U-Multirank Gender Monitor 2022

Gender disparities in higher education

Second edition

September 2022

Introduction

After the first Gender Monitor was published in 2021, this is the second – updated – analysis, which does not only look at the gender ratio among students, but also among staff at the various stages of the higher education career ladder.

Gender has been and still is a major dimension of inequalities in higher education. No demographic characteristic is so fraught with stereotypes than that of gender. In social life, school and of course even later in higher education, some people live, or are bound by these stereotypes: 'women are more social', 'men are more technically adept' - even the choice of study courses is influenced by the social constructs of gender.

To assess the current state of this, U-Multirank presents an analysis to show how women and men are generally distributed at universities, and whether the well-known 'male and female subjects' still exist at higher education institutions. The analysis includes more than 1,000 institutions from more than 80 countries which provided comprehensive data on gender.

The underlying data are taken from the U-Multirank database and on the institutional level refer to the academic years 2018, 2019 and 2020. The subject data cover 25 subjects and refer to the three years used in the respective subjects. In 2022 we updated the engineering and natural science subject rankings: This for the first time allows to compare the numbers on gender balance with the data published in 2019.

Gender requires more than a binary classification of female and male, but the current data available for such an analysis is limited. On the one hand, many institutions do not yet collect gender data in a more inclusive way, while on the other hand numbers are too small to allow for any disaggregation by additional variables. Therefore, this analysis only looks at gender in a binary system and will be improved upon in future years. U-Multirank will continue to extend its definition of gender in ongoing and upcoming data collections.

Gender balance is defined as having a minimum of 40% of 'both' sexes (European Commission 2010). Our data show that there are many departments and subjects where gender balance is not (yet) achieved, both among students enrolled and graduates, as well as among staff.

Most prominent gender imbalances can be found among engineering subjects as well as in computer science and physics (male dominated), and on the other hand in female dominated programmes such as nursing, education and social work**.** In those fields, solutions must be created to make gender-dominated subjects more attractive for other genders. Between these two extremes, there are subjects, which do show a gender balance, particular in terms of students and graduates.

Furthermore, evidence from U-Multirank data suggests that there is a wide variation among departments, even within subjects.

Although in some subjects the general tendency regarding gender balance is clear, it is interesting to see that there are always some (and sometimes even more) departments that are different from the general pattern.

European Commission (2010): Stocktaking 10 years of "Women in Science" policy by the European Commission 1999-2009. Luxembourg: Publications Office of the European Union.

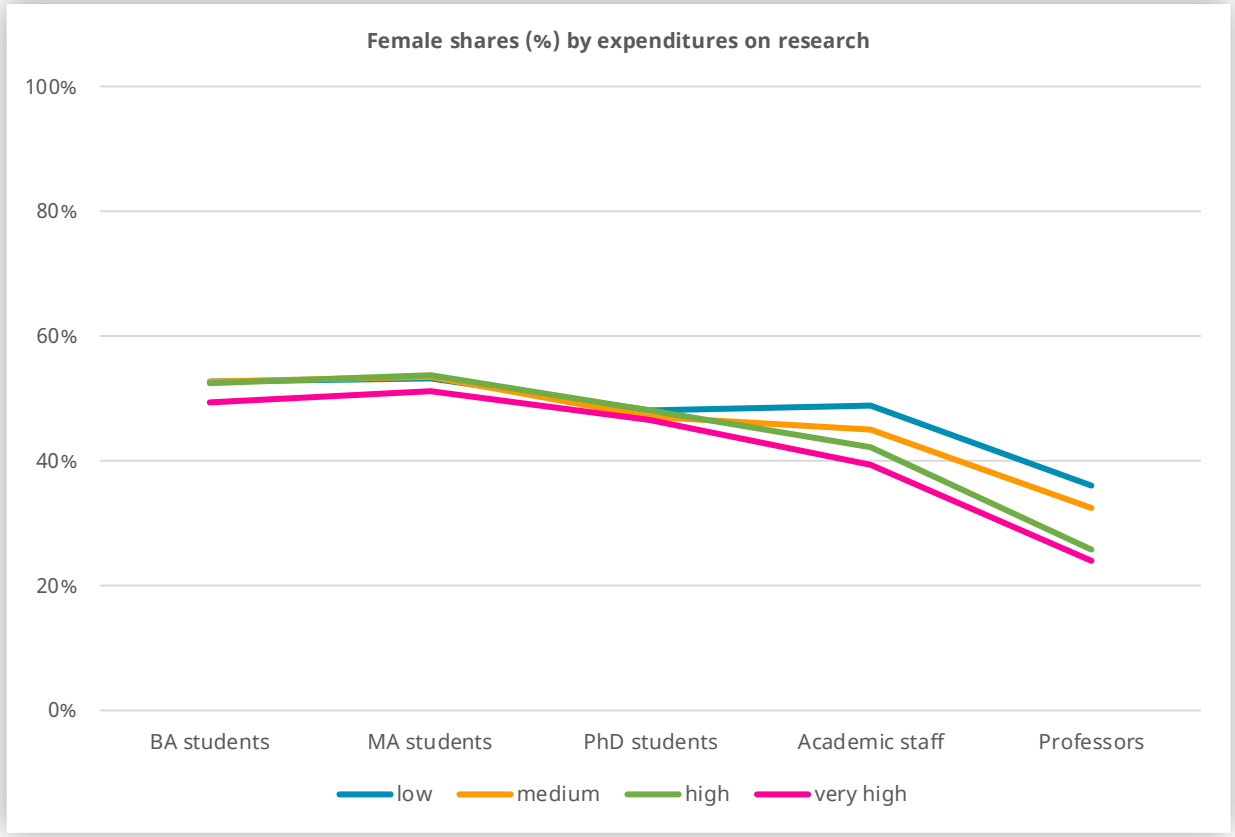
U-Multirank Gender Monitor – Persistence of the Gender Gap

U-Multirank data confirm on a global scale that there is still a gender imbalance in academic careers.

While at the undergraduate level the proportion of female students is slightly above 50% for BA and MA students, it steadily decreases over the academic career path for PhD students (47%), academic staff (44%) and professors (29%).

For the first time we analysed data on academic leadership: In the U-Multirank sample, only 20% of all institutions had a female rector / vice-president in 2021/2022.

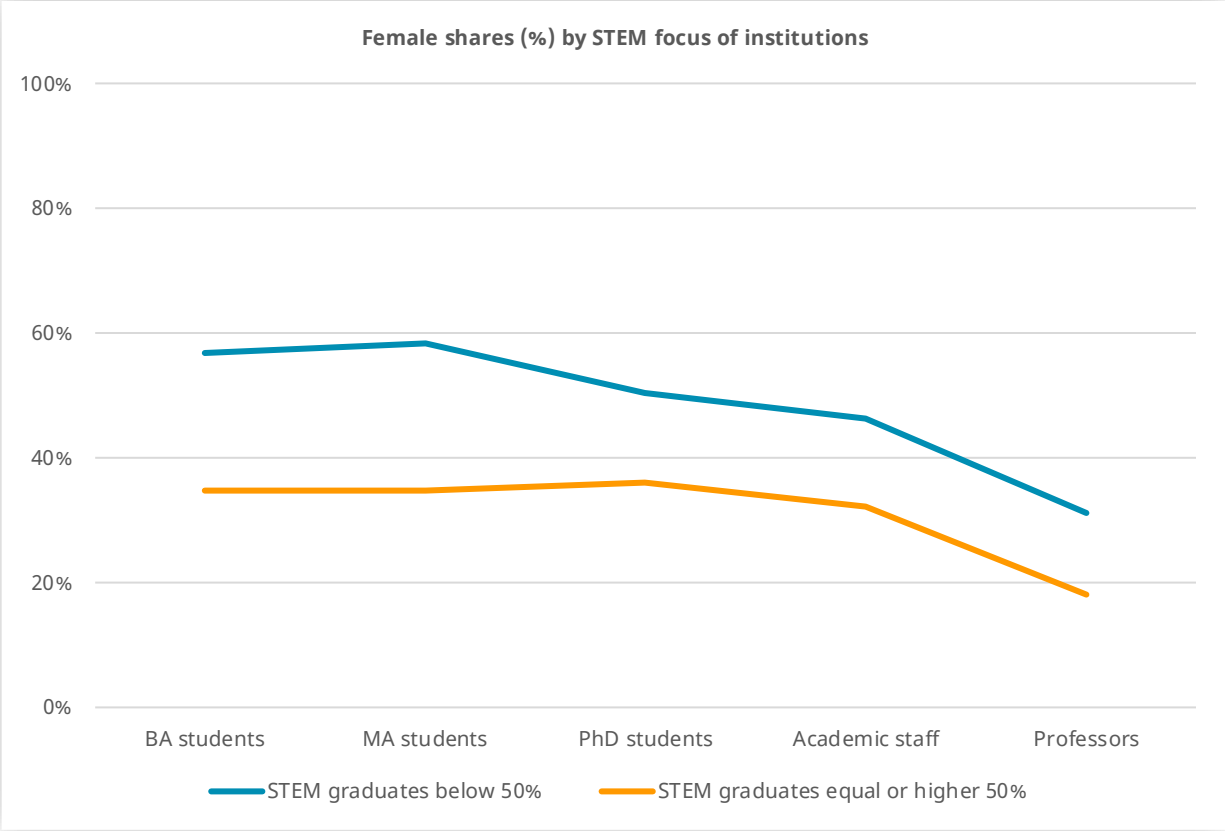
Analysis by institutional profiles



Women are particularly underrepresented among academic staff at research intense institutions.

Across academic career stages, the gender gap opens up more at research-intensive universities (measured by their share of research expenditure). Among students (BA, MA as well as PhD), the share of women is largely equal. Starting at the level of academic staff, the proportion of women differs between institutions with different levels of research expenditure. Institutions with high research expenditures have 9% points fewer women among academic staff - among professors it is 12% points.

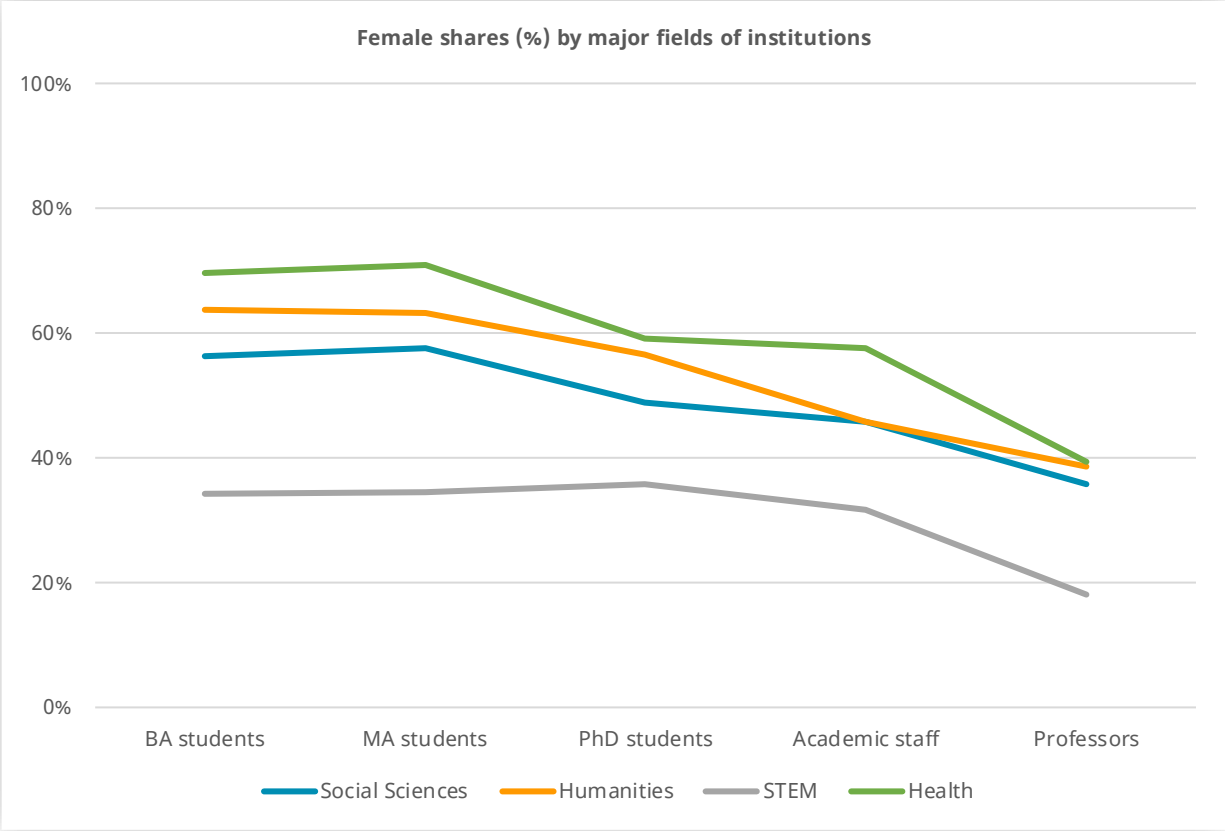
Analysis by institutional profiles



Institutions characterised by STEM fields are still typically 'male-dominated' institutions.

Another important profile feature that affects the gender balance is the subject focus of the HEIs. At HEIs with a majority of graduates in STEM subjects, the proportion of female students is significantly lower than at HEIs without a STEM focus. However, the difference between the proportions of women at the two types of higher education institutions seems to slowly decrease over the course of an academic career.

Analysis by institutional profiles



Women's share depends on the major fields of the institutions.

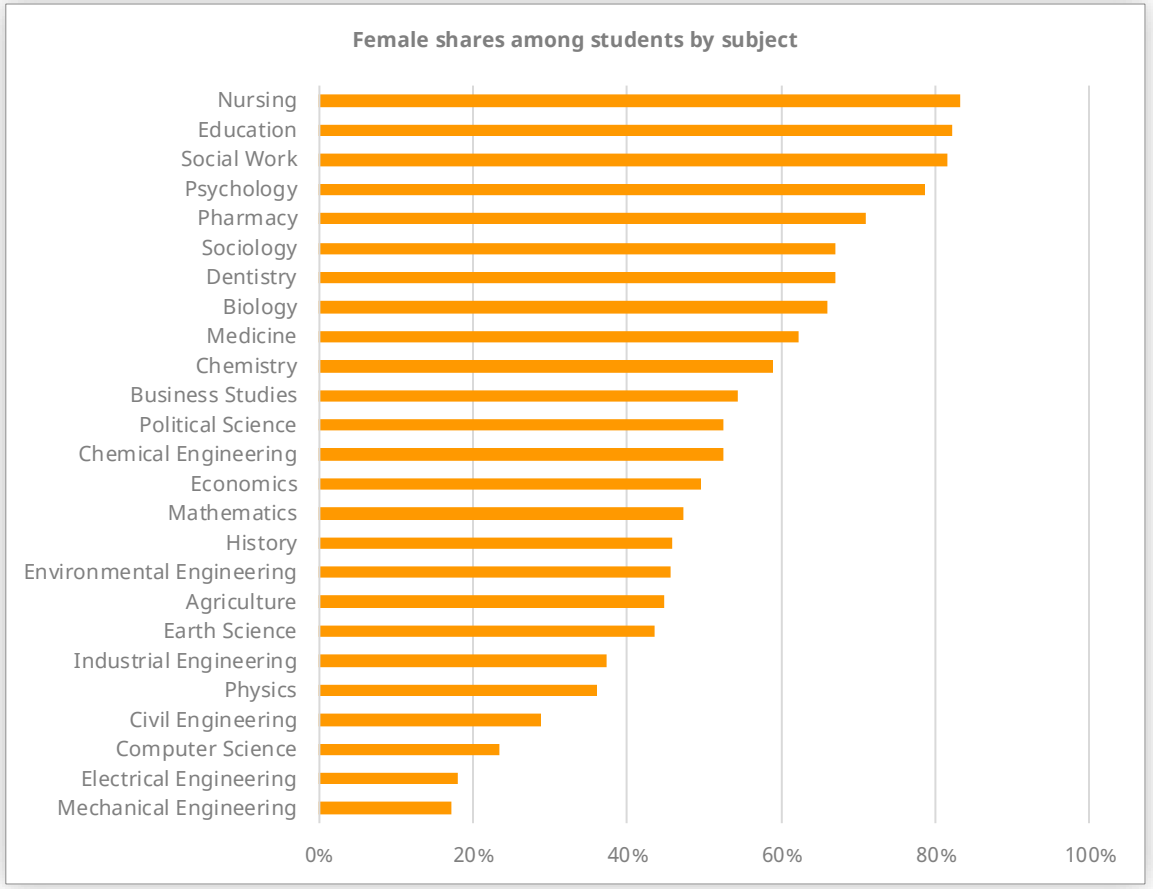
Whilst institutions characterised by health and humanities subjects have a large majority of female students, women continue to be underrepresented among academic staff and professors in all subjects.

A more detailed disaggregation by major fields of institutions (measured by graduate numbers) reveals some characteristic patterns. While the differences among BA students are huge between institutions with a different field focus (35 percentage points), the percentages get closer to each other at the level of academic staff and, even more, professors. The decline is less marked in humanities and STEM and strongest in health focused institutions.

