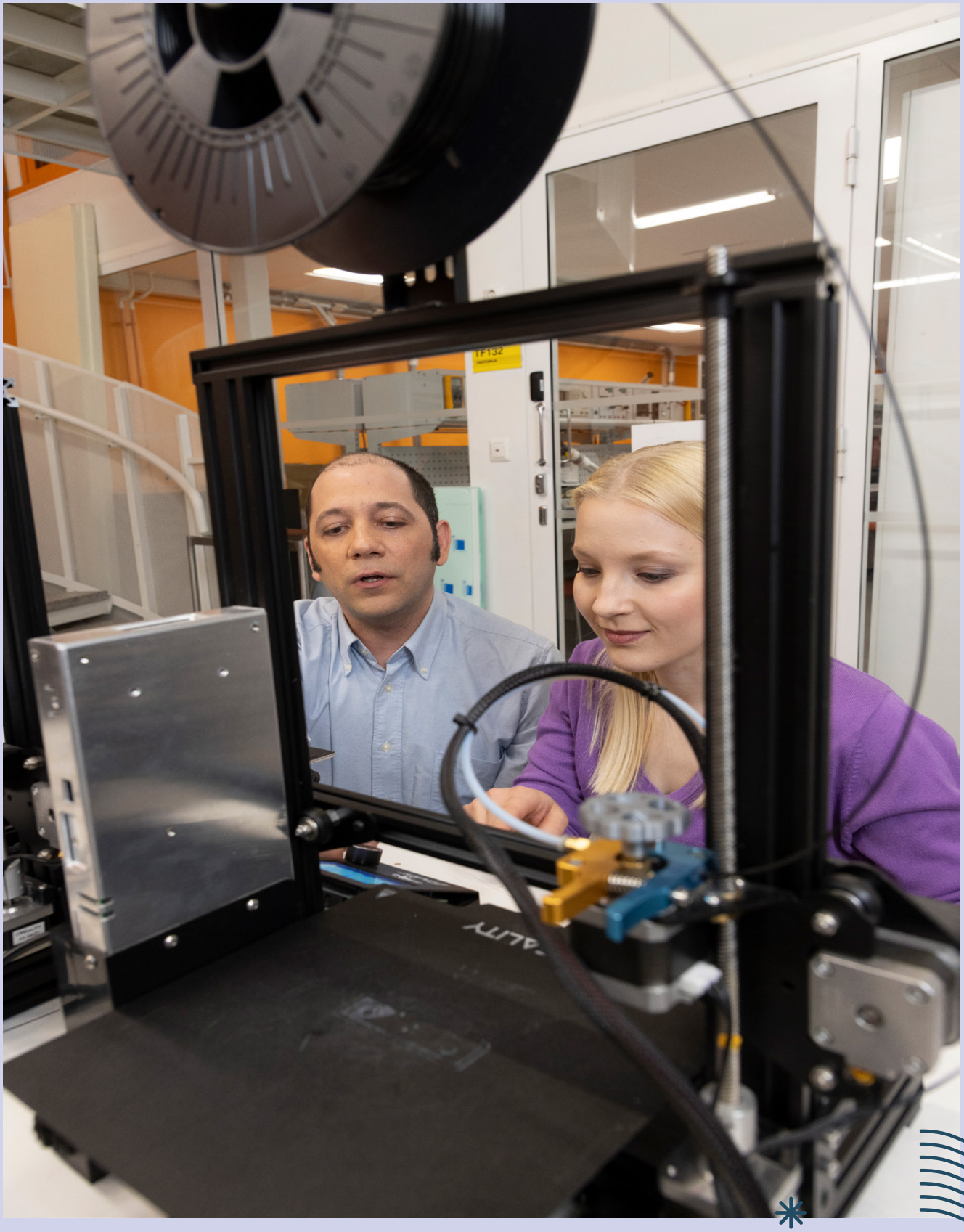

Towards equal representation in tech

A study on ways to achieve gender balance in the field of technology at universities

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This study examines ways to boost female representation in fields of technology at universities. TEK aims to promote a more equal gender balance in the field. This would bring many benefits not only to universities, but also the labour market and society.

Key recommendations

Bold rebranding of degree programmes

The choice of field of study and study track is motivated as much by impressions as by rationality. What value proposition does the name and content of the degree programme offer? Do they successfully reflect the key role of the field in addressing major societal challenges and saving the world? In this study, we highlight several inspiring cases of successful rebranding.

Enjoying the world's best student culture

The student culture in the field of technology has transformed in recent years. Students have taken a giant leap towards a more inclusive student culture. This is something that should be communicated to young people considering the field, and the best possible partners for communicating this are the students themselves. It is worth making more systematic use of students' skills and developing an even better study and student culture in cooperation between students and the university.

Cooperation and pooling resources

All key players in the field of technology try to do their part in balancing the gender ratio in the field. In addition to this common ambition, there is a relatively unified view on the measures required. This starting point provides an excellent basis for extensive marketing and branding campaigns, as long as the partners can join forces and channel small streams of resources into one great current.

Background

In recent years, the proportion of female students in university education in the field of technology has developed in a positive direction. From 2018 to 2024, the change has been dramatic, with an increase of around 8 percentage points in both engineering, manufacturing and construction (EMC) and information and communication technologies (ICT)[1] . In the same period, the share of women among primary applicants in these fields has increased by just under 3 percentage points. Among the bigger fields of education, the largest increase in the share of women among students and new students has been in the field of Chemical engineering and processes, which includes degree programmes in Chemical Engineering, Biotechnology and Process Engineering (Vipunen 2025). We believe that this positive development can be continued and accelerated further by developing the study options, course content, marketing and culture in the field of technology. This study presents good practices from universities in the field of technology that we hope will also spread elsewhere.

A more equal gender balance in technology would bring significant benefits. Universities would benefit as an increase in female applicants would broaden the pool of applicants and allow for the selection of even more proficient students. Universities would also benefit from the higher academic performance of female students, as universities are rewarded financially for study progress and graduating students. Society and the economy would benefit from a more diverse technology sector, as diversity in workplaces promotes innovation and the quality of innovations. In addition, the pool of potential applicants is increasingly female: 59% of new upper secondary school students in 2021 were female and 41% male. Similarly, 59% of all new university undergraduates this year were women.

This study was inspired by the newly established degree programme in Energy Transition at Tampere University. How has a degree programme that focuses on male-dominated electrical engineering and that includes male-dominated studies in automation, civil engineering and energy technology been so much more successful in attracting female students than the degree programmes that make up the Energy Transition programme? This weak signal raised the question of whether, with the right formulation of names and descriptions of degree programmes, it would be possible to attract significantly more female students to study technology, as has been the aim for several decades.

The study is based on a survey sent to all universities of technology to learn more about their interventions to attract female students to the field. In addition, several background discussions with individual fields of technology and study options have been held for the study and TEK's prior research and expertise has been utilised. The report presents the results of the survey and provides recommendations for interventions to improve the attractiveness of the field of technology.

In attracting female students to the field, it is important to keep in mind the systemic level and not to resort to sub-optimisation: we do not want to see separate male- and female-dominated fields within technology, but a more equal gender balance across all study options.

1 Information and Communication Technologies (ICT) also includes BSc, Computer Science, and MSc, Computer Science students, with the exception of the University of Helsinki

Results of the survey

The purpose of the study was to gather information about the measures taken by universities to attract female students, for example in terms of marketing, renaming degree programmes and updating course content. Data was collected through a concise questionnaire sent to all universities offering education in technology. The questionnaire was open from 4 November to 22 November 2024.

We received 23 responses. The majority of respondents answered from the perspective of more than one study or degree programme and a few respondents from the perspective of the whole university. Responses were received from almost all universities of technology. The proportion of women in the degree programmes mentioned by the respondents varied from around 5% to 80%.

The questionnaire asked about any measures that had been taken to attract female students from the perspective of five different themes. The themes were

1. cooperation with other higher education institutions,

2. cooperation with schools, associations or other organisations,

3. marketing specifically to female applicants,

4. changing the content or names of degree programmes to make them more attractive to female applicants, and

5. other special measures and strategies.

If the respondent stated that the institution they represent had taken measures in line with one of the themes, they were asked to specify and describe the actions in more detail in an open field.

