Statistics of higher education institutions

2018 edition

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Home Affairs FDHA
Federal Statistical Office FSO

Published by:	Federal Statistical Office (FSO)
Information:	Juan Segura (for students and exams), tel. +41 58 463 69 19, sius@bfs.admin.ch Mehmet Aksözen (for staff and finance), tel. +41 58 467 16 50, persfinhs@bfs.admin.ch
Editor:	Vera Herrmann, FSO
Contents:	Mehmet Aksözen, FSO; Juan Segura, FSO; Elena Zafarana, FSO
Series:	Swiss Statistics
Topic:	15 Education and science
Original text:	German, French
Translation:	FSO language services
Layout:	DIAM Section, Prepress/Print
Graphics:	DIAM Section, Prepress/Print
Front page:	DIAM Section, Prepress/Print
Maps:	DIAM Section, ThemaKart
Printed:	In Switzerland
Copyright:	FSO, Neuchâtel 2018 Reproduction with mention of source authorised (except for commercial purposes).
Print format orders:	Federal Statistical Office, CH-2010 Neuchâtel, tel. +41 58 463 60 60, fax +41 58 463 60 61, order@bfs.admin.ch
Price:	free of charge
Downloads:	www.statistics.admin.ch (free of charge)
FSO number:	1802-1800

Table of contents

1 Introduction

This brochure provides a statistical overview of Switzerland's higher education landscape.

The institutions of higher education are: the ten cantonal universities and the two federal institutes of technology (ETH/EPF) which together constitute the universities (UNI), the seven universities of applied sciences (UAS) and the 16 universities of teacher education (UTE) and several other special teacher training institutions. The UTE are responsible for the education and continuous training of teachers. The UAS provide basic professional skills at tertiary level with a practice-based focus, whereas the UNI are committed to a combination of teaching and (foundational) research. All institutions of higher education provide consultancy and other services to third parties.

This brochure presents statistics on students, diplomas, the higher education institutions staff and the funding of higher education institutions, in each case with current data from the academic year 2016/17 or from the calendar and financial year 2016. To show changes in higher education institutions over a ten year period, data from 2007/2008 or 2007 is included for comparison. In addition to the total number of students, the number of new enrolments is also listed. For the UAS and the UTE, Bachelor's and Master's degrees are mentioned separately and at the UNI, a distinction is made between basic tertiary education and more advanced education (usually a doctorate). All figures on higher education staff and financial resources have been rounded.[1]

Further information on higher education statistics can be found on the FSO website at www.education-stat.admin.ch

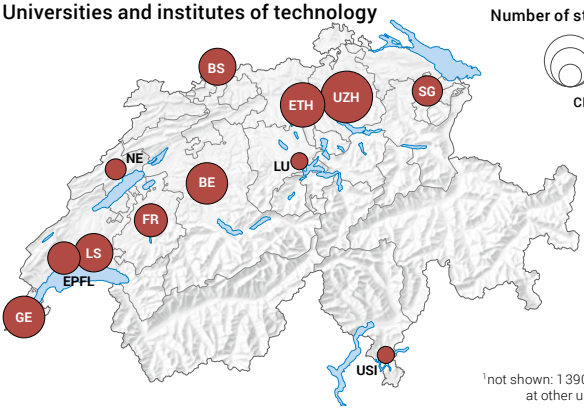
The sites of higher education institutions

The following graphs show the sites of higher education institutions. Please note that universities of applied sciences in particular are made up of several specialist schools, which may be located at different sites. The main site of each institution is given in brackets.

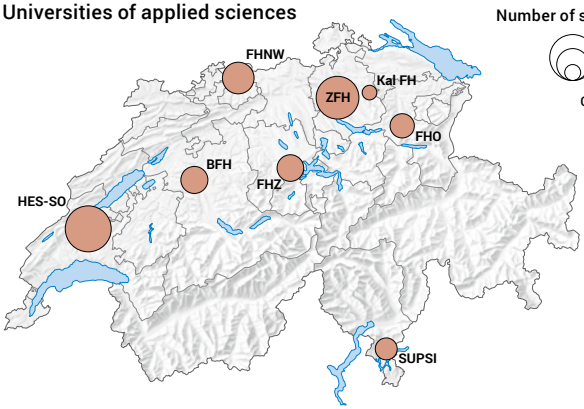
[1] The higher education staff statistics are based on administrative (personnel) data, sent to the FSO by each higher education institution and the higher education costs statistics are based on data from cost accounting. As a result, information about the costs and activities, due to general difficulties in isolating costs, are approximate values.

Students at universities, 2016/17 G1

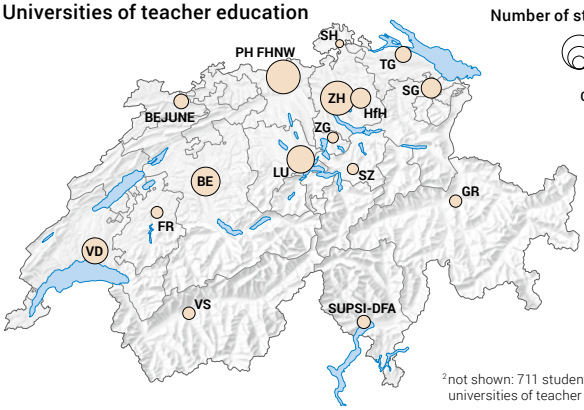
Universities and institutes of technology



Universities of applied sciences



Universities of teacher education



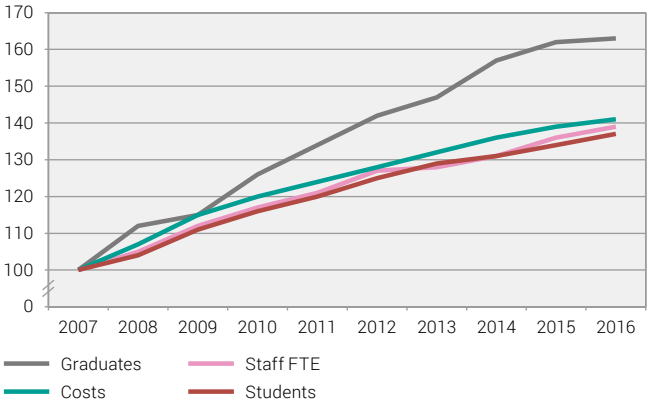
Source: FSO – SHIS-studex

2 Overview

The number of students at the UNI, UAS and UTE has risen constantly over the past 10 years to more than 240 000. The number of diplomas has consequently risen too. Staffing and financial resources also increased continuously from 2007 to 2016. Graph G2 shows the growth rate compared with the base year 2007 (= 100).

The number of diplomas (UTE diploma, Bachelor's, Master's, doctorate) has grown disproportionately to over 53 000 in this period. The growth in costs has been only slightly higher than the growth in student numbers and the number of teaching staff. In 2016, more than 89 000 personnel were employed or 59 000 full-time equivalents[2]. Higher education costs totalled CHF 11 billion.

Development of higher education institution students, graduates, staff and costs **G2**



Source: FSO – SHIS

[2] A full-time equivalent is equal to a work-time percentage of 100% during 12 months. A part-time job of 50% during 6 months is equal to 0.25 of a FTE.

3 Students, entrants and final exams

During the 2016/17 academic year, more than 244 000 people were in education at a Swiss higher education institution. 61% of students were enrolled at a university or institute of technology (UNI), 31% at a university of applied sciences (UAS) and 8% at a university of teacher education (UTE). Numbers have regularly increased over the years. In the course of a decade (2007 – 2016), an increase has been seen of 27% at the UNI, 54% at the UAS and 71% at the UTE.