U-Multirank Gender Monitor – Subjects

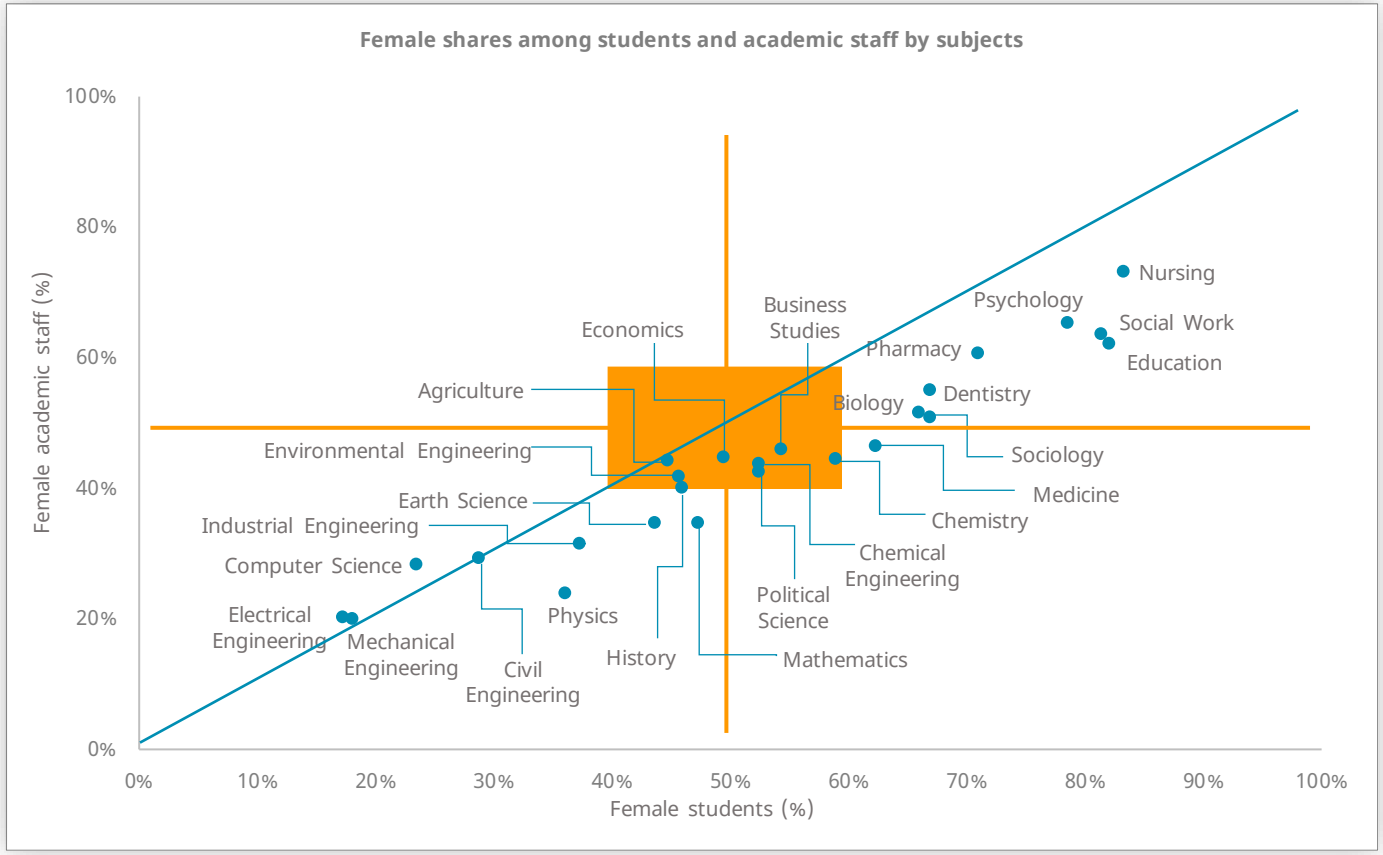
Still worlds apart.

The analysis of the gender-specific proportions of students in the subjects of U-Multirank illustrates the continued existence of gender roles and stereotypes. Nursing, education, pharmacy, medicine as well as society continue to be women's subjects, while subjects such as computer science, mathematics, physics and engineering are studied by men. Exceptions are the natural sciences biology and chemistry as well as interdisciplinary engineering sciences such as environmental and chemical engineering, among whose students there is a balanced gender ratio (biology is female driven). Also in the gender balanced area are the subjects of economics and politics.



U-Multirank Gender Monitor – Subjects

Still worlds apart.



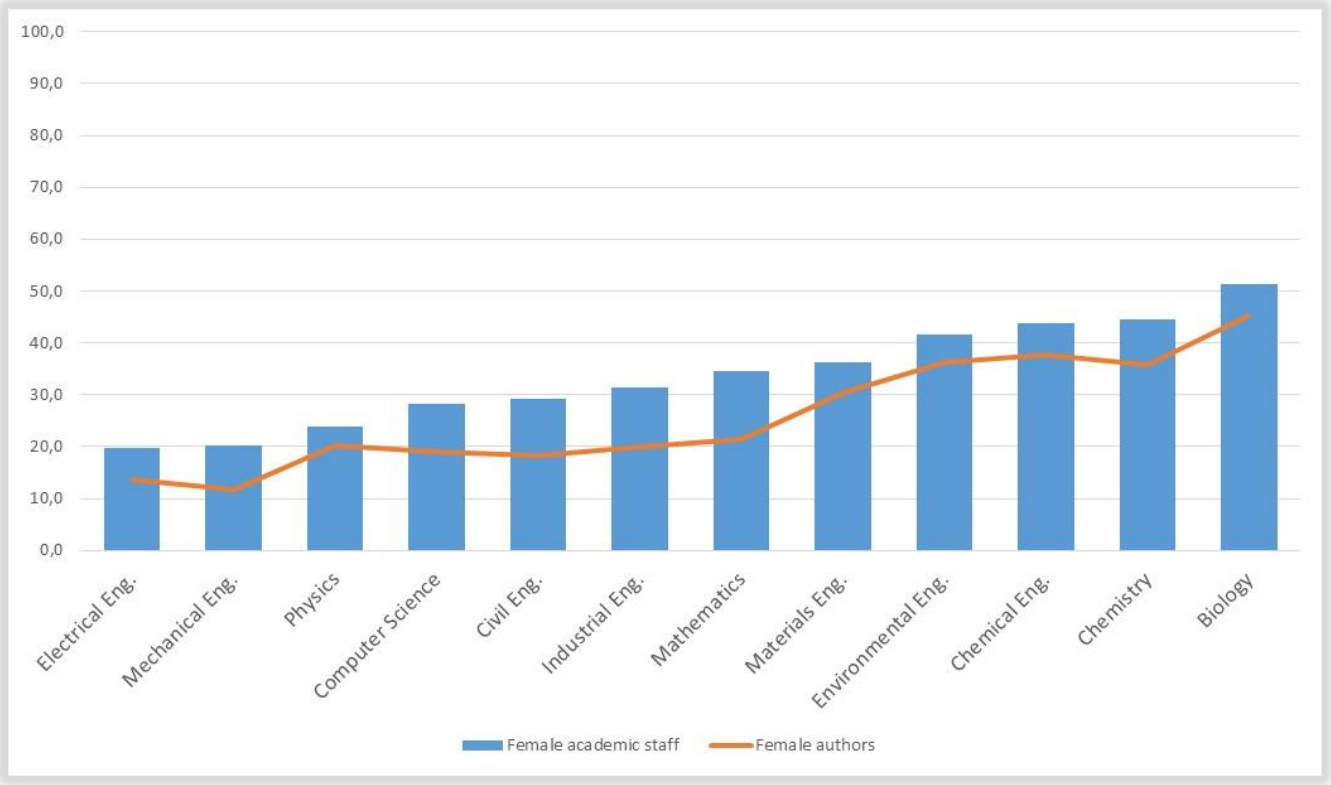
The analysis of gender shares within student's body and academic staff reveals that the subjects are still worlds apart. On the one hand we find subjects, mostly STEM fields which traditionally and still are dominated by males; on the other we can identify typical 'women subjects' in health and education areas. Our data show that a couple of subjects, including business studies, economics, political science, agriculture, history, chemical and environmental engineering are gender balanced in both metrics: In these subjects there is at least 40% of each gender. Subjects inside the orange frame are gender balanced regarding both, students enrolled and academic staff (headcount).

Analysis of female authors by STEM subjects

Writing publications is still men-driven in traditional STEM.

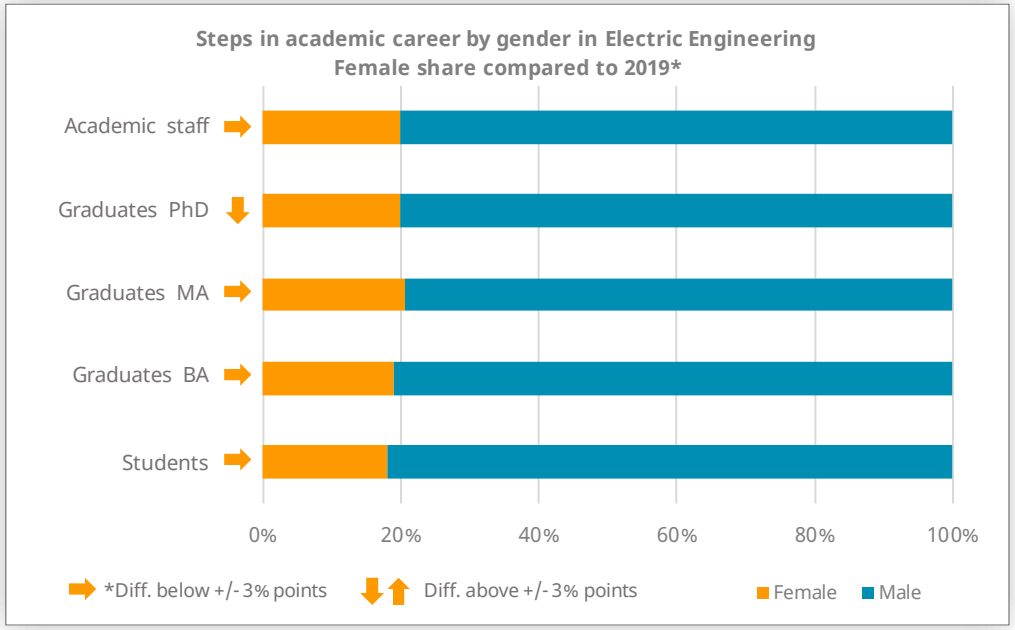
In its 2022 release U-Multirank introduced a new indicator measuring the percentage of all female authors in all authors of all publications of an institution.

While the gender ratio of authors and academic staff are stromal correlated, the percentage of female authors of all publications of an institutions is lower than their percentage in academic staff in all fields. In mathematics, civil engineering and industrial engineering the gap between female authors and female academic staff is highest.



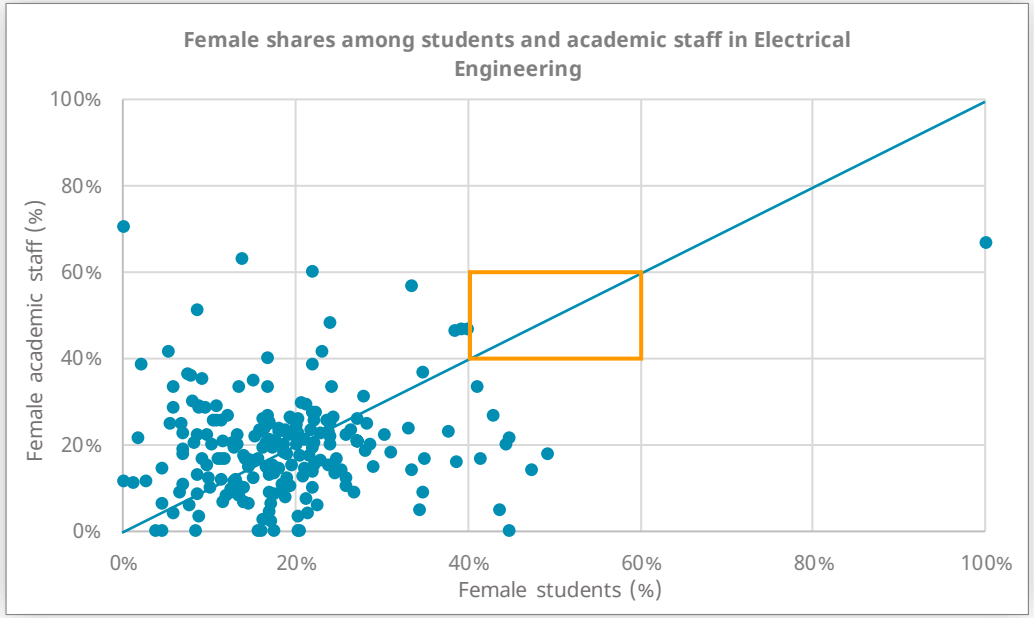
U-Multirank Gender Monitor – Electrical engineering

Traditional engineering subjects are still male-dominated.



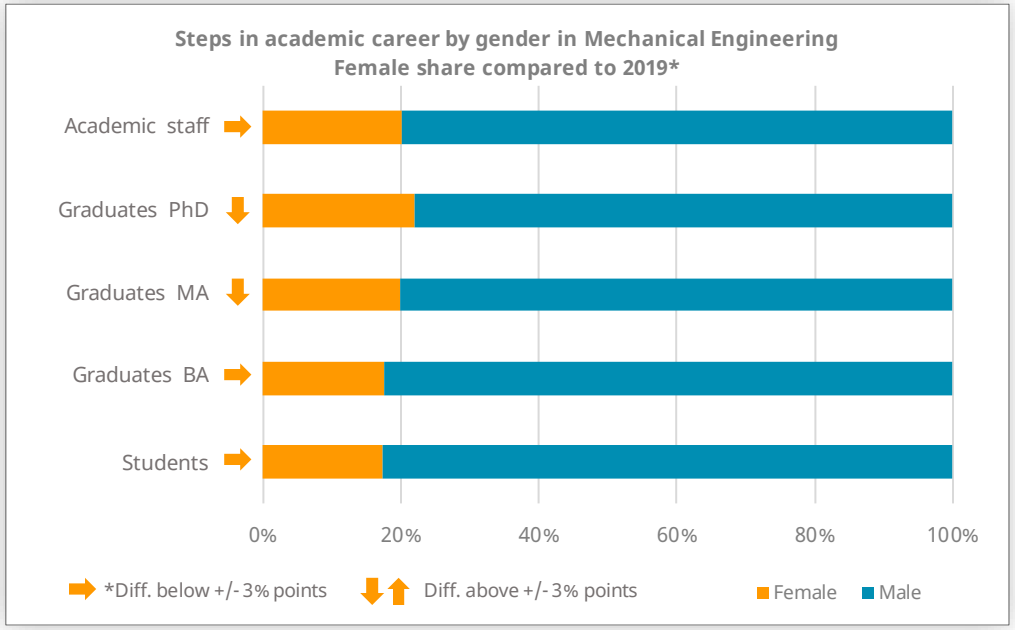
This overall picture is strongly confirmed on the department level. The most departments show very low female shares on both levels – student body and academic staff. Only 10% of the departments have a share of more than 40% at least one stage – students or academic staff.

Electrical engineering (together with mechanical engineering) as a traditional engineering department still shows the lowest shares of women at all stages of higher education career. It still applies for every stage: One out of five is female. Compared to the data from 2019, the proportion of women at the individual stages has remained stable - except for PhD graduates. Here the proportion of women dropped to 20%.

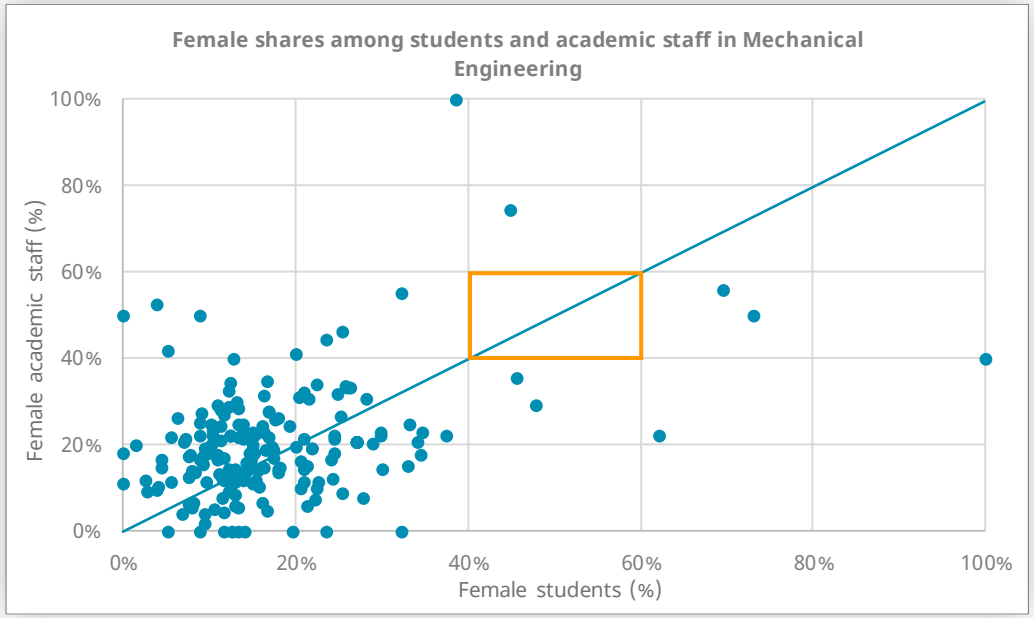


U-Multirank Gender Monitor – Mechanical engineering

One of the most male-dominated study subjects.



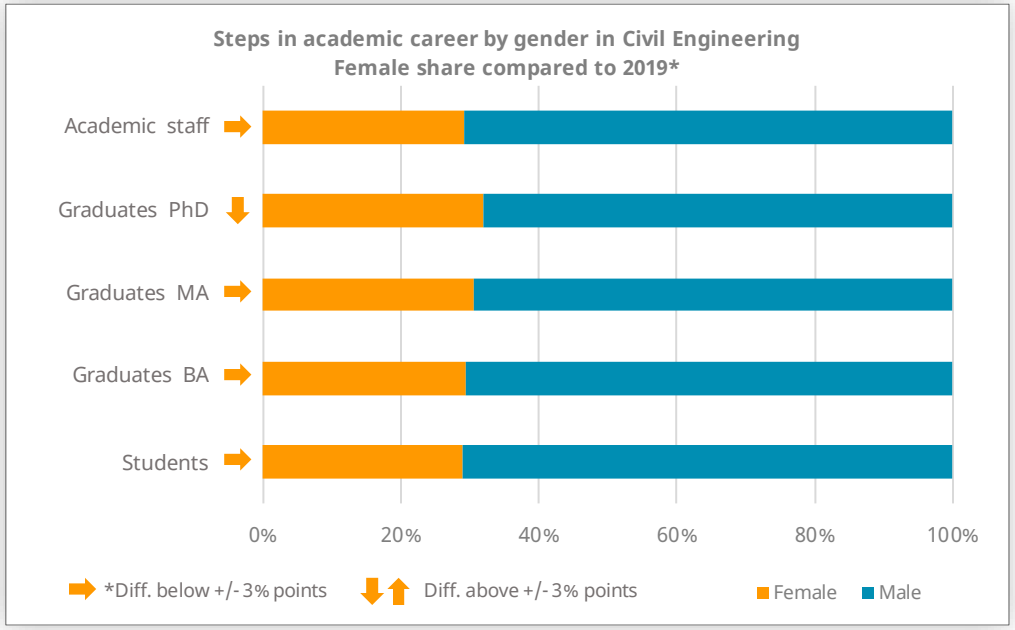
In mechanical engineering, together with electrical engineering, the gender ratio at all stages of the academic career path, is most imbalanced. Like in electrical engineering, women that enter the field as students perform strongly, but they are still heavily underrepresented on each level. In comparison to 2019 the female proportion of MA and PhD graduates has decreased.