The questionnaire highlighted the various actions taken by degree programmes and universities to attract female students to the field. By far the most respondents mentioned marketing to female applicants. The least frequent measure was changing the content or names of degree programmes (Figure 1). Some respondents already represented a female-dominated degree programme, in which case measures aimed specifically at attracting females were not seen as particularly relevant. Nevertheless, these programmes had still taken some measures, such as participating in the Shaking up Tech event.

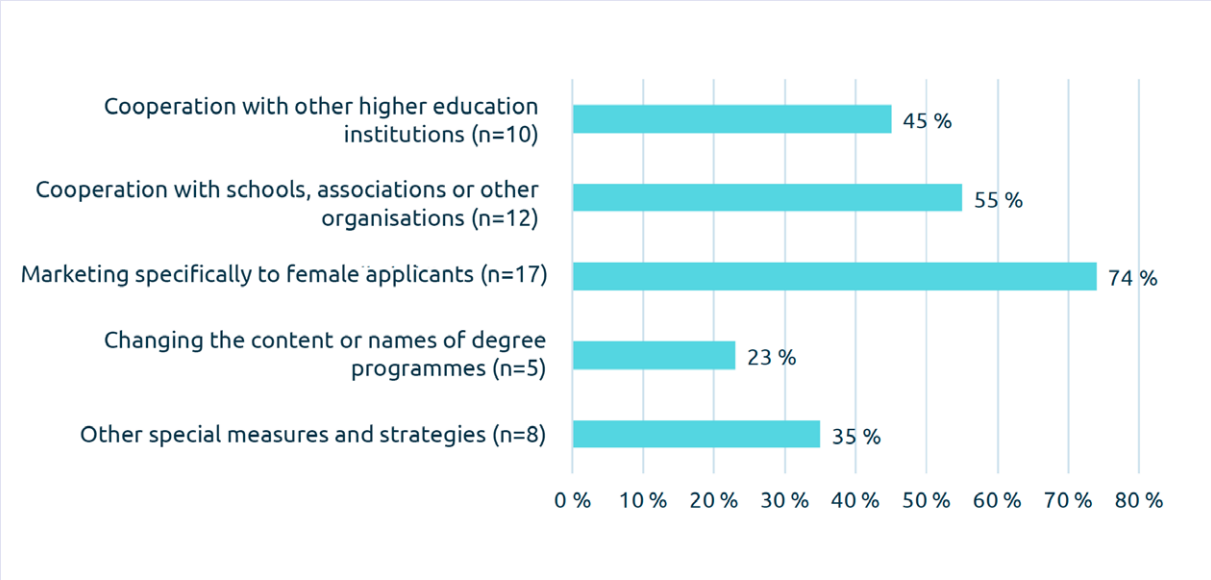


Figure 1. Themes indicated by respondents under which the responding institution has taken or is preparing measures to attract women to the field.

Two respondents indicated that the degree programmes they represent had not taken any measures in line with the themes in the questionnaire to attract female students to the field, despite the fact that these respondents represented highly male-dominated fields of technology.

The measures identified in the questionnaire are presented in more detail below. The responses are themed under different headings than in the questionnaire itself, as different respondents described similar actions under different headings.

Marketing and stakeholder engagement

Most universities participate in Shaking up Tech, an event that brings together female upper secondary school students who are interested in technology and introduces them to the field. Other forms of engagement mentioned in the survey include participation in the Women in Tech event or the organisation of coding workshops with the Mimmit koodaa community.

Universities also promote women's interest in the field of technology through science education. This helps to develop an interest in maths, science and technology already at pre-school age. In addition to visits to upper secondary schools, universities also carry out other targeted activities for young people under upper secondary school age. Several respondents also mentioned the students' own social media channels or student ambassadors as marketing channels.

Gender-inclusive marketing materials

Aalto University is currently conducting a university-wide project to achieve a more even gender balance in the fields of technology and business:

"In 2024, increasing the proportion of women in the fields of technology and business has been one of the strategic goals for communication and student recruitment at Aalto. For this purpose, a working group has been set up to discuss various measures."

The survey responses indicate that universities and degree programmes have different attitudes towards promoting gender equality in marketing materials. Fields of technology are generally male-dominated and therefore there is often a desire to increase the proportion of women in marketing imagery and, for example, in alumni stories. Several responses also highlight the importance of presenting female role models.

"...social media posts aimed at women, visibility of women in general as role models in different channels or interviews, in introductions. We try to choose equal numbers of women and men as student ambassadors."

On the other hand, there are also female-dominated fields of technology, and they obviously have no need to attract more women to the field. In these cases, it was not clear whether there had been any attempt to address the gender imbalance by introducing more male role models and alumni stories and adding more male students into the marketing imagery of the field.

Changing or developing the content or names of degree programmes

In addition to marketing and engagement, some programmes had made concrete changes to appeal to female applicants. In addition to name changes, the descriptions of the content of the studies had been modified. Universities have also created entirely new study options, with content that is largely similar to male-dominated fields of technology, but with the value proposition offered by the programme name and description formulated with the interests of female applicants in mind. A good example of this is degree programme in Energy Transition at Tampere University, mentioned in the introduction.

Some responses also stressed the importance of considering the views of female students or others belonging to the target group when revising the names and content of programmes. Others emphasised interdisciplinarity, whereby students can build multidisciplinary study modules through minor subjects, for example.

However, it was pointed out in the responses that the changes were not always aimed exclusively at attracting female applicants, but rather at improving overall attractiveness of the degree programme.

"The name of the Bachelor of Science in Technology degree programme was changed to "Sustainable Energy and Smart Technology". - - Any descriptions of topics where you can somehow make the world/ environment/society a better place and promote justice appeal, in our opinion, particularly to female applicants."

Views on the impact of measures and strategies

The changes also had a noticeable impact on the number of applicants, as one respondent reported:

"In the School of Engineering, for example, study options were revised, and changes were also made to their names. These changes led to a significant increase in the proportion of women who accepted an offer of admission. In 2021, the share of women who accepted an offer of admission in the Built Environment programme was 47.2%. During the programme reform, this was replaced by Sustainable Communities, in which the share of women who accepted an offer of admission was 62% in 2024."

However, others stressed the difficulty of assessing the impact of the measures. Many of the measures were relatively recent and their longer-term effects were not yet clear. Also, the impact did not always meet the expectations, but despite measures, the share of female applicants and students had not increased as hoped. In the big picture, however, the measures can be considered to have been a step in the right direction, given the significant increase in the proportion of female students in fields of technology in recent years.

The survey also revealed various beliefs related to attracting female applicants to fields of technology. Some of the responses demonstrated somewhat stereotypical ideas about what appeals to women. There was also the idea that more multidisciplinary universities would be more popular in terms of the number of applicants. However, this was not supported by statistical analysis.

What will be and should be done in the future?

Respondents were asked not only about the current measures, but also about their thoughts on the future. The majority felt it was important to continue efforts to address the gender imbalance. In addition to traditional communication and marketing tools, such as highlighting inspiring examples and role models, events and updating the imagery, the student culture and its impact was mentioned.

"We received new (female) students because someone in the student guild had run a TikTok account for the guild, through which students had found and applied to the field. We have the guild to thank for this; the university can take no credit for this. But the point is that the guilds probably have the best ideas of how to reach young people: we could work with students even more extensively in our marketing."

As the above quote from a respondent shows, the image of the fields created by student activities can differ from the images created by marketing to potential applicants. This may also be influenced by the authenticity and credibility of such content, which are some of the main reasons why content marketing has become so popular in recent years.

Student activities were linked to a broader change in tech student culture and its continued development in cooperation with student unions and tech student associations. Tech student culture has already seen a clear development in recent years, which is also reflected in the attractiveness of the field of technology.

"The activities organised by our student associations are designed so that students feel welcome to participate, regardless of their gender. This is extremely important for student satisfaction, and I believe that this information is effectively passed on to upper secondary school students who are thinking about their further studies through the grapevine, without the university having to specifically advertise it."

In addition to the communications of the field itself, respondents highlighted a broader societal perspective. It makes a difference how the field of technology is discussed in the media and how women in technology are portrayed. The diversity of the fields of technology is easily overlooked, and school-age children should already be told about the multidisciplinary nature of technology. Cooperation between universities and various partners was seen as important particularly in social influencing. In addition to TEK, the Technology Industries of Finland and educational institutions at various levels were mentioned.

