [https://www.csb.gov.lv/lv/dzimumu-lidztiesiba/nodarbinatiba-un-darba-sa-maksa?fbclid=IwAR2qW16UtKcTlproJyF3IP57D\\_oWU1\\_jXRMxvPWN10rXBgNliff\\_wDRv6-4](https://www.csb.gov.lv/lv/dzimumu-lidztiesiba/nodarbinatiba-un-darba-sa-maksa?fbclid=IwAR2qW16UtKcTlproJyF3IP57D_oWU1_jXRMxvPWN10rXBgNliff_wDRv6-4) (Last viewed on 05.05.2020)

## IV THE MAIN CHALLENGES IN THE WORK ENVIRONMENT OF THE ICT SECTOR

- (ABOUT STARTING WORK AT A COMPANY) “I feel anxious—do I fit in, because if I do not succeed in something or I do not understand something, there are all those male colleagues around me and they find it all very easy. I had these feelings due to fitting in, as I started from absolute zero.”
- “With my colleagues it was like that—I had the feeling that I was a junior, a woman and had come from the beauty care sector [the woman had retrained from previously working in the beauty care sector], there was a feeling that I had to fight to be heard, for someone to listen to me (...).”
- “At work it has been like that from the very beginning—the guys feel like they know better, because they are guys, they are in the majority, but it only promoted my professional stubbornness and encouraged me to prove that there are two sides to the coin.”
- (ABOUT ORDER) “Men are a bit more chaotic when programming, more spontaneous, women are more orderly. I have had cases, when I am going through the work, and it seems like something is too much, something can be cleaned up. There have been situations, where I ask why, and then they agree with me.”
- “(...) men create the code chaotically, they do not follow the principles of code design, and then it is quite difficult to work with this code afterwards, but I have never thought that it is because of gender, although I have probably never seen any code created by a woman.”
- “(...) there have been many situations, when it is important for men to do the work in order to provide functionality, but at the same time there are so many details that I would like to correct. There have been cases, when I receive a notification from the previous contract. I edit the work before I send it to the customer. They just don’t think about it, but when they see it, they understand.”
- “Recently I had to create a presentation, and I was the first one, and then the guys were asked to create one according to my sample. The format, the details, and the structure—it was all there. It was associated with women, because of the use of symbols, images. Men joked about it, they didn’t think such elements mattered. But I think they do matter, as they provide better perception, etc.”

## IV THE MAIN CHALLENGES IN THE WORK ENVIRONMENT OF THE ICT SECTOR

**Male ICT specialists:**

- “I have experience of assigning the same task. The guy would sit for three days and nights and complete it so that the result may not be altered for the next couple of years. The female employee completes the work up to halfway, then stops, develops the procedure, so there will be more work to do tomorrow.”
- “It is probably due to uncertainty [that women work very carefully]. But whatever they do complete works great. A guy rages if something goes wrong, and then solves it again.”
- “(...) Taking the fact that there are so many guys around into account, the female colleagues fear fitting into the team, are afraid to ask something. Anxiety, all guys in the team, no one will tell me that you can deal with it differently, understand it, etc.”
- “(...) we developed a user interface that was quite functional; easy to switch from one function to another. She, who was also working on it, didn’t think it was right, even though the client liked it. She spent a week trying to make it perfect, to improve something, etc.”
- “I’m trying to see the differences [women’s working style]; probably, yes, they do it more carefully, do all the documentation work that the guys miss, the guys are bolder and more creative in their solutions—and if anything goes wrong, the guys correct their mistakes.”
- “(...) male employees ask more questions, female employees try to do it themselves to the very end; they do not come and ask me as many questions, as they maybe think that I will be disturbed or because I am a man.”

**THE ADVANTAGE OF THE ICT SECTOR: BALANCING WORK AND PRIVATE LIFE**

In the public perception the image of the sector in relation to the impact on family life is more critical than the assessment of those employed in the sector. In the SKDS survey only 16% of respondents agreed with the statement that work in the ICT sector can be successfully combined with family life. Results of the surveys of ICT professionals conducted by Providus demonstrate that 76% of women and 63% of men believe that ICT work can be easily and conveniently combined with family life.<sup>49</sup> Those working in the sector particularly value the benefits of flexible working hours and remote working option.