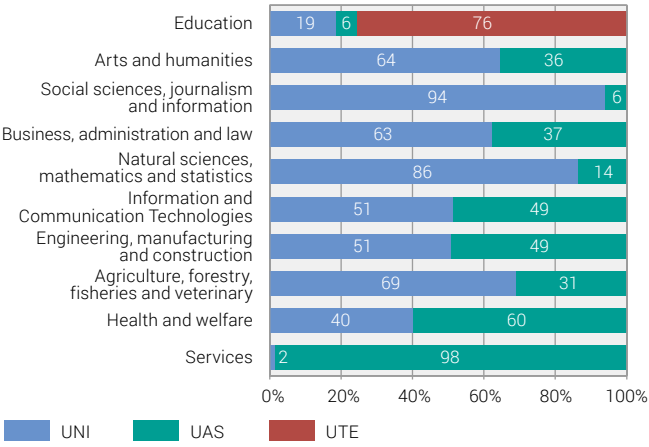
3.1 Students at higher education institutions

The distribution of students in basic tertiary education and training (licence/diploma/bachelor/master) in the different types of higher education institution varies considerably by field of studies. For comparisons, graph G3 shows this distribution by the ISCED fields[3]. Logically, we have also seen a predominance by UTE students in *education* (76%). Fields such as *social sciences, journalism and information* (94%), *natural sciences, mathematics and statistics* (86%) are essentially taught at universities while courses in *health and social security* (60%) and *services* (98%) in particular are mainly taught at the UAS. There is a more equal balance in the distribution of students between the UNI and UAS in the fields of *information technology* and *engineering*.

Overall, there has been parity in numbers of male and female students since around the last decade. In 2016/17, women accounted for 51% of students. However, numbers do vary considerably according to the type of higher education institution and in particular according to the field of study.

[3] The International Standard Classification of Education (ISCED) of the UNESCO provides a comprehensive framework for organising education programmes and qualification by applying uniform and internationally agreed definitions to facilitate comparisons of education systems across countries.

Distribution of students in basic training curriculum by ISCED fields[1] and type of institutions, 2016/17 G3



[1] The "field unknown" area, 1 620 students only at the universities and institutes of technology, is not contained in this graph.

Source: FSO – SHIS-studex

The international character of higher education

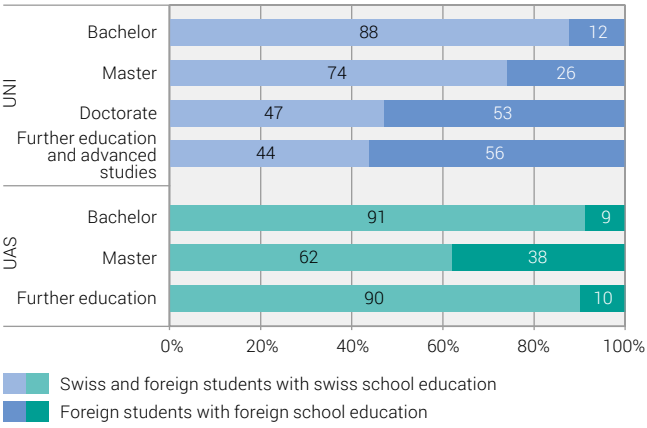
In 2007/08, the share of foreign students educated abroad before starting their studies was 16% in all higher education institutions. In 2016/17, it was nearly 20%. In terms of growth, this represents an increase of 73% in ten years.

The share of foreign students educated abroad has increased every year in the three types of higher education institutions.

There were more foreign students educated abroad at the UNI (25% in 2016/17) than at the UAS (12%) and at the UTE (5%). At the UNI, this population is mainly found at doctorate level (53% of all doctoral students in 2016/17) and in other university postgraduate courses (56%; see graph G 4). At doctorate level, foreign students educated abroad are specifically under-represented in *engineering sciences* (75%), *exact and natural sciences* (69%) and *economics* (63%).

If generally the share of foreign students educated abroad varies considerably by level of study, this is particularly the case at the UAS. While foreign students educated abroad account for 10% of students at bachelor level, they make up 38% of students at master level. In actual fact, master courses in artistic fields particularly appeal to foreign students educated abroad. For example, they account for the majority of students in *music, theatre and other arts* (59%) and make up 48% of design students.

Students at UNI and UAS by level and place of education, 2016/17 G 4



The share of foreign-educted foreign nationals at the UTE is 4% to 8% depending on the level.

Source: FSO – SHIS-studex

3.2 Higher education entrants

An entrant is a person starting a bachelor course for the first time (or licentiate/diploma for older UNI or UAS student cohorts) at a Swiss higher education institution.

In 2016/17, there were more than 20 000 UNI entrants, 30% of whom studied humanities and social sciences. Meanwhile, there were more than 17 000 UAS entrants, 35% of whom studied economics and services. At the UTE, just under 4000 students started a bachelor, with most doing so in order to have the right to teach at pre-school and primary levels. Nonetheless, this number excludes future teachers for the lower and upper secondary levels starting a UTE course after having obtained a bachelor or master degree.

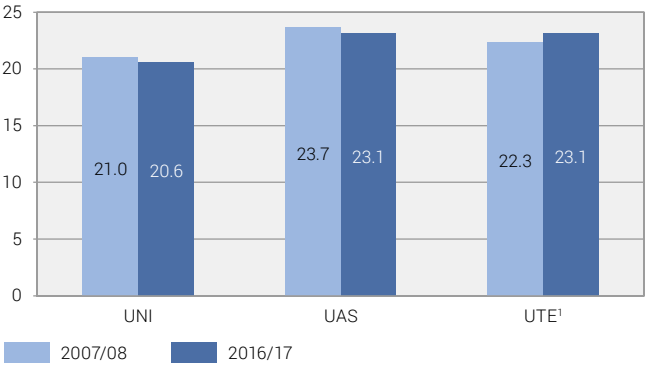
Average age on entry

The age on entry to higher education is almost identical for men and women. By contrast, age does however vary considerably depending on the type of higher education institution (see graph G 5).

With an average age of 20.6 years, the UNI had the youngest entrants in 2016/2017. Compared with their UNI counterparts, UAS entrants were 2.5 years older when starting their bachelor courses. This gap exists firstly because the vocational Matura, the main certificate granting access to the UAS, tends to be obtained later than the academic Matura and secondly the transition from the vocational Matura to the UAS is slower than the transition from the academic Matura to the UNI. The average age of UTE entrants at bachelor level (23.1 years) is identical to that of UAS entrants and is therefore higher than that of UNI entrants. One of the factors that explains this age difference compared with UNI bachelor-level entrants is the possibility of retraining that is open to persons already working.

At the UNI and UAS, the average age of entrants was lower in 2016/17 than it was ten years previously. This decrease can be seen in most fields of study at the UNI whereas at the UAS it can be seen in particular in *applied psychology* (– 4 years) and *social work* (– 2 years). At the UTE, a reverse trend was observed: the age on entry increased from 22.3 years in 2007/08 to 23.1 years in 2016/17, a rise that is partly due to an increase in entrants changing careers.

Average entrance age at bachelor and diploma levels by type of institutions G5



[1] only bachelor's entrances

Source: FSO – SHIS-studex

Certificates before the start of studies granting access to higher education

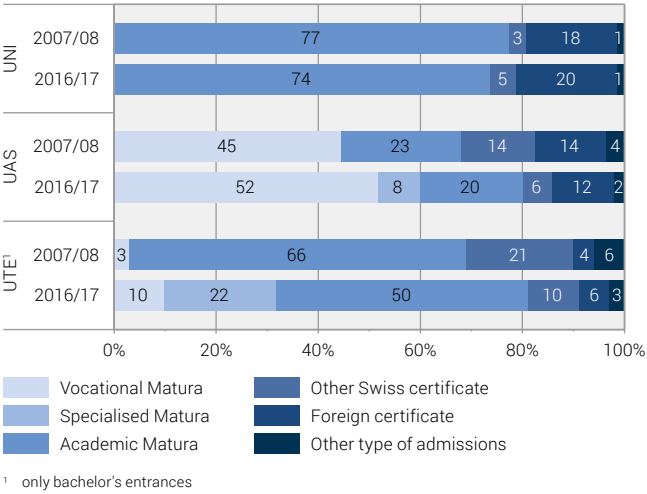
The transition from upper secondary level to education at a Swiss higher education institution essentially takes place following completion of a Matura.