Key findings from other studies

Both the TEK Graduate Survey and Student Survey (Figure 2 and Table 2) have found differences between male and female students that are interesting in light of this survey. For example, women systematically consider sustainability skills as a more important career skill than men.

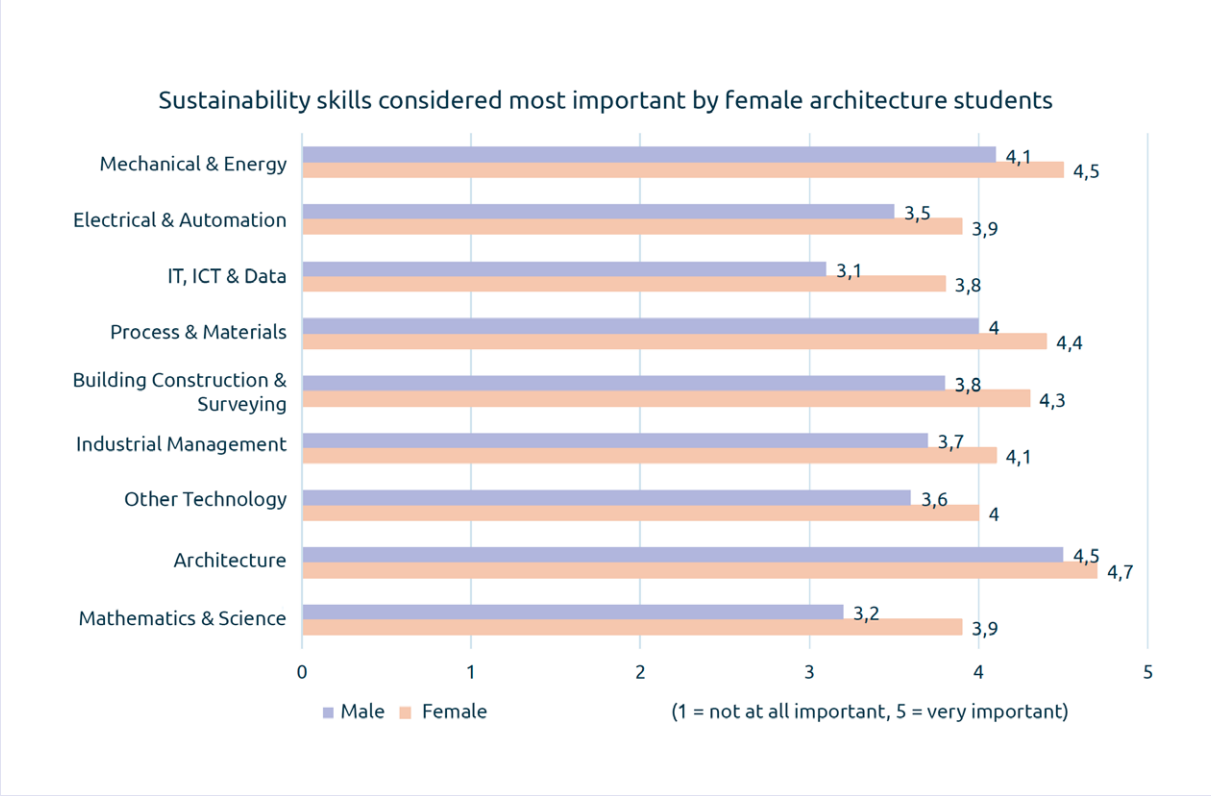


Figure 2. Perceived importance of sustainability skills among students by field of education and gender (Source: TEK's Student Survey 2023).

Table 1. How important is it to you to be able to further the following Sustainable Development Goals in your career?

Gender	Sustainable economic development	Sustainable social development	Environmentally sustainable development	Cooperation and partnerships	Peace, fairness and good governance
Male, n=1931	3,66	3,46	3,94	3,55	3,69
Female, n=908	3,89	3,92	4,41	3,84	4,00

(Source: TEK's Student Survey 2019)

According to a study by Junior Achievement (JA) Finland, there are interesting gender differences in young people's career values and their views of the most important career skills (Figures 3 and 4). The differences in career values are smaller, but girls are more likely than boys to, for example, express a willingness to help others through their work and show concern for the environment. As for the most important career skills, differences are particularly obvious in the appreciation of the ability to face and respect diversity, and of emotional skills. In general, the results suggest that girls find so-called soft values and skills more important than boys and vice versa.