Out of 189 departments, the main part is located in the men-driven sector. But some departments also show a gender-balanced share among students or among academic staff. Furthermore, three departments of mechanical engineering show a women-driven orientation for academic staff and among students.

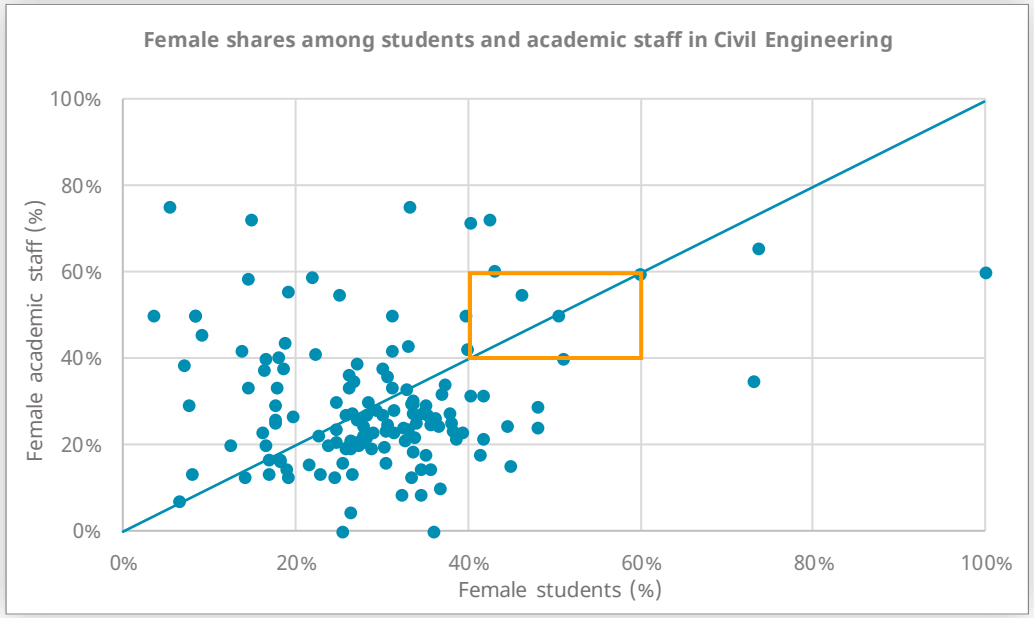
U-Multirank Gender Monitor – Civil engineering

More male students and staff.



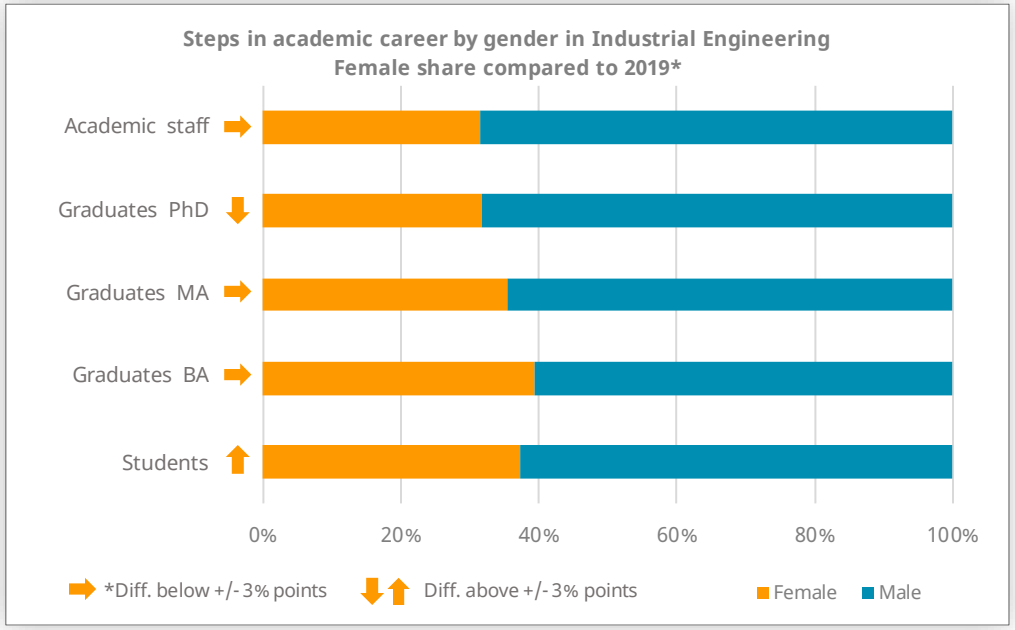
In the vast majority of departments, the proportion of women among both students and academic staff is low. However, there are a handful of departments that are in the gender balanced range.

While the female shares at all stages are higher than for electrical and mechanical engineering, civil engineering is a male-dominated subject, too. The proportion of women among PhD graduates declines to the level of all other career stages: One out of three persons is female.



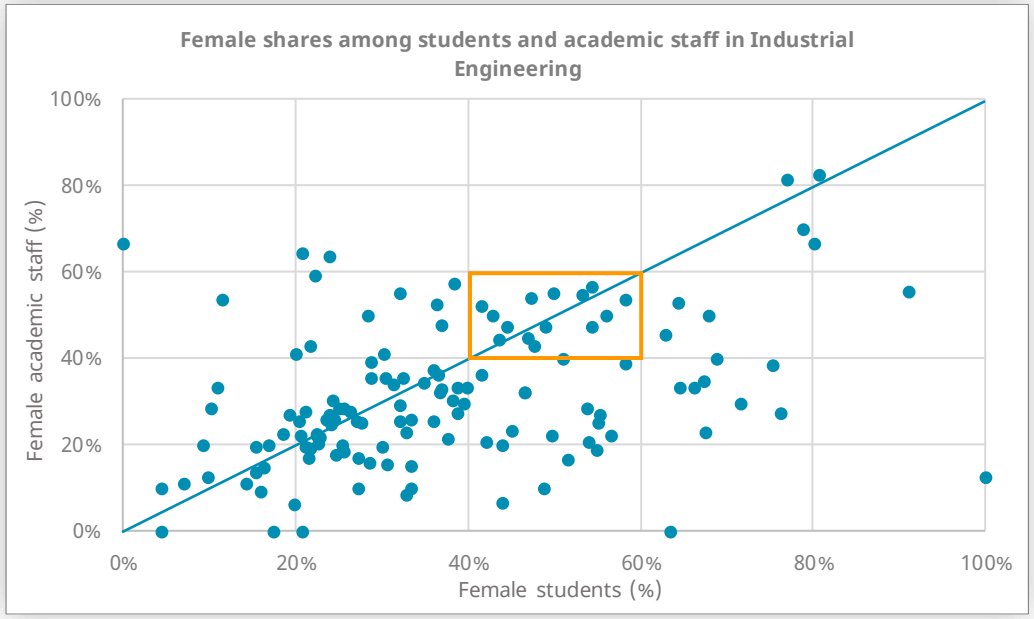
U-Multirank Gender Monitor – Industrial engineering

A subject on the frontier of gender-balanced, especially among students and BA graduates.



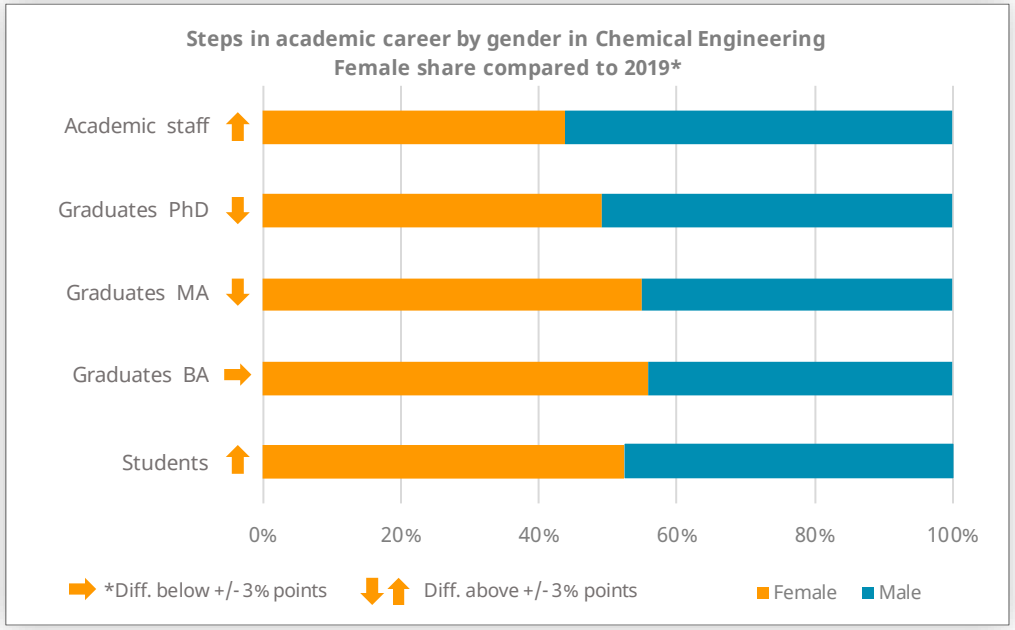
Compared to mechanical and electrical engineering the picture for individual departments is more heterogeneous. 50% of departments show themselves as male-dominated. But almost 10% of the departments can be described as gender-balanced among staff and students and 25% of departments are gender-balanced at student level.

At all stages of the university career, the women's share is between 30% and 40%. Among students the share increases by five percentage points to 37%, while the female share of BA and MA graduates as well as for academic staff remains constant. As in all other engineering disciplines, the proportion of women among PhD graduates in industrial engineering also declines.



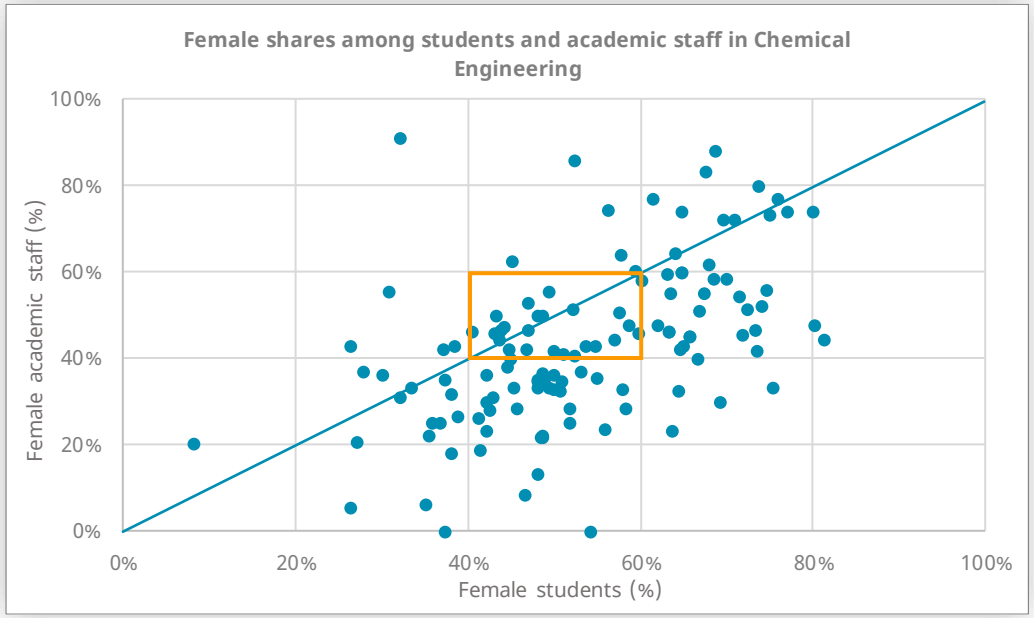
U-Multirank Gender Monitor – Chemical engineering

One of two engineering subjects with a balanced gender ratio at all stages of academic career ladder.



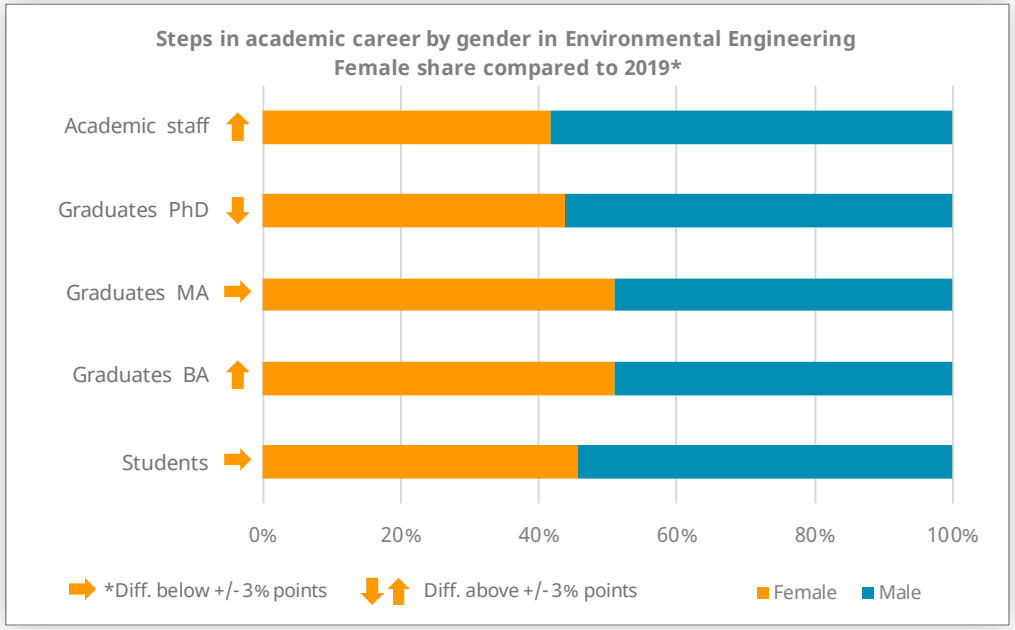
A mixture of chemistry and engineering seems to appeal to more women. At all stages of academic career ladder the female share is above 40% - among students and BA/MA graduates the share is higher than 50%. Compared to 2019, there has been an increase among students and academic staff.

As industrial engineering, chemical engineering also shows a diverse picture of departments according the female share of student body and academic staff. One out of five of departments is located in the gender-balanced sector and only 13% of the departments are male-dominated.



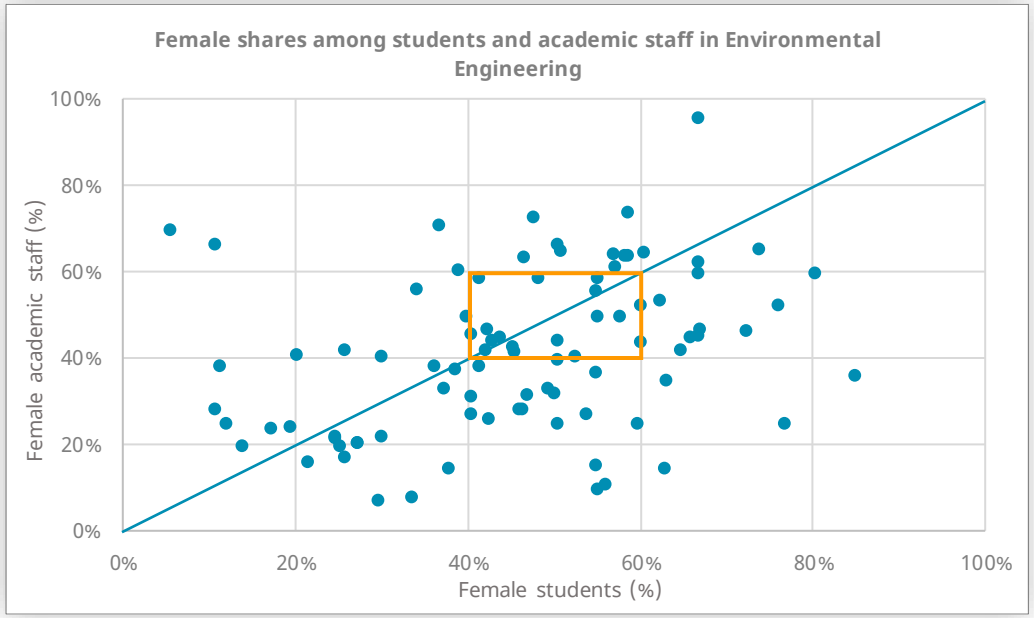
U-Multirank Gender Monitor – Environmental engineering

One of two engineering subjects with a balanced gender ratio at all stages of academic career ladder.



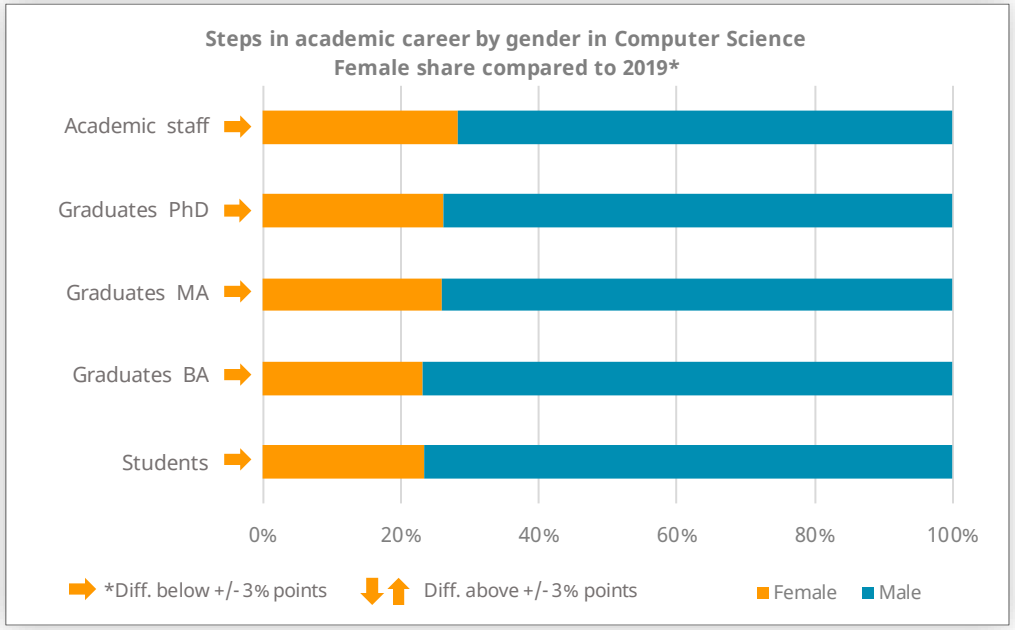
Engineering programmes with a focus on environment riented engineering programs seem to appeal to more women. At all stages of academic career ladder the female share is the same as the proportion of males. In fact, the proportion of women decreases from the PhD graduates' level.