As shown by graph G6, the Swiss academic Matura was the main route to the UNI (74% of all entrants in 2016/17 and 94% of entrants with a Swiss certificate granting access to higher education). The 6% of UNI entrants holding another Swiss certificate granting access to higher education were mainly those who had passed the UNI-vocational Matura transition examination. Persons who access a UNI with a foreign certificate account for a major part of UNI entrants (20%).

The UAS mainly open their doors to holders of a vocational Matura (52% of entrants in 2016/17) but also to those who have obtained an academic Matura (20%). For around eight years, it has also been possible to access certain UAS courses with a specialised Matura (8%). The other types of Swiss access certificates that enable UAS entrants to start their course are mainly professional college degrees, followed or not followed by a university entrance test. There were nonetheless fewer UAS entrants holding Swiss certificates other than the Matura in 2016/17 (8%) than ten years previously (18%).

The UTE welcome in particular holders of the academic Matura (50% of entrants in 2016/17), followed by those with a vocational Matura (10%) or more recently, the specialised Matura (22%). In observing the change in the shares of UTE entrants by certificate granting access to higher education over the past ten years, we see that it is increasingly less common to access a UTE without holding a Matura (27% of entrants in 2007/08 compared with 13% in 2016/17).

New students at bachelor and diploma levels by type of institutions and by type of university entrance qualification G6



[1] only bachelor's entrances

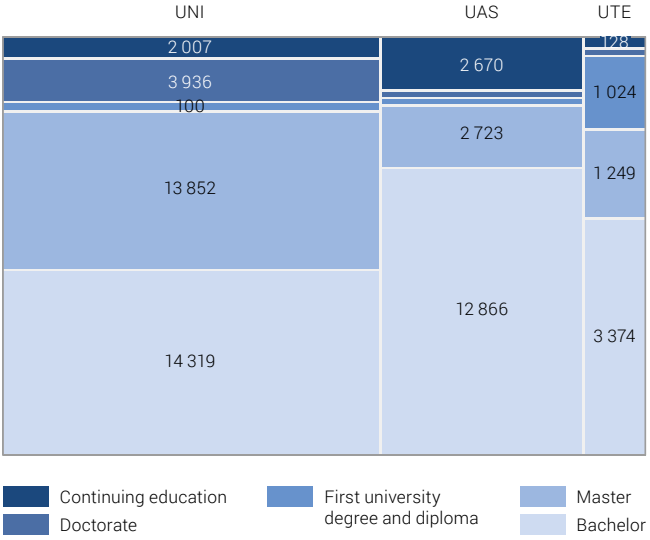
Source: FSO – SHIS-studex

3.3 Final examinations at higher education institutions

This chapter looks at diplomas at different educational levels issued by higher education institutions. The subject of the study is the diploma and not the person obtaining the diploma who may successively or simultaneously obtain several qualifications in the same civil year.

The UNI award bachelor degrees, essentially to enable their students to continue a second cycle, i.e. a master degree. They also issue master degrees, doctorates and continuing education diplomas. The UAS mainly award bachelor degrees. The master degree courses on offer have developed over the years but still remain less extensive than the number available at bachelor level. At the UTE, the type of diploma obtained depends on the education level at which students later wish to teach. The Graph G7 provides an overview of the number of qualifications awarded in 2016 by each type of higher education institution for the different examination levels.

Number of diplomas in relation to the type of institutions and the level of graduation, 2016 **G7**



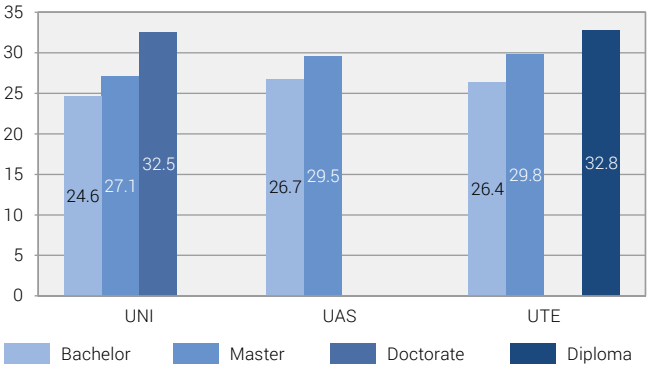
Source: FSO – SHIS-studex

Age on obtaining diploma

In 2016, the average age on obtaining a UNI bachelor degree was 24.6 years. The average age on obtaining a master degree was 27.1 years. A doctorate was obtained at the age of 32.5 years. The average age of the holder of a UAS bachelor degree was 26.7 years and that of a UAS master degree 29.5 years. At the UTE, the bachelor degree for pre-school and primary education was obtained on average at the age of 26.4, the master degree for lower secondary education at 29.8 and the diploma for upper secondary education (academic Matura) at the age of 32.8.

The age on obtaining the Matura and thus entering higher education provides one explanation for the age at which a first diploma is obtained from a higher education institution.

Average age at graduation by type of institutions and level, 2016 G8



The UTE special education fields of study are not considered.

Source: FSO – SHIS-studex

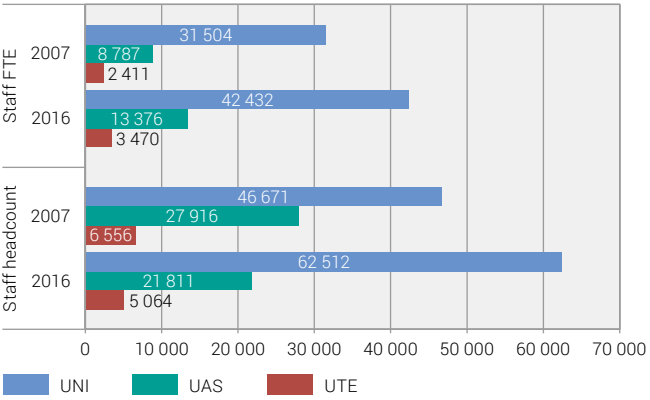
4 Staff at higher education institutions

The task of higher education staff depends on the level at which they are teaching: At the UAS and UTE, the communication of practical skills in basic tertiary education and continuing education and training is important, at the UNI it is a combination of teaching and research. This requires different things of teaching and higher education staff: what they have in common is that today they must have completed their education at a higher education institution.

4.1 Staff numbers

At the end of 2016, higher education institutions were employing a total of 89 387 people, of whom 62 512 (or 70%) worked in the UNI, 21 811 (or 24%) in the UAS and 5064 (or 6%) in the UTE. Higher education staff includes all people (headcount) who were employed at a UNI, UAS or UTE on the reference day, 31.12.16. If staff are considered as a resource instead of persons, these resources are measured in full-time equivalents (FTE). This variable measures effort for the whole calendar year.

Development of number of staff and full-time equivalents by type of institutions **G 9**



Source: FSO – SHIS-PERS

Expressed in FTE, 59 278 units were available to the Swiss higher education institutions in 2016. Almost three-quarters of these personnel resources (42 432 FTE or 72%) were used at the UNI. UAS personnel accounted for 13 376 FTE (23%) and UTE personnel 3470 FTE or 6% of personnel resources in higher education. The difference between the number of persons and the number of FTE illustrates the large share of part-time employees.

The number of staff rose between 2007 and 2016. This applies to the UNI, UAS and UTE in equal measure. However, due to changes in the survey method, the rate of increase cannot be deduced exactly. During revision of the data collection method for the survey of higher education personnel, the OASI number was introduced as a personal indicator, identifying and eliminating the double counting of persons. In addition, the reporting period and personnel categories were standardised for all types of higher education institution. For the UAS and UTE the reference day approach was introduced to ascertain the number of employed persons, making it difficult to make a ten-year comparison of the number of UAS and UTE personnel. For this reason, the FTE is a better variable for demonstrating growth.

4.2 Age pyramid

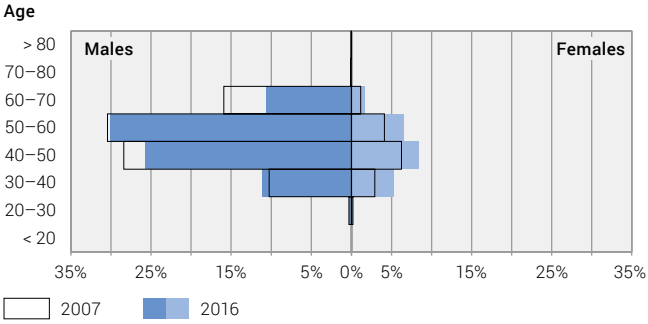
The median age is used as key data to describe ageing in a given population[4]. Overall it rose in all types of higher education institution and in almost all personnel categories between 2007 and 2016. Ageing is more marked in the UAS and UTE than in the UNI with men tending to be older than women.