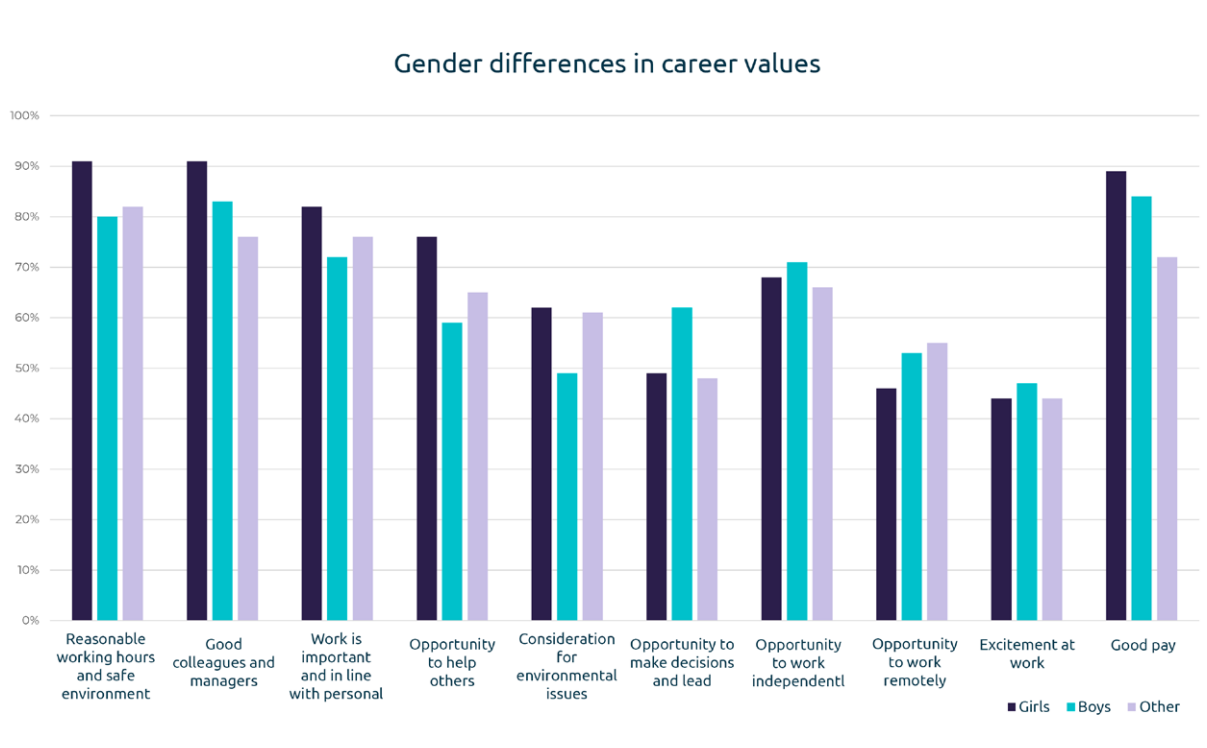


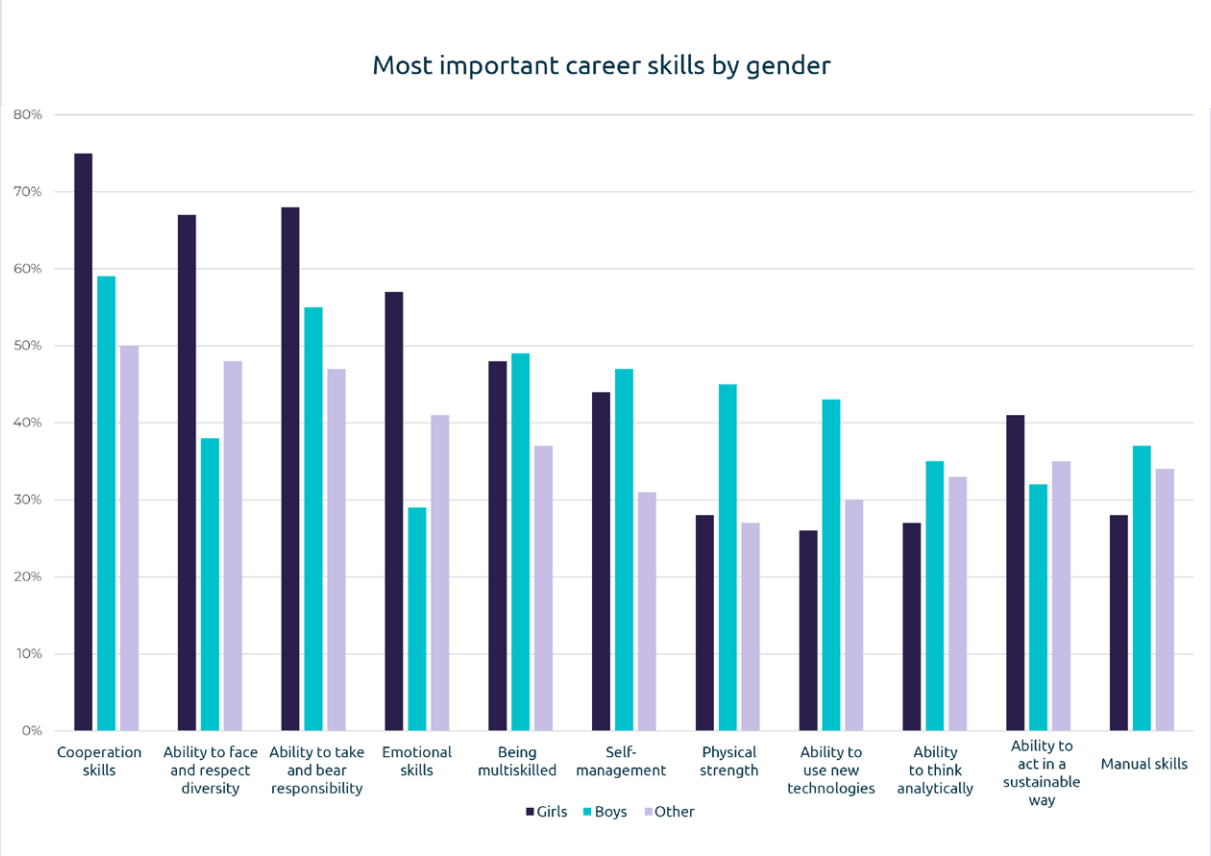
Figure 3. Gender differences in career values (Source: Youth Future Report of Finland 2024)

Conclusions

The problem in the field of technology is not that women are not interested in its contents, but that they seem uninteresting to women. This view is also supported by the observation that many of the women who initially start studying technology with the intention of applying to another programme later end up staying in the field. Rather than changing the content, the most important thing would be to change the perceptions associated with different fields of technology. All degrees in technology open up a wide range of career paths, but the image of a career in technology can be very narrow.

When attracting women to technology, it would also be good to work in cooperation with the UAS sector, as it is becoming increasingly common to pursue a master's degree in technology as a UAS degree. If the current gender imbalance in fields of technology at universities of applied sciences remains, it will be difficult to achieve equal gender representation, even if progress continues well at universities.

While attracting more female students to the field of technology, efforts must also be made to develop the working culture in technology. It will be difficult to convince female applicants that they can look forward to a rewarding career if the unexplained pay gap persists, discrimination and harassment continue, and women have fewer opportunities to progress in their careers.



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Fields of education in this survey

- The statistics are obtained from Vipunen and delimited using the classification of education and education titles of the Ministry of Education and Culture

- **Information and Communication Technologies (ICT) (OKM1)**

- **Information and Communication Technologies (ICT) (OKM2)**

  - Inter-disciplinary programmes and qualifications involving information and communication technologies (ICTs) (incl. all education in this field) (OKM3)

Includes the education titles of Bachelor of Science, Computer Science, and MSc, Computer Science, with the exception of the University of Helsinki

Engineering, Manufacturing and Construction (OKM1)

- **Engineering and engineering trades (OKM2)**

  - Chemical engineering and processes (= degrees in Biotechnology, Chemical Engineering and Process Engineering) (OKM3)

  - Environmental protection technology (= degrees in Environmental Engineering) (OKM3)

  - Electricity and energy (incl. degrees in Engineering Physics) (OKM3)

  - Electronics and automation (= degrees in Automation Engineering) (OKM3)

  - Mechanics and metal trades (= degrees in Mechanical Engineering) (OKM3)

  - Inter-disciplinary programmes and qualifi cations involving engineering and engineering trades (incl. degrees in Industrial Management and Science and Engineering) (OKM3

Manufacturing and processing (OKM2)

- Materials (glass, paper, plastic and wood) (= degrees in Wood Processing Technology) (OKM3)

- Mining and extraction (OKM3)

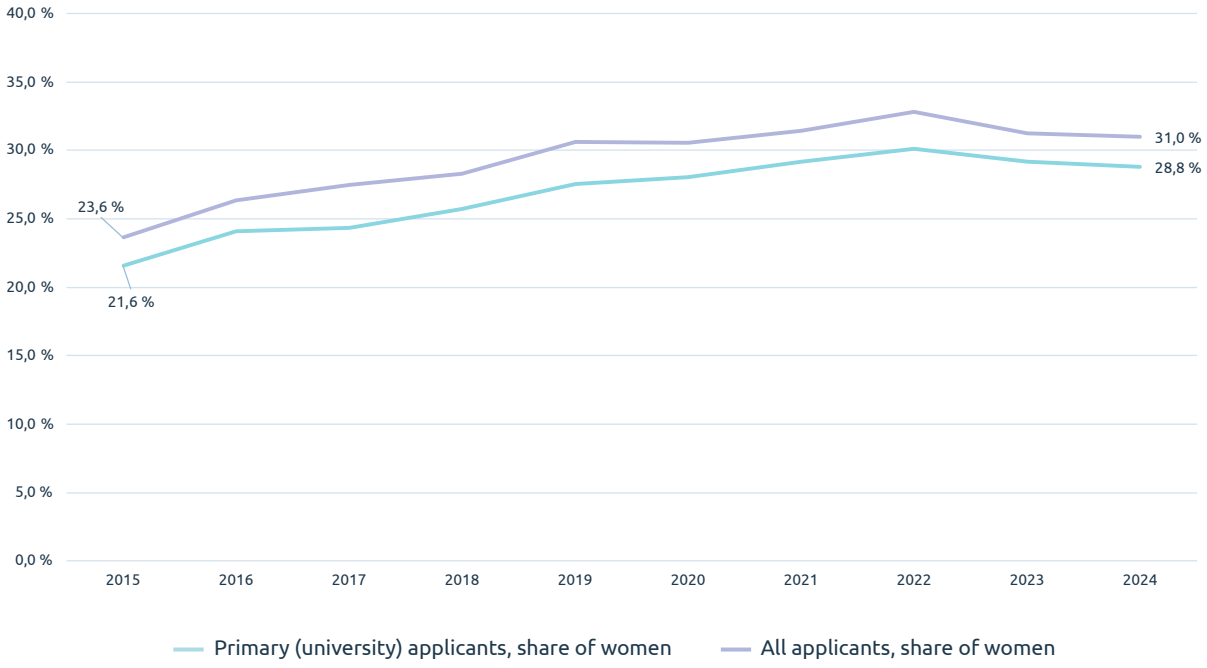
- Inter-disciplinary programmes and qualifications involving manufacturing and processing (= degrees in Materials Technology, Rock Engineering) (OKM3)

Architecture and construction (OKM2)

- Architecture and town planning (OKM3)

- Building and civil engineering (OKM3)

Share of women among primary and all applicants to Engineering, Manufacturing and Construction and ICT in total 2015–2024