<sup>49</sup> In a survey of ICT specialists conducted by Providus, 39 out of 51 surveyed female ICT specialists agreed that it is easy and convenient to combine work in the ICT sector with family life (76%). Male ICT professionals support this statement less, but in general also do support it, as 42 out of 67 respondents (63%) agree with it.

Unlike studies implemented abroad, in this study neither women, nor men mentioned overload and overtime as negative conditions; the list of advantages already mentioned prevailed. ICT professionals acknowledge that they themselves are increasingly noting and respecting the working hours of other colleagues and try not to disturb them outside these hours. Those working in the sector have noticed that the origin of the company plays an important role in this area—Scandinavian companies pay significantly more attention to family needs than others.

#### Male ICT specialists in the focus group:

—— “I used to think that a good programmer can be one who can do the job at any time, but this opinion has changed. I have a very good colleague programmer, but he strictly observes the boundaries.”

—— “(...) I have a daughter at home myself and when I am at home, I do not deal with any work issues; everyone knows and respects it. If there is something to do, my wife and daughter will not suffer; I will do it at night, when they are already asleep.”

#### The female ICT specialists in focus groups:

—— “I have not felt it in a negative way [because of family responsibilities]. I am a mother of two small children; we have an agreement that I leave at a certain time. Sometimes I have to refuse and say that I cannot do it now, and it is accepted, even though other colleagues [who do not have children] can't act the same. It is easier in international companies, as the results are important there, and it does not matter to them how the employee organises the work.”

—— “It is difficult for everyone, both men and women, because everyone has needs, everyone has dentist appointments, also men are starting to take more care of the children, no one is ashamed to say that he has to solve some things during the day that cannot be done in the evening. But the advantage of the work is that it can be done in the evening.”

—— “It depends on the management. I have not heard that it is difficult for colleagues with children to arrange something. There were problems where overtime had to be taken. Then, knowing that I have no family, no children, I am a student, I was offered significantly more overtime, as they already knew that I would be ready to do the task.”

#### MEN AS THE OWNERS OF THE IT SECTOR

Taking the fact that the ICT sector has long been dominated by men into account, when speaking about the professional suitability of women and fitting into the work environment, men look at these issues from the owners' perspective. This observation would be worth exploring in more depth, in order to understand the extensiveness of it, however, from what has been expressed in the male focus group, as well as the individual opinions expressed, it can be concluded that the professional skills of women are related to their ability to be similar (communication style, visual appearance) or at least not being different from the dominant group.

#### Male ICT specialist:

—— “In the IT field, if a woman is a huge specialist, she is not a woman. Meaning that I had a female colleague, who after about three months told me that she had started to say unfamiliar words at home, and that all sorts of swear words were coming out of her, which is due to the fact that she had successfully fitted into the team.”

#### DIVISION OF GENDER ROLES IN EVERYDAY SITUATIONS AT WORK

The interviews of the focus groups demonstrate that in companies with a very large predominance of men in the team, women may face very simple everyday problems that can affect their well-being in the work environment.

#### Experience of a woman at the workplace:

—— “We had a situation, where there was one men's toilet and one shared women's/men's toilet in one office, and we started to solve this issue. Why do men still need to partly use the women's toilet? In the end we achieved having our own women's toilet, without the slash.”

However, unlike professional discrimination, in everyday situations women and men accept and expect the opposite gender to act in a certain way and do not see it as an unfavourable sign. The views expressed by women demonstrate that women divide gender roles in everyday situations and thus do not consider it unacceptable.

#### Female ICT specialists in the focus group:

—— “For example, when I had to move to another office, the men in the office had done everything.”

—— “Also for us—when we need to replace the water container. “Guys, where are you?” It is rather a benefit.”

The participants of the male focus group admit that in many situations women take the initiative themselves, and it is not specifically requested, but it is also clear that men actually expect such actions from women.

#### Male ICT specialists:

—— “Well, I asked to cut the cake [to female colleagues]. (...) No, I can cut it myself, but I don't usually cut cake at home either, my wife does it.”

—— “There is a woman in our team, who has taken on the role of mother in a way; she applies herself, initiates something. She has two children herself.”

#### WOMEN AS THE DECORATION OF THE SECTOR

A major challenge for increasing the representation of women in the ICT sector is the sense of danger that women who work in the sector feel regarding the various positive discrimination measures aimed at this goal, fearing the effects that these measures can have on their professional value, i.e., make it less important than their female gender. Communication activities aimed at raising awareness of the problem should include invitations from companies for women to apply for jobs in the company that make it clear that the goal of gender parity goes hand in hand with equivalent professional requirements.