Graphs G10, G11 and G12 show the age distribution of professors (UNI) and lecturers with management responsibilities (UAS and UTE) in a comparison of 2016 and 2007. Professors and lecturers with management responsibilities are the highest level of an academic career at a UNI, UAS or UTE. Younger teaching staff are given an opportunity to further their careers in temporary posts as junior professors, at least at the UNI. An increase in the proportion of female staff is also stated as an objective at most higher education institutions.

The median age of female professors at the UNI was 47 for both periods considered here. The median age of male professors was 52 in 2007 and 51 in 2016.

The median age of female UAS lecturers with management responsibility was 47 in 2007 and ten years later 51. The median age of male lecturers with management responsibility was 49 and 52 respectively. Considered collectively, therefore, management staff at the UAS have become "older".

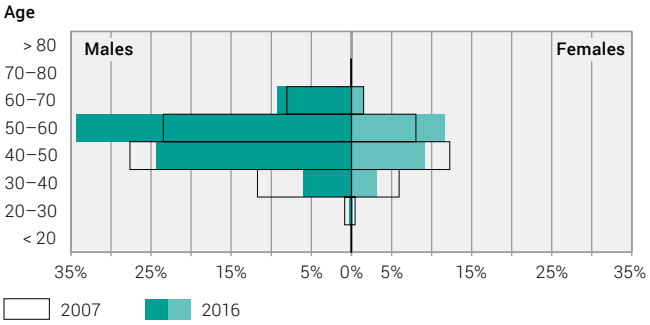
Professors (UNI) by age and sex — G10



Source: FSO – SHIS-PERS

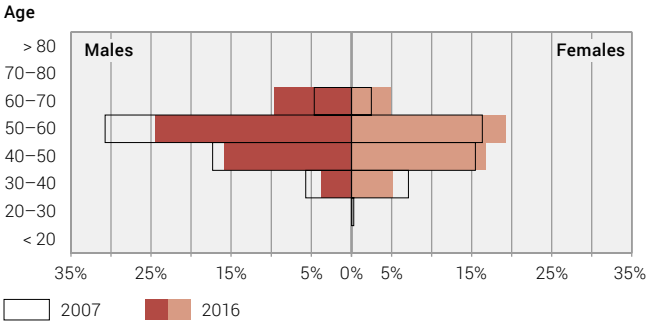
[4] In statistics the median is a middle value and location parameter that denotes a value at the midpoint of values sorted by size. The median age of higher education staff is, therefore, the age that divides personnel into two groups, with 50% of staff being younger and 50% older than that age.

Lecturers with management responsibilities (UAS) by age and sex G11



Source: FSO – SHIS-PERS

Lecturers with management responsibilities (UTE) by age and sex G12



Source: FSO – SHIS-PERS

The same applies to lecturers with management responsibility at the UTE, where the median age of women was 49 in 2007 and 51 in 2016, that of men 52 and 54 respectively.

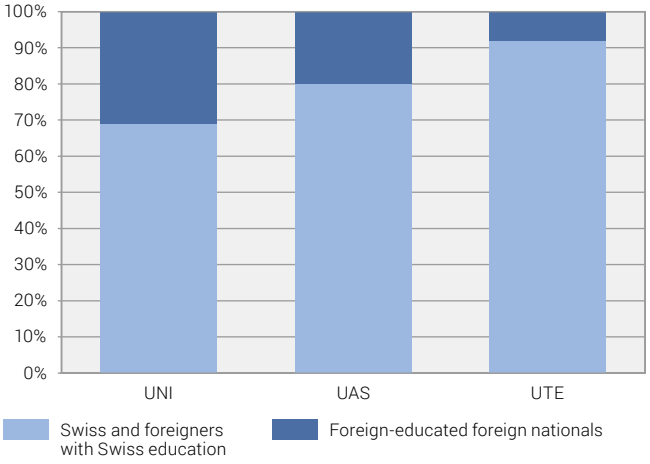
Overall, the three age pyramids indicate a shift towards the upper age groups, especially at the UTE. They also show that at the UNI, professors are predominantly male, whereas the ratio at the UAS and in particular at the UTE is somewhat more even. The age pyramids also show that women – with the exception of the UAS – were able to increase their proportion in almost every age group.

4.3 Educational background

The origin of the higher education entrance qualification held by higher education staff who graduated from a Swiss higher education institution varies greatly between the different types of institution. The original qualification may have been obtained in Switzerland or abroad; people who obtained the qualification in Switzerland are designated "Swiss-educated", those with a foreign higher education entrance qualification "foreign-educated". The graph shows graduates from the years 2012 – 2016, who were working at a higher education institution in 2016, by the origin of their higher education entrance qualification.

At the UNI, 69% of these graduates had obtained a Matura or comparable qualification in Switzerland. At the UAS, the percentage of Swiss-education graduates was 80% and at the UTE 92%.

Staff at universities by university entrance qualification in the university graduating classes of 2012–2016 G13



Source: FSO – SHIS-PERS

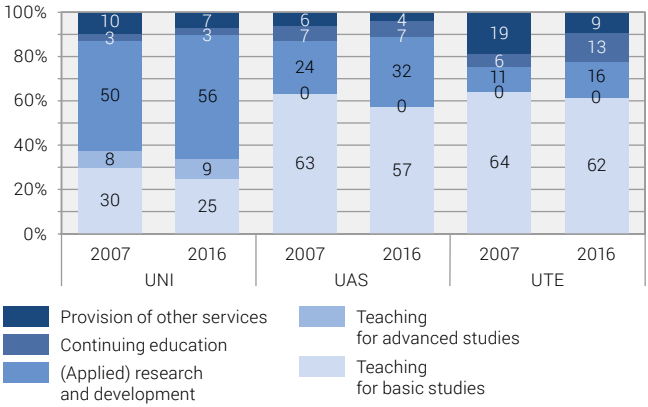
4.4 Staff by type of activity (in FTE)

The remits of each different type of higher education institution are reflected in the distribution of staffing resources by type of activity.

At the UNI, research and development (R+D) uses up more than half of the staffing resources and has risen from 50% to 56% over the period under consideration. The UAS and UTE have also increased their share in applied R+D (from 24% to 32% and from 11% to 16% respectively) at the cost of staffing resources used for teaching. In 2016, the latter accounted for approx. 60%, i.e. roughly 5% less than in 2007 although over the same space of time the number of students following a basic tertiary education course rose considerably (by 24% in the UNI and by 58% and 71% in the UAS/UTE respectively).

Only the UNI offer advanced educational courses (doctorate) on which they use just under 10% of their resources (2016: 9%, 2007: 8%). Continuing education courses (e.g. Master of Advanced Studies) are available at all types of higher education institution: at the UTE 13% of available resources were used for this in 2016 (2007: 7%), at the UAS 7% (2007: 7%) and at the UNI 3% (2007: 3%). Services such as scientific analyses for the public sector or private businesses, are also provided by all types of higher education institutions, although the proportion of resources used has declined in comparison with 2007. Overall, the proportions of the various course types in the three types of higher education institutions remained similar throughout the ten years from 2007 – 2016, with a relative increase in the ratio of research to teaching.

Distribution of human resources by type of institutions and by type of activities, full-time equivalents (FTE) **G14**



Source: FSO – SHIS-PERS

4.5 Staff by category (in FTE)

The following graph G15 shows the distribution of FTE by institution type and personnel category in 2016 and 2007.