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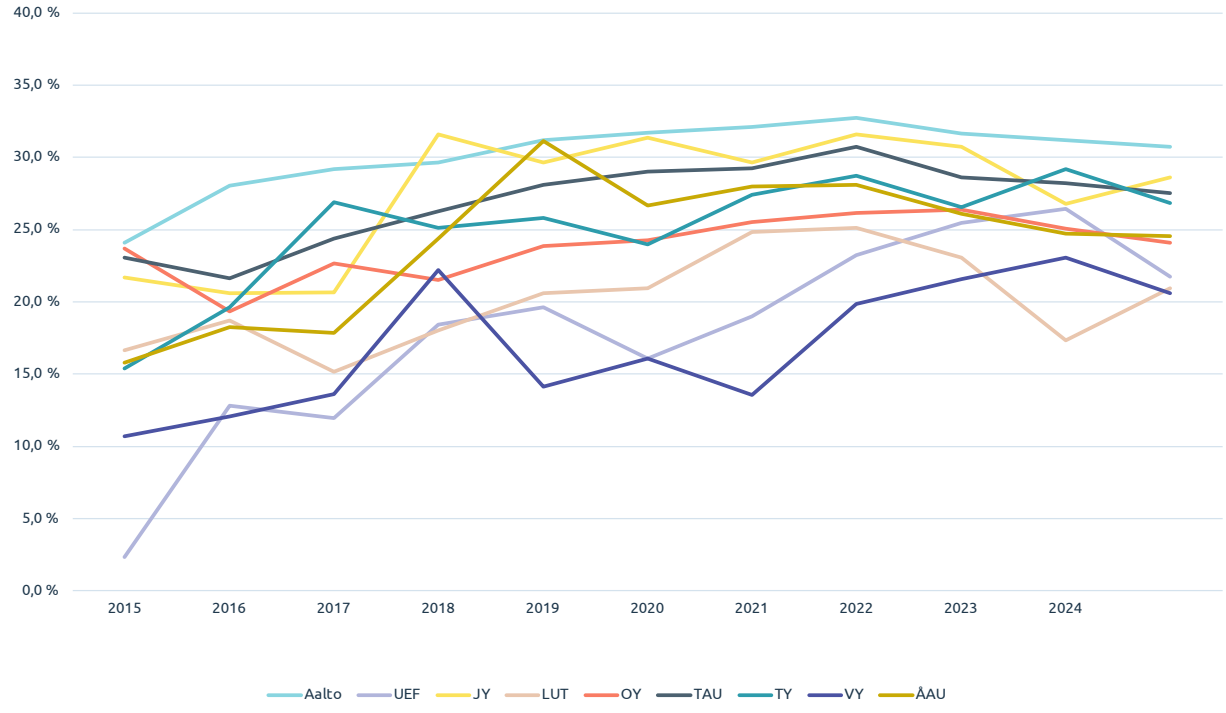

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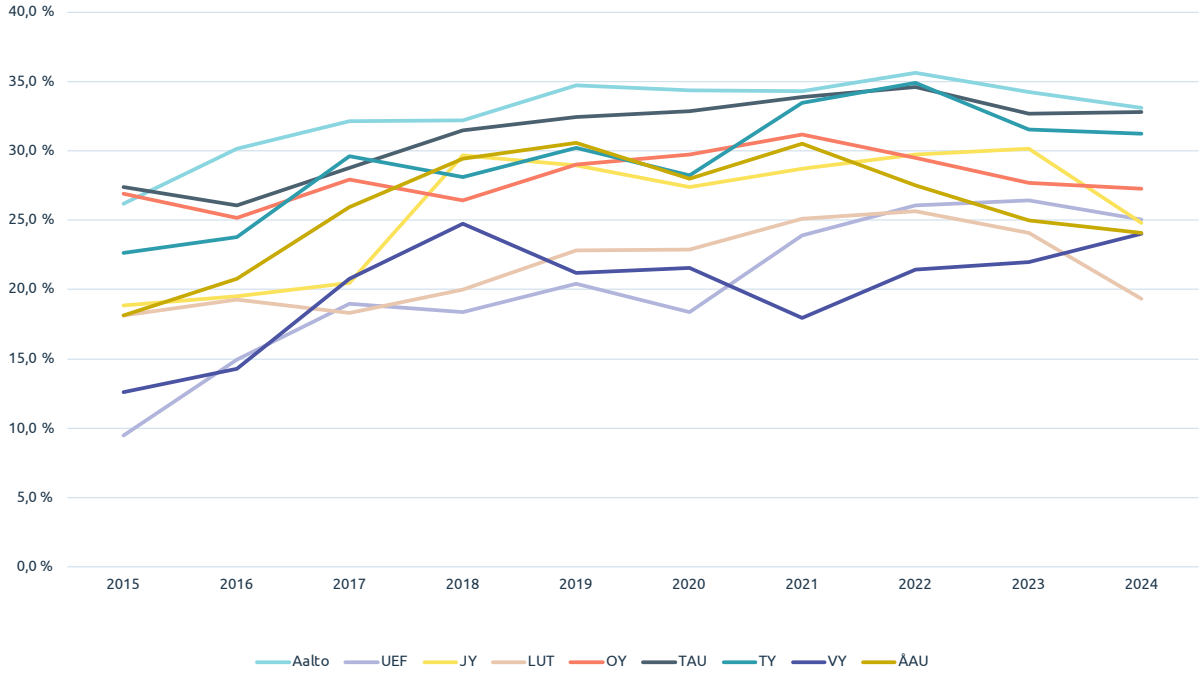

