



U-Multirank Gender Monitor

An analysis of the female to male ratio
within the higher education ladder

November 2021



Introduction

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 address this gender stereotyping and gender imbalances within subjects, there were and are a variety of initiatives, such as 'Women in STEM' aimed at paving the way for young women into traditionally male-dominated subjects. 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. In this first analysis, we not only look at the gender ratio among students, but also among staff at the various stages of the higher education career ladder.

The underlying data are taken from the [U-Multirank database](#) and refer to the academic years 2018 or 2019. The analysis includes 900 institutions from more than 80 countries which provided comprehensive data on gender. The data is assessed at both the institutional and subject levels and includes 25 subjects in total. This analysis is the first of a planned annual monitoring on gender in higher education.

Although gender requires more than a binary classification of female and male, 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. As a first step in 2020, U-Multirank introduced the category 'non-binary/diverse' into its student survey.

Additionally, U-Multirank will continue to extend its definition of gender in ongoing and upcoming data collections, including surveys at the institutional and department levels, which are the basis for the U-Multirank gender monitor.

Gender balance is defined as having a minimum of 40% of 'both' sexes (European Commission 2010). Our data shows 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 among female dominated programmes such as nursing, education and social work. Between these two extremes, there are subjects, which do show a gender balance, in particular in terms of students and graduates.

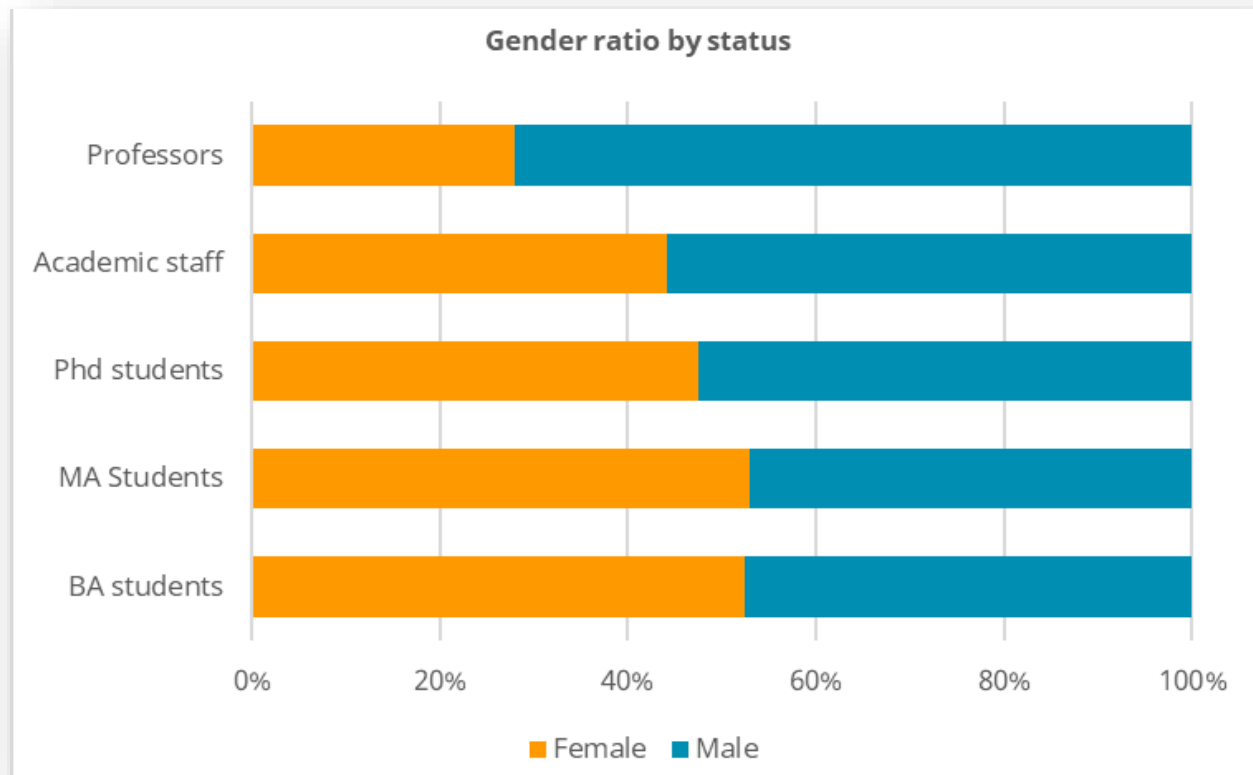
Furthermore, evidence from U-Multirank data suggests that there is a wide variation among departments, even within subjects.

Although in some subjects the central tendency regarding the 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.

This first analysis shows that there are still the stereotypical subjects which are dominated by one gender. On the one hand, there are the engineering courses as well as computer science and physics, which are male dominated. On the other hand, there are the 'female-driven' programmes such as nursing, education and social work. Between these two extremes, there are subjects, which are developing in the direction of gender balance, or even are gender balanced. Nevertheless, solutions must be created to make gender-dominated subjects more attractive for other genders.

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

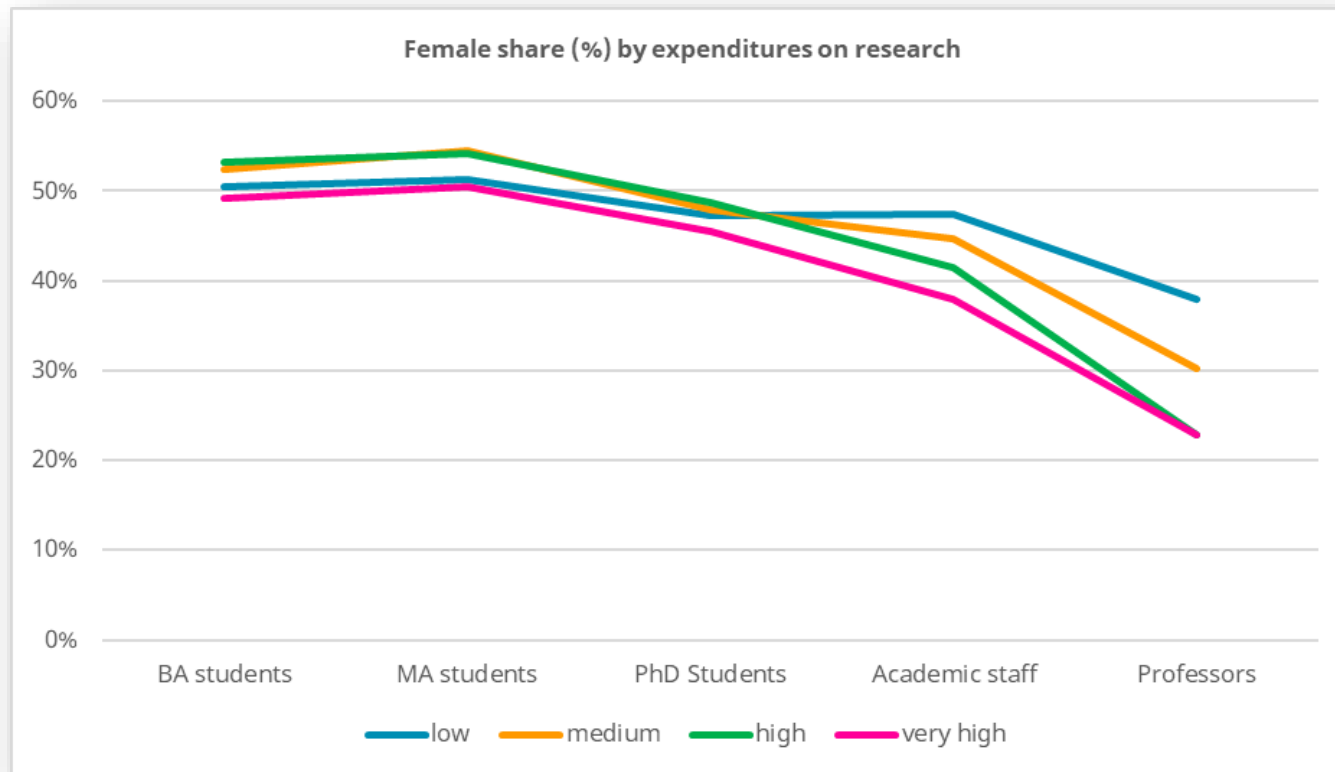
U-Multirank Gender Monitor – Institutional data



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

U-Multirank data confirm that the female shares are still lower across the academic career path. While among BA and MA students the share of female students is slightly above 50%, it continuously decreases among PhD students (48%), academic staff (44%), and particularly professors (28%).

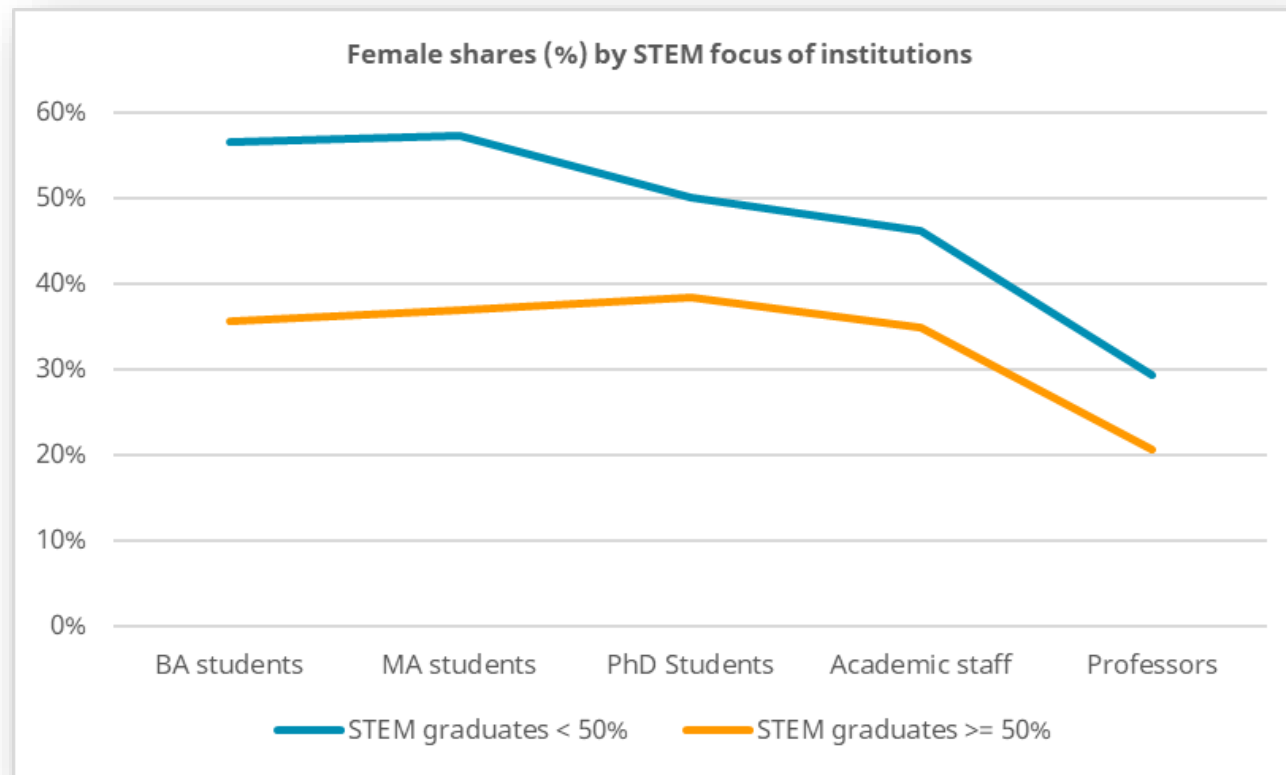
Analysis by institutional profiles



Women are particularly underrepresented among academic staff at research intense institutions

Across the academic career steps the gender gap opens more widely at research intense universities (as measured by the percentage of their expenditures spent on research). At research intense universities the share of females among professors is only 23% compared to 38% at institutions with low expenditure on research.

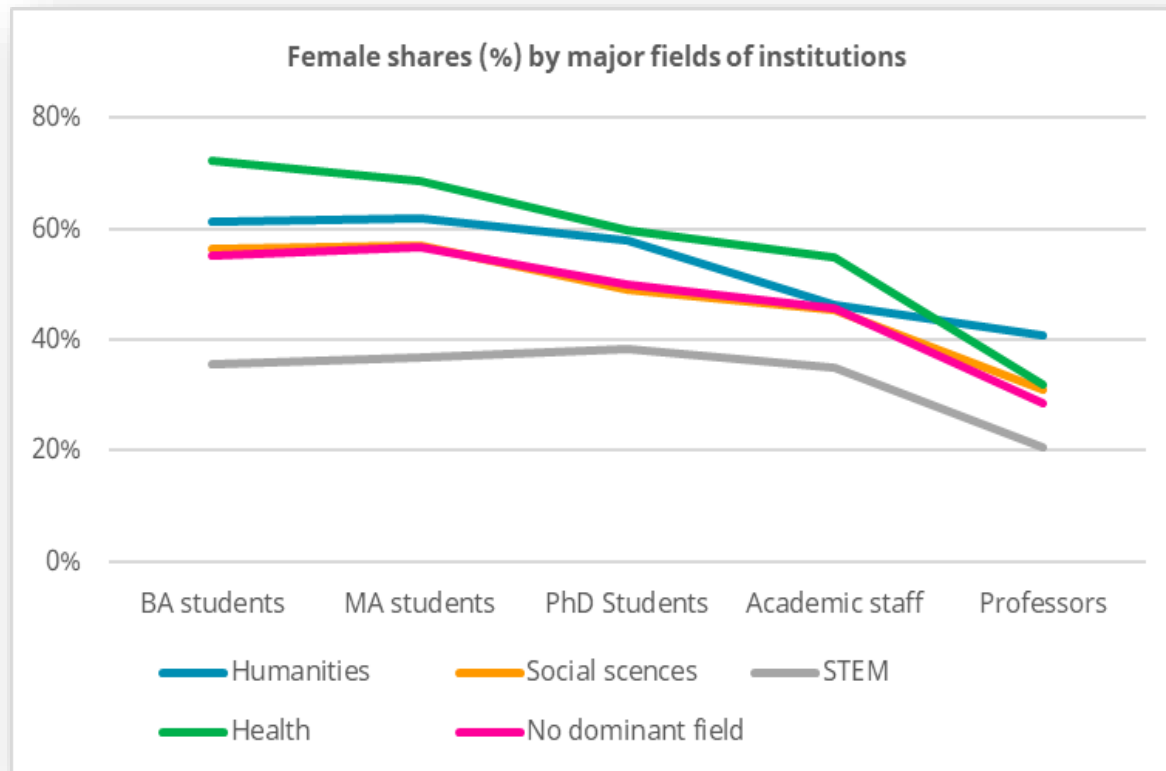
Analysis by institutional profiles



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

Another important profile characteristic affecting gender balance is the discipline focus of higher education institutions. At institutions with a majority of graduates in STEM fields, the percentage of female students is much lower than in non-STEM focused institutions (36% to 56%). In contrast to the pattern described above, we see that the substantial differences among major fields of education regarding gender imbalance when looking at bachelor students are less and different when looking at staff. Even though, women are still underrepresented at STEM institutions among professors (21% compared to 29%).