Also, environmental engineering shows a diverse picture of departments according to the female share of student body and academic staff. 20% of departments are located in the gender-balanced sector and only 13% of the departments are male-dominated. The rest are gender-balanced, at least in a female share - mostly among the students.



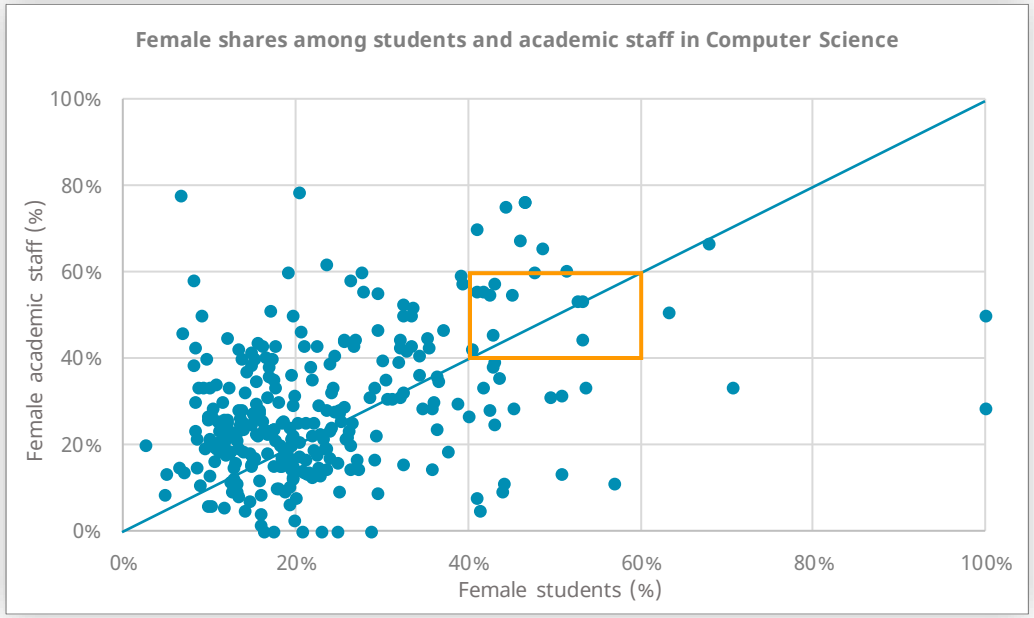
U-Multirank Gender Monitor – Computer science

A playground for men.



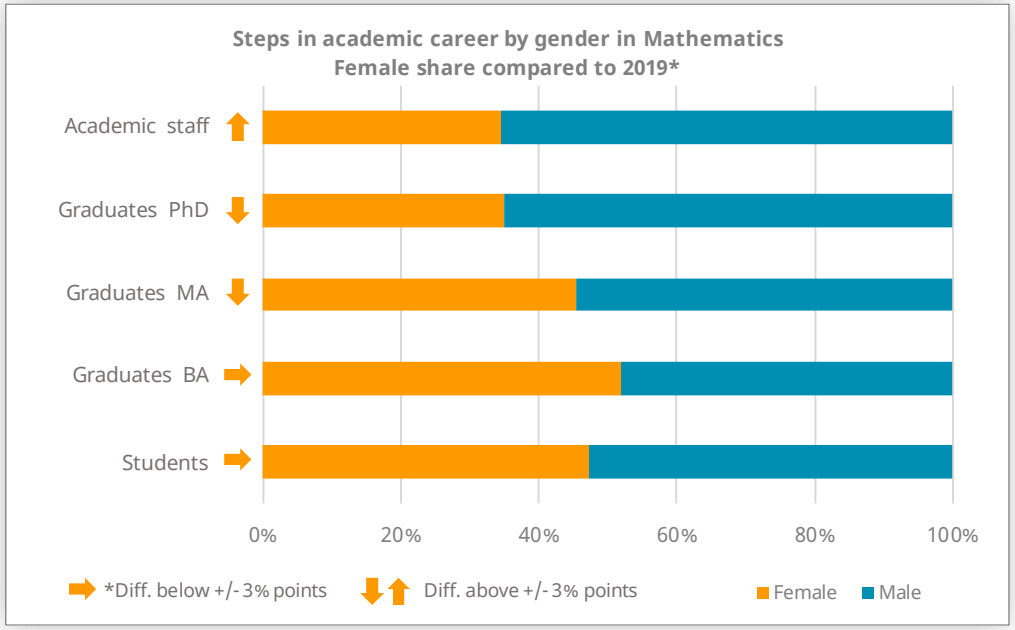
Most departments have less than 40% female students, while a high number have a higher share of women among academic staff than among students. Only 4% of departments are balanced (percentages from 40% to 60% each) on both levels.

The proportion of women does not reach 30% at any level on the computer science career ladder. Besides this computer science is the only subject, wherein women's proportion increases slightly with each stage. It seems that women – once they have entered the field – have a chance to advance. In comparison to the data out of 2019, the values remained constant.



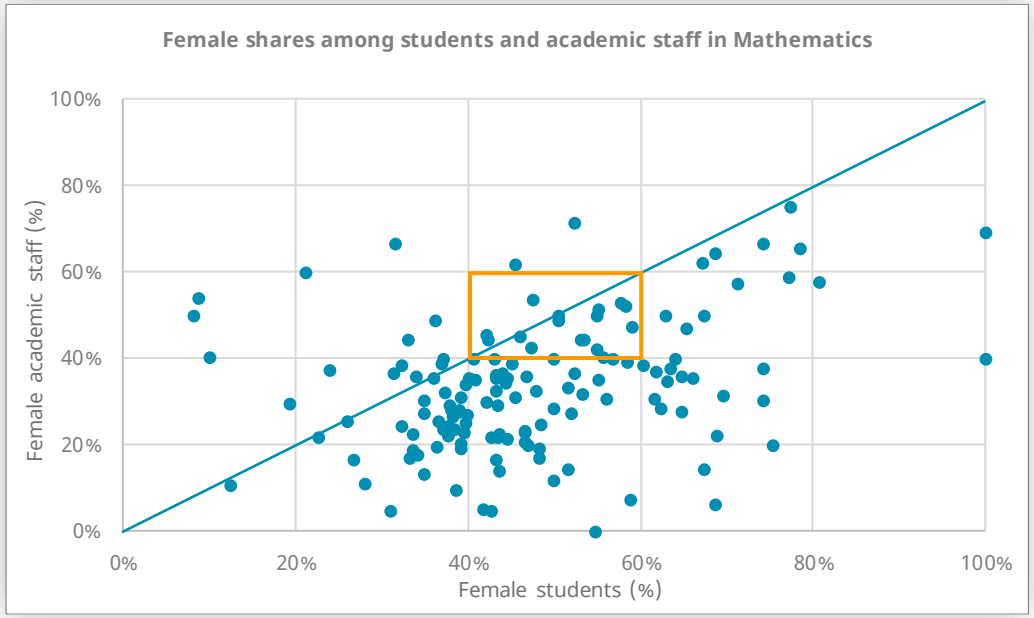
U-Multirank Gender Monitor – Mathematics

A balanced gender ratio among students and graduates; imbalance among PhDs and academic staff.



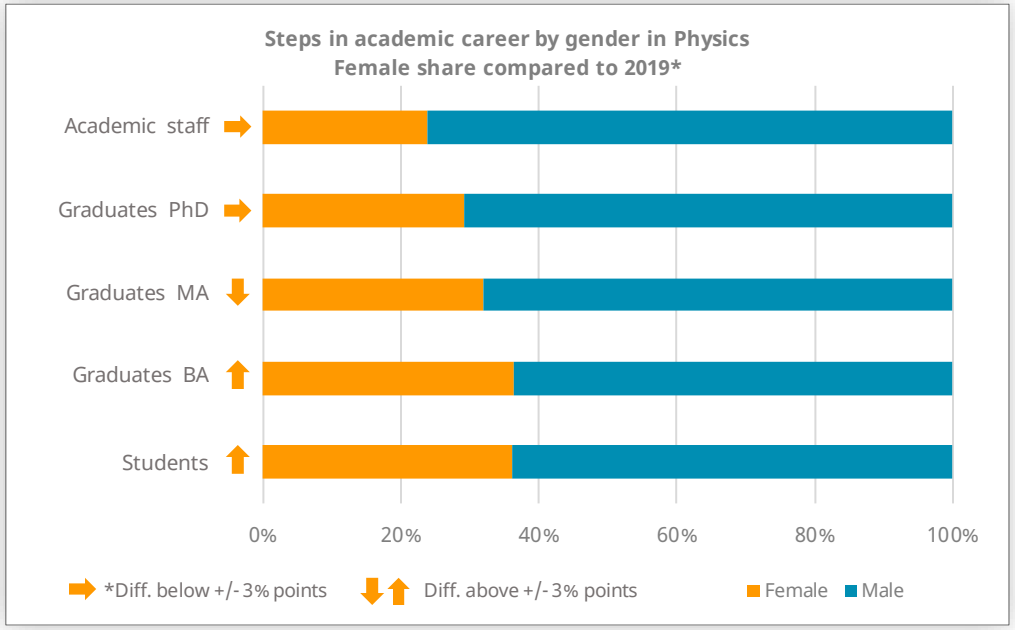
Around 13% out of 142 departments are gender-balanced on both levels and other 50% of the departments show a female proportion from more than 40% among students. The majority of mathematics departments have a higher proportion of women among students than among academic staff.

On average, the proportion of female students, BA and MA graduates is more or less equal to that of males. The proportion of women among doctoral and master's graduates has decreased, while the proportion among academic staff has increased since 2019. Nevertheless, the proportion of women among doctoral students and academic staff is much lower than at the first three academic levels.



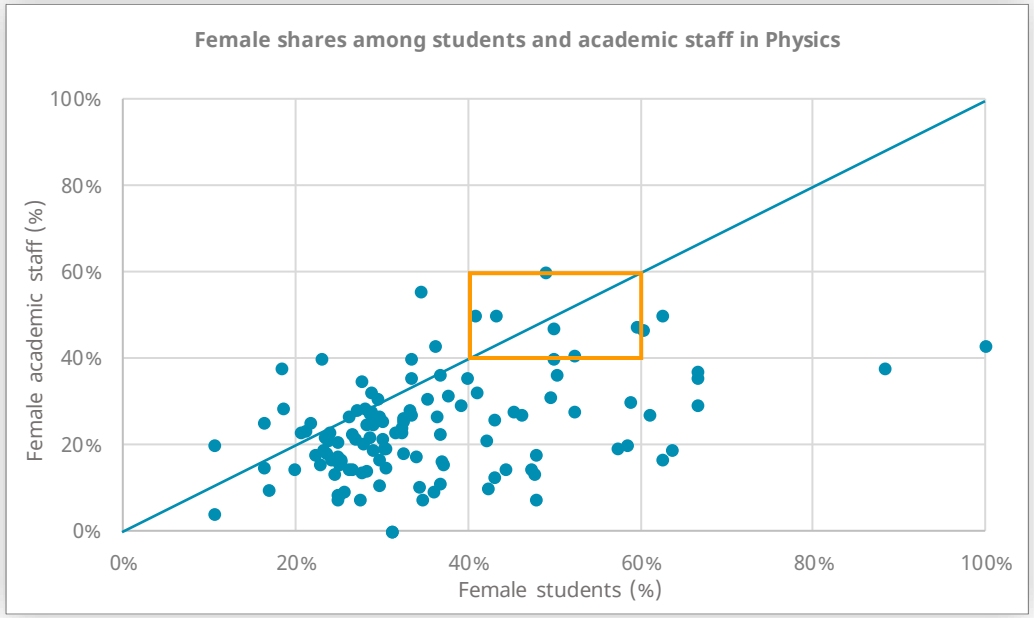
U-Multirank Gender Monitor – Physics

Still a male-dominated world – but female growth among students.



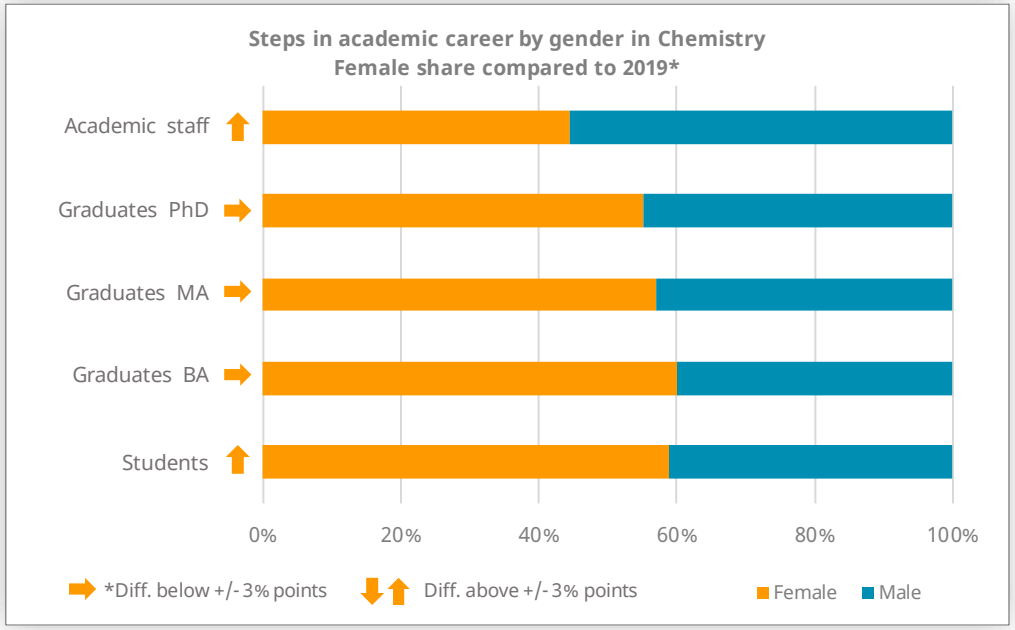
Physics recorded an increase in the proportion of women among students and BA graduates since 2019: nearly 35% are female. On the higher rungs of the academic career ladder, the proportion of women is reduced. Not even 25% of the academic staff is female.

Only six departments are gender-balanced in their shares of students and academic staff and further 16% departments shows a gender-balanced ratio among students. The most departments are located in the men-driven sector and the majority shows also a higher share of women among students than among academic staff.



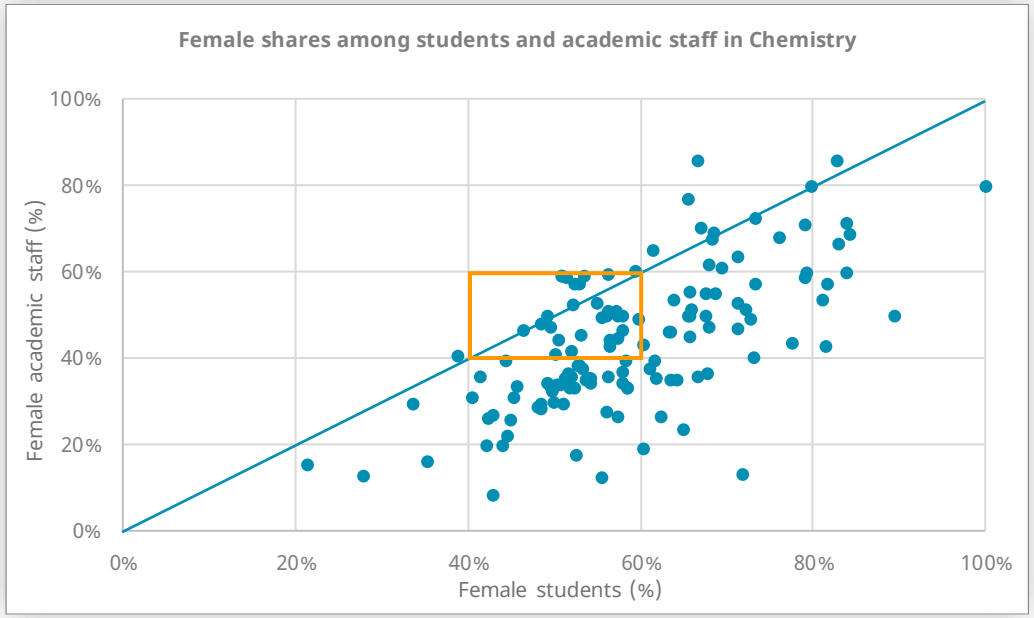
U-Multirank Gender Monitor – Chemistry

Female dominated study programs.



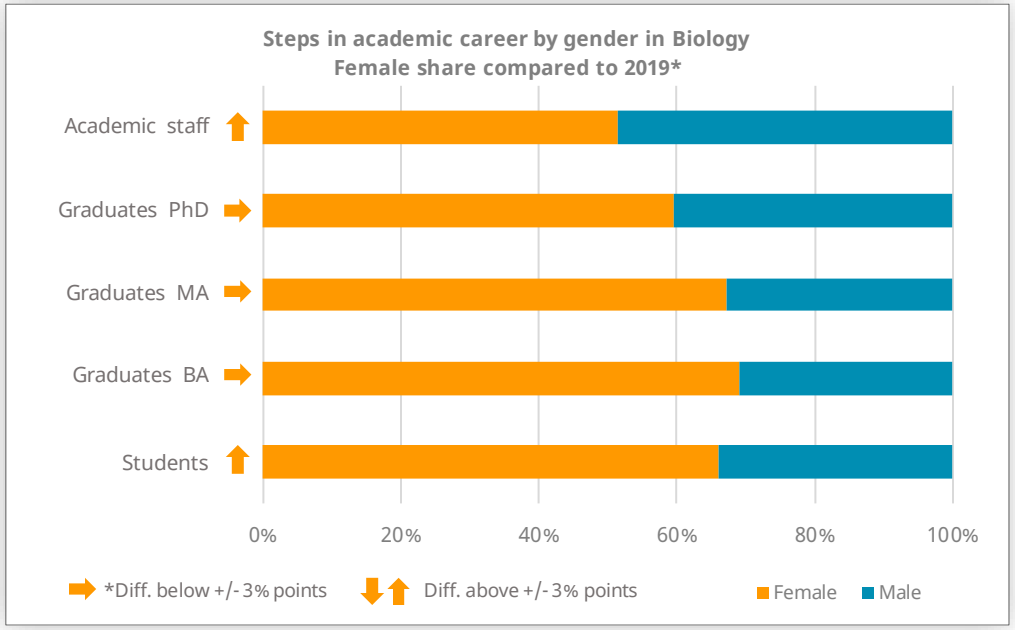
As the proportion of women within the academic staff has increased since 2019, all levels of the career ladder for departments of chemistry are now gender-balanced. Among students (59%) and BA graduates (60%) women's proportion is almost female-driven.