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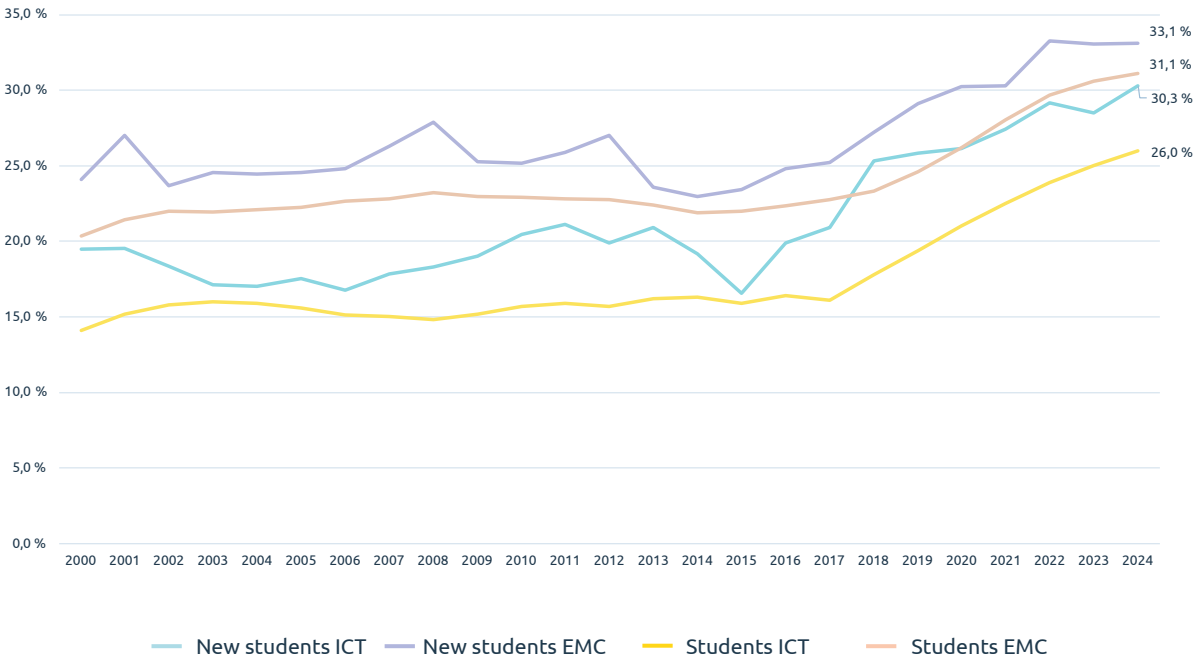
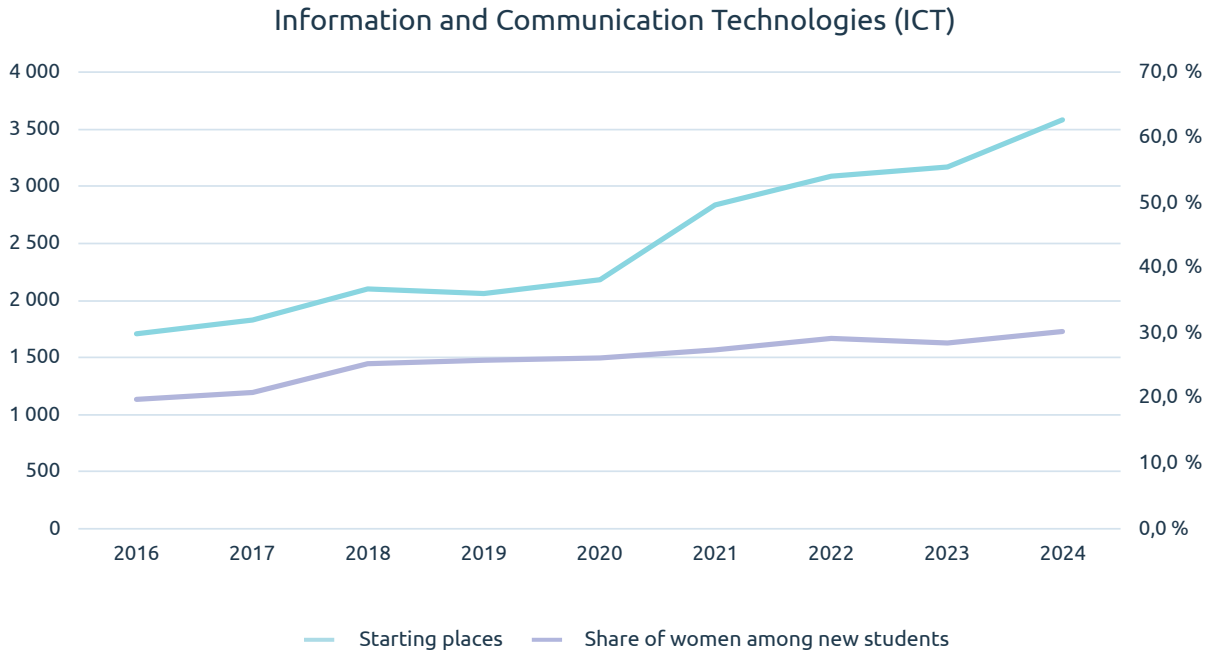
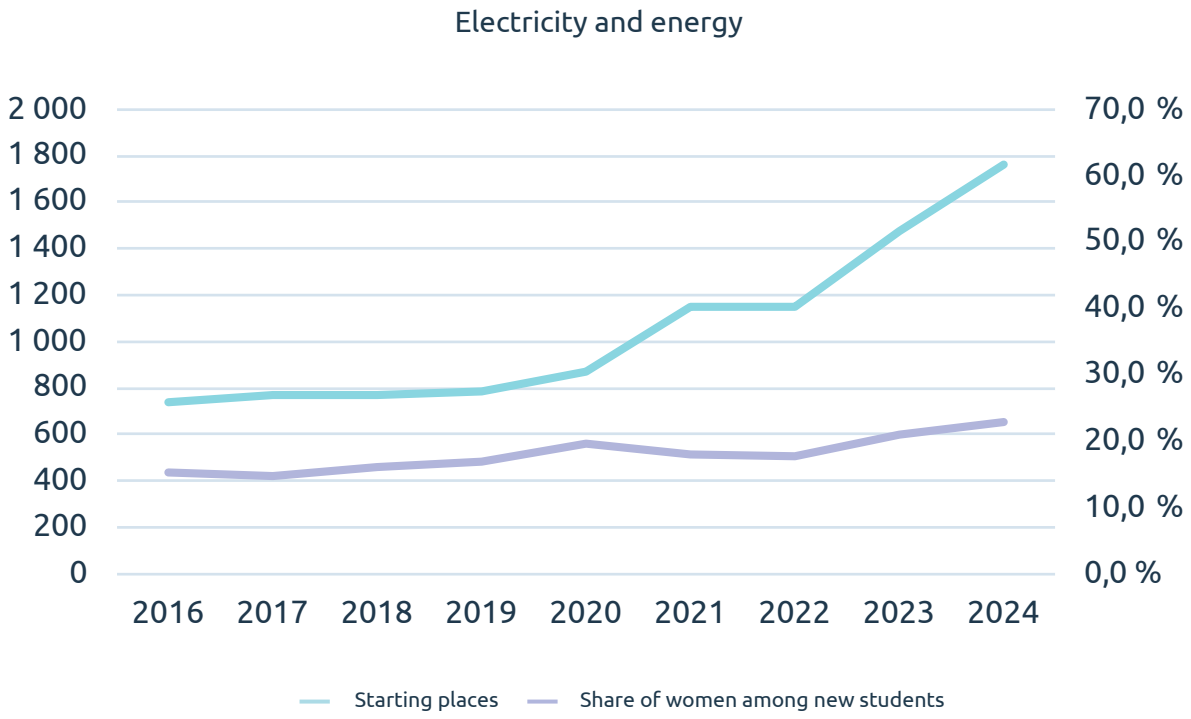
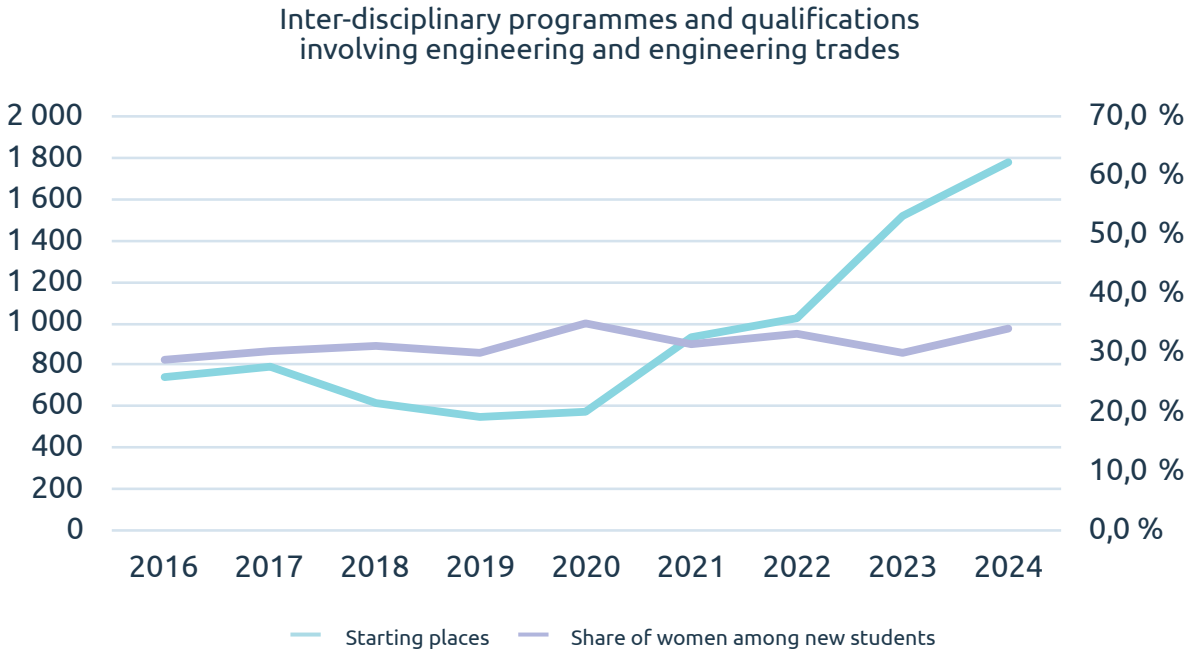


Share of women among new students and starting places in ICT in 2016–2024

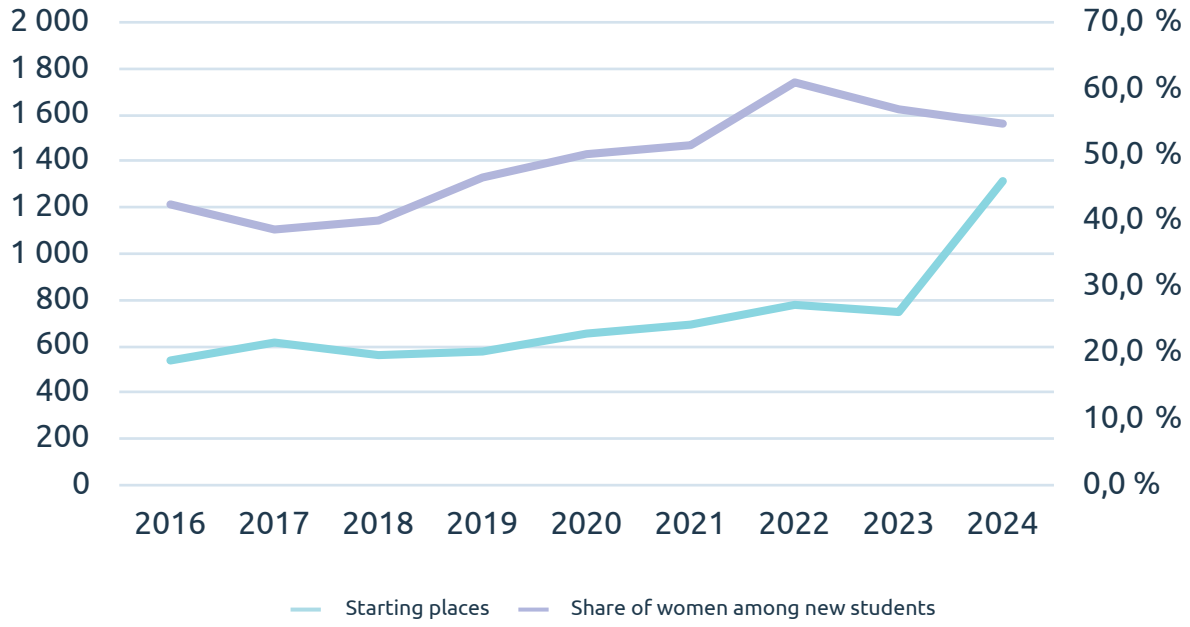


Share of women among new students and starting places in engineering and engineering trades (biggest fields)