Analysis by institutional profiles

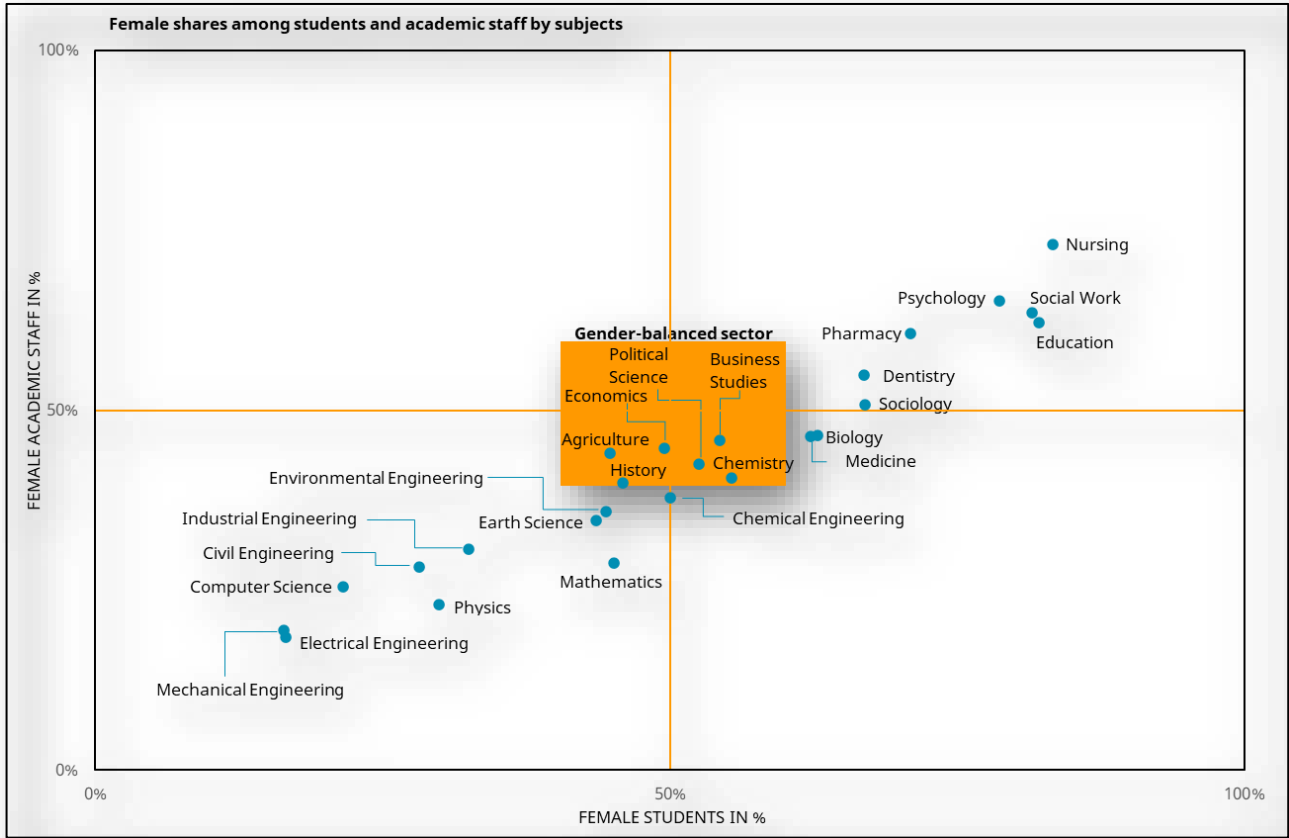


While institutions characterised by health and humanities fields have a large majority of female students, women are still underrepresented among academic staff and professors across subjects.

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 (37 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

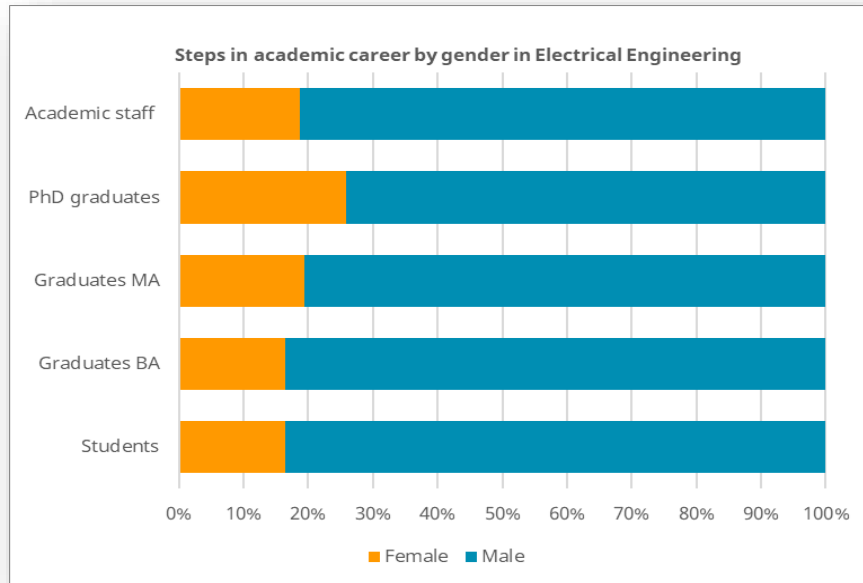
Still worlds apart.



The analysis of gender shares for the 25 subjects with the highest participation in U-Multirank, reveal that the subjects are still worlds apart. Looking at the gender ratio of students and academic staff, evidence shows that the different subjects still belong to different worlds in terms of gender representation. 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 and history and chemistry are gender balanced: 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).

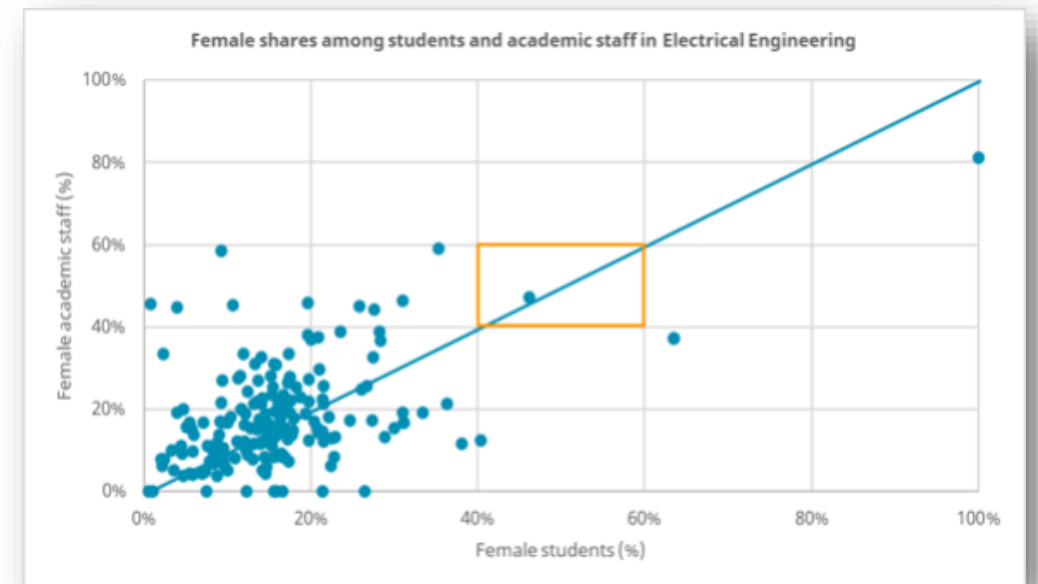
U-Multirank Gender Monitor – Electrical engineering

One of the most male-dominated subjects.



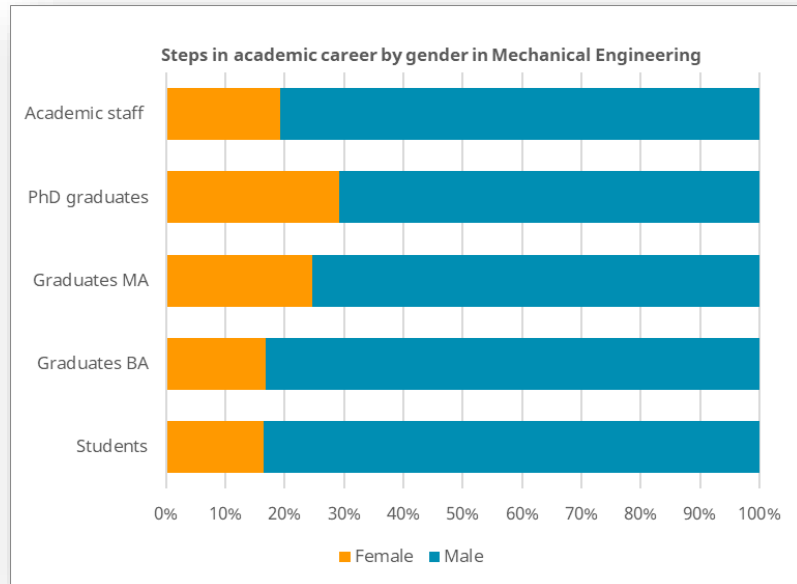
Electrical engineering (together with mechanical engineering) is one of the subjects with the lowest proportion of women at all stages of higher education career. Among students, BA graduates and MA graduates, and academic staff – less than one out of five is female. Among PhD graduates, female proportion is slightly higher: Every fourth PhD graduate is a woman.

This overall picture is strongly confirmed on the department level. There is only one department (out of 177) with an even gender balance.



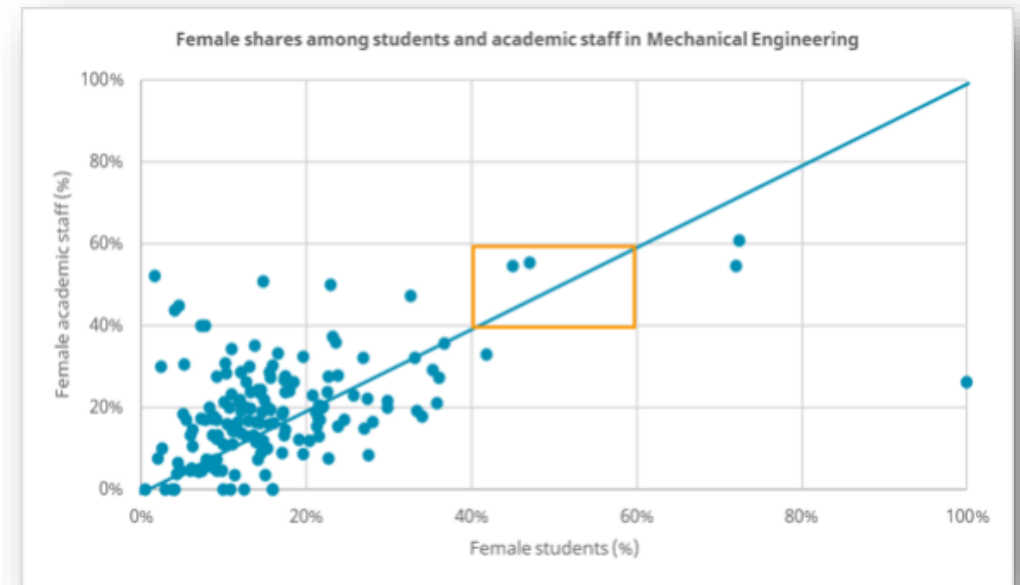
U-Multirank Gender Monitor – Mechanical engineering

One of the most male-dominated study subjects.



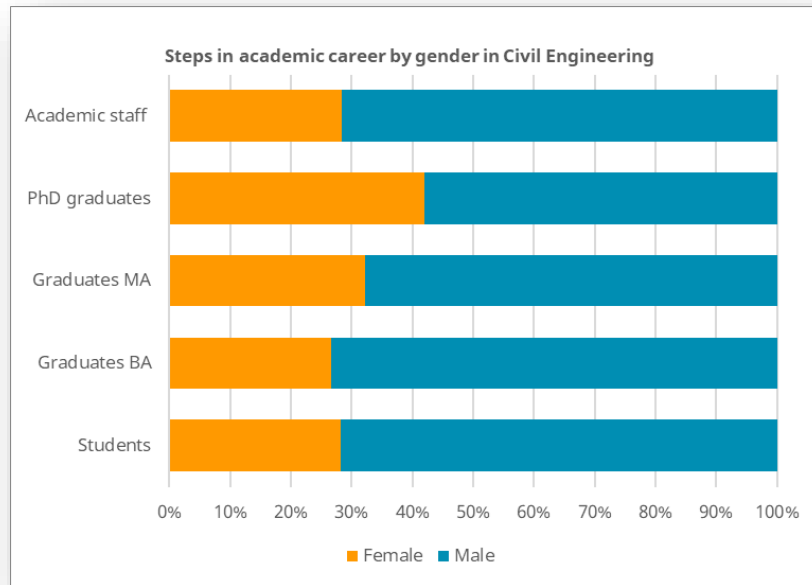
In mechanical engineering, together with electrical engineering, the gender ratio at all stages of the academic career path, is most imbalanced. Like in electrical engineering, women that enter the field as students perform strongly: their share among graduates and PhD students are higher than among students; but they are still heavily underrepresented on the level of academic staff.

Out of 158 departments, only two departments have a good gender balance on both levels; and only a handful have more than 40% of female students. However, for a large part of departments, the share of women in the academic staff is larger than for students.