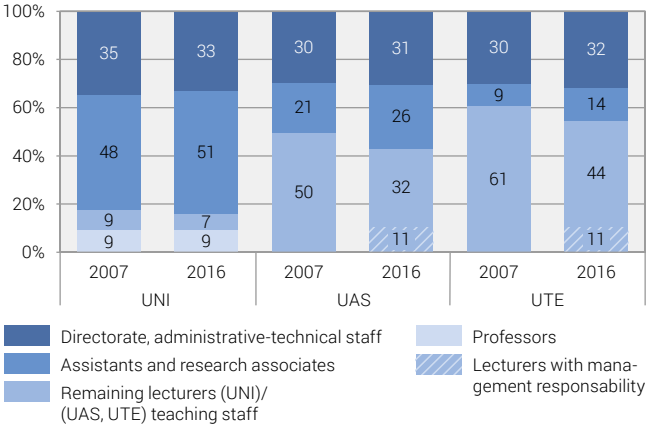
This distribution remains almost unchanged in the UNI; in the other institution types major changes can be observed. Some of the changes can be explained by a revision to the data collection method. At the UNI the distinction between professors and other lecturers is clear from the appointment practice alone. In the UAS and UTE a distinction has been made since 2013 between lecturers with and without management responsibility (comparable to professors and other lecturers) in order to enable better comparability of management across all institution types. To make a ten-year comparison for the UAS and UTE it is best to look at the teaching staff as a whole.

With 55%, the share of FTE at the UTE (2007: 54%), and with 43% at the UAS (2007: 50%) is greater than at the UNI with 16% (2007: 18%). In 2016 and in 2007, professors at the UNI represented 9% and at the UTE and UAS 11% of FTE.

Research associates and assistants who undertake research and teaching, accounted for over half of the staffing resources at the UNI in 2016 with 51% of FTE, whereas at the UAS and UTE they used only 26% and 14% respectively of staffing resources. The FTE among research associates and assistants rose in the UAS and UTE between 2007 and 2016 by roughly 5 percentage points. This was mainly due to an in increase in research activities.

In all higher education institution types the management staff responsible for the coordination and management of the higher education institutions, and the administrative and technical staff that are mainly responsible for the administration and running of the institutions, accounted for approximately 30% of the staffing resources.

Distribution of human resources by type of institutions and by category of staff, FTE **G15**



Source: FSO – SHIS-PERS

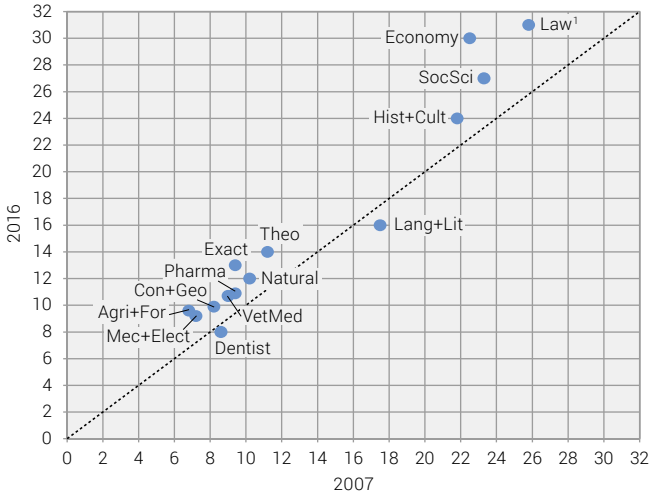
4.6 Student-staff ratio (in FTE)

If the ratio between the two main protagonists at higher education institutions – students and teaching staff – is measured, indications can be obtained about the conditions of study. The number of students in basic tertiary education per FTE of academic staff teaching in basic tertiary education is the student-teacher ratio presented here (S-T ratio II).

The graphs G16 and G17 show the student-staff ratio in 2007 compared with that of 2016. Values above the diagonal line correspond to an increase in the number of students per member of teaching staff.

At the UNI, the number of students per member of teaching staff rose for all faculties except for *language and literature* and for *dentistry*. Student numbers per teacher also rose at the UAS and UTE in all faculties except for *agriculture and forestry* as well as *architecture, civil engineering and planning*.

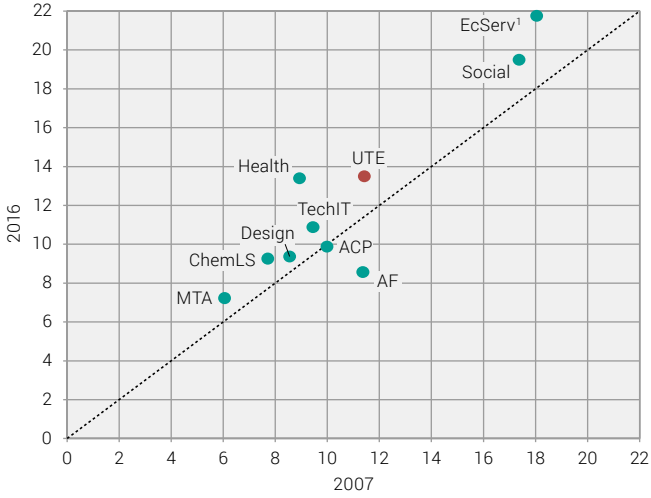
Student-to-staff ratio at universities (UNI) G16



[1] abbreviations see p.38

Source: FSO – SHIS-PERS

Student-to-staff ratio at UAS and UTE G17



[1] abbreviations see p.38

Source: FSO – SHIS-PERS

5 Finance of higher education institutions

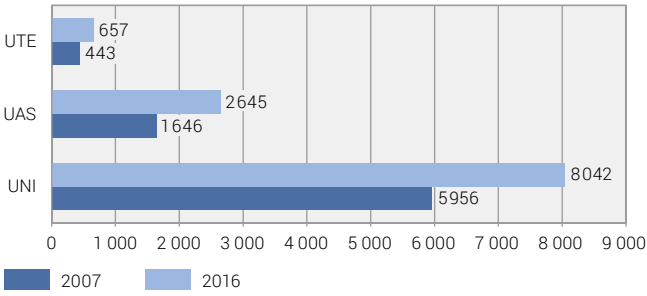
The following information has been taken from financial reports from the controlling unit of the respective higher education institutions. It is based on the absorbed costs of a calendar year and shows the operating costs for the individual higher education institutions, separated into staff, material and infrastructural costs. The cost calculations also provide information on revenue and the funding of all services. However, the UNI, UAS and UTE each use their own cost calculation model whereby the model used by the UTE heavily relies on the UAS model.

5.1 Cost development

Since 2007 – the first year of the introduction of cost calculations for all types of higher education institution – the total costs have continuously increased (G18). Costs for the UNI grew by more than a third and exceeded the CHF 8 billion mark in 2016. During the same period, the costs of the UAS increased by 58% to CHF 2.6 billion. The costs of the UTE in 2016 were CHF 657 million, i.e. an increase of 46% since 2007.

Development of costs by type of institutions

In CHF million **G18**



Source: FSO – SHIS-FIN

The distribution of costs between the departments of universities and institutes of technology has hardly changed. At the UAS (including the UTE), costs in the departments of *technical sciences and information technology* (IT), *music, theatre and other arts* and *teacher training* have also increased proportionately at the expense of all other departments.

5.2 Types of activities

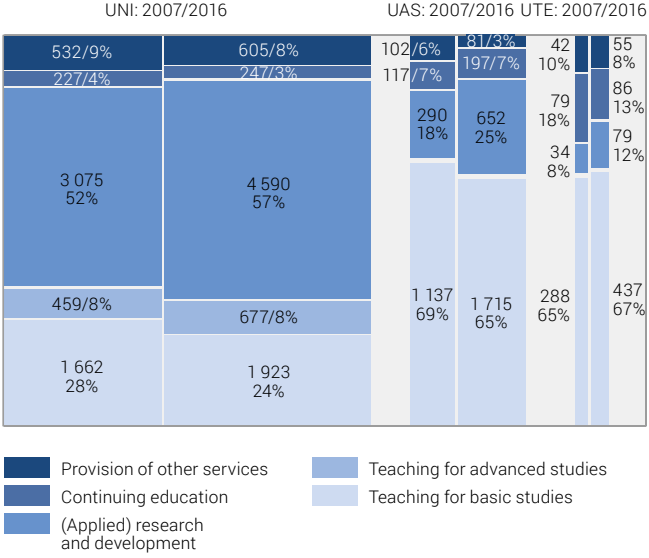
The universities perform five types of activities: Teaching for basic tertiary education, teaching for advanced studies, research and development (R&D), continuing education and services. For this type of higher education institution, R&D accounts for the largest budgetary item with over half of the costs. This is the only sector that increased its share between 2007 and 2016. Teaching for basic tertiary education followed in second place, accounting for around a quarter of the costs of universities.