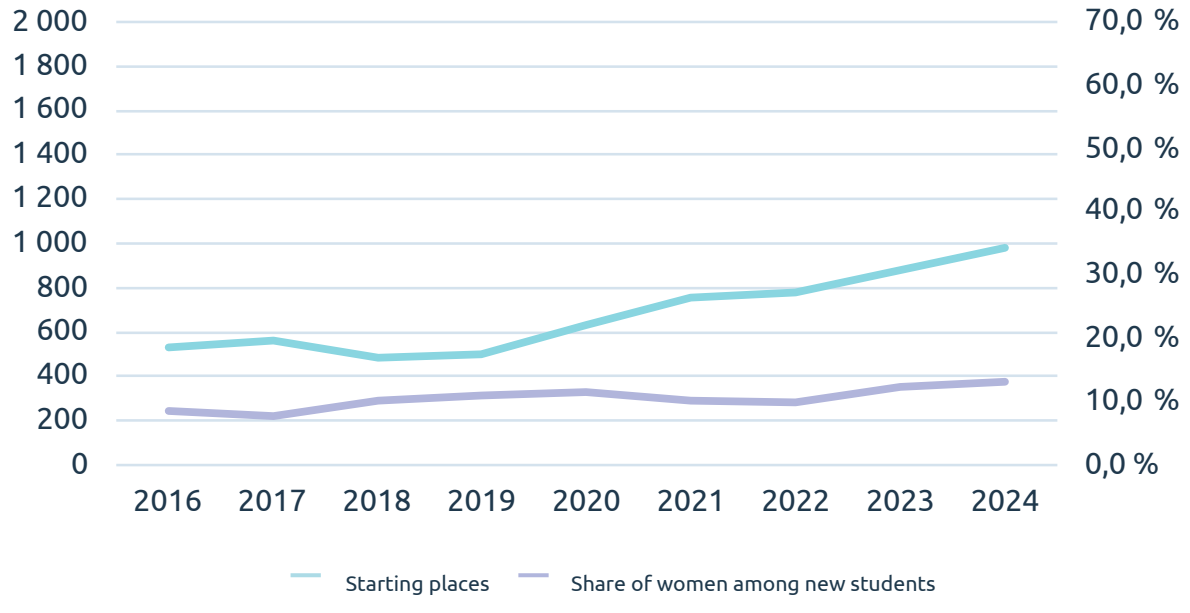




Chemical engineering and processes

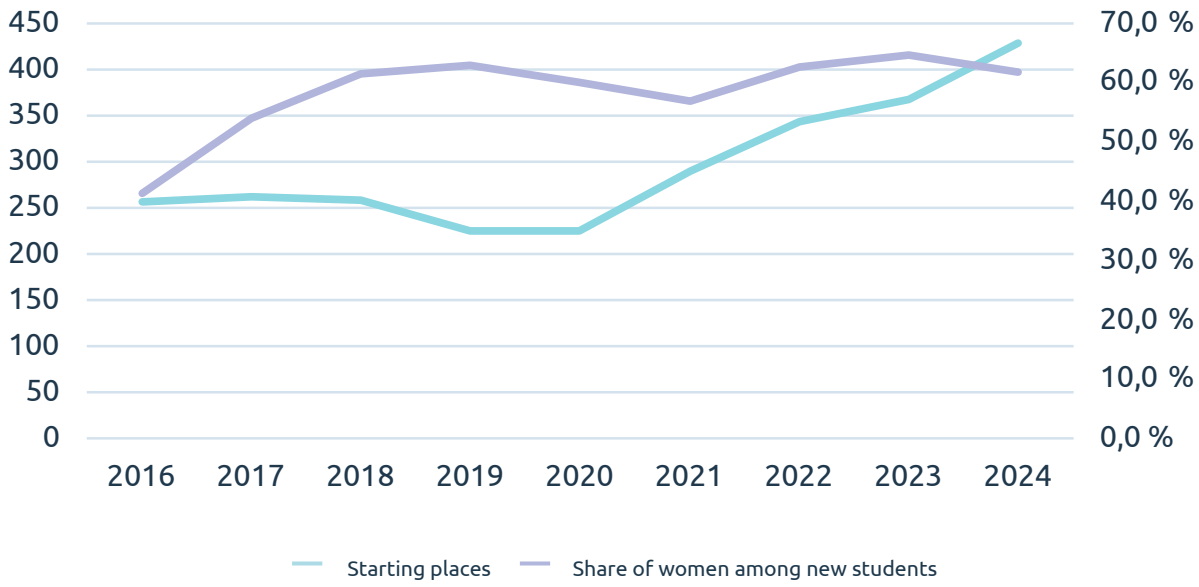


Mechanics and metal trades

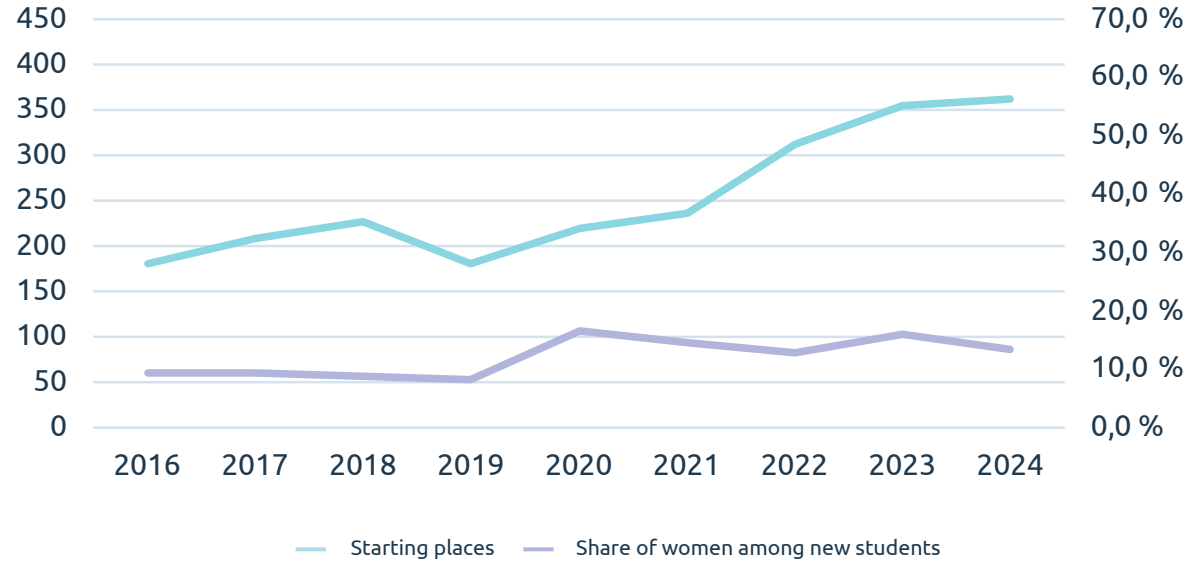


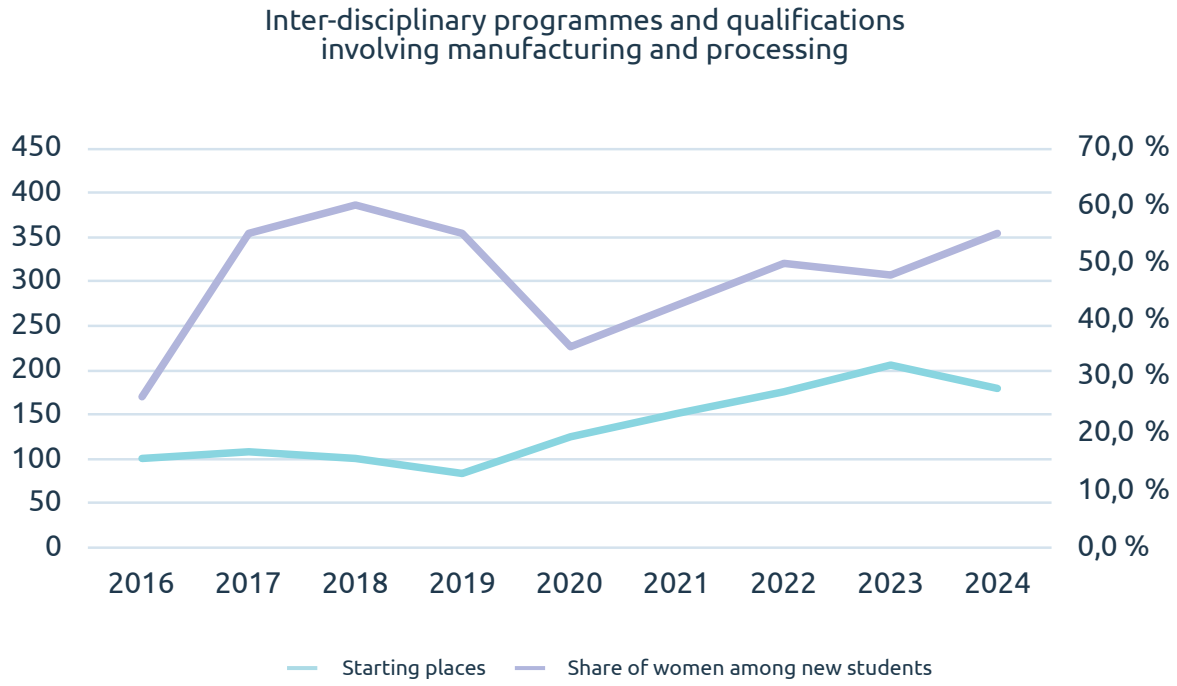
Share of women among new students and starting places in engineering and engineering trades (smaller fields) and in inter-disciplinary programmes and qualifications involving manufacturing and processing