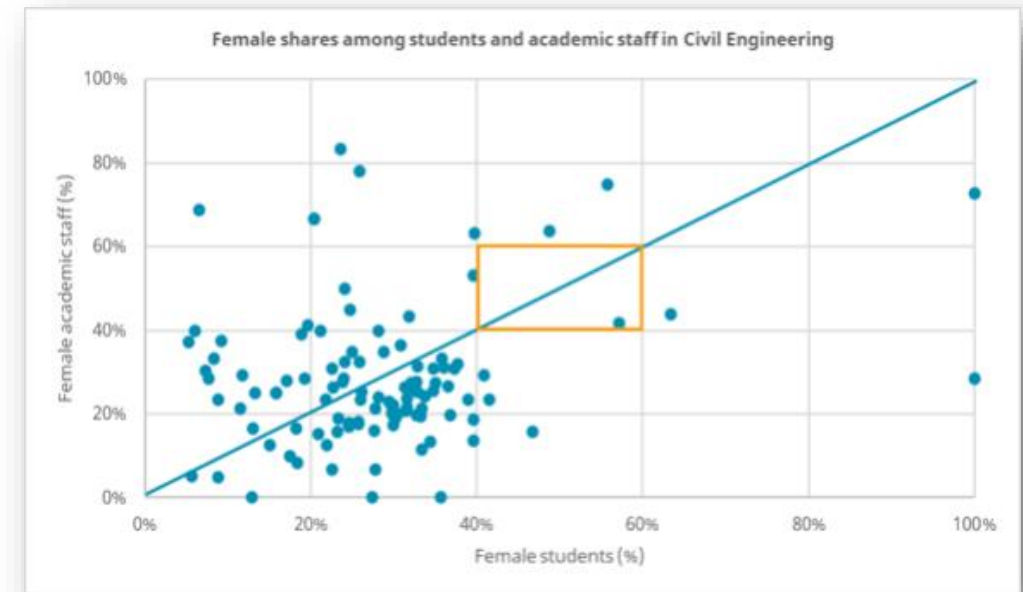
U-Multirank Gender Monitor – Civil engineering

More male students and staff.



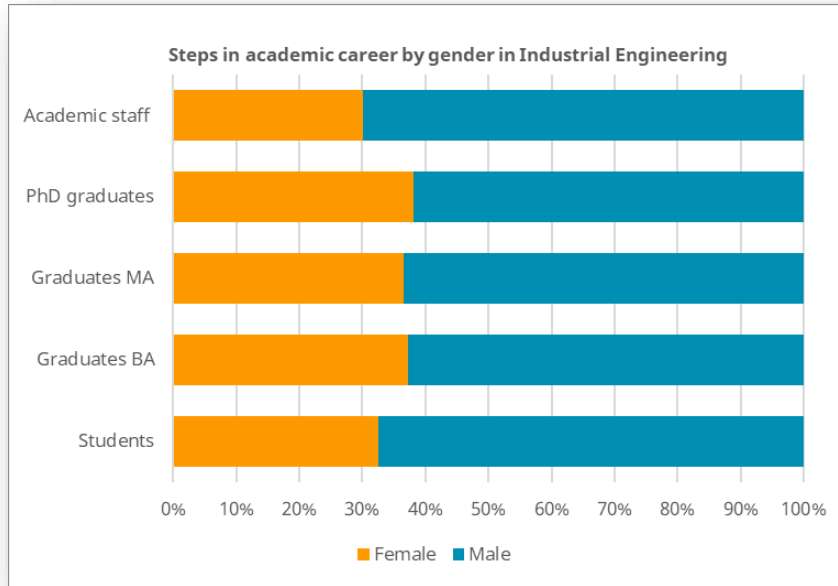
While the female shares at all stages are higher than for electrical and mechanical engineering, civil engineering is a male-dominated subject. The fact that the share of women among PhD graduates is higher than among MA graduates indicates that women stay in academia after graduation to a higher degree than men. However, this does not translate into a respective representation among academic staff.

The vast majority of departments have low percentages of women both among students and among academic staff. Only one department out of 108 can be characterised as gender balanced.



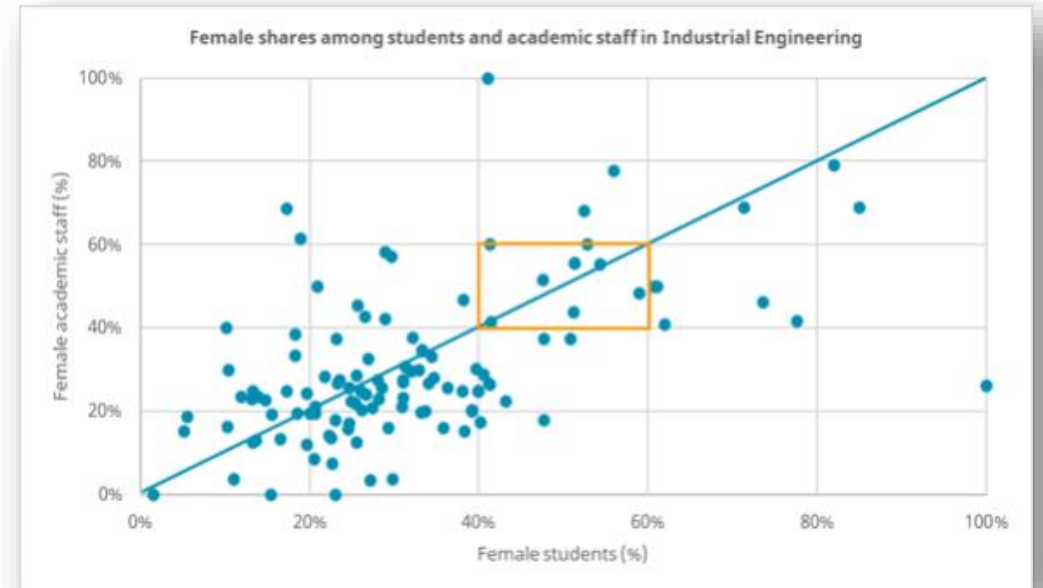
U-Multirank Gender Monitor – Industrial engineering

A subject that is still male-dominated, but there are exceptions among departments.



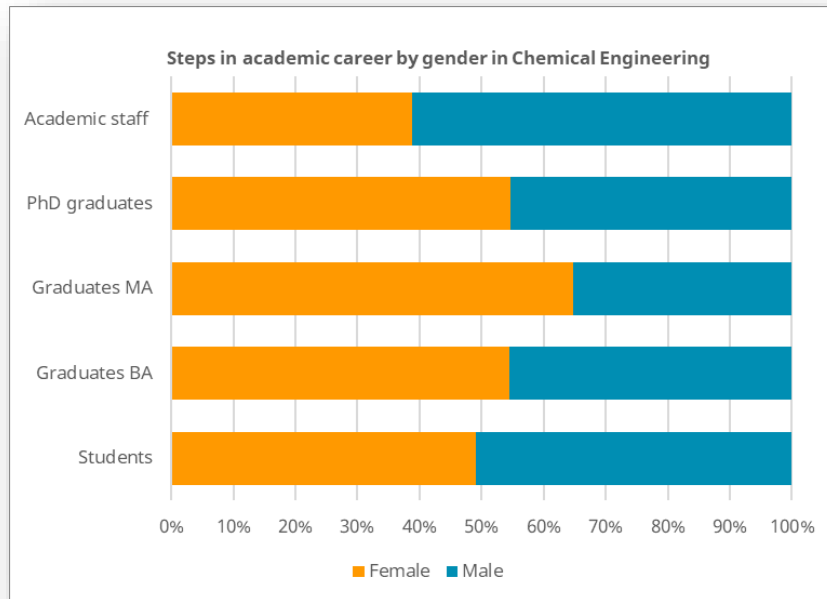
At all stages of the university career, the percentage of females is only between 30% and 40%.

Compared to mechanical and electrical engineering the picture for individual institutions is more diverse. Eight departments can be considered as gender-balanced; and at 17% of all departments (18 out of 116) the share of females is more than 40% among both students and academic staff.



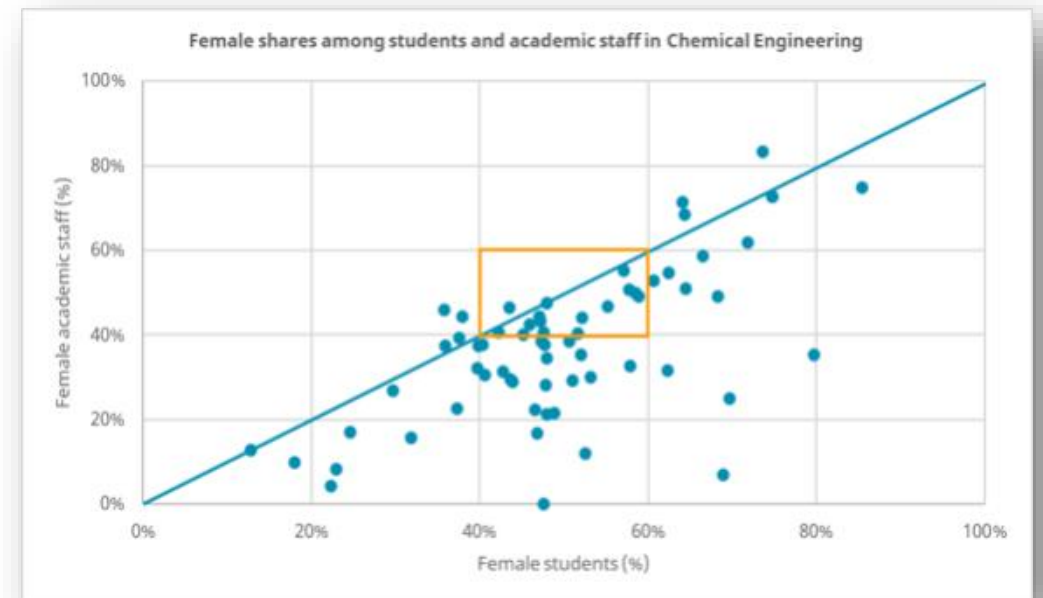
U-Multirank Gender Monitor – Chemical engineering

The engineering subject with the most balanced gender ratio.



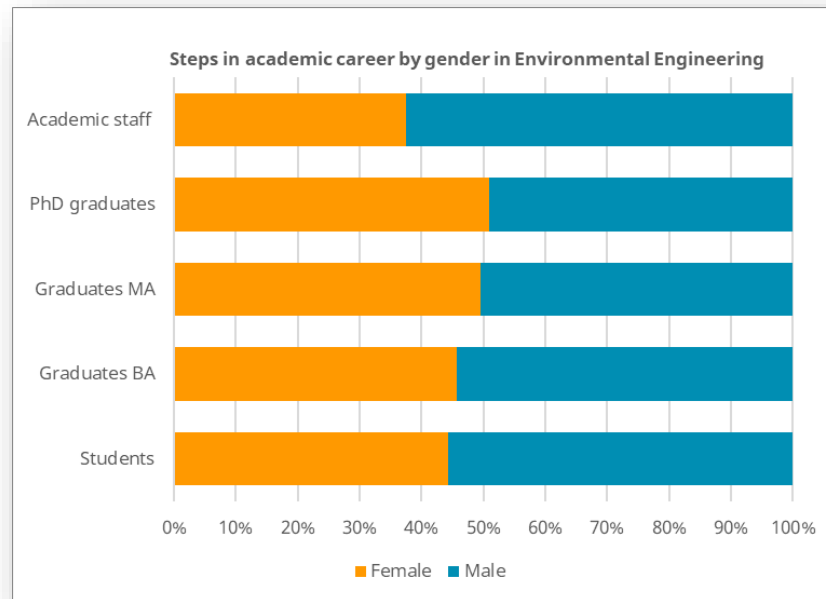
A combination of chemistry and engineering seems to appeal to more women. Among students and graduates, the gender ratio is close to 50:50. Only among academic staff, are men still dominant (more than 60%). However, the female share is still the highest among all engineering subjects.

The gender ratio among students is very diverse at chemical engineering departments: at 43% of all departments, the majority of students are female. 15 out of 65 departments are in the gender-balanced range; at eight departments women are proportionally overrepresented among academic staff.



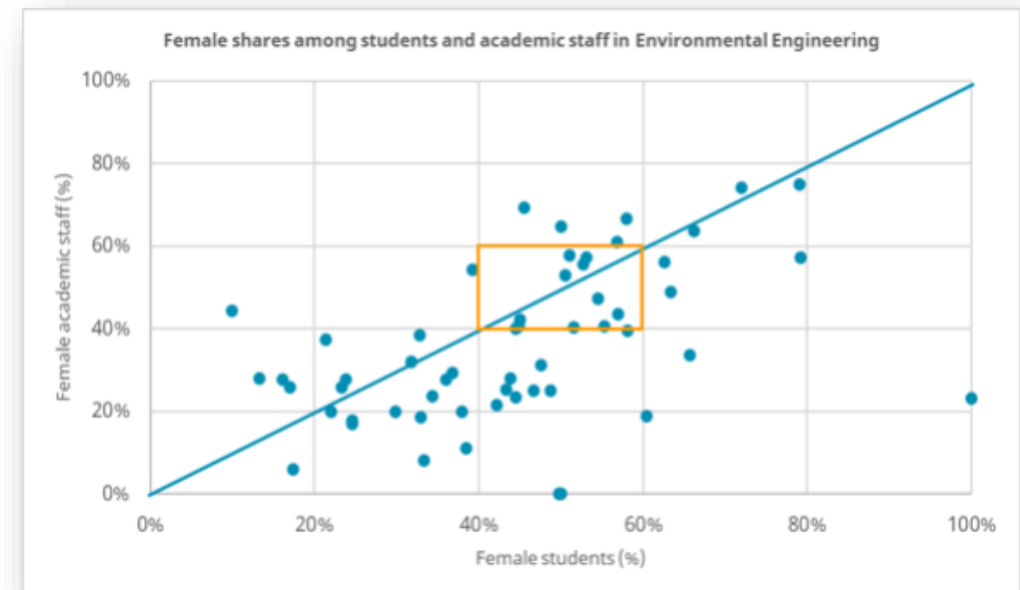
U-Multirank Gender Monitor – Environmental engineering

A more even gender balance than in traditional engineering subjects.



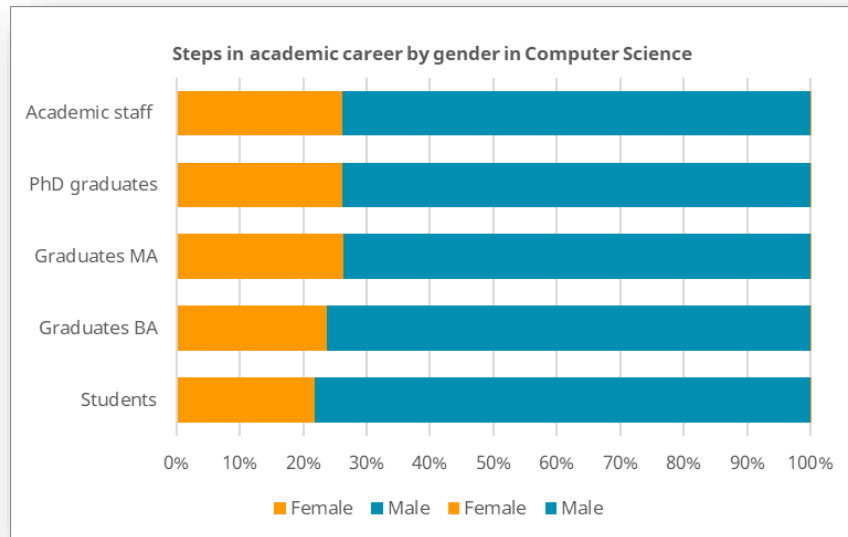
The mix of environmental sciences with the usually very technical and technologically skilled engineering also increases the participation of women. Compared to mechanical, electrical and civil engineering, environmental engineering is more gender-balanced at all stages. The percentage of female academic staff is the second highest of all engineering subjects.