The universities of applied sciences and the universities of teacher education are the courses designed to teach skills for a specific occupation. They provide practice-based education, which is why basic education accounts for the main activity at both of these types of higher education institution with around two thirds of the total costs. The applied R&D is the second largest and the only proportionately increasing expense of the UAS, accounting for a quarter of their costs. At the UTE, research and continuing education generate the same amount of costs (G 19), in contrast with 2007 when research accounted for a far smaller share.

Type of activities by type of institutions

In CHF million

G 19



Source: FSO – SHIS-FIN

The costs for all activities at all types of higher education institution increased in absolute terms between 2007 and 2016; lower costs were only incurred for activities at the UAS.

In G19 the areas correspond to the absolute costs (in CHF million), the percentages are represented by the height of the blocks.

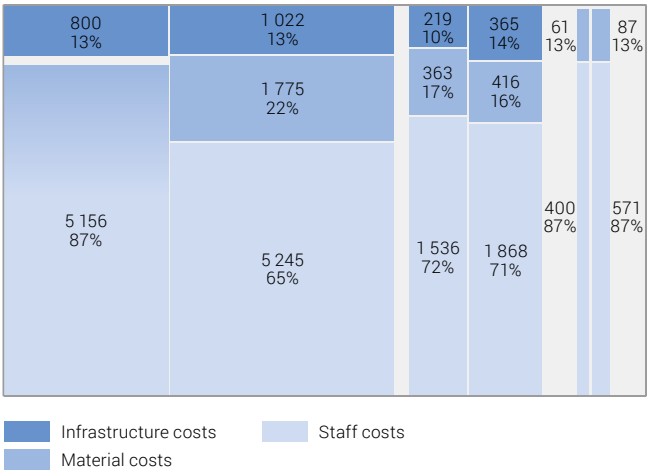
5.3 Types of costs

The ratio of operating costs to infrastructural costs hardly changed between 2007 and 2016 for the UNI, while at the UAS the share of infrastructural costs in the total costs increased over the same period. For the UTE, there was no change in the ratio between staff and material costs. Infrastructural costs are not published in detail due to differences in handling by the supporting cantons and lack of comparability.

Cost categories by type of institutions

In CHF million

G20



Due to rounding differences, the total of the columns may add up to a value other than 100%.

Source: FSO – SHIS-FIN

Staff costs account for 75% of operating costs at the UNI, 82% at the UAS and 87% at the UTE. The higher material costs at the UNI and the UAS are likely to be associated with greater research and development (G 20).[5]

In the graph G 20, the areas correspond to the absolute costs (in CHF million), the percentages are represented by the height of the blocks.

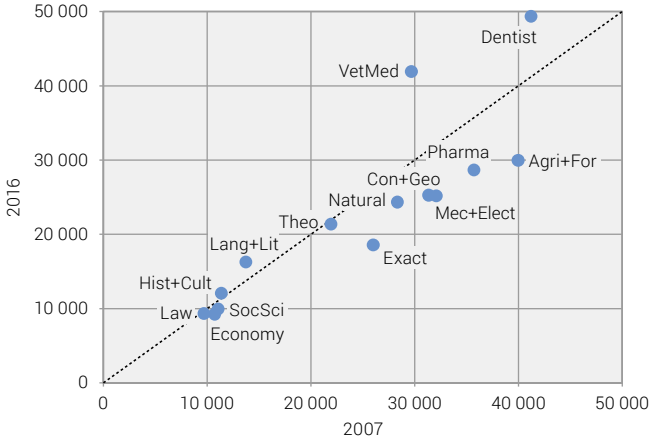
5.4 Costs per student

The cost indicator considered here is calculated as the ratio of costs for basic tertiary education to the number of students in basic education (headcount).

The graphs G 21 and G 22 show the costs per student in 2007 compared with 2016. Values below the diagonal line equate to a decrease in costs per student.

The cost indicator fell between 2007 and 2016 for 10 out of 14 UNI departments. There was a rise in costs only for the departments *history and cultural sciences, language and literature, veterinary medicine* and *dentistry.* At the UAS the value of the indicator decreased for all departments.

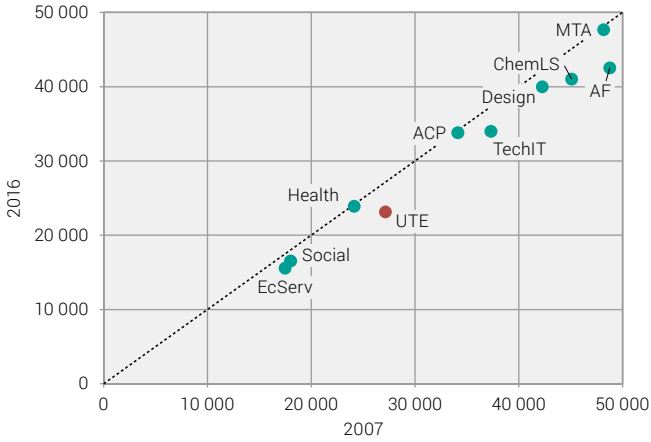
Costs per student UNI, 2007 in comparison with 2016 **G 21**



Source: FSO – SHIS-FIN

[5] Separate data for staff and material costs for the UNI have only been available since 2010.

Costs per student UAS and UTE, 2007 in comparison with 2016 G22



Source: FSO – SHIS-FIN

Costs per student and student-staff ratio 2007/2016

In the graphs G23 and G24, the change in costs (in CHF) per student (in basic education) is shown against the student-staff ratio (academic staff for basic education in FTE) between 2007 and 2016 using an arrow.

The start of the arrow shows the value in 2007 and the end of the arrow the value in 2016. An arrow represents a department.

The combination with the student-staff ratios at the UNI shows that the decrease in costs per student is largely accompanied by an increase in the number of students per teacher. The four exceptions form two subgroups: Per person, students of *dentistry* and *language and literature* generated more costs and had more teachers available to them, whereas the departments of *veterinary medicine* and *historical and cultural sciences* showed high costs per student but also more students per teacher.

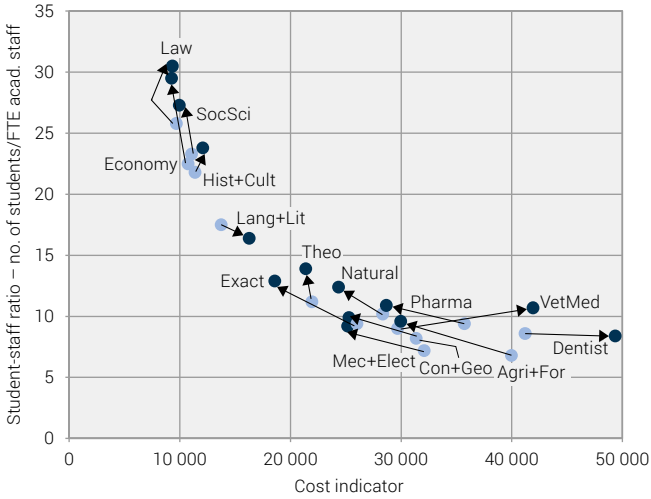
The combination with the student-staff ratios at the UAS shows that the decrease in costs per student is consistently accompanied by an increase in the number of students per teacher. The only exception is the department of agriculture and forestry in which there was a decrease in the number of students per teacher.

The arrows start with the values for 2007 and end with those for 2016: except for teacher training these are always absorbed costs (in CHF).