One out of five chemistry departments shows a balanced gender ratio in both shares. The most chemistry departments are female-driven among students. However, the figure also points out that at the vast majority of chemistry departments, the share of women among academic staff is much lower than among students.



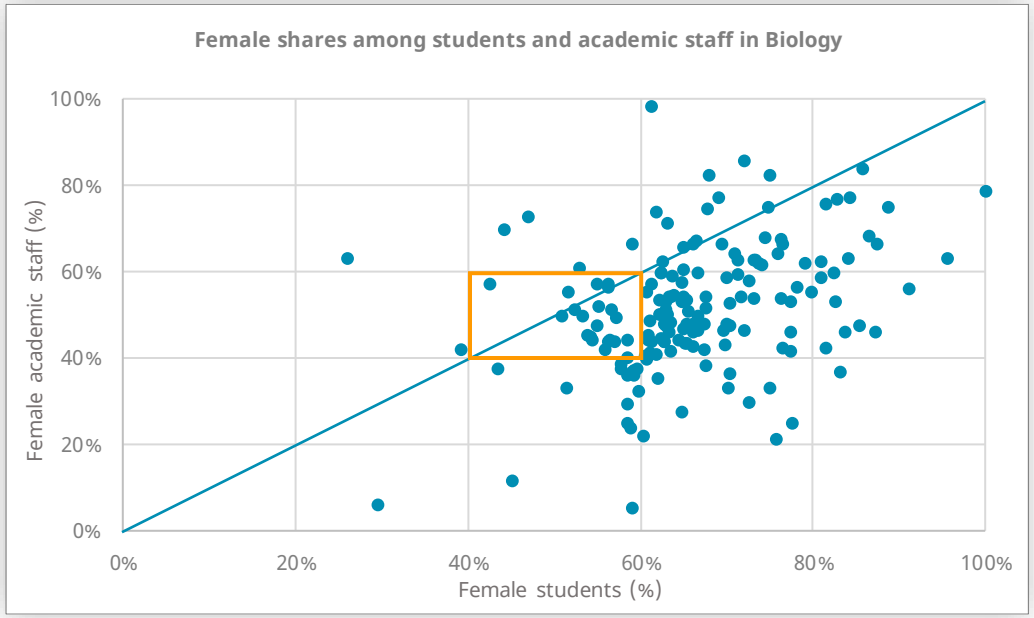
U-Multirank Gender Monitor – Biology

The most female-dominated natural science subject.



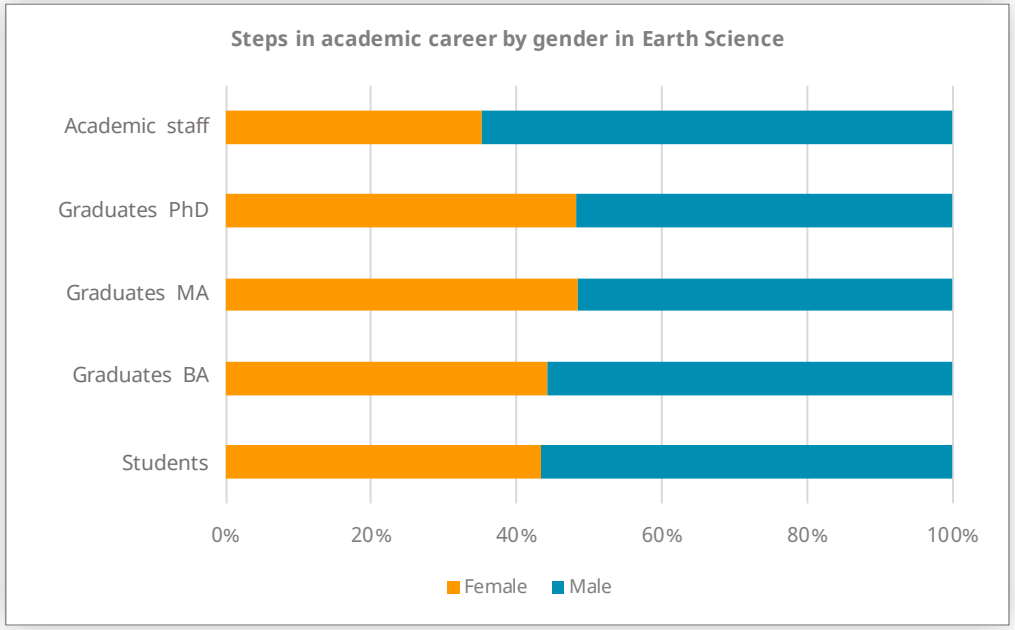
Biology is dominated by women at the lower levels of the academic career ladder. The female share is lower for PhD graduates and within academic staff but on a gender-balanced level. Nevertheless, the level of female academic staff is 51%, and the highest among all natural science subjects.

The analysis by departments shows there are only a few departments dominated by males. In three out of four departments the students are dominated by women. In total, 21 departments can be characterised as gender-balanced, having between 40% and 60% of both male/female students and staff.



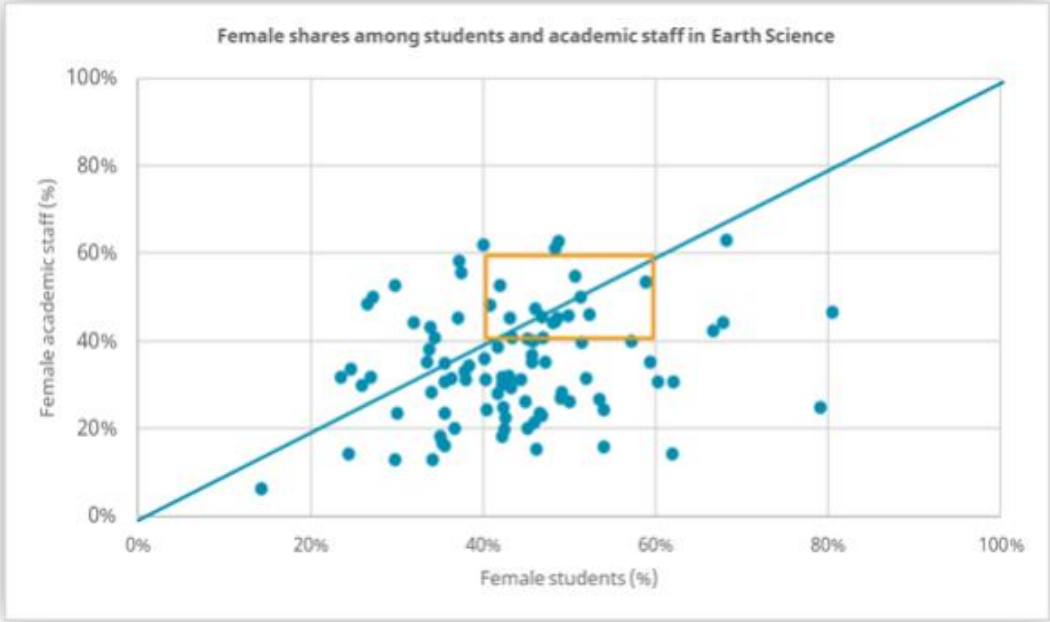
U-Multirank Gender Monitor – Earth sciences

Slightly male-dominated at all levels.



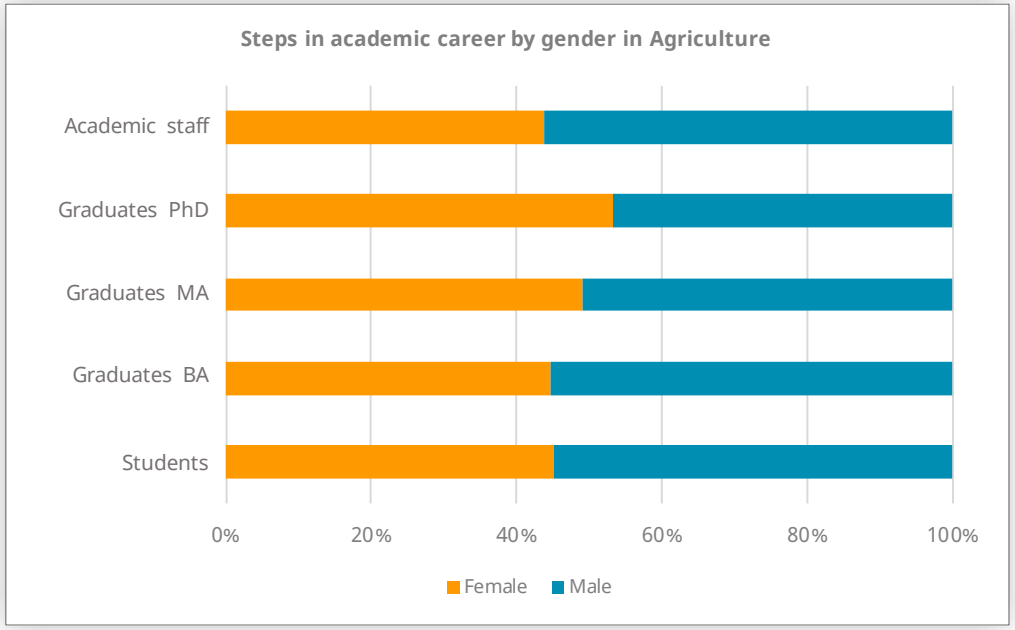
When comparing departments, the range of the gender ratio is much more balanced among students than among academic staff. At eight out of 94 departments, more than 60% of students are female, compared to only four with regard to academic staff. 18 departments are inside the gender-balanced box.

Besides academic staff, the share of women at all stages of academia comes close to 50%. At the level of academic staff, the female share decreases to 35%.



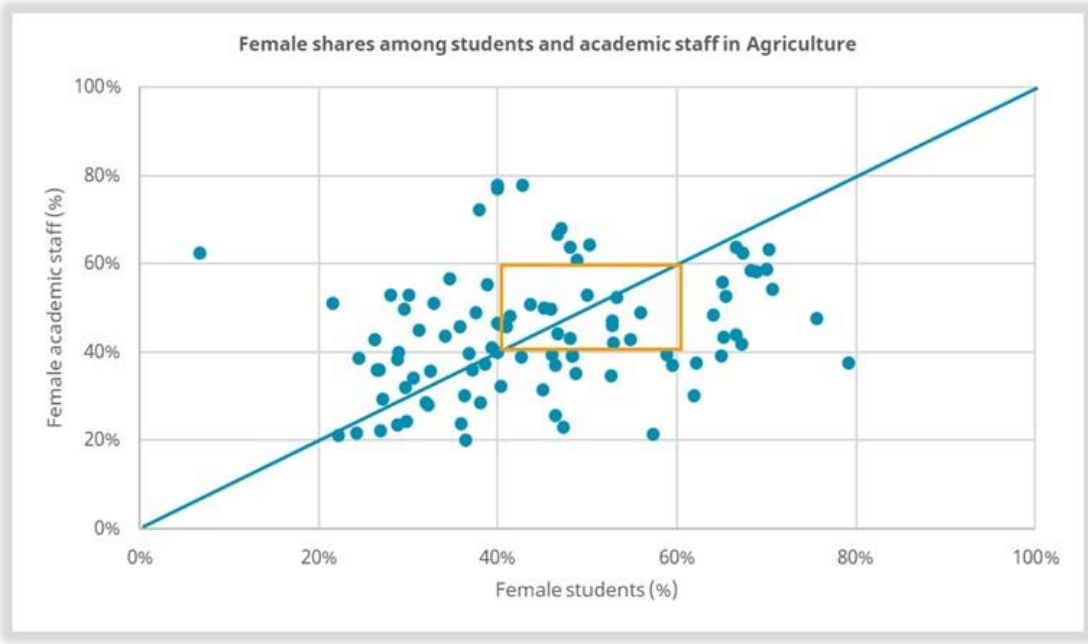
U-Multirank Gender Monitor – Agriculture

In higher education agriculture is slightly male-dominated.



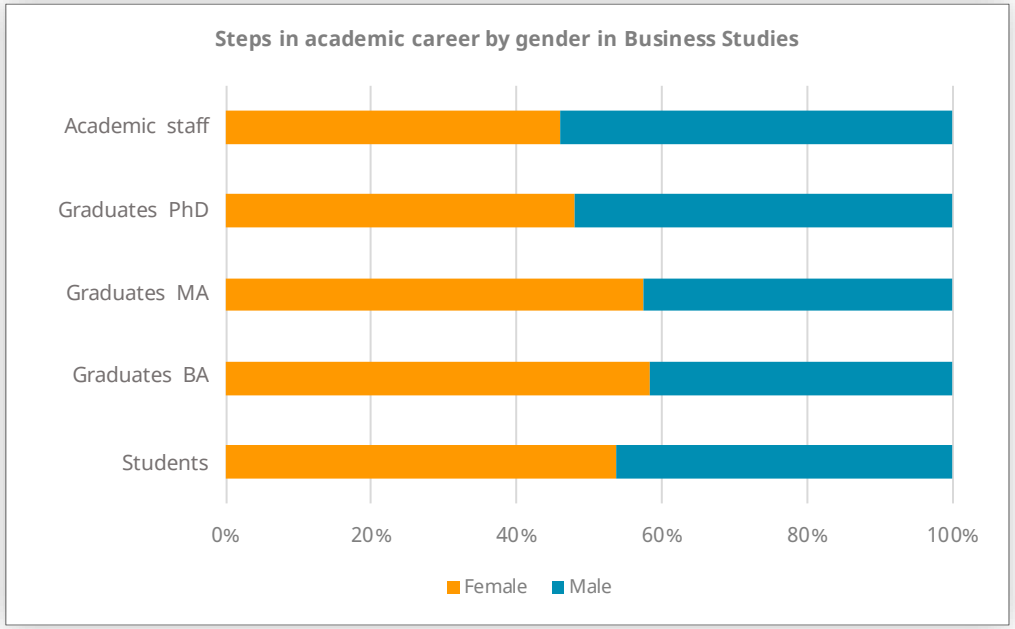
Compared to other subjects, the diversity of gender ratios is small in agriculture. With one exception, there is no department at which either men or women count for more than 80% of students and academic staff. 16 out of 96 departments are identified to be gender-balanced.

In agriculture, gender ratio is rather even at all stages of the higher education career. The share of females is between 42% and 48% at almost all stages; only among PhD graduates is it slightly higher than 50%.



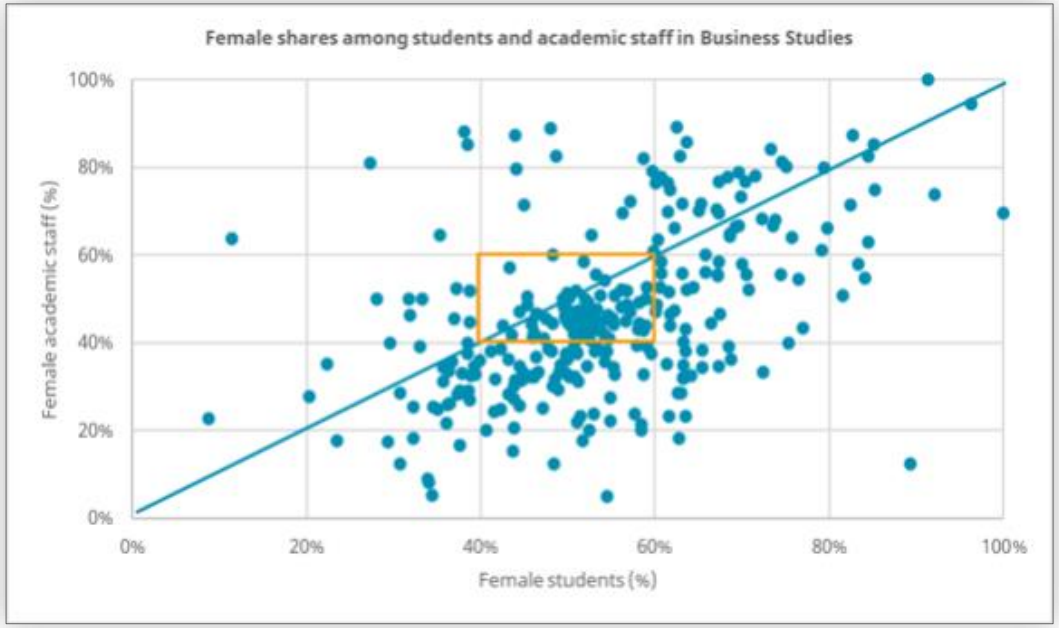
U-Multirank Gender Monitor – Business studies

The most diverse and balanced subject.



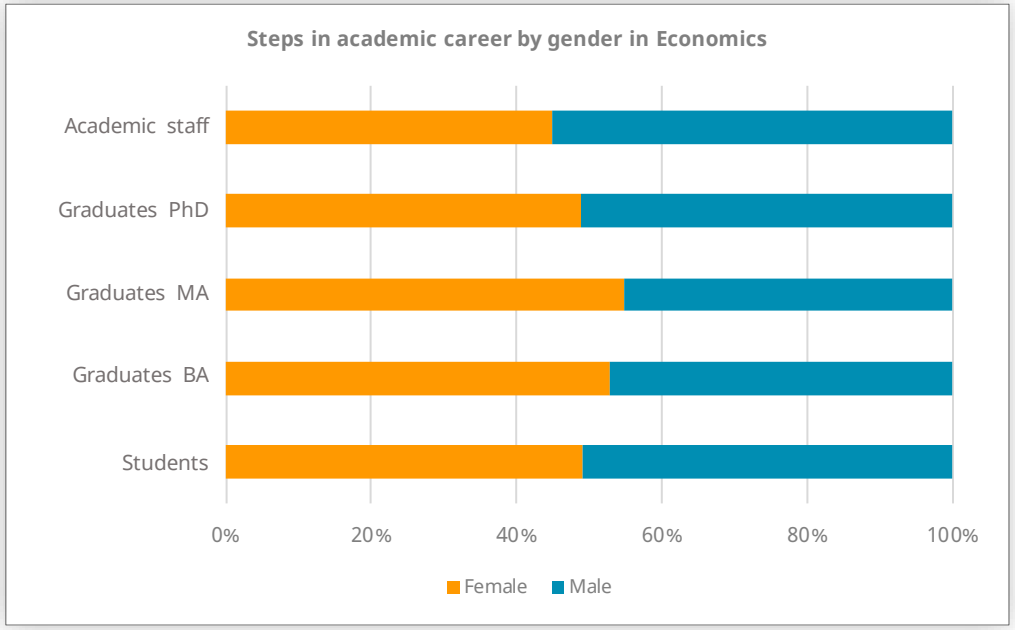
At all levels of higher education, business studies is characterised by a relatively balanced share of males and females. However, as noticed in other subjects, there is a women's gap from the PhD level onwards.