Like in chemical engineering, the gender ratios among students are quite diverse. But at many departments (18 out of 56) women are represented among staff at a higher level than among students. Almost 20% of all environmental engineering departments are in the gender-balanced field, where the male/female percentages in both students and academic staff is between 40 and 60%.



U-Multirank Gender Monitor – Computer science

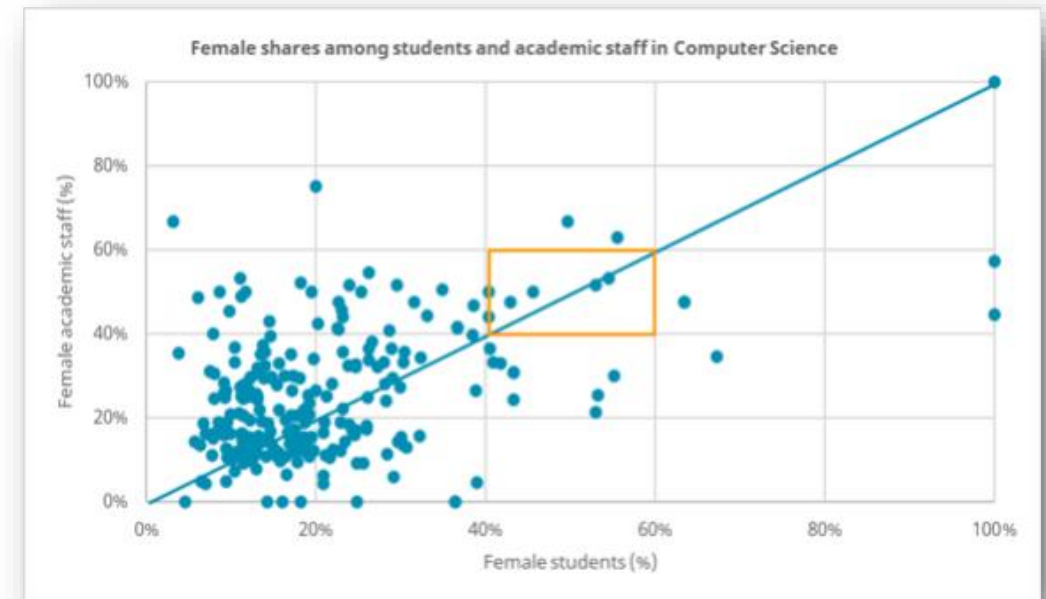
A playground for men.



At all U-Multirank institutions only 21% of all computer science students are female. Based on this very small share, the portion of females even rises slightly by the academic status. This general view is confirmed for many individual institutions at which female percentages among staff are higher than among students.

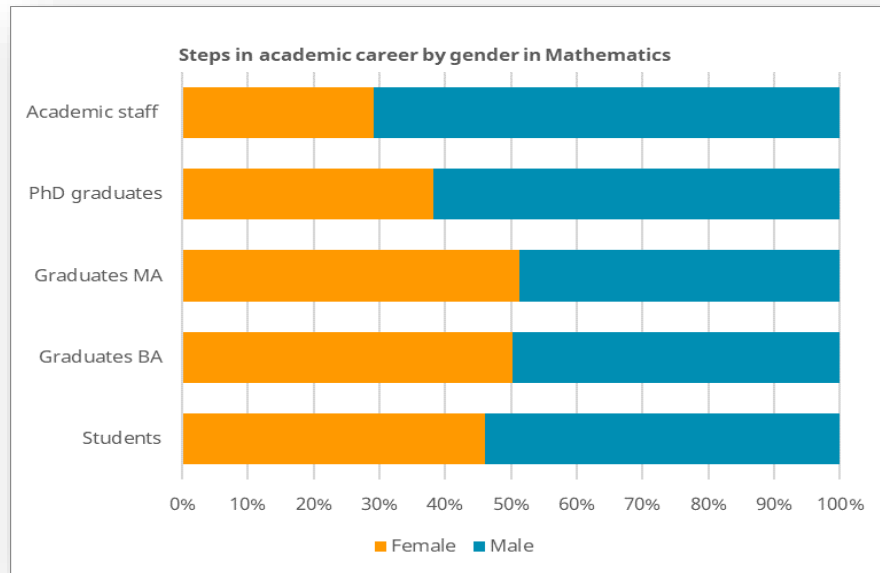
It seems that women – once they have entered the field – have a chance to advance.

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



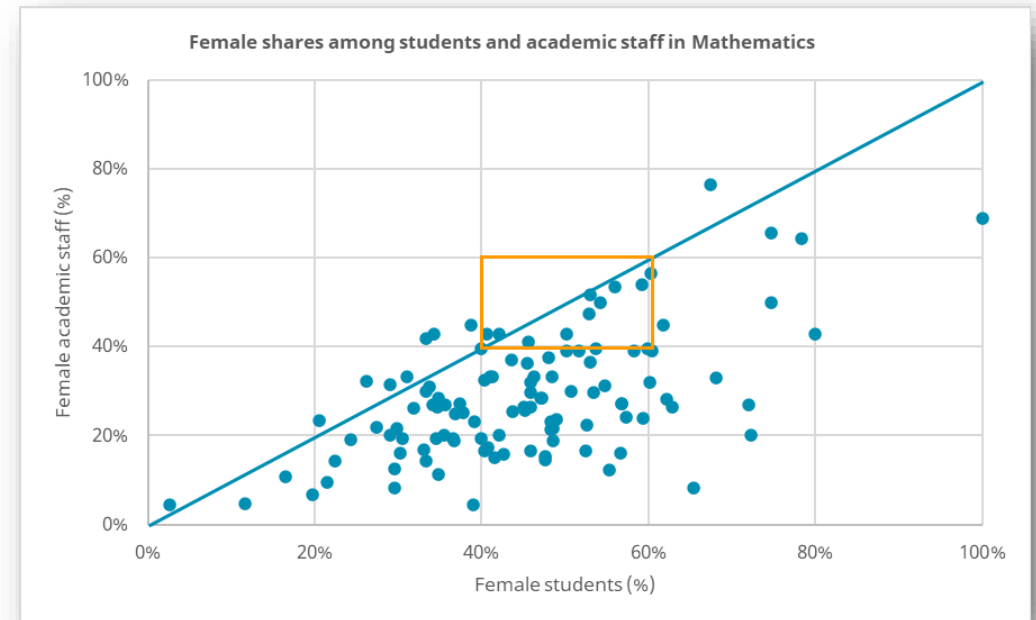
U-Multirank Gender Monitor – Mathematics

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



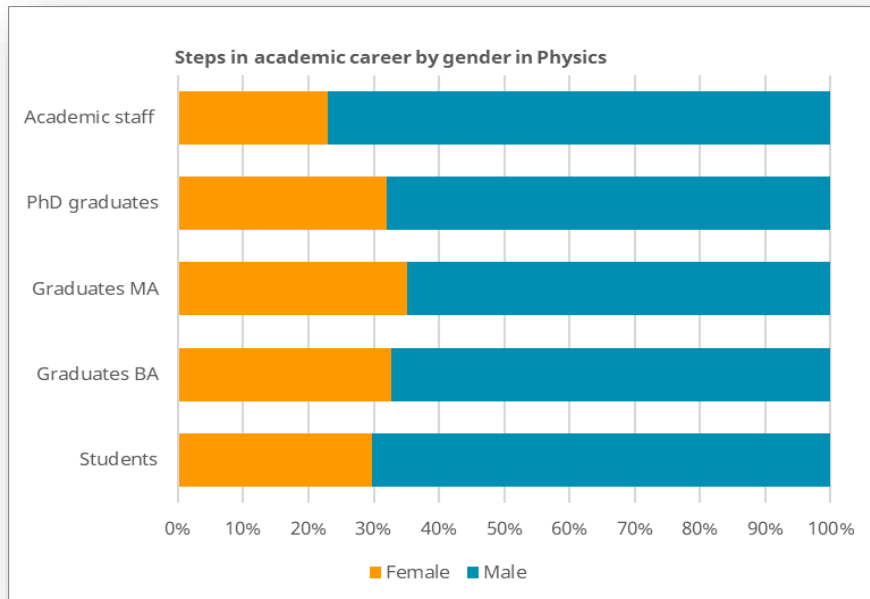
On average at all U-Multirank institutions offering mathematics, the proportion of female students, BA and MA graduates is more or less on par with that of males. Among doctoral students and academic staff, however, the proportion of women is much lower than among students. Less than one third of the academic staff is female.

While the overall gender ratio among mathematics students is quite diverse, there are only nine departments that show a balanced gender ratio for students and academic staff. Only 10 departments have more than 50% female academic staff. According to our criteria (40 – 60% in both categories) only nine departments are marked as gender balanced.



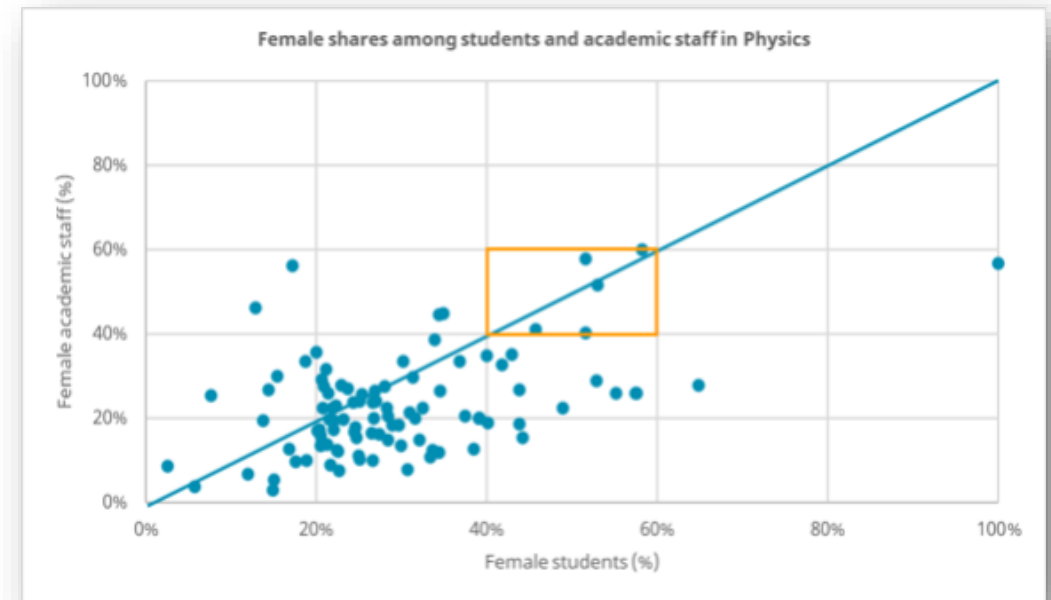
U-Multirank Gender Monitor – Physics

Still a male-dominated world.



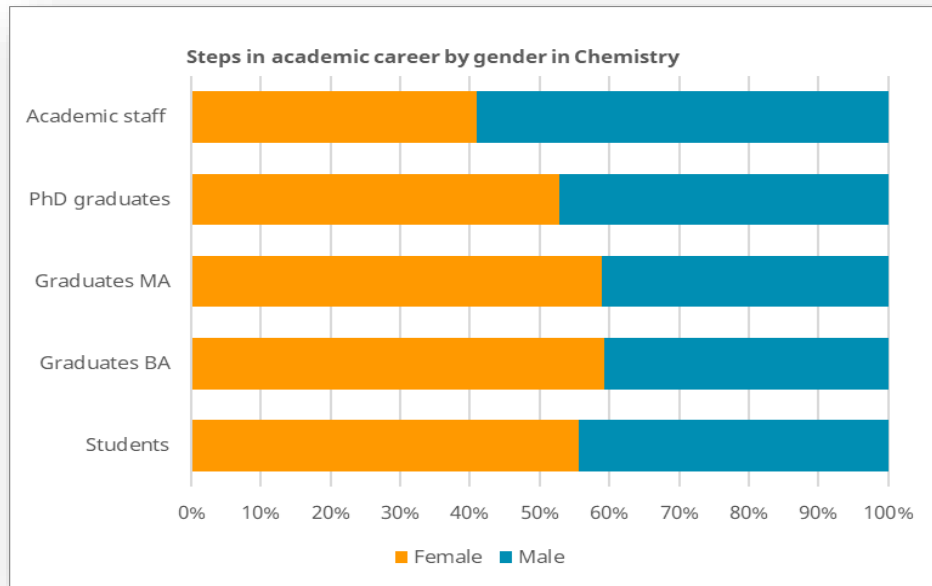
Physics is among the most imbalanced study subjects. While less than 33% of all students are females, their share among academic staff is even lower at less than 25%.

Only five departments are gender balanced in both their shares of students and academic staff. Only at 15 out of 100 departments do women count for more than 40% of all students, while the share of female academic staff at only nine departments is above 40%.



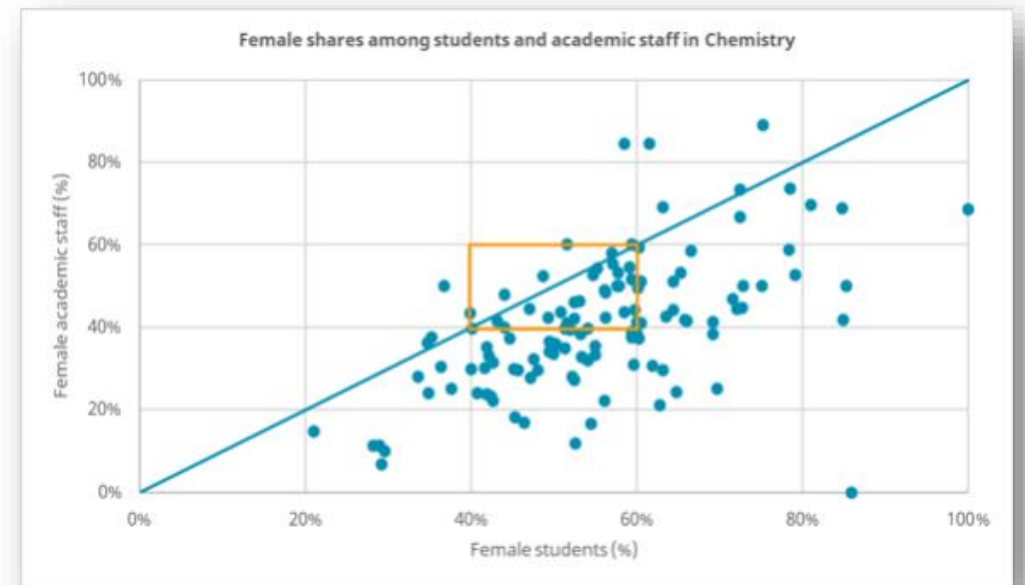
U-Multirank Gender Monitor – Chemistry

Female dominated study programmes, but male dominated academic staff.