In recent years, some IT companies and the Riga TechGirls movement have organised various activities to attract women to the IT sector—scholarships for women to acquire IT skills, opportunities to participate in training, facilitated conditions for participation in educational conferences, the promotion of successful retraining stories of women and other activities. Those working in the ICT sector have noticed these activities, understand their goals, but both in the focus groups and in the survey of the professionals, the attitude towards such activities is strongly critical. This is especially true among women themselves, who see the danger that the strong emphasis on the gender of the IT professional will diminish the importance of their professional skills.

Women in focus groups acknowledge that they face mistrust and prejudice due to gender disproportion and that it takes time to prove their professional skills. Scepticism about specific support measures to attract more women to work in the ICT sector can be explained by the fear of returning to “the starting point of mistrust”. Positive discrimination measures attract great attention to gender, but women have in fact tried to divert attention away from it.

#### Female ICT specialists:

—— “In my experience I have had to prove that I know things. You have to first overpower the other person with your knowledge, as well as be very self-confident,

and only then are you perceived seriously. Unfortunately, women in the IT field provoke a reaction: “Oh, how sweet, how unusual!”

—— “Guys will be happy to tell you when and where you are wrong. And they will look at your reaction, will test you, and maybe do it with competitive interest. Over time you have to prove that you are not stupid and that you can do it. Then these talks are over and everything is fine.”

—— “I understand that it is required, but the emphasis on it is annoying, if it is exaggerated. Let's do something more special to help women, but I do not feel that special need; it is forming this negative attitude. But the speed at which everything is taking place right now, is unfortunately moving right at it.”

—— “My biggest fear is that I am being pushed somewhere, because I'm a woman. And it is not related to the responsibilities, but because I'm a woman.”

—— “I have similar fears. It is unfair to those women, who are already working in the industry.”

—— “I am not a woman at work, I am a programmer. Specialists should be recruited, and not gender representatives.”

—— “(...) My greatest joy is that I am perceived as a good professional, and not as ‘the decoration of the office’.”

#### IT PROFESSIONALS DO NOT SEE THE POSITIVE EFFECTS OF GENDER BALANCE

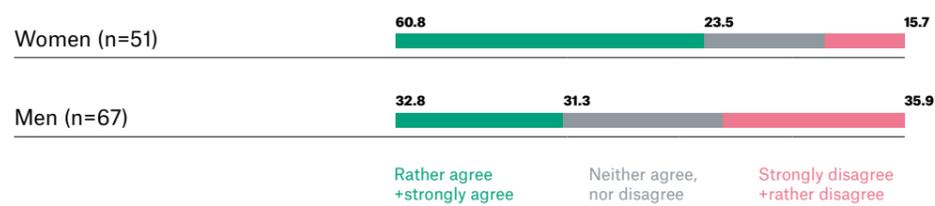
In diversity management not only is setting these values at the level of the company goals very important, but also active communication with employees, about how these values are put into practice. The data obtained in the study demonstrate that ICT professionals currently rather do not see the benefits of gender balance in the company. Companies that set it as a goal need to regularly recall these goals and demonstrate the link between diversity in the team and its impact on the results, so that employees value and support the diversity of the company and the activities aimed at inclusion.

The survey of employees conducted by Providus in the sector cannot be considered representative, but other, more reliable data are not available, thus the results of the survey should rather be perceived as an indicator of some potential risks in diversity management, which should be tested in a more extensive selection. As Diagram 35 demonstrates, women in comparison to men appreciate the benefits from

## IV THE MAIN CHALLENGES IN THE WORK ENVIRONMENT OF THE ICT SECTOR

more balanced gender representation twice as much: 60.8% of women in the ICT sector believe that the company benefits from it, if women and men are represented in approximately equal numbers; 32.8% of men agree with it (see Diagram 36).