Our analysis of the departments of business studies shows a large spread of the gender ratio among students and academic staff. While there is a large number of departments in the gender-balanced sector, there are at the same time many departments that are either predominantly male or female.



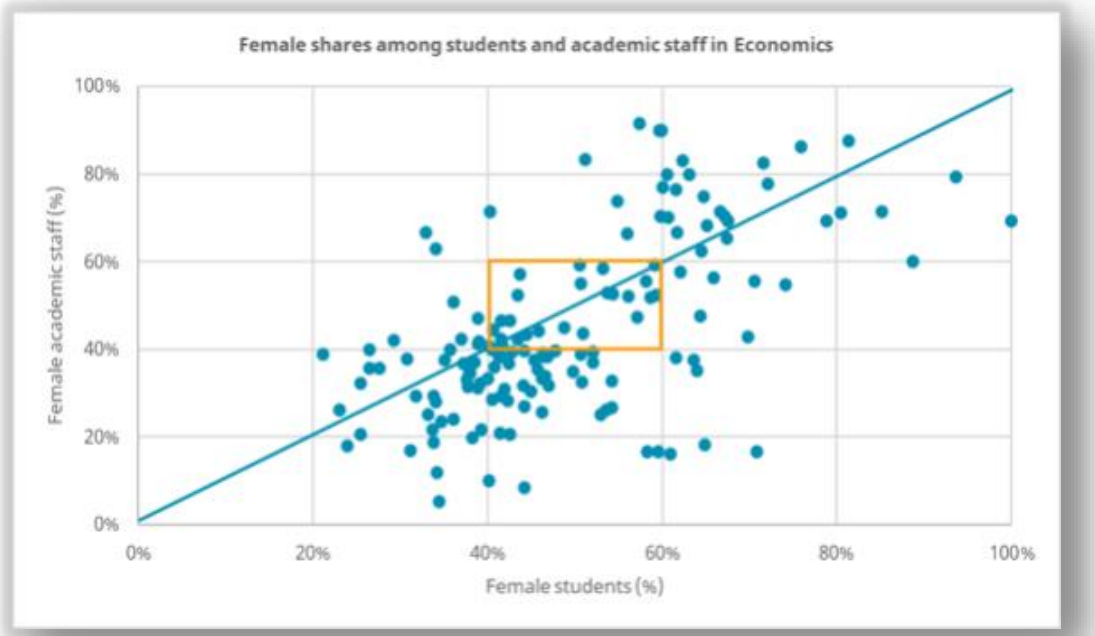
U-Multirank Gender Monitor – Economics

Among the subjects with the best gender balance.



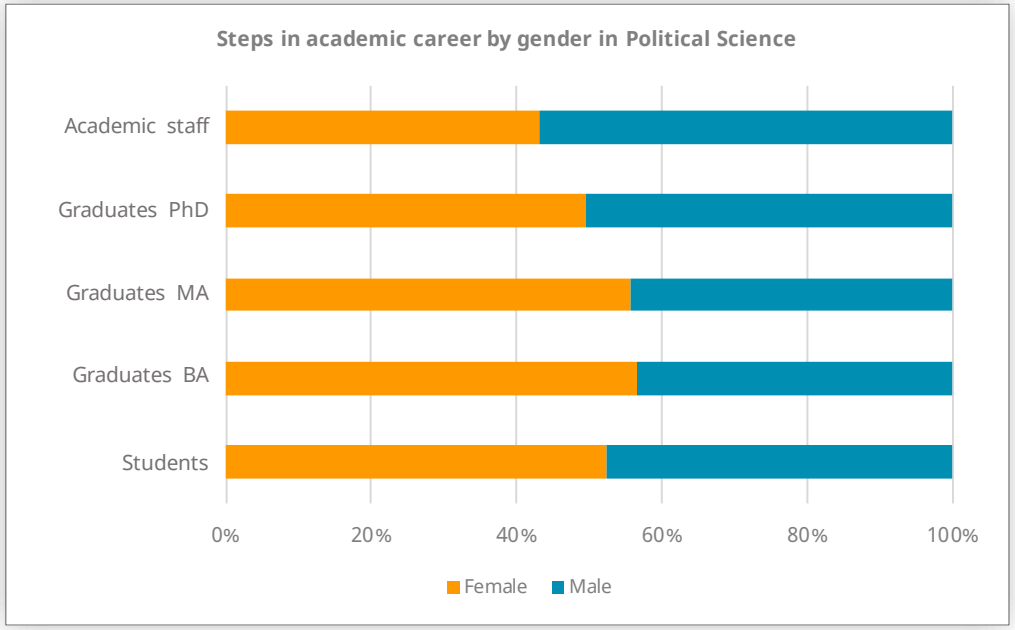
Economics is a gender balanced subject at all steps of the academic career ladder. The female shares are around 50% across the board.

A view on the departments of economics reveals a large range of the gender ratio for students and academic staff, with a substantial number located in the 'balanced box'. But the figure also shows a lot of departments with a clear majority of either women or men.



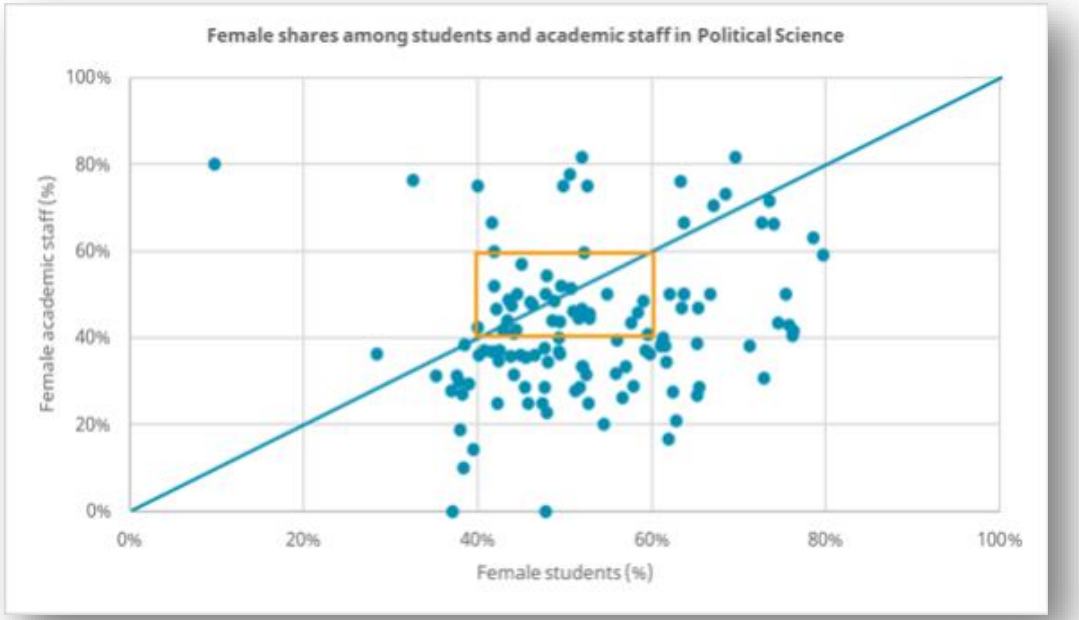
U-Multirank Gender Monitor – Political science

A moderately gender-balanced subject.



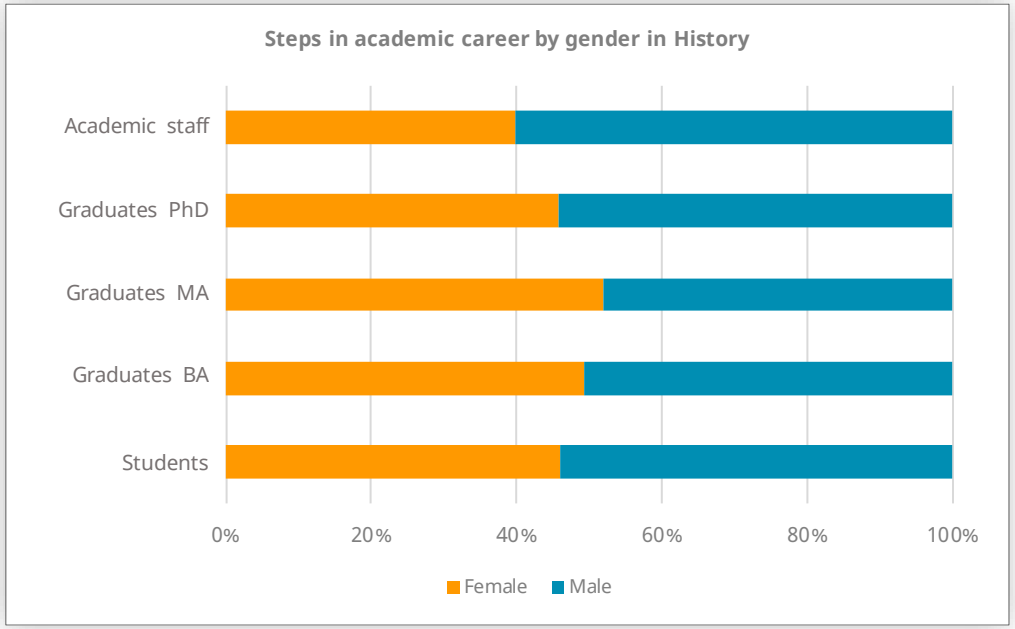
Even though there are many departments in the gender-balanced sector, at the majority of departments men are overrepresented among academic staff compared to their share among students.

While more than 50% of students and BA/MA graduates are female, only 42% of academic staff are women.



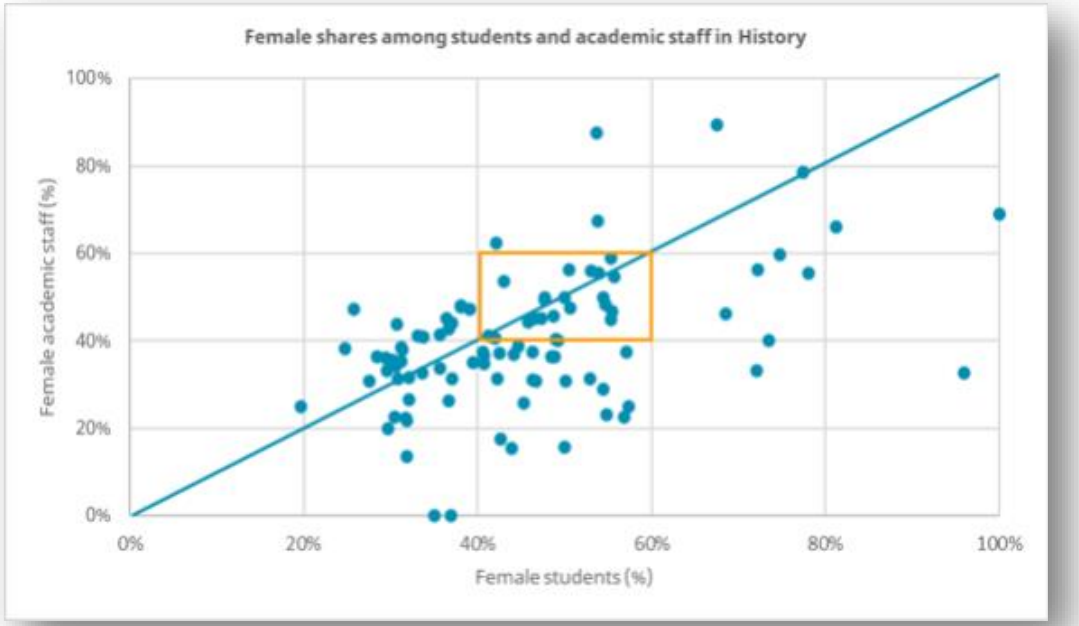
U-Multirank Gender Monitor – History

Although balanced at the student and the graduate's level, only four out of 10 academic staff are female.



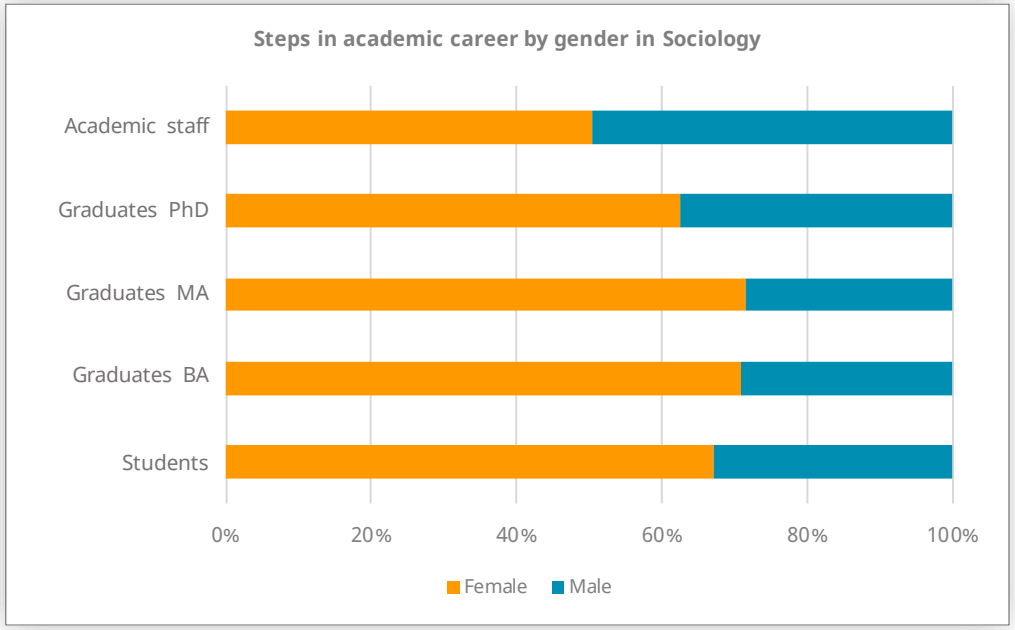
A look at individual departments shows a quite diverse picture. While in many departments the female share among academic staff is lower than among students, there is as well a number of departments at which the share of females in academic staff is higher than that of males.

History is a rather gender-balanced subject at all stages of the higher education career, apart from the academic staff level. While the proportion of women increases slightly from the first level of students to the MA graduates, it decreases from PhD level to academic staff.

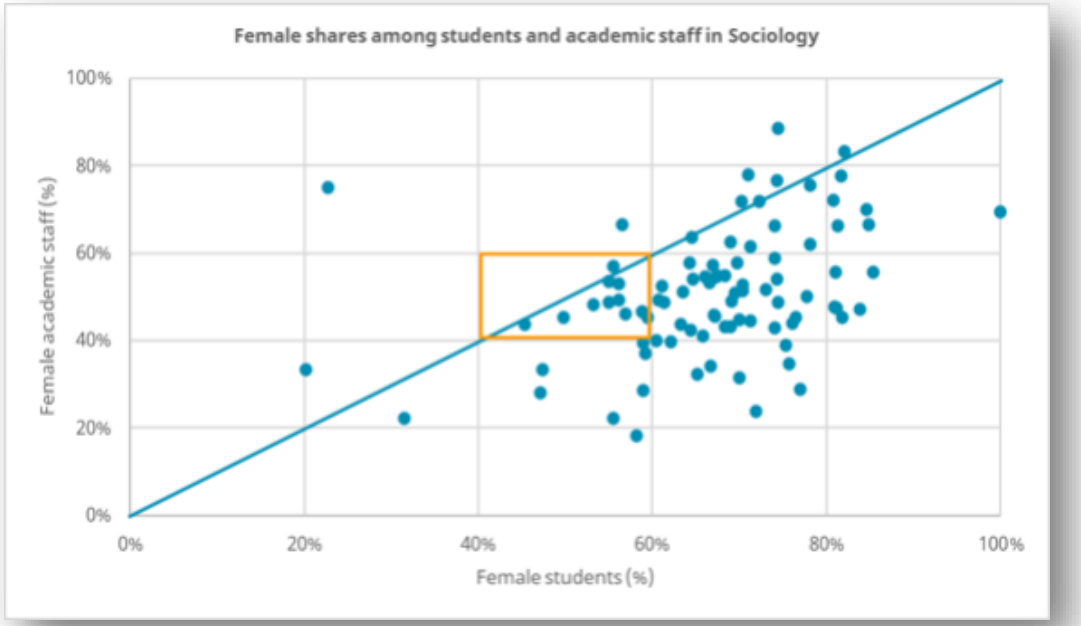


U-Multirank Gender Monitor – Sociology

A subject dominated by women.



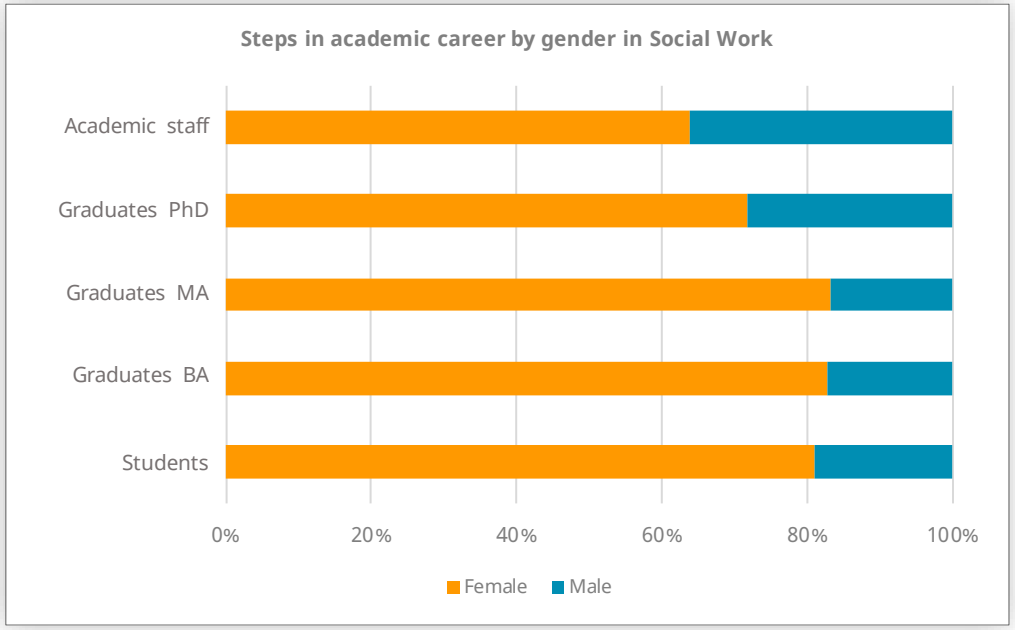
The student body and BA/MA graduates show a female share between 60% and 70%. While the female percentages of PhD graduates and academic staff are lower, they are still higher than 50% at both, the levels of PhD and academic staff.