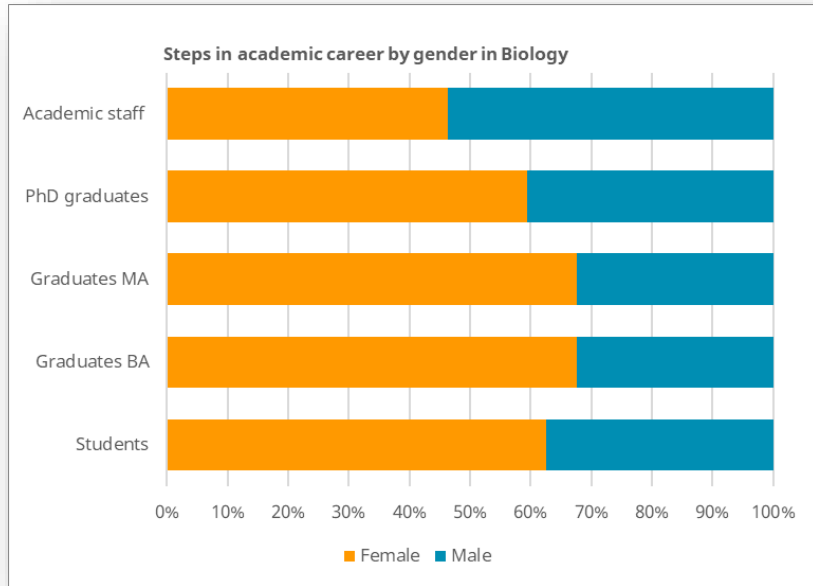
There are many chemistry departments with a balanced gender ratio. However, the figure also points out that at the vast majority of chemistry departments, the share of women among academic staff is much lower than among students. Only at a few departments women are overrepresented among academic staff compared to the student level.

While the majority of BA and MA graduates in chemistry are female, the ratio turns around on the level of academic staff.



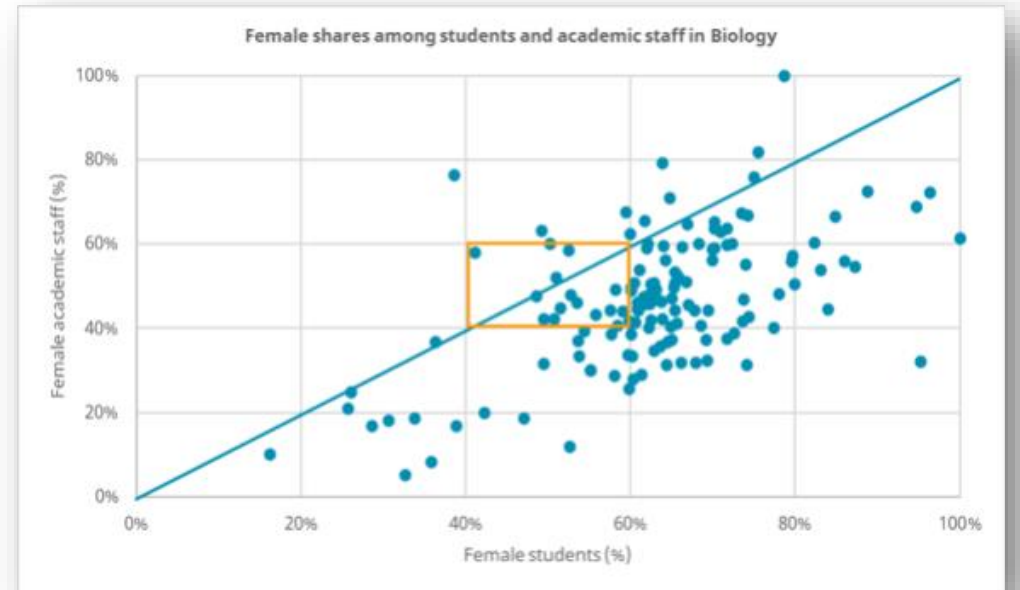
U-Multirank Gender Monitor – Biology

The most female-dominated science subject.



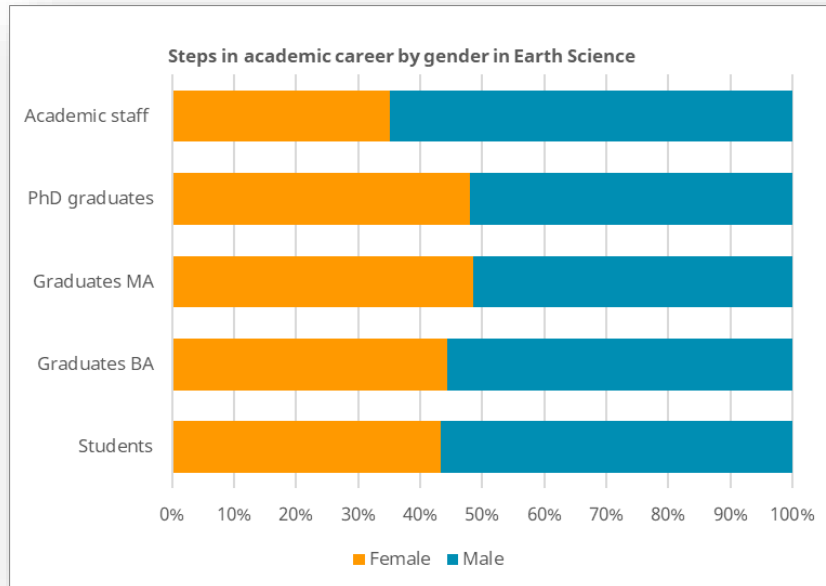
More than 60% of students and BA/MA graduates are female. As noticed in other subjects, the female share decreases for PhD graduates and within academic staff to a low gender-balanced level. Nevertheless, the level of female academic staff is close to 50%, and the highest among all science subjects.

The analysis by departments shows that there are only a few departments dominated by males. In most departments the share of women among students is higher than 60%. In total, 16 departments can be characterized as gender balanced, having between 40 and 60% of both male/female students and staff.



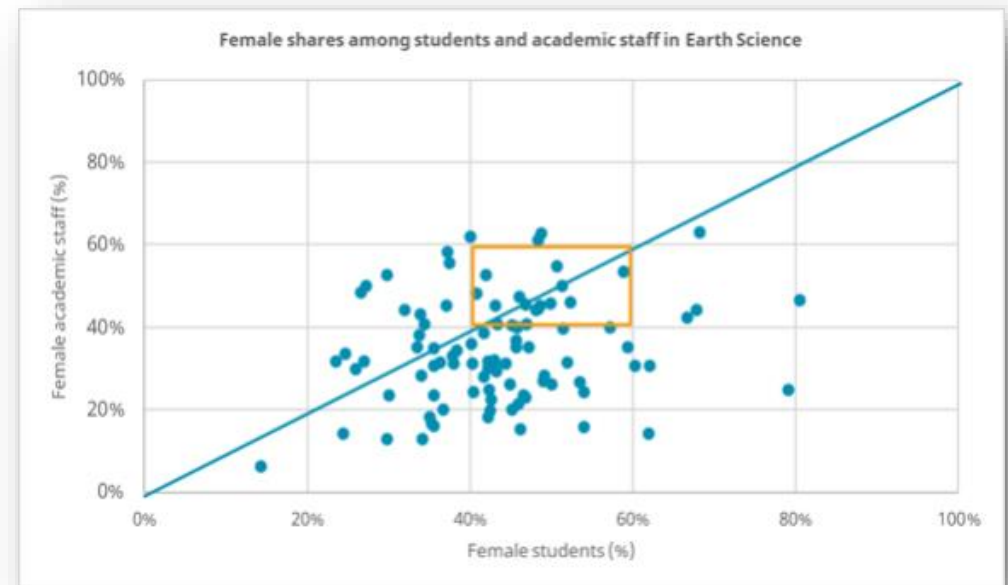
U-Multirank Gender Monitor – Earth sciences

Slightly male-dominated at all levels.



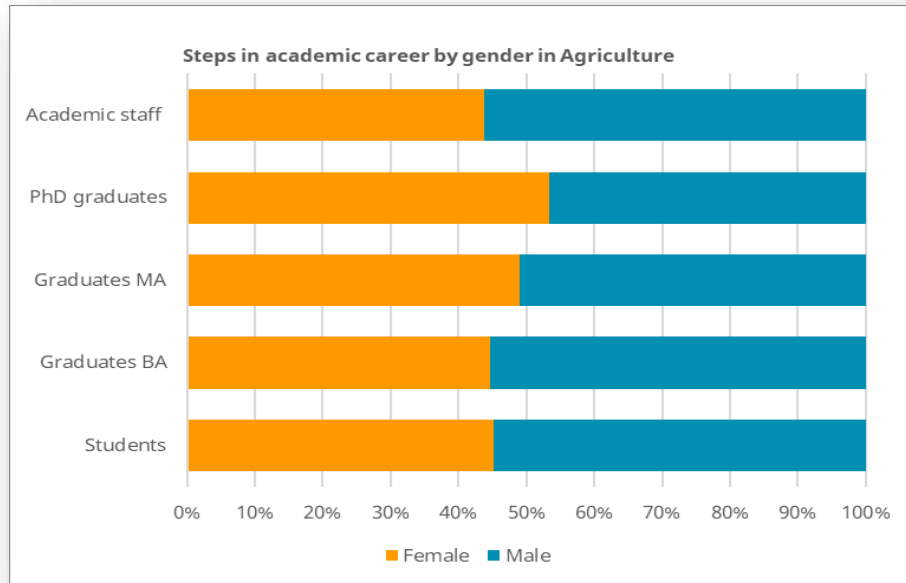
Besides academic staff, the share of women at all stages of academia comes close to 50%. At the level of academic staff, the female share drops to 35%.

When comparing departments, the range of the gender ratio is much higher 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.



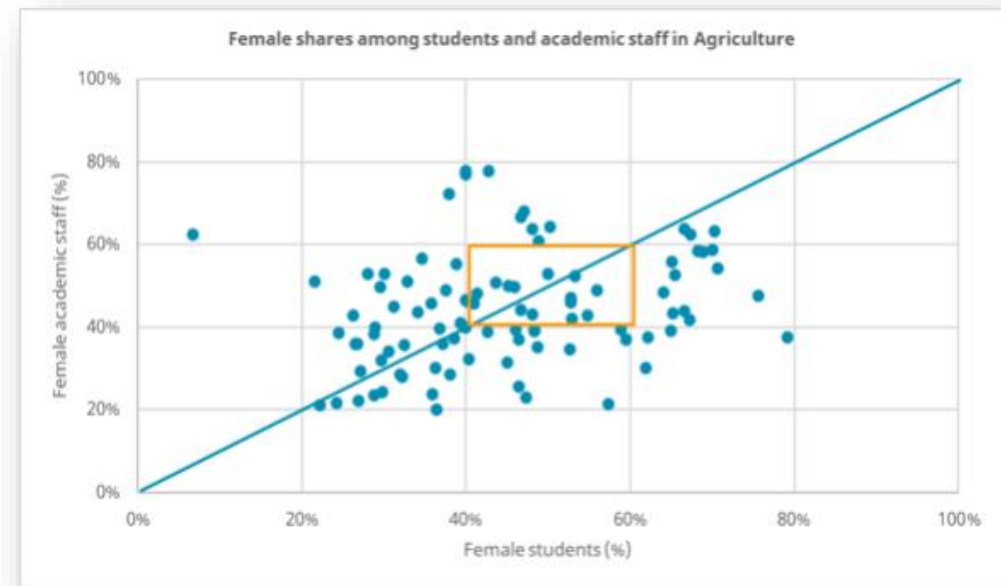
U-Multirank Gender Monitor – Agriculture

In higher education agriculture is slightly male dominated.



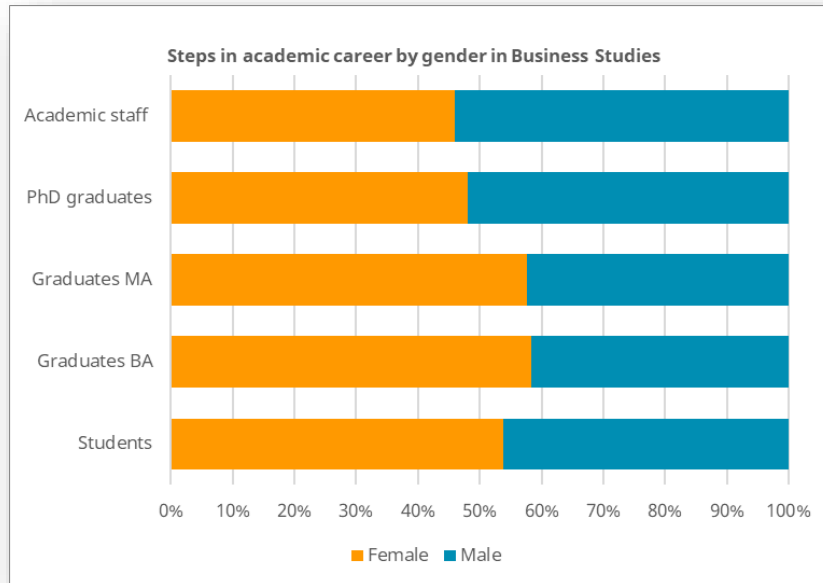
In agriculture, gender ratio is rather even at all stages of the higher education career. The share of females is between 42% and 48% at almost all stages; only among PhD graduates is it slightly higher than 50%.

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.