Environmental protection technology



Electronics and automation

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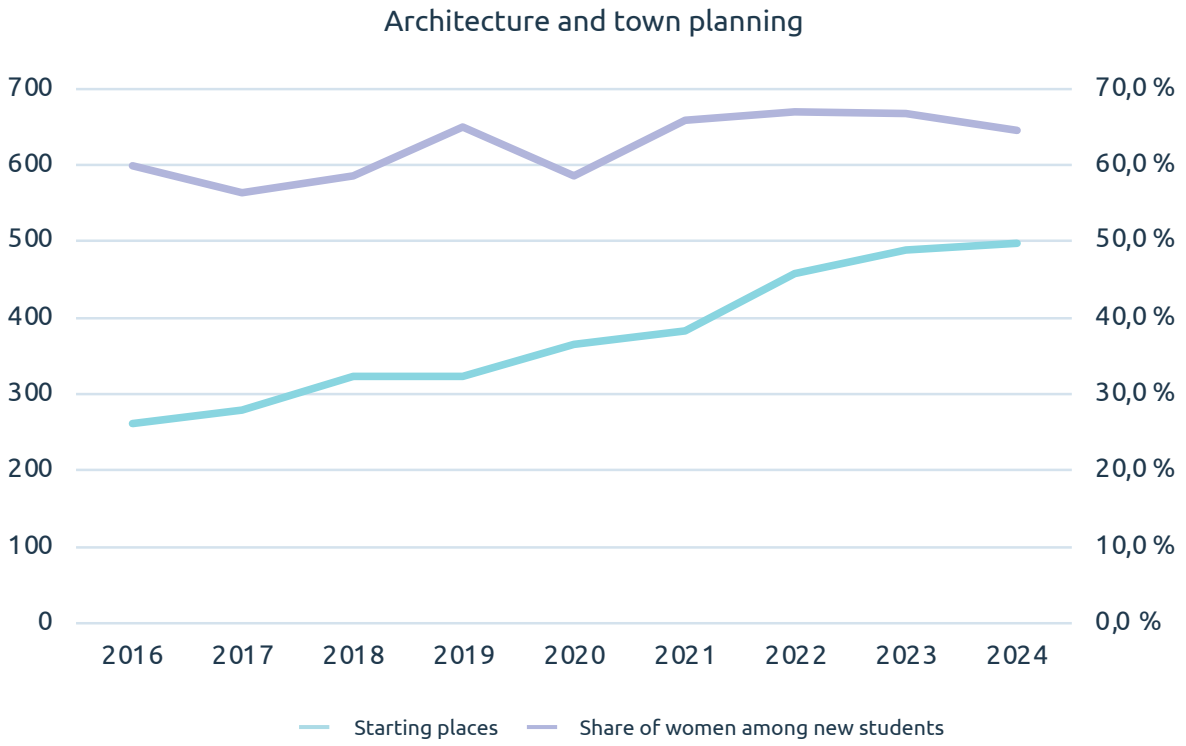
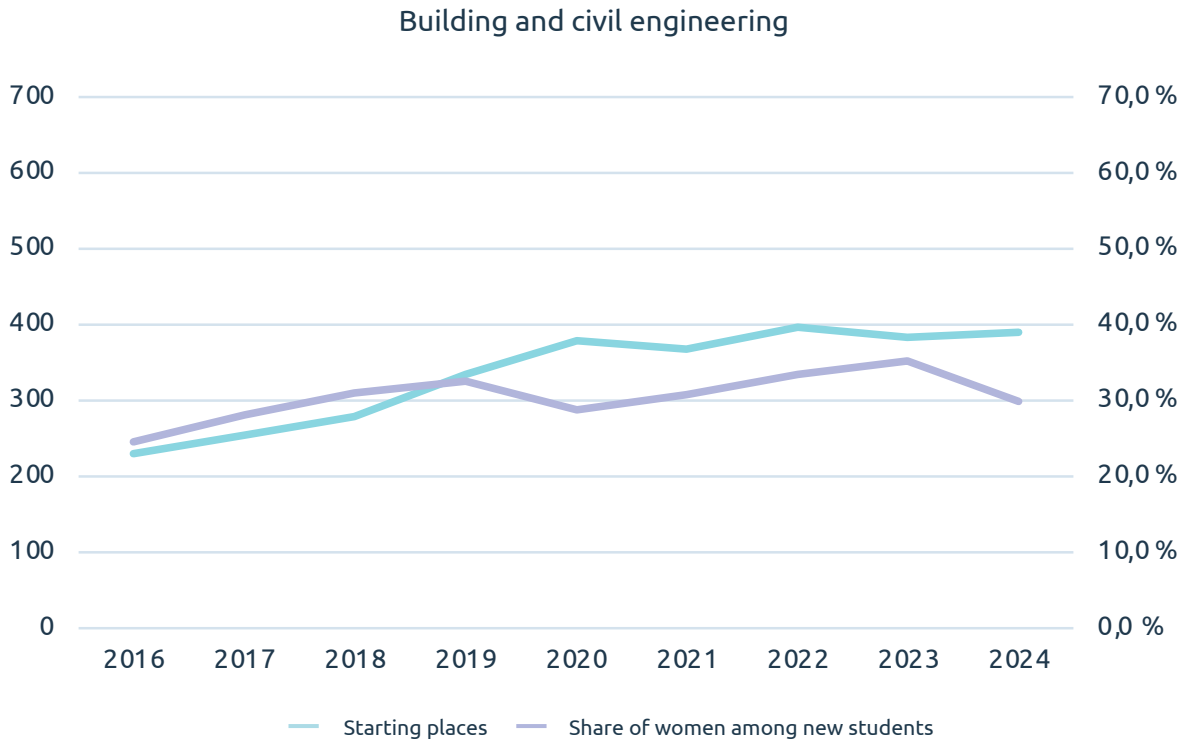
Starting places
Share of women among new students

Share of women among new students and starting places in architecture and construction



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