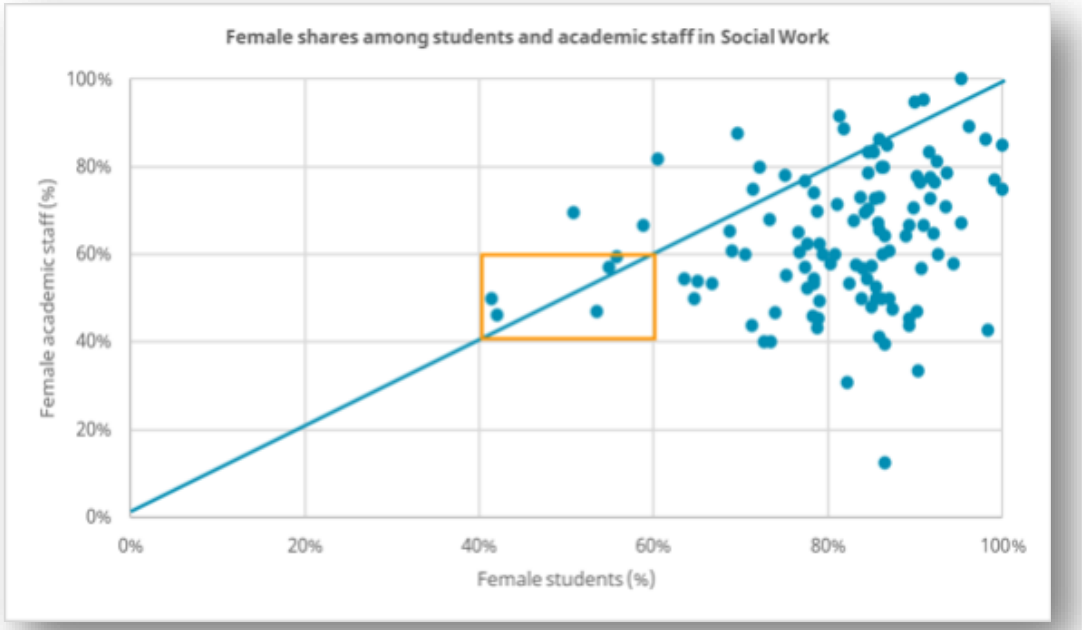
Data on departments confirm the strong role of women in studying sociology. At the majority of departments, more than 60% of sociology students are female. Only eleven departments are located in the gender-balanced field. But only at nine departments the percentage of female academic staff exceeds their share among students.

U-Multirank Gender Monitor – Social work

Social work is still 'female work'.



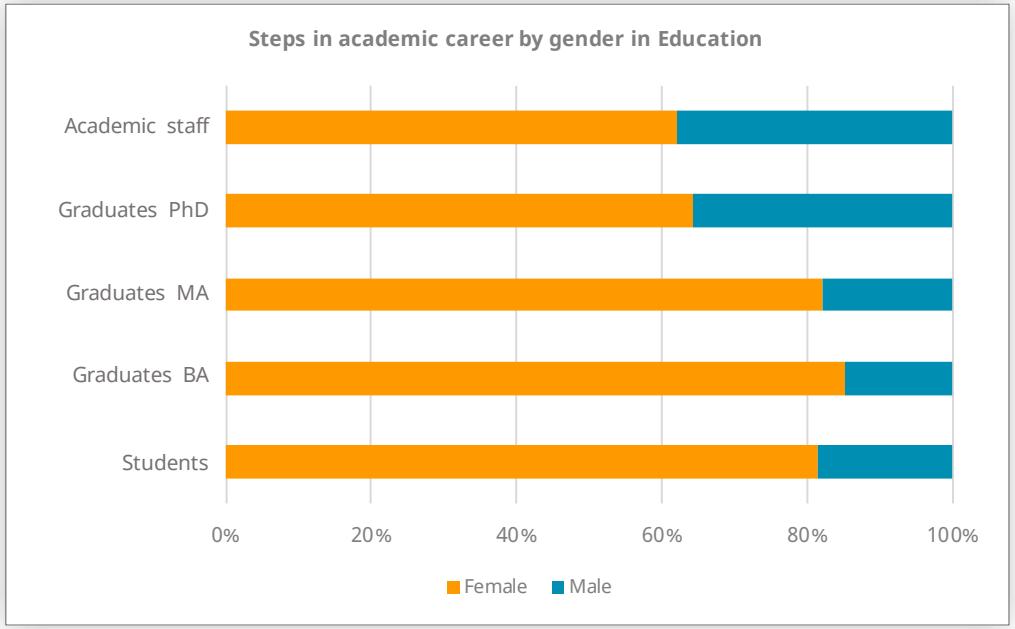
More than eight out of ten students, as well as BA and MA graduates are female. Compared to this, women are underrepresented among academic staff and PhD students although they represent more than 60% of the two categories.



The analysis by individual departments confirms the picture of a 'female world': only at two departments more than half of the students are male. As a consequence, only five departments have a balanced gender structure. Still, at most departments (all but 17), females are proportionally underrepresented among academic staff compared to their share among students.

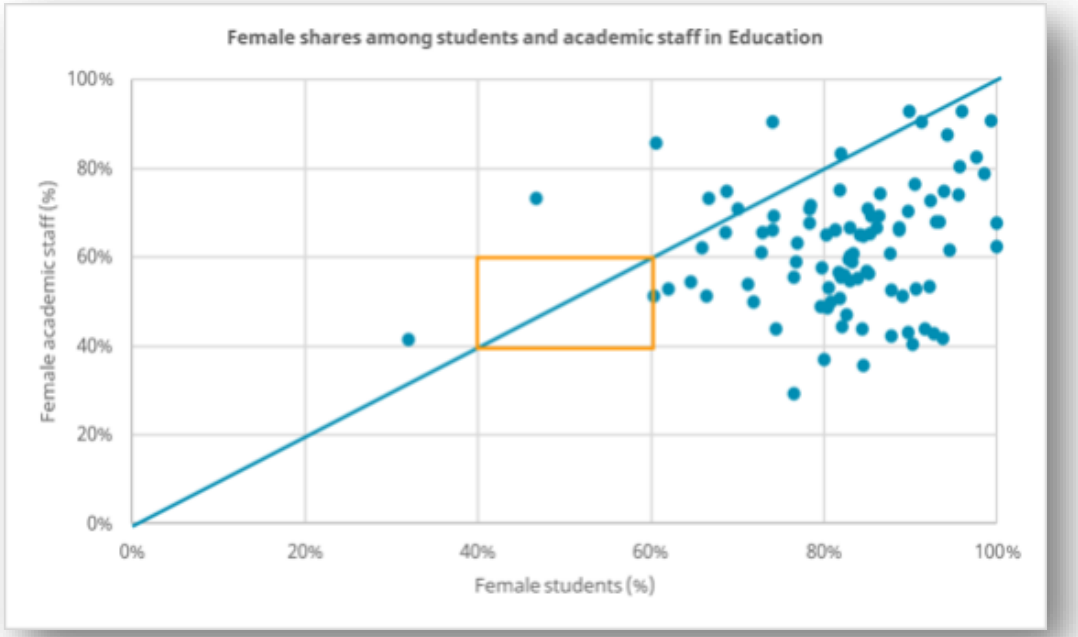
U-Multirank Gender Monitor – Education

A subject strongly dominated by women.



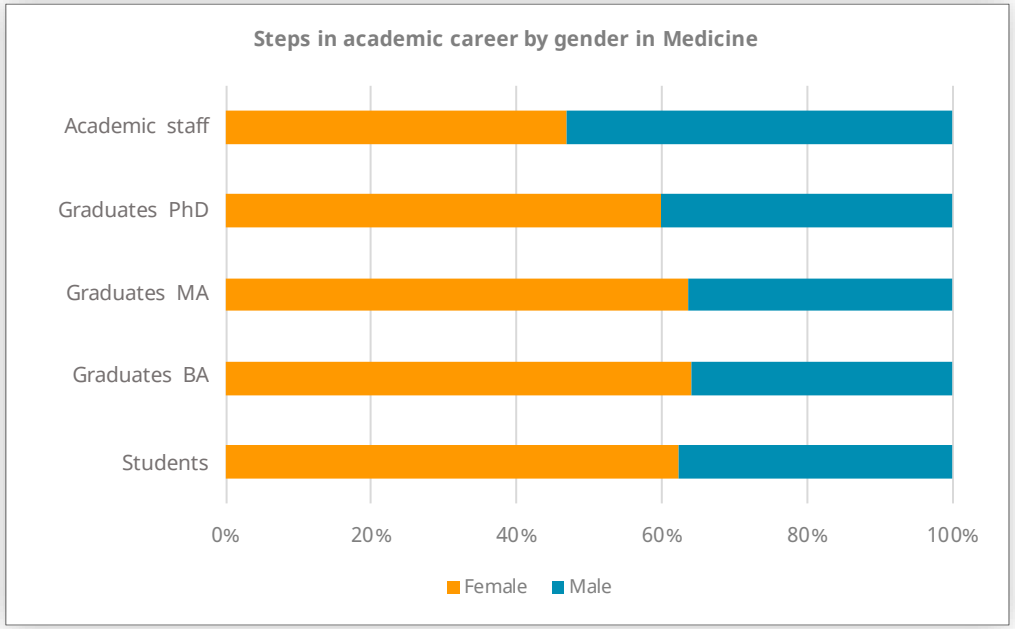
Education is among the four fields that is dominated strongest by women. Among students, as well as BA and MA graduates, more than 80% are female. Though this share decreases for PhD graduates and academic staff, the percentages are among the highest of all fields.

An analysis of education departments confirms the domination of women in this subject. There are only two departments at which the percentage of female students is lower than 60%. There is only one department located at the margin of the gender-balanced box.

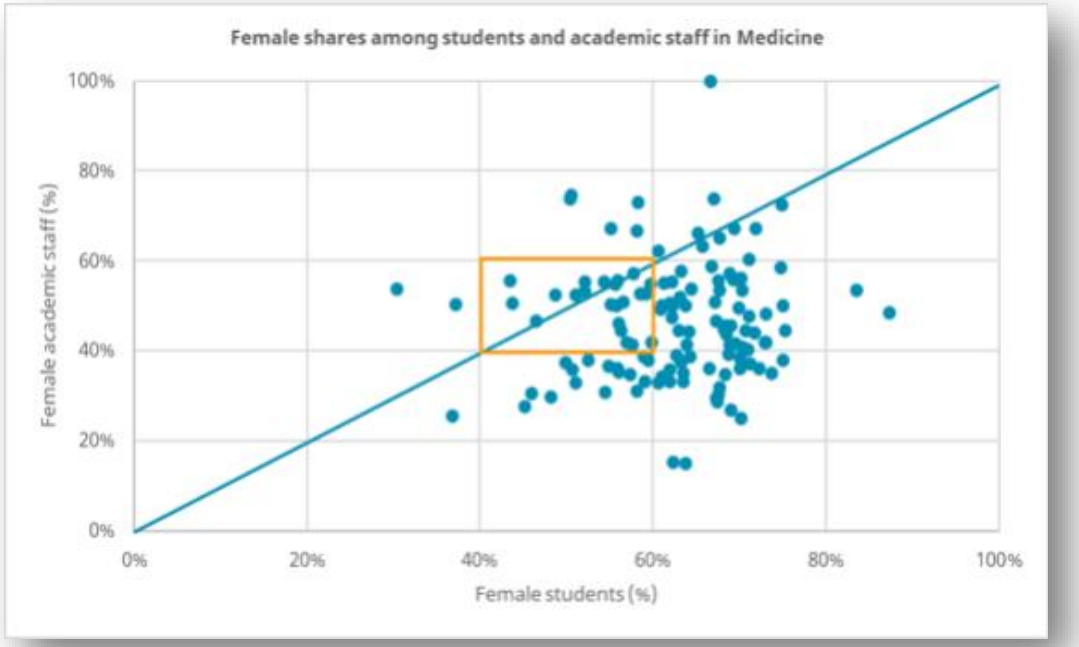


U-Multirank Gender Monitor – Medicine

All levels of the academic ladder are dominated by women – except academic staff.



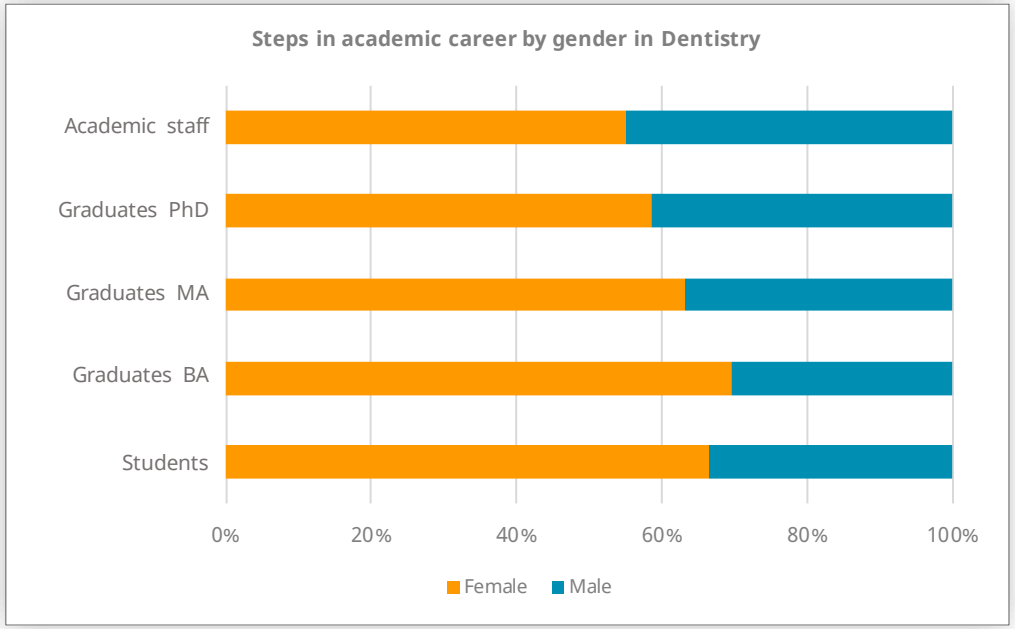
Medicine is a subject with high female shares at the student, BA/MA and PhD graduate stages. Only among academic staff is the proportion of women less than 50%.



The analysis of the individual departments shows a small degree of diversity of women in terms of gender ratios. We find only three departments at which male students count for more than 60%. Still, at the vast majority of departments the female share among staff is lower than among students. 22 out of 130 medicine faculties are characterised as gender-balanced.

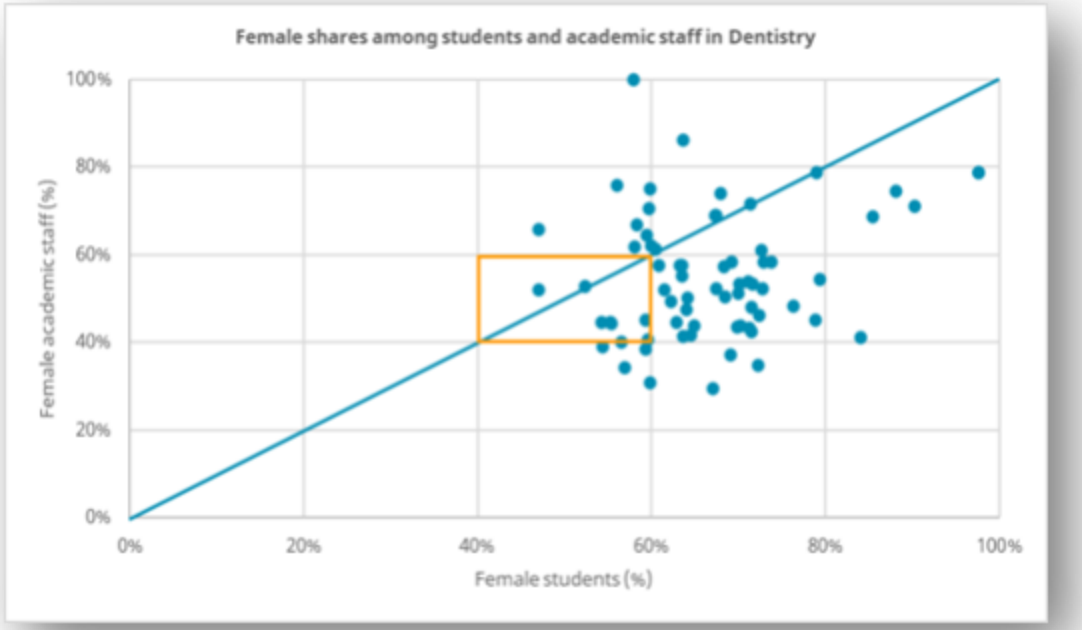
U-Multirank Gender Monitor – Dentistry

A subject with a female majority across all levels.