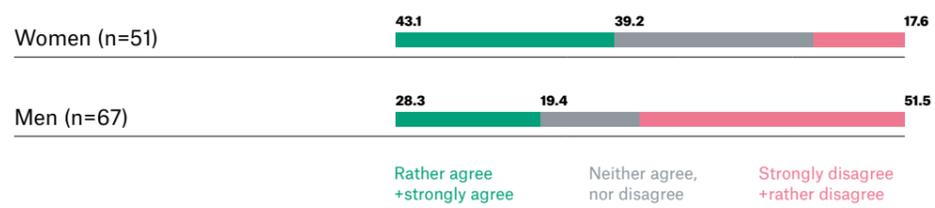
**DIAGRAM 36.** The companies benefit, if men and women in them are represented in approximately equal numbers? (%)



SOURCE: Online student survey implemented by Providus, 2020

The survey results demonstrate that both genders are not convinced that gender balance has a positive effect on the IT work results, although women in general see such benefits more than men (see Diagram 37).

**DIAGRAM 37.** IT product quality is affected by whether both genders are involved in the development of it (%)

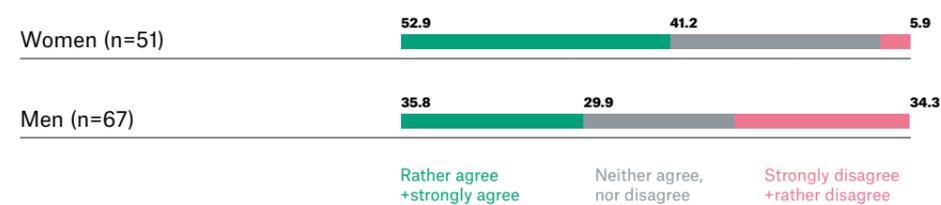


SOURCE: Online student survey implemented by Providus, 2020

The survey also allows one to conclude that there is a lack of confidence among ICT specialists that women should be represented in larger numbers (see Diagram 38).

## IV THE MAIN CHALLENGES IN THE WORK ENVIRONMENT OF THE ICT SECTOR

**DIAGRAM 38.** Women should be represented in the IT sector in much larger numbers (%)



SOURCE: Online student survey implemented by Providus, 2020

### Conclusions and suggestions

- 1 Women in this profession face the questioning of their professional abilities due to gender, and it manifests more specifically in the programming specialisation. This means that, when they start working in an IT company, they have to put more effort into gaining the trust and cooperation of their colleagues.
- 2 Women also have to overcome various psychological barriers. Both men and women have observed that women work more cautiously, pay more attention to detail and take less risks. Men tend to mistake it for weaker skills or knowledge.
- 3 Women have also experienced sexual harassment. It was mentioned by some women. Situations when men make comments, sexist jokes are more common. These situations prove that companies should:
  - implement clear policies that emphasise gender equality as a value;
  - create an inclusive internal work culture: team building activities, support of mentors, regular internal communication on the professional achievements of both genders, the benefits of diversity, etc.;
  - provide the order, of how women can receive assistance, if they face discrimination.
- 4 In the sector women are paid less than men. The pay gap in the ICT sector is approximately 20–28%. These data demonstrate a strong counter-message to the efforts to convince the public that there are high expectations of women in the industry, as professionally they are as capable as men. To decrease this problem, companies should regularly monitor the level of pay by gender.
- 5 The participants of the study do not feel the need for and benefits of taking specific measures to increase gender balance in the sector. Women currently working in the sector feel endangered that the activities of positive discrimination will decrease the

---

IV THE MAIN CHALLENGES IN THE WORK  
ENVIRONMENT OF THE ICT SECTOR

significance of the professional skills of women, therefore they do not really support a special emphasis on gender. These findings suggest that the current working environment is not strongly supportive of activities aimed at balancing the gender representation. A much greater awareness of the benefits of diversity should be promoted. Awareness raising campaigns aimed at increasing the interest of women in the sector must send a message that highlights other benefits along with gender, including professional skills.

- 6 The study reveals that employees mention the opportunity to work remotely more often and more flexible working hours as a significant advantage of working in the IT sector, while the society perceives working in the industry as being difficult to balance with family life. When recruiting employees, the companies should promote the successful experience of the employees in balancing work life and private life more as a significant advantage of this sector.

---

Authors would like to express their gratitude to participants of focus groups, field's experts, representatives of companies and teaching staff that greatly contributed to this research paper.

The research was implemented by the order of the IT Education Fund foundation and Accenture Latvia. The responsibility for the content of the study is held by the Center for Public Policy Providus.



The Research was conducted by the Centre for Public Policy Providus.

Alberta iela 13, 6th floor  
Riga, LV-1010, Latvia  
E-mail: [info@providus.lv](mailto:info@providus.lv)  
Phone: +371 67039252