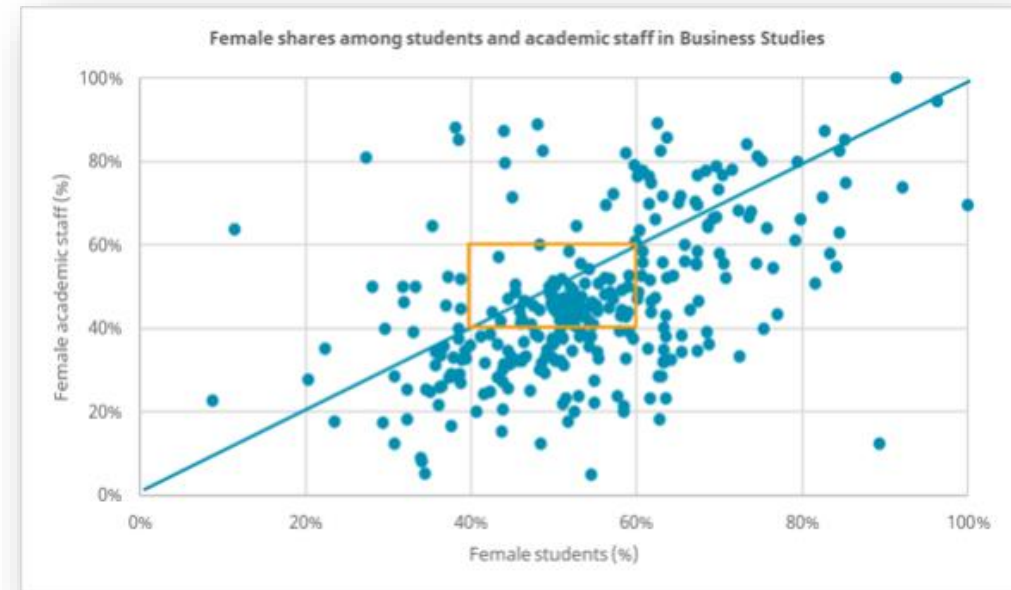
U-Multirank Gender Monitor – Business studies

The most diverse and balanced subject.



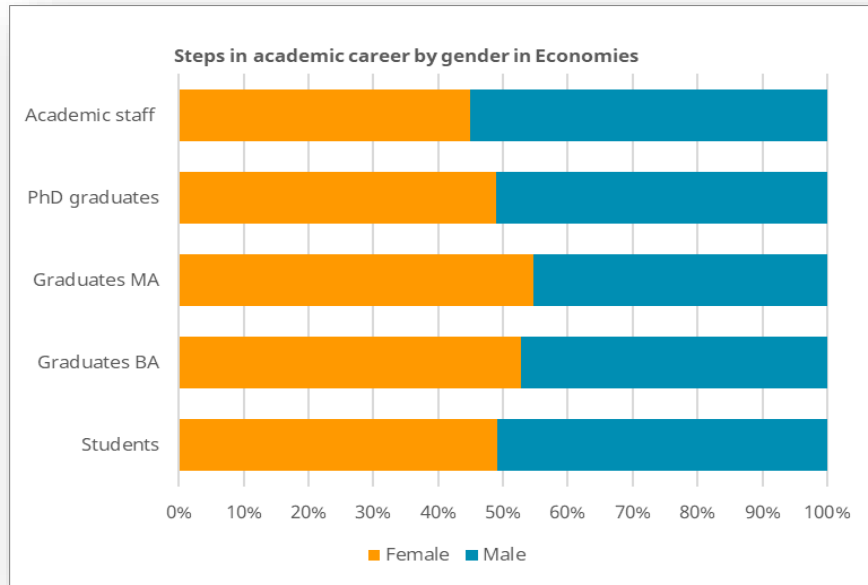
At all levels of higher education, business studies is characterised by a relatively balanced share of males and females. However, as noticed in other subjects, there is a women's gap from the PhD level onwards.

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.



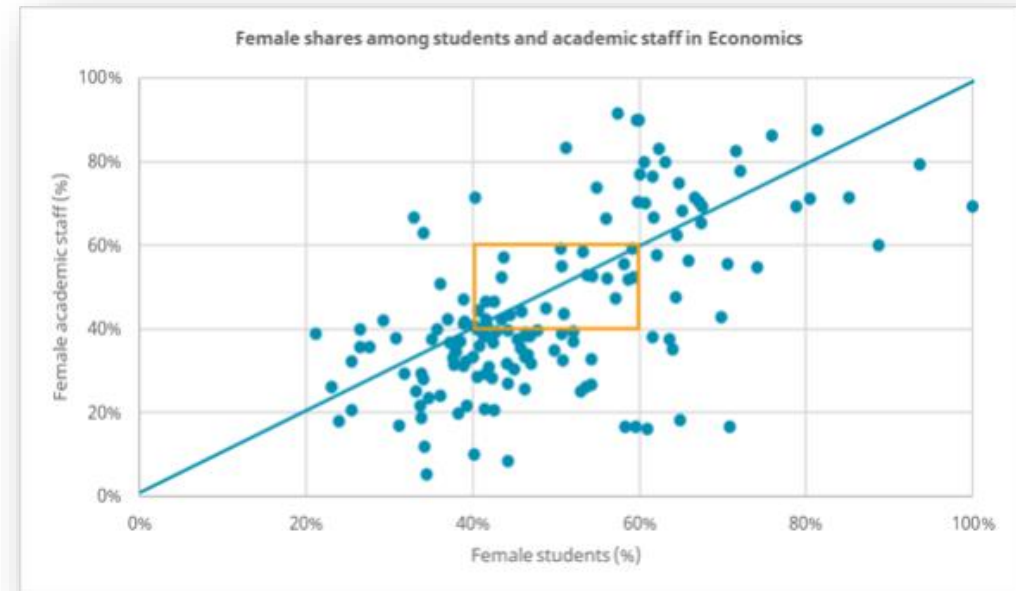
U-Multirank Gender Monitor – Economics

Among the subjects with the best gender balance.



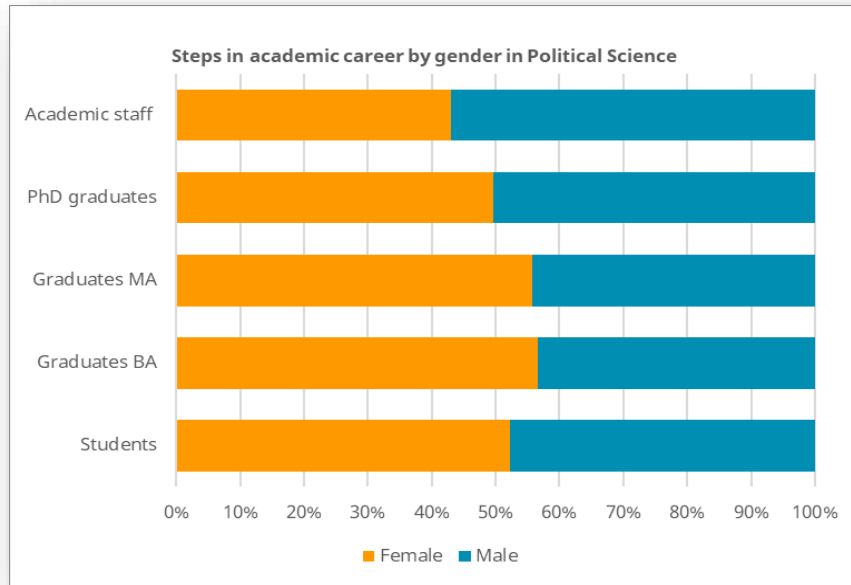
Economics is a gender balanced subject at all steps of the academic career ladder. The female shares are around 50% across the board.

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.



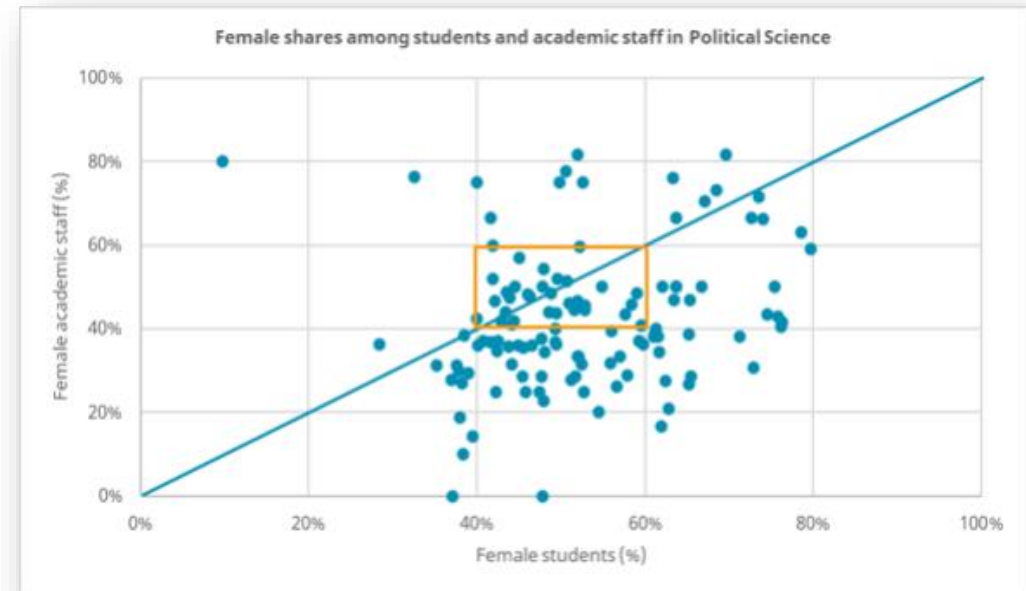
U-Multirank Gender Monitor – Political science

A moderately gender-balanced subject.



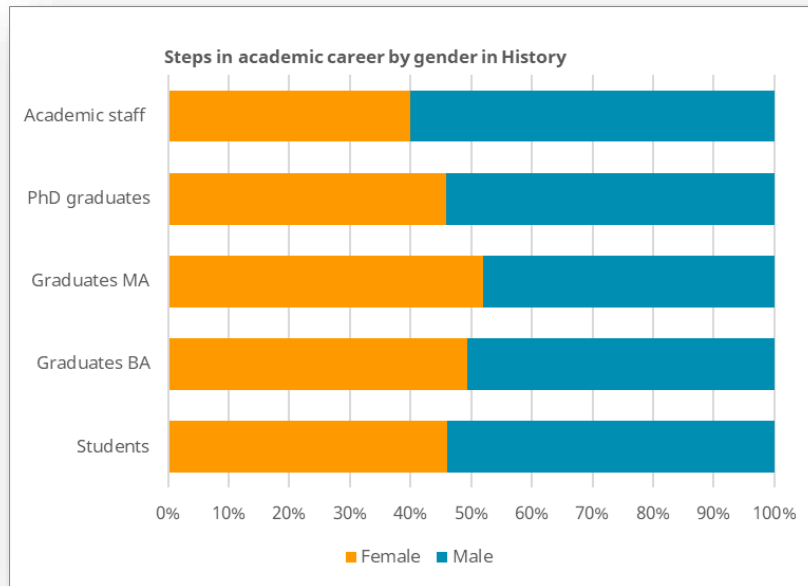
While more than 50% of students and BA/MA graduates are female, only 42% of academic staff are women.

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.



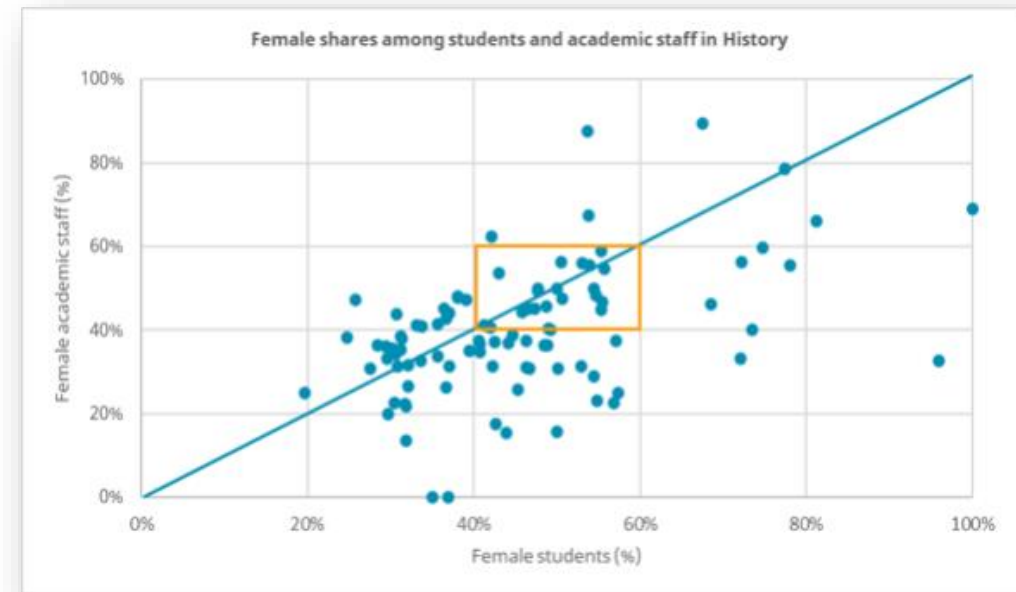
U-Multirank Gender Monitor – History

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



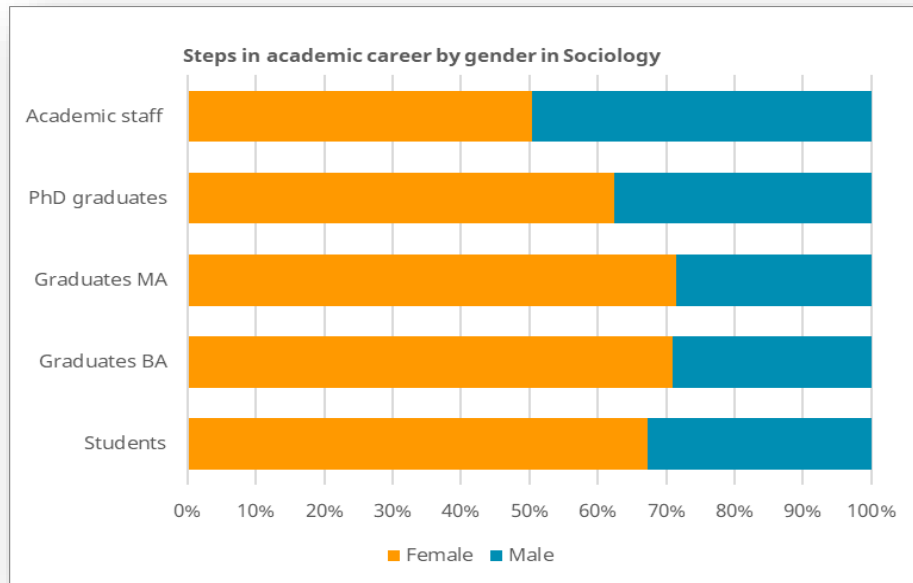
History is a rather gender balanced subject at all stages of the higher education career, until at the PhD level. While the proportion of women increases slightly from the first level of students to the MA graduates, it decreases from PhD level to academic staff.