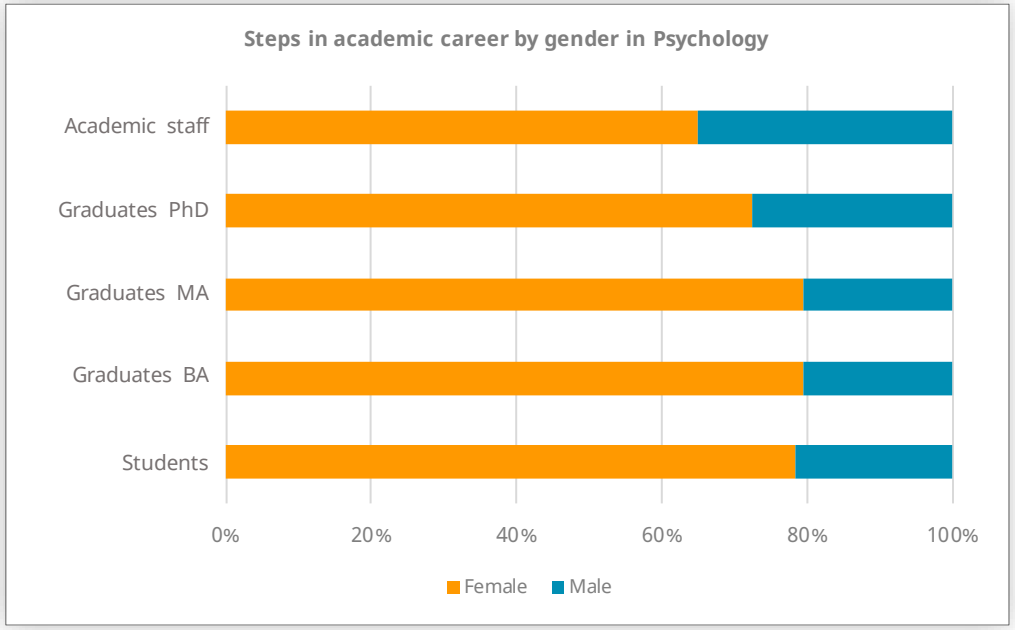
Women count for more than 60% of students and BA/MA graduates and almost 60% of PhD graduates. Unlike in medicine, women dominate in the academic staff of dentistry.

The analysis of the individual departments shows that there is no single department with less than 40% female students, nor less than 25% female academic staff.

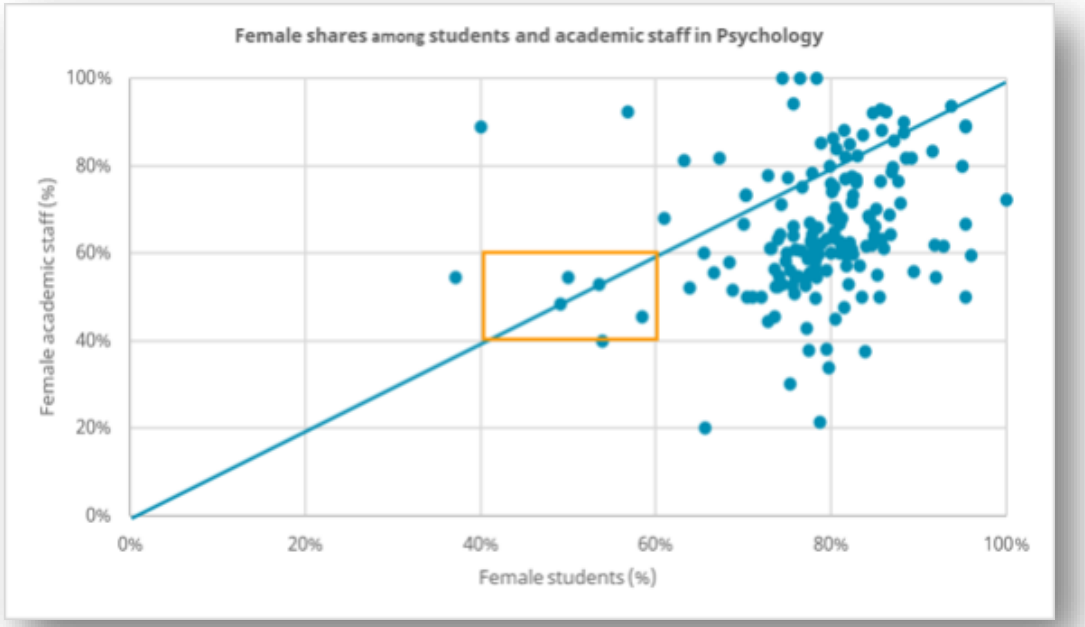


U-Multirank Gender Monitor – Psychology

The subject with the second highest percentage of female academic staff.



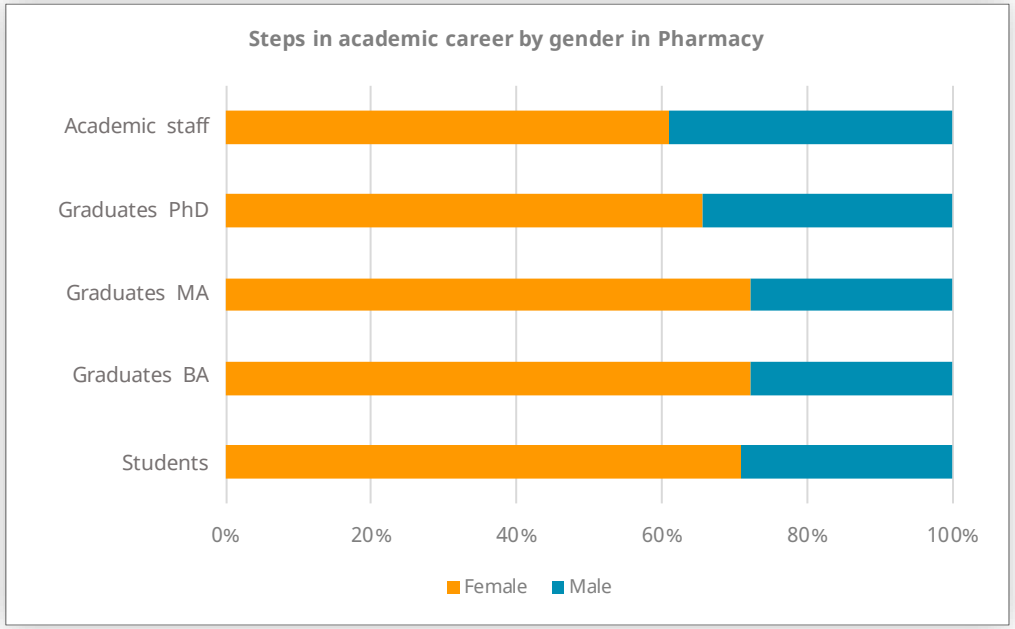
Almost 80% of the psychology students and BA/MA graduates are women, however the percentage among PhD graduates is slightly lower. Compared to the student level, women are still underrepresented in academic staff, but the percentage is the highest of all subjects aside from nursing.



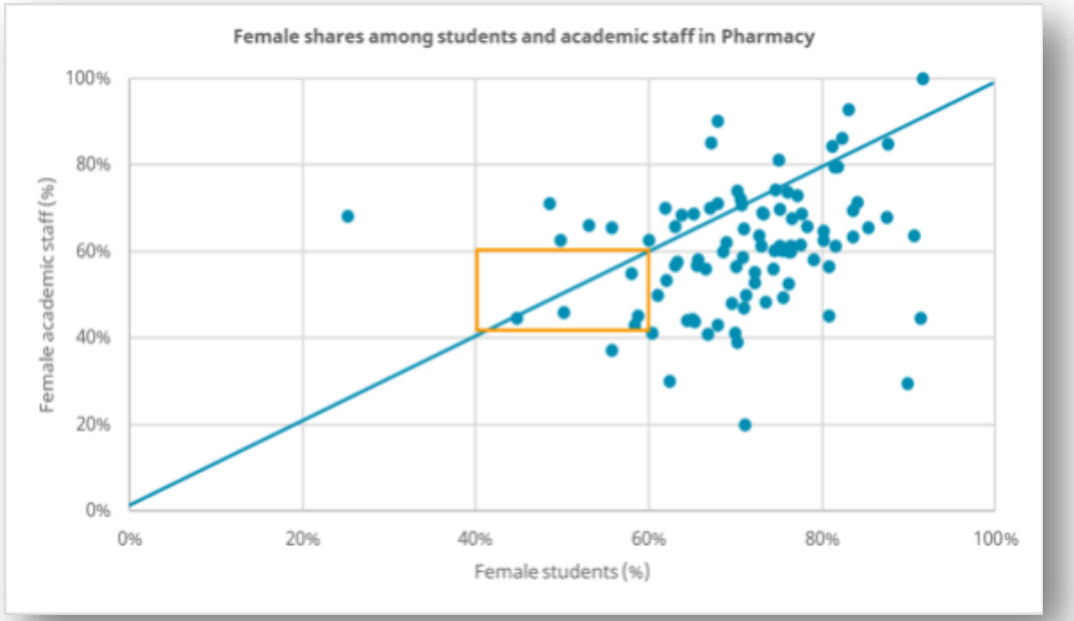
Most departments are located in the upper right sector of the graph, where female shares among both students and academic staff are very high. On the other hand, only five departments have a balanced gender ratio for students and academic staff. There are some departments at which the difference in the ratio from students to academic staff is particularly high in both directions.

U-Multirank Gender Monitor – Pharmacy

A strong role of women shown.



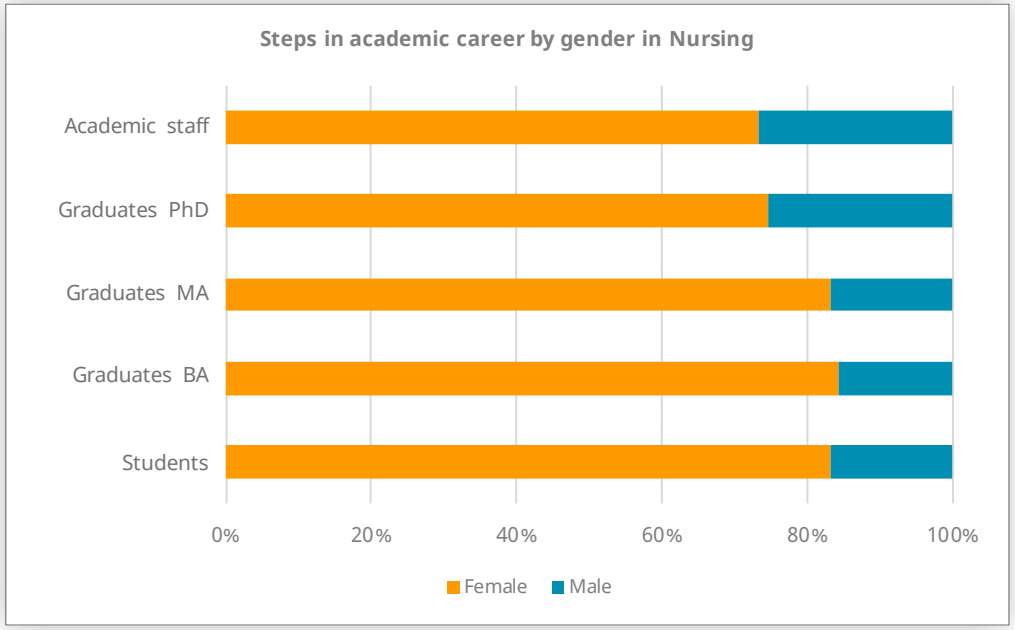
At all levels, females make up more than 60% of the majority in pharmacy, including among academic staff. While their share among academic staff is lower than among students, the funnel effect is less noticeable than in medicine and most science subjects.



While five pharmacy departments are gender-balanced at the academic staff and student levels, there is only one department with less than 40% female students. On the other hand, there are six departments at which the relative underrepresentation of women among academic staff is particular high, i.e., the female share among academic staff is more than 30 percentage points lower than among students.

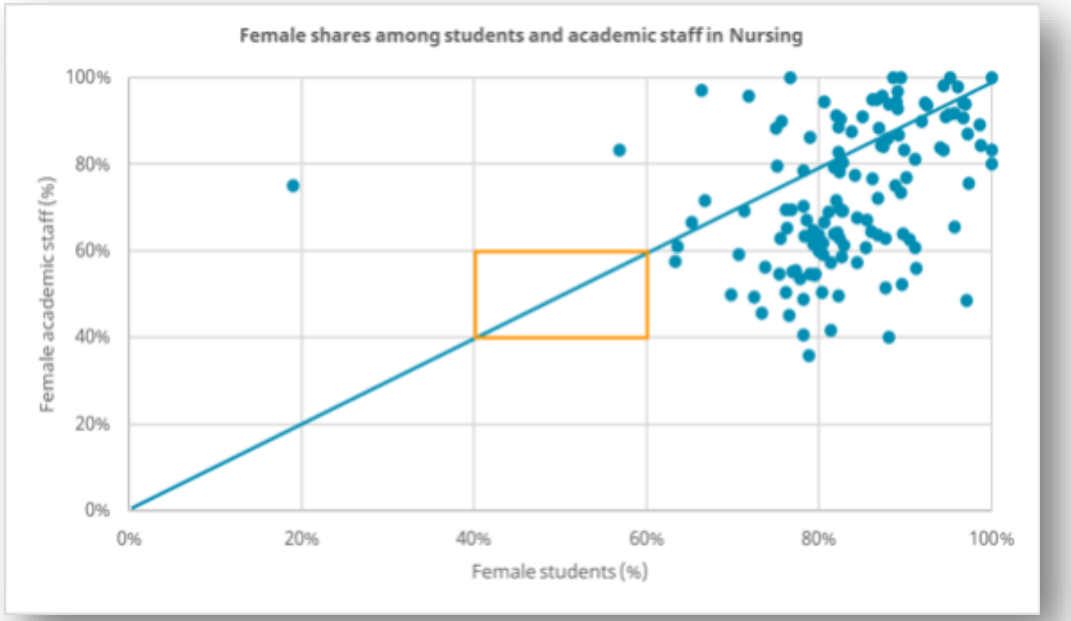
U-Multirank Gender Monitor – Nursing

A world (almost) without men.



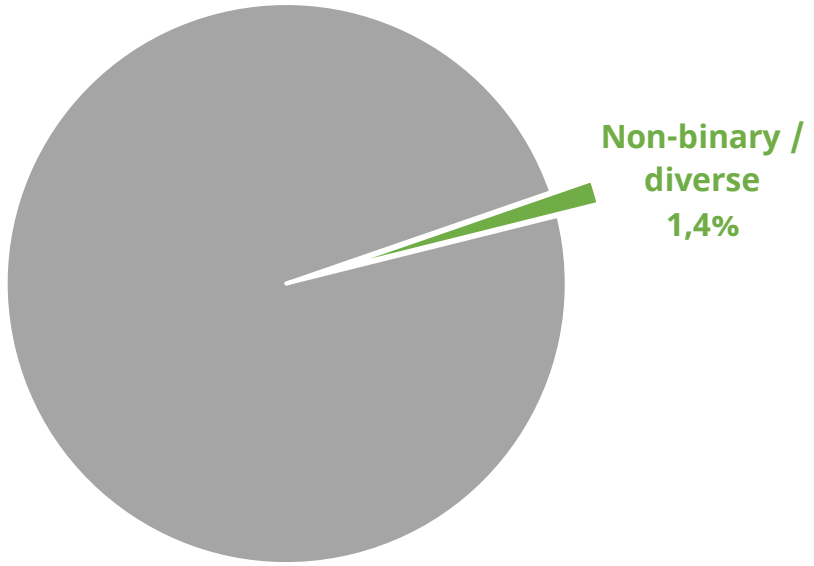
The strong dominance of women in nursing is reflected by the fact that no department is gender balanced. Only two departments have more than 40% male students. On the other hand, we found 51 out of 130 departments at which women count for more than 80% of academic staff.

For students as well as for BA and MA graduates, the female quota is over 80%. From the PhD stage onwards, the proportion of women is lower, but far beyond 50% and at the highest level of all subjects.



U-Multirank Gender Monitor – Non-binary/diverse students

Share of non-binary / diverse students among all students



In 2020, U-Multirank introduced the category 'non-binary/diverse' into its student survey.

About 1.4% of the responding students classified themselves as non-binary/diverse. Unfortunately, this number is too small to undertake a further, disaggregated analysis on them – neither by subjects nor by institutions. We are very aware that the notion of gender has to be extended beyond the binary classification. Therefore, U-Multirank will continue to extend its definition of gender in ongoing and upcoming data collections, including surveys at institutions and departments, which are the basis for the U-Multirank Gender Monitor. At the same time, we know that many higher education institutions have not yet, or only recently started to collect gender data in a broader way.

U-Multirank Project

U-Multirank is a global transparency tool and an alternative approach to traditional league tables. Its multi-dimensional approach compares the performance of universities across a range of different activities grading each of them from 'A' (very good) to 'E' (weak). It allows users to identify a university's strengths and weaknesses, on the aspects that most interest them. The data included in U-Multirank are drawn from a number of sources, providing users with a comprehensive set of information: data supplied by institutions – on the entire institution and on subjects/departments; and drawn from international bibliometric and patent databases; from national databases; and from surveys of more than 100,000 students at participating universities.

Since its first publication in 2014, U-Multirank has more than doubled the number of universities (higher education institutions) from 850 to 2,202 in 2022 and increased the coverage of countries from 74 to 96, including more than 5,000 faculties and more than 11,000 study programmes across 30 subject areas.

U-Multirank Methodology

U-Multirank is a non-commercial, multi-dimensional international transparency webtool on performance of higher education institutions. Its 2022 release covers 2,202 higher education institutions from 96 countries.

U-Multirank uses several different data sources to provide a multi-faceted and multi-perspective picture of university performance, incl. national and international statistical data. This data is reported by the participating institutions, and a survey among students. Data for the Gender Monitor are based on self-reported data at the level of the entire institutions and on departments (for the subject rankings and gender monitor).

Data on gender are collected on different categories: students, BA and MA graduates, PhD graduates, academic staff and professors (currently only on the institutional level). For the gender monitor we calculated gender-ratios on each of these categories, highlighting the discrepancies between the student and academic staff ratio. Data on 25 subjects are included in the analysis. U-Multirank covers a few additional subjects (e.g., linguistics, international law), which with regard to low numbers of institutions have not been included into the gender monitor.

A detailed description of the U-Multirank methodology and data collection can be found here.

Since 2017 U-Multirank is funded by the Bertelsmann Foundation, the European Union's Erasmus+ Programme and Santander Group. U-Multirank is developed and implemented by an independent consortium led by the Centre for Higher Education (CHE) in Germany. The Center for Higher Education Policy Studies (CHEPS) at the University of Twente and the Centre for Science and Technology Studies (CWTS) from Leiden University, both in the Netherlands, as well as Fundación Conocimiento y Desarrollo (FCYD) in Spain are partners in the project. The consortium is headed by professors Frans van Vught (CHEPS) and Frank Ziegele (CHE).

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