Fields of studies at UNI: Costs per student and student-to-staff ratio

Basic training curriculum

G23

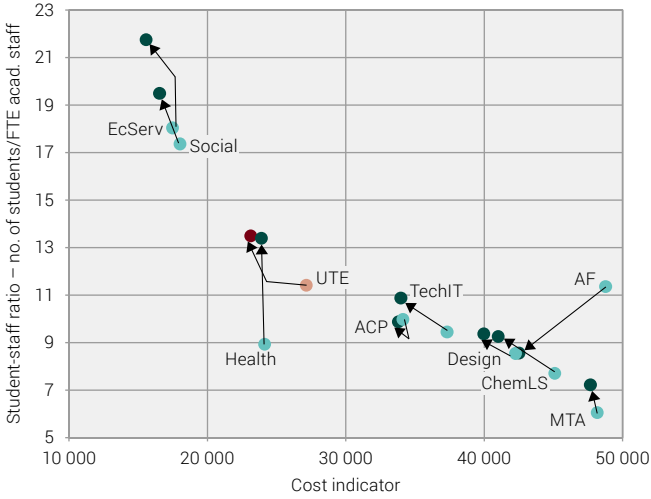


Source: FSO – SHIS-FIN

Fields of studies at UAS and UTE: Costs per student and student-to-staff ratio

Basic training curriculum

G24



Source: FSO – SHIS-FIN

6 A look at STEM degree courses

Due to the economic importance of the STEM fields Science, Technology, Engineering and Mathematics and the numerous initiatives intending to promote education in these subjects, it would also be useful to consider the change in students and diplomas for these degree courses and the resources used for these in higher education.

6.1 Students, entrants and final examinations

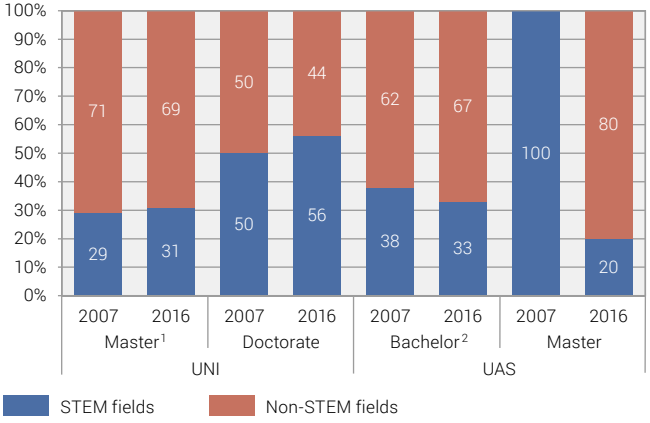
In 2016/17, around 70 000 students were following a course in the STEM subjects, i.e. just under a third of the total number of students. More than two thirds were enrolled at a UNI. Half of STEM students were concentrated in the fields of *technology, chemistry and life sciences*. Women were also unevenly distributed in the STEM subjects. Their presence was particularly important in the field of *chemistry and life sciences* (54% at the UNI and 43% at the UAS). In contrast, women were under-represented at the UAS in both technology (10%) and informatics (14% at the UNI and 12% at the UAS).

Final examinations in the STEM subjects

In 2016, the UNI awarded just under one third of master degrees (around 4400 diplomas) in STEM subjects. The highest share of STEM qualifications was seen at doctorate level. Within a decade, the share of STEM doctorates increased from 50% in 2007 to 56% in 2016, i.e. positive growth of 35%. The field of *chemistry and life sciences* was generally the field in which the UNI awarded the largest number of STEM qualifications. The share of examinations in this field exceeded 40% at all levels. A third of bachelor degrees (4300 diplomas) awarded in 2016 by the UAS were in the STEM subjects. The share of masters in STEM subjects was lower (20%, i.e. 546 diplomas). Most STEM bachelor and master degrees at the UAS were in the field of *technology*.

Proportion of qualifications awarded in STEM and non-STEM fields by type of institutions and the level of graduation

G25



[1] former licentiate degrees/diplomas included
[2] former diplomas included

The UTE do not offer any STEM fields

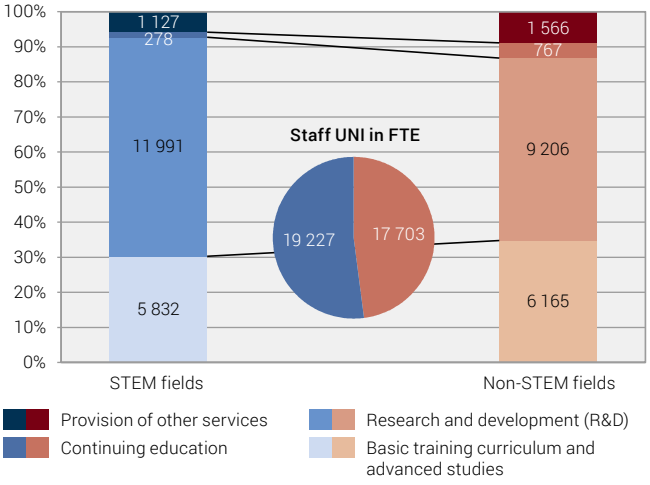
Source: FSO – SHIS-studex

6.2 Staffing resources

52% of staff at the UNI are employed in the STEM subjects. Between 2007 and 2016, the share of the STEM subjects at the UNI thus slightly increased (2007: 50%). Most staff worked in research and development (R&D) whereby the share in STEM subjects was 62% and thus far higher than in the non-STEM subjects (52%). Teaching staff accounted for the second-largest share (STEM subjects 32% and non-STEM subjects 39%). Service staff accounted for around 6% of staff in the STEM subjects and was thus far lower than that of the non-STEM subjects (around 9%). For both subject groups, the share of R&D increased proportionately compared with other activities.

At the UAS, the staff ratio remained stable (44% STEM subjects, G 27). Teaching staff (basic tertiary education and postgraduate degree programmes) accounted for the largest share (STEM subjects: 47% and non-STEM subjects: 66%). In the STEM subjects, the share of staff in applied research and development (applied R&D) followed with 42%. In non-STEM subjects, the share of staff in applied R&D and other services was just equally high (17%). More weight has also been given to research and development in recent years (6–10% more) with the same consequences, only teaching in non-STEM subjects has remained unchanged (66%).

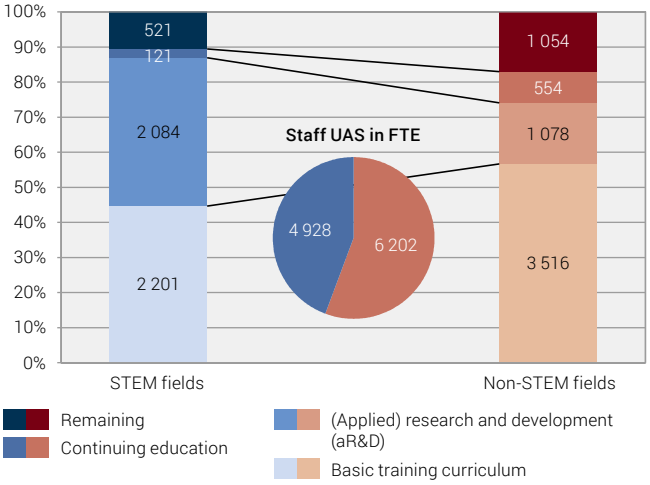
Staff of STEM and non-STEM fields at UNI, 2016[1] G 26



[1] excluding central field staff

Source: FSO – SHIS-PERS

Staff of STEM and non-STEM fields at UAS, 2016[1] G 27



[1] excluding staff from non-attributable fields

Source: FSO – SHIS-PERS

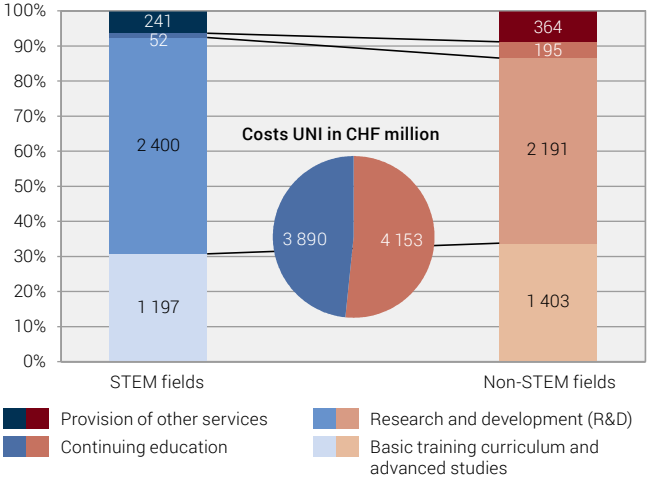
6.3 Costs

STEM area subjects contributed to 48% of UNI costs. R&D had the largest share of the costs: in the STEM subjects this amounted to 62% and was thus higher than in the non-STEM subjects (53%). R&D was followed by teaching in the STEM-subjects which accounted for 32% of costs (compared with 38% in the other subjects). Costs for services accounted for around 6% in the STEM subjects and were far lower than in the non-STEM subjects (9%).