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.



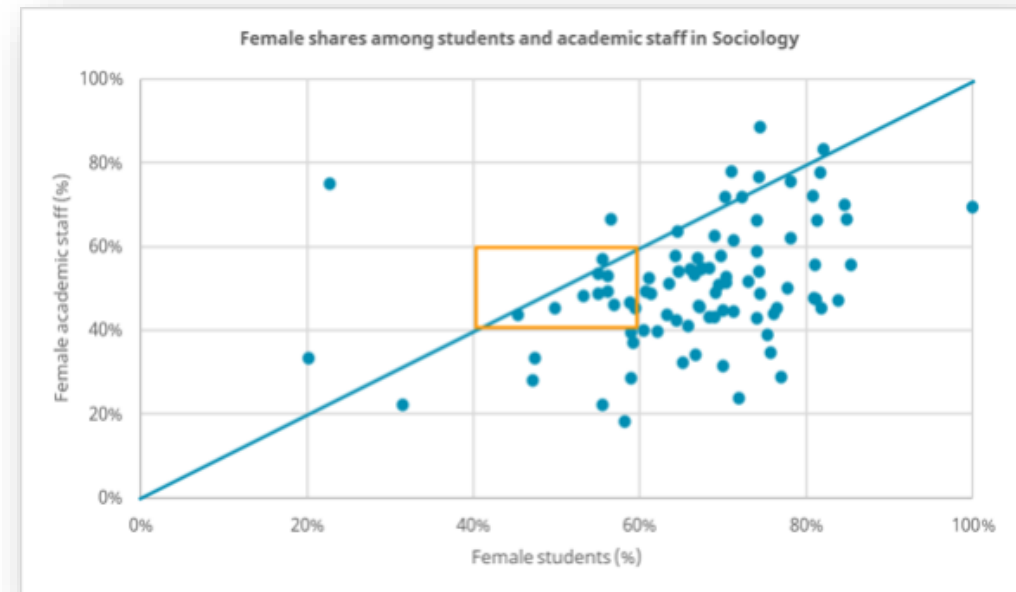
U-Multirank Gender Monitor – Sociology

A subject dominated by women.



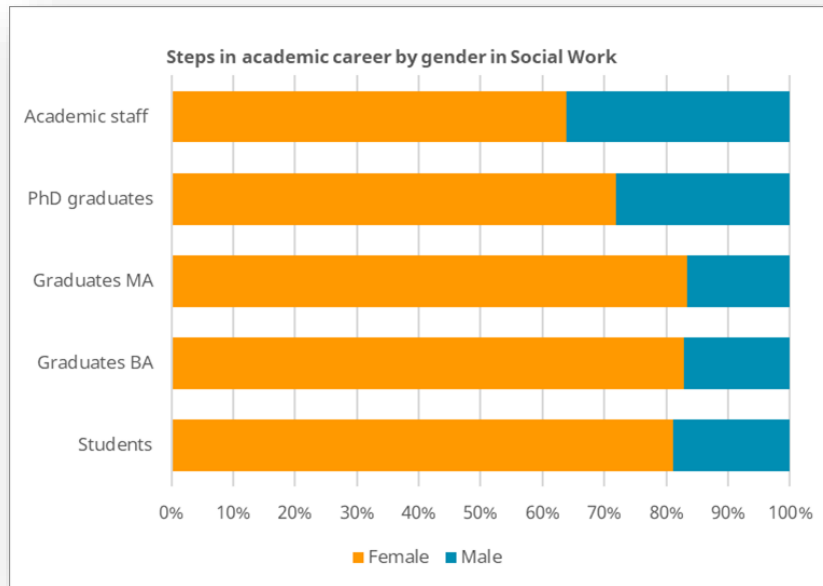
The student body and BA/MA graduates show a female share between 60% and 70%. While the female percentages of PhD graduates and academic staff are lower, they are still higher than 50% at both the levels of PhD and academic staff.

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'.



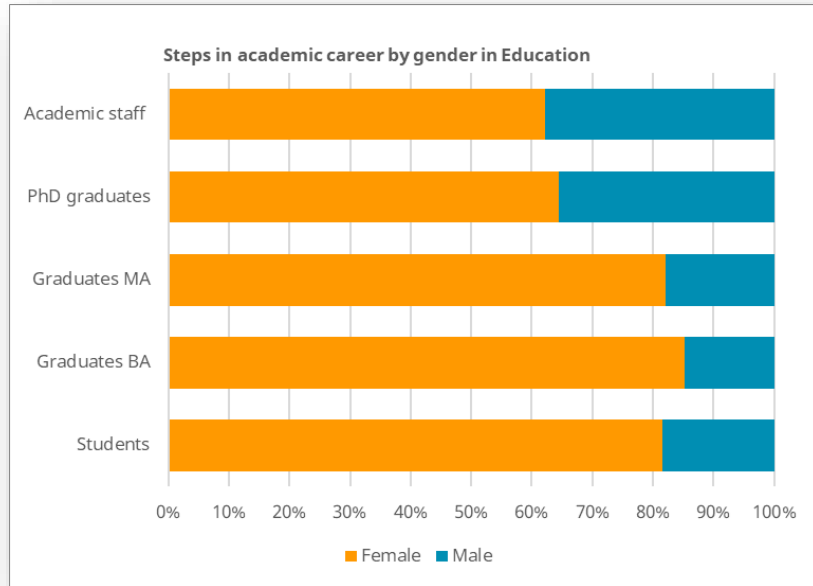
More than eight out of ten students, as well as BA and MA graduates are female. Compared to this, women are underrepresented among academic staff and PhD students although they represent more than 60% of the two categories.

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.



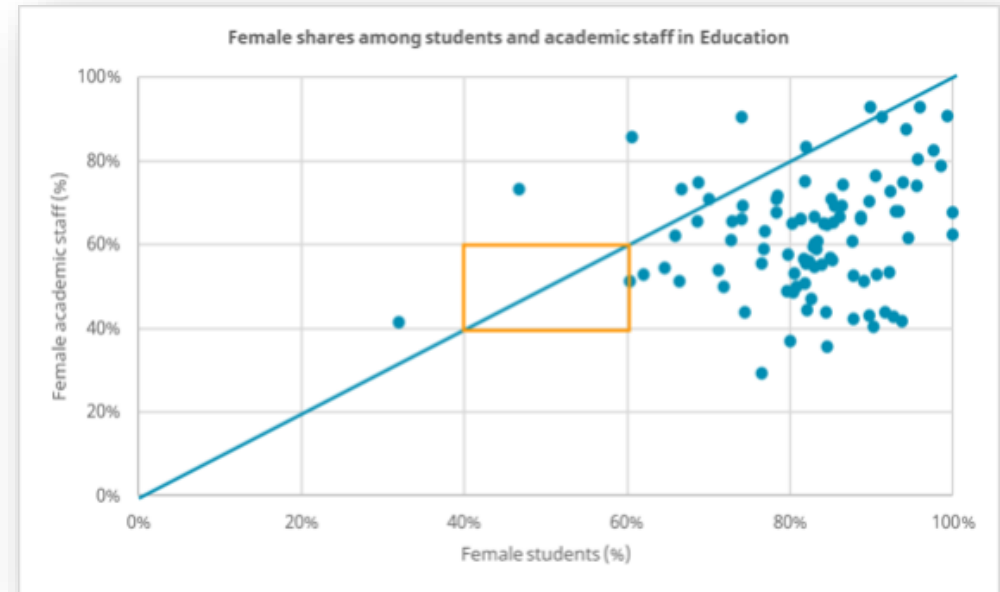
U-Multirank Gender Monitor – Education

A subject strongly dominated by women.



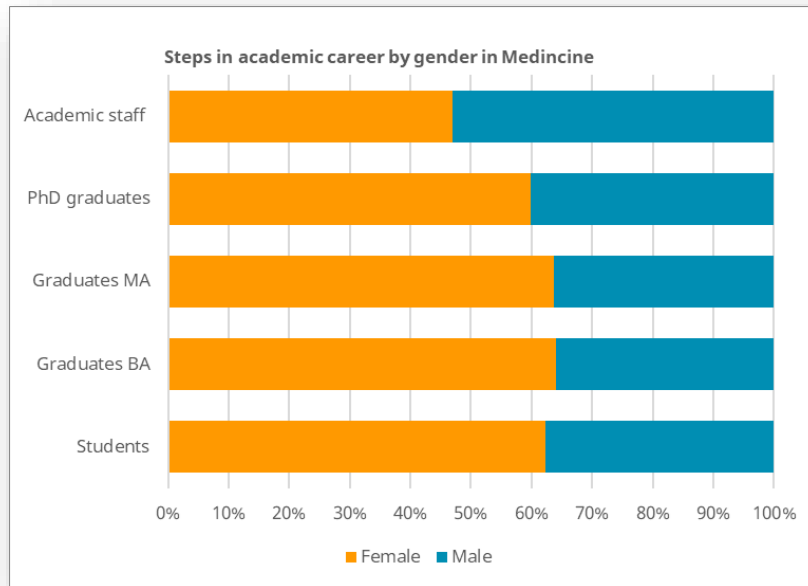
Education is among the four fields that is dominated strongest by women. Among students, as well as BA and MA graduates, more than 80% are female. Though this share decreases for PhD graduates and academic staff, the percentages are among the highest of all fields.

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.



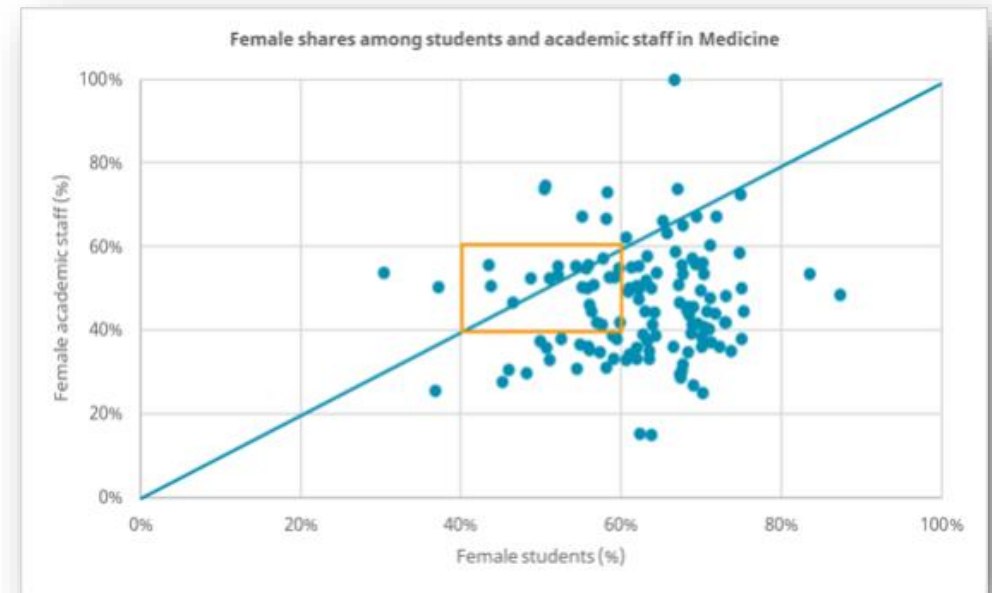
U-Multirank Gender Monitor – Medicine

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



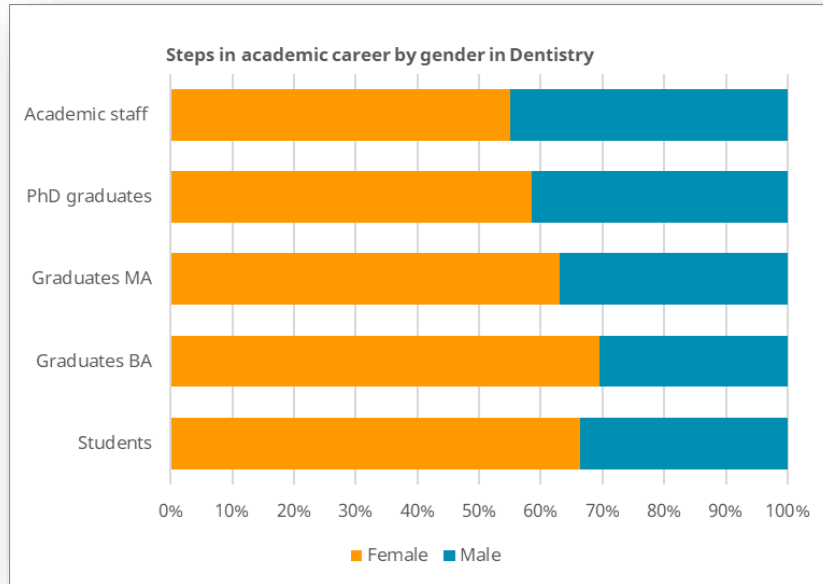
Medicine is a subject with high female shares at the student, BA/MA and PhD graduate stages. Only among academic staff is the proportion of women less than 50%.

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/schools are characterised by a good gender balance.



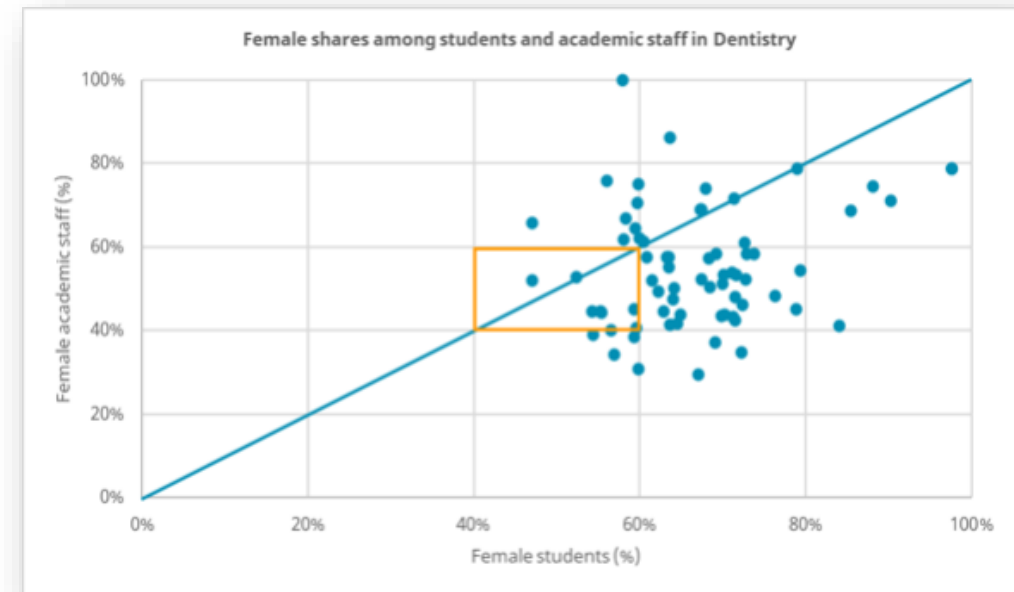
U-Multirank Gender Monitor – Dentistry

A subject with a female majority across all levels.