At the UAS the focus continued to be on teaching however the share of applied R&D at the UAS also increased by 5 to 12 percentage points. STEM area subjects contributed to 43% of costs. Teaching accounted for the largest share (STEM subjects: 62% and non-STEM subjects: 80%). This was followed by applied R&D with costs in STEM subjects making up 36% of the total costs, i.e. over twice as much as in the non-STEM subjects (17%). Costs for services were between three and four percent for both subject types.

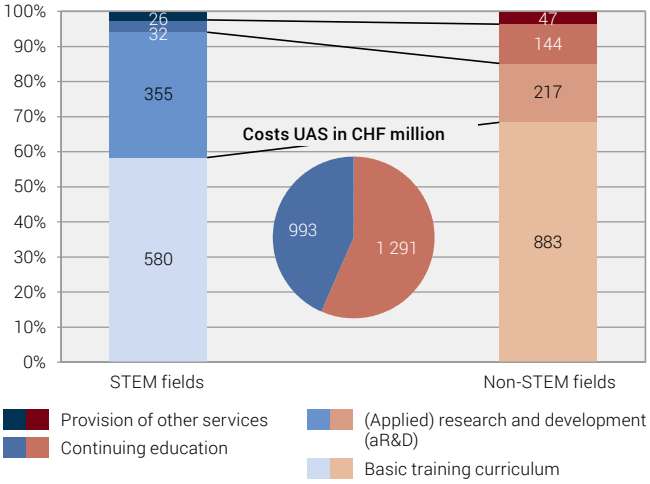
The ratio between the STEM and non-STEM subjects evolved between 2007 and 2016 to the benefit of the non-STEM subjects (2007: 48%). This was largely due to new courses.

Costs of STEM and non-STEM fields at UNI, 2016 G28



Source: FSO – SHIS-FIN

Costs of STEM and non-STEM fields at UAS, 2016 G29



7 Sources

SHIS

The Swiss university information system (SHIS) is an institution in which representatives of higher education institutions, university cantons and the Confederation work together to develop Swiss statistics on higher education. The FSO's Population and Education Division is the governing body.

Higher education students and diplomas

The Swiss university information system's student and graduate database (SHIS-studex) was created in the 1970s to meet a growing need for coordination and planning by the Confederation and the cantons in the university sector. It provides information on the situation with regard to higher education institutions, how courses are run and various socio-demographic factors. All persons enrolled have an individual identification number that enables personal data to be treated anonymously and flow analyses to be carried out. The database serves as the basis for the scientific analysis of courses at Swiss higher education institutions. The FSO uses these to calculate the university indicators and to make forecasts about trends on the number of students. Since the academic year 2012/13, the OASI number has enabled longitudinal analyses to be made for all levels of education and training.

University staff statistics

Statistics on staff of higher education institutions have been conducted at universities and federal institutes of technology since 1980, at universities of applied sciences since 2000 and at universities of teacher education since 2005 (SHIS-PERS). The surveys concern the administrative data contained in the UNI, UAS or UTE staff registers. These staff statistics were revised in 2012. Since this revision, the OASI number has been used in the statistics to identify persons which will enable the educational path of students and staff to be studied in the mid-term. The reference periods were also modified: since 2012, the data on persons relate to a reference date (31.12) whereas the data in FTE relate to the civil year for all types of higher education institution. Staff categories have been harmonised.

Financial statistics of higher education institutions

In the higher education sector, analytical accounting provides information on the costs and activities of the three types of higher education institution. It indicates both public and private sources of funding (funding of student tuition fees, R&D mandates of enterprises, etc.). The expenses of universities have been surveyed by the FSO since the 1996 financial year and their costs surveyed since 2006; the costs of universities of teacher education have been surveyed since 2008. The costs of universities of applied sciences are compiled by the State Secretariat for Education, Research and Innovation (SERI; data compiled since 2000).

8 List of higher education institutions and departments

Universities and institutes of technology (UNI)	
Uni Basel	BS
Uni Bern	BE
Uni Freiburg	FR
Uni Genf	GE
Uni Lausanne	LS
Uni Luzern	LU
Uni Neuenburg	NE
Uni St. Gallen	SG
Uni Zürich	UZH
Università della Svizzera Italiana	USI
ETH Lausanne	EPFL
ETH Zürich	ETHZ
Universitäre Fernstudien Schweiz*	FS CH
Universitäres Institut Kurt Bösch*	IKUB

Departments of universities and institutes of technology	
Theology	Theo
Language and literature	Lang+Lit
Historical and cultural sciences	Hist+Cult
Social sciences	SocSci
Economic sciences	Economy
Law	Law
Exact sciences	Exact
Natural sciences	Natural
Human medicine*	HumanMed
Dentistry	Dentist
Veterinary medicine	VetMed
Pharmacology	Pharma
Civil engineering and surveying	Con+Geo
Mechanical and electrical engineering	Mec+Elect
Agricultural and forestry sciences	Agri+For
Interdisciplinary and other Studies*	Inter

Universities of applied sciences (UAS)	
Berner Fachhochschule	BFH
Haute école spécialisée de Suisse occidentale	HES-SO
Fachhochschule Nordwestschweiz	FHNW
Fachhochschule Zentralschweiz	FHZ
Scuola Universitaria Professionale della Svizzera Italiana	SUPSI
Fachhochschule Ostschweiz	FHO
Zürcher Fachhochschule	ZFH
Kalaidos Fachhochschule*	KAL
HES Les Roches-Gruyère*	LRG

Departments of universities of applied sciences	
Architecture, construction and planning	ACP
Technology and IT	TechIT
Chemistry and life sciences	ChemLS
Agriculture and forestry	AF
Economy and services	EcServ
Design	Design
Sport	Sport
Music, theatre and other arts	MTA
Applied Linguistics	ALing
Social work	Social
Applied Psychology	APsy
Health	Health
Teaching and education at UTE	UTE

Universities of teacher education (UTE)	
Haute école de travail social – Genève, HES-SO	HETS-GE
Pädagogische Hochschule FHNW	PH FHNW
Hochschule Luzern – Musik, FHZ*	FHZ Musik
SUPSI – Dipartimento formazione e apprendimento	SUPSI-DFA
Zürcher Hochschule der Künste, ZFH*	ZHdK
Interkantonale Hochschule für Heilpädagogik Zürich	HfH
Pädagogische Hochschule Zürich	PHZH
Haute école pédagogique BEJUNE	BEJUNE
Haute école pédagogique du canton de Vaud	VD
Haute école pédagogique du Valais	VS
Haute école pédagogique Fribourg	FR
Pädagogische Hochschule Bern	BE
Pädagogische Hochschule Luzern	LU
Pädagogische Hochschule Schwyz	SZ
Pädagogische Hochschule Zug	ZG
Schweizer Hochschule für Logopädie Rorschach*	SHLR
Pädagogische Hochschule Thurgau	TG
Pädagogische Hochschule Schaffhausen	SH
Pädagogische Hochschule Graubünden	GR
Pädagogische Hochschule St. Gallen	SG
Swiss Federal Institute for Vocational Education and Training*	SFIVET

* no financial information available; not included in finance statistics

Orders
Tel. +41 58 463 60 60
Fax +41 58 463 60 61
order@bfs.admin.ch

Price
free of charge

Downloads
www.statistics.admin.ch (free of charge)

FSO number
1802-1800