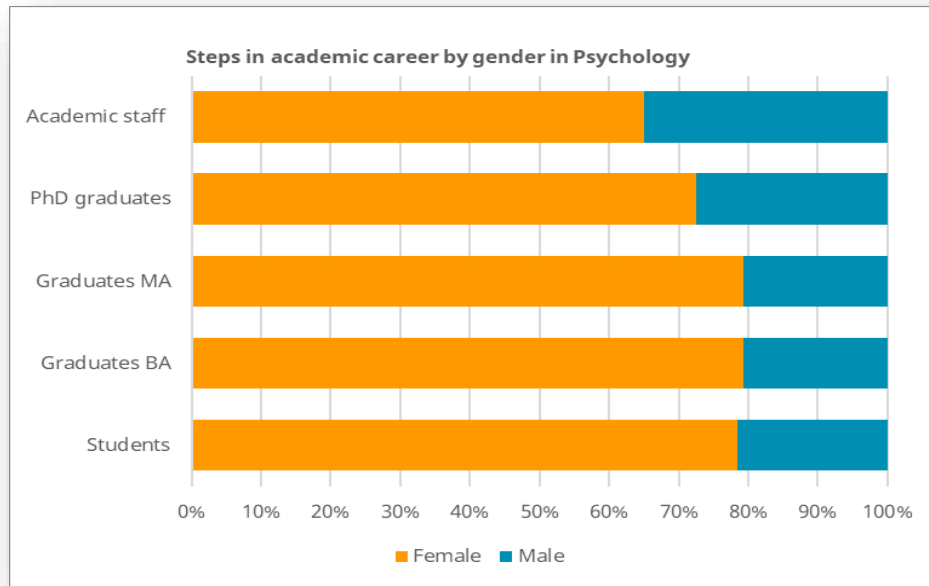
Women count for more than 60% of students and BA/MA graduates and almost 60% of PhD graduates. Unlike in medicine, women dominate in the academic staff of dentistry.

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.



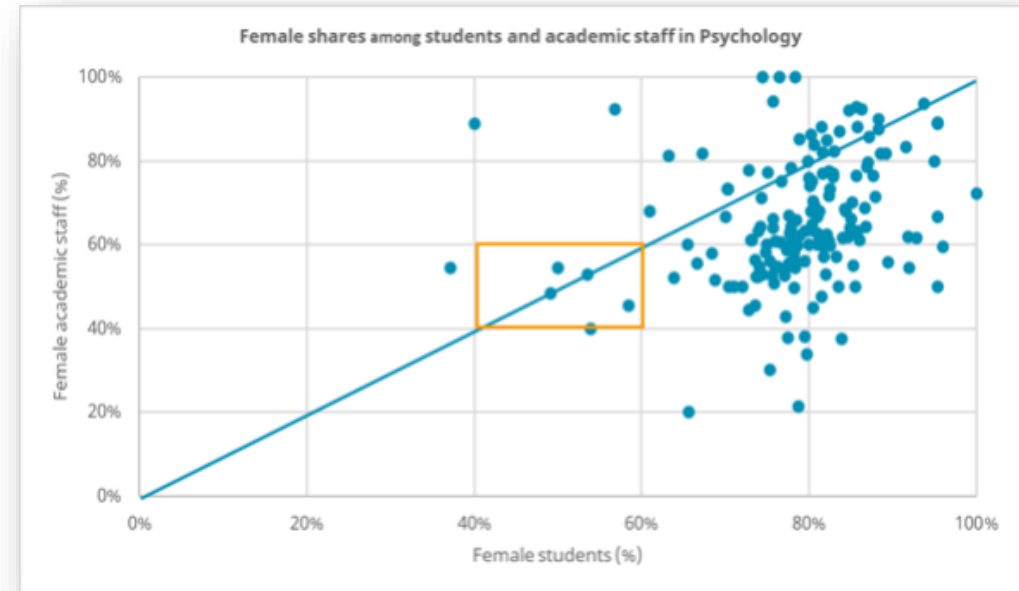
U-Multirank Gender Monitor – Psychology

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



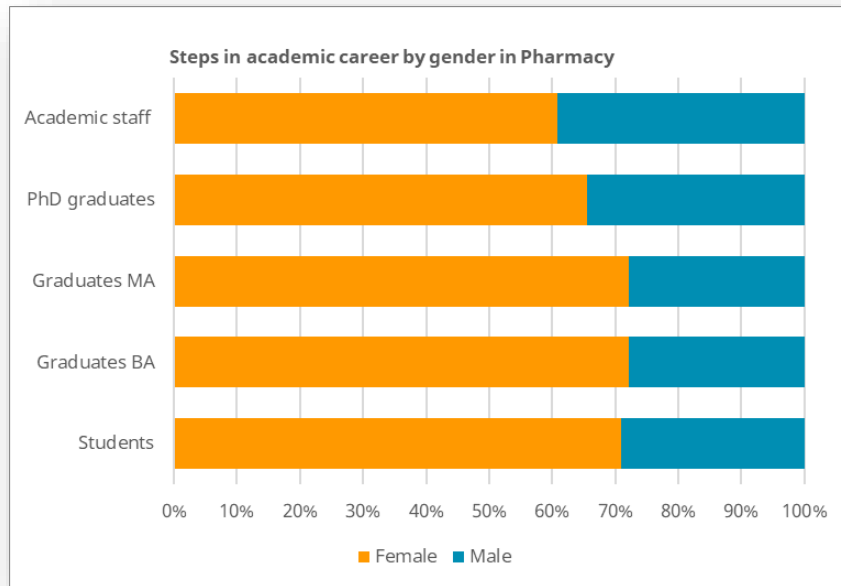
Almost 80% of the psychology students and BA/MA graduates are women, however the percentage among PhD graduates is slightly lower. Compared to the student level, women are still underrepresented in academic staff, but the percentage is the highest of all subjects aside from nursing.

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.



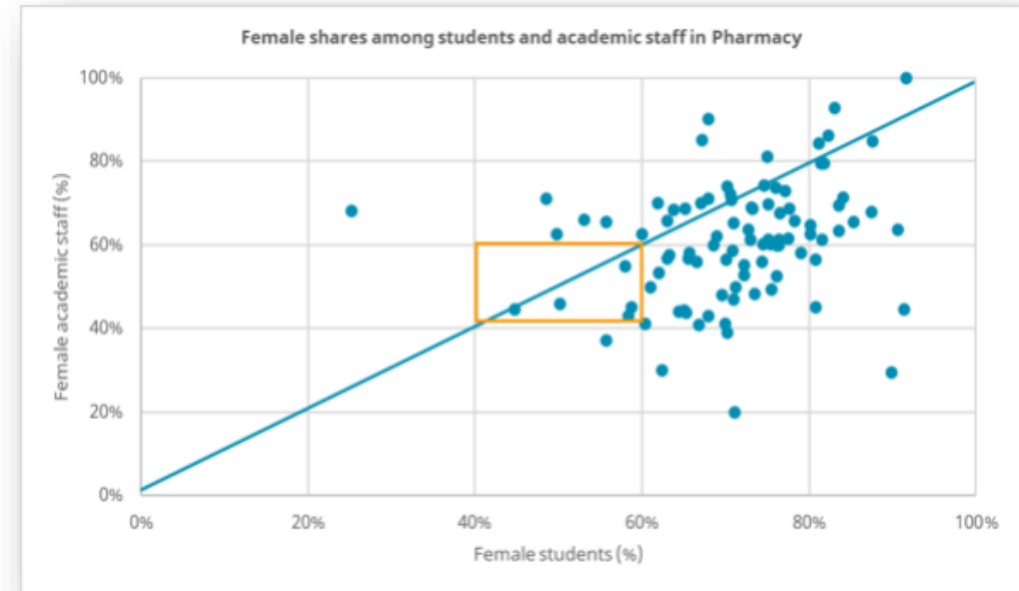
U-Multirank Gender Monitor – Pharmacy

A strong role of women shown.



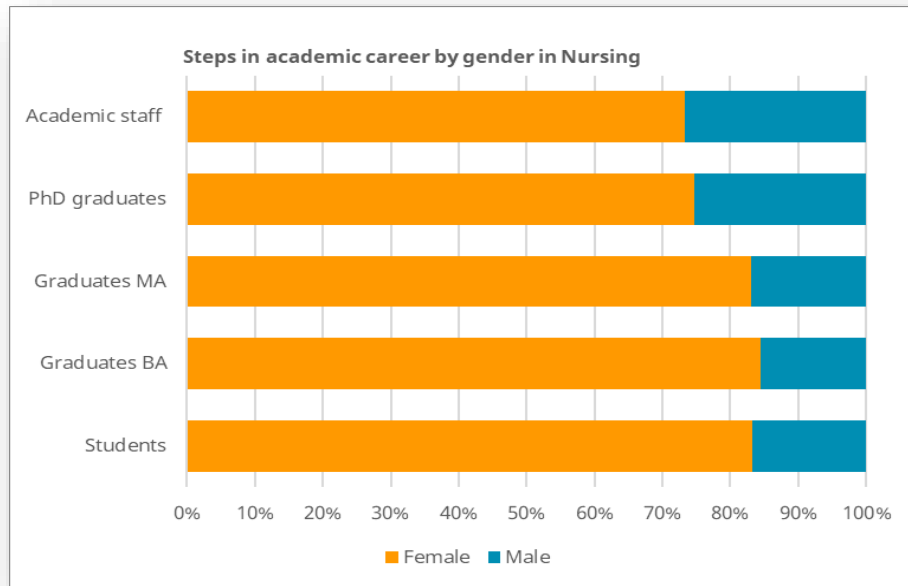
At all levels, females make up more than 60% of the majority in pharmacy, including among academic staff. While their share among academic staff is lower than among students, the funnel effect is less noticeable than in medicine and most science subjects.

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 particularly high, i.e., the female share among academic staff is more than 30 percentage points lower than among students.



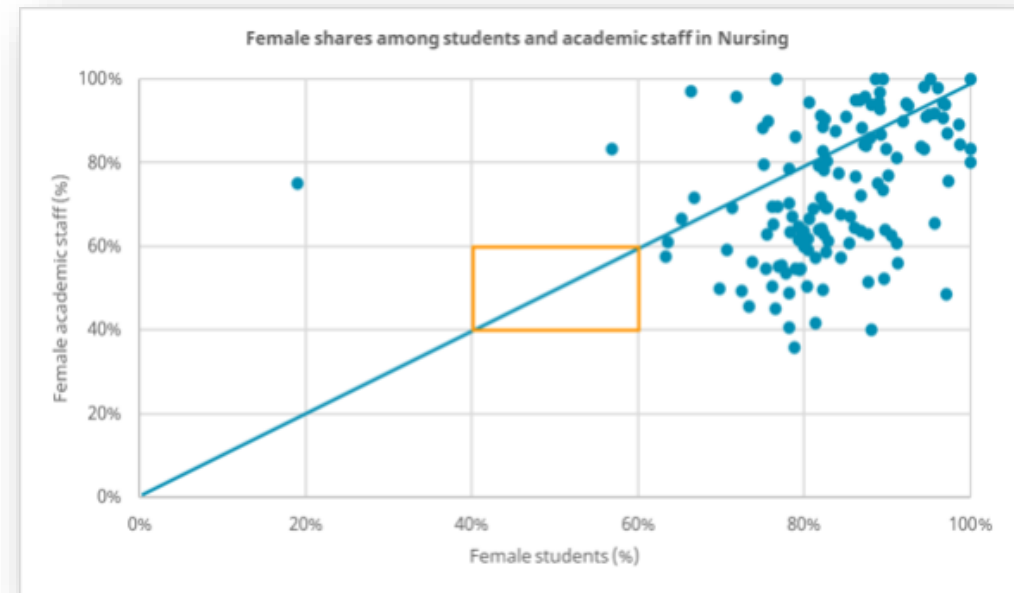
U-Multirank Gender Monitor – Nursing

A world (almost) without men.



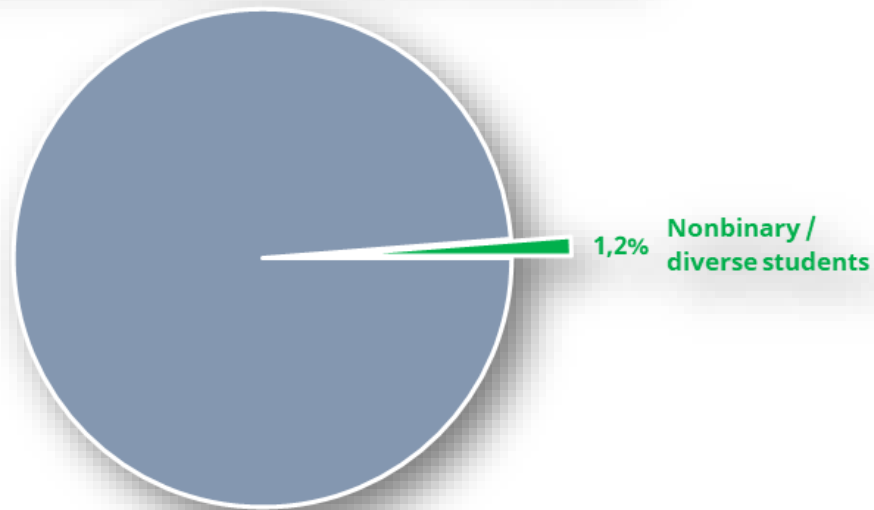
For students as well as for BA and MA graduates, the female quota is over 80%. From the PhD stage onwards, the proportion of women is lower, but far beyond 50% and at the highest level of all subjects.

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 female students. On the other hand, we found 51 out of 130 departments at which women count for more than 80% of academic staff.



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

Share of nonbinary / diverse students in the studentery



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

About 1,2% 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 Methodology

U-Multirank is a non-commercial, multi-dimensional international transparency [web tool](#) on performance of higher education institutions. Its 2021 release covers 1,948 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, data 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](#).

U-Multirank Project

Since its first publication in 2014, U-Multirank has more than doubled the number of universities (higher education institutions) from 850 to 1,945 and increased the coverage of countries from 74 to 96, including more than 5,000 faculties and more than 12,000 study programmes across 30 subject areas.

U-Multirank is an alternative approach to comparing universities and offers a solution to the flaws of 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.

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 xx 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.



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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