

OECD-Review of Swiss Tertiary Education Policy 2001/2002

Swiss National Report

**SWITZERLAND'S
TERTIARY
EDUCATION POLICY**

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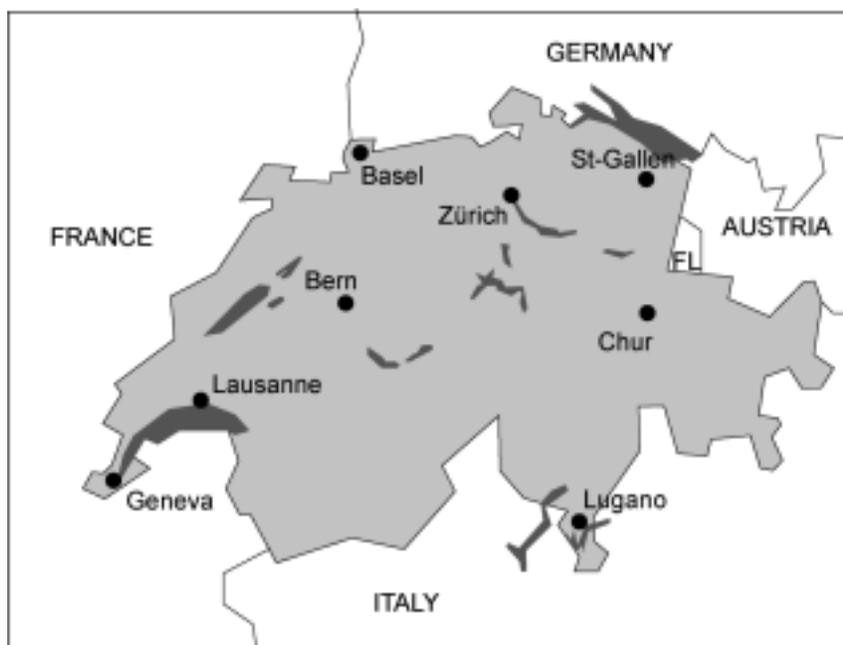
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1. Switzerland

The country and its people

Switzerland, or the Swiss Confederation, is a small country of 41 284 square kilometres located in the heart of Europe between (moving clockwise, from left to right) France, Germany, Austria, the Principality of Liechtenstein (FL) and Italy (see Figure 1). Its capital is Bern. The country is one of the most mountainous in Europe: the Alps, Pre-Alps and Jura occupy more than two-thirds of its land area. Contrasting with these mountainous regions is the Swiss plateau, which is home to a majority of the country's 7.16 million people. While this figure has remained fairly stable, the population of persons over 65 is on the rise, while that of young people under 19 is in decline (see Figure 2).

Fig. 1: Switzerland



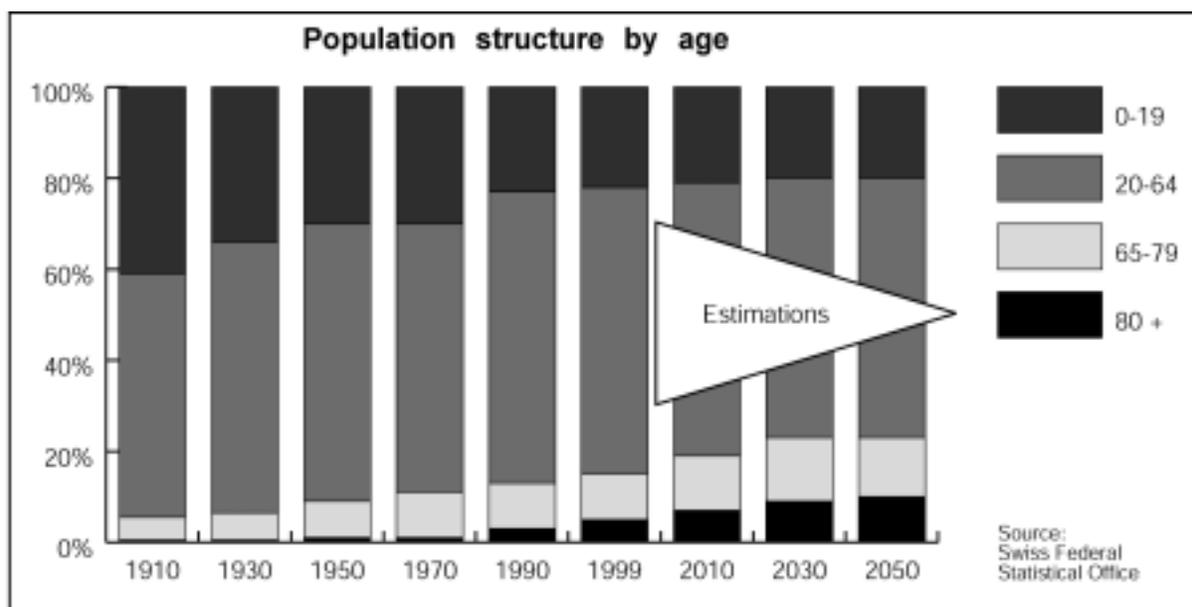


Fig. 2: Population structure by age

Geographically diverse, Switzerland is also diverse in terms of the languages that are spoken there. This small country recognises no fewer than four national languages. German is spoken by nearly two-thirds of the population, French by one-fifth, Italian by under 10%, and Romansh by less than 1%. The remaining 10% or so speak other languages. It must be said that a fifth of the population is made up of resident foreigners. This proportion has risen steadily, but it would drop to less than 10% if it included only those foreigners that have lived in Switzerland for a limited amount of time. Over half of the foreigners living in Switzerland have resided there for more than 15 years, or were born there.

From agriculture to industry

In 1815, when Switzerland's final borders were drawn at the Congress of Vienna, the population was 2.2 million. It was divided between plateau farmers, mountain dwellers and residents of already-large cities such as Geneva, Zurich and Basel. It was in the late 19th and early 20th centuries that modern Switzerland took shape, with its industries, its tourism and its financial services. Agricultural Switzerland was transformed into an industrial country.

Today, the structure of the economy features a high degree of specialisation, the presence of large multinationals and a strong banking sector. Over two-thirds of the population live in urban areas. Zurich is Switzerland's largest city, with about 370 000 people. Four other cities have populations in excess of 100 000: Geneva, Basel, Bern and Lausanne.

Services in the forefront

The labour force accounts for more than half of the permanent resident population. It breaks down into the service sector (64%), industry (32%) and agriculture (4%) (see Figure 3). Within the population of permanent residents aged 15 and up, the proportion of the labour force rises to two-thirds (see Figure 4). In that same category, the rate of jobless people has diminished steadily since 1997, when it peaked at 4.1% (see Figure 5).

Fig. 3: Working population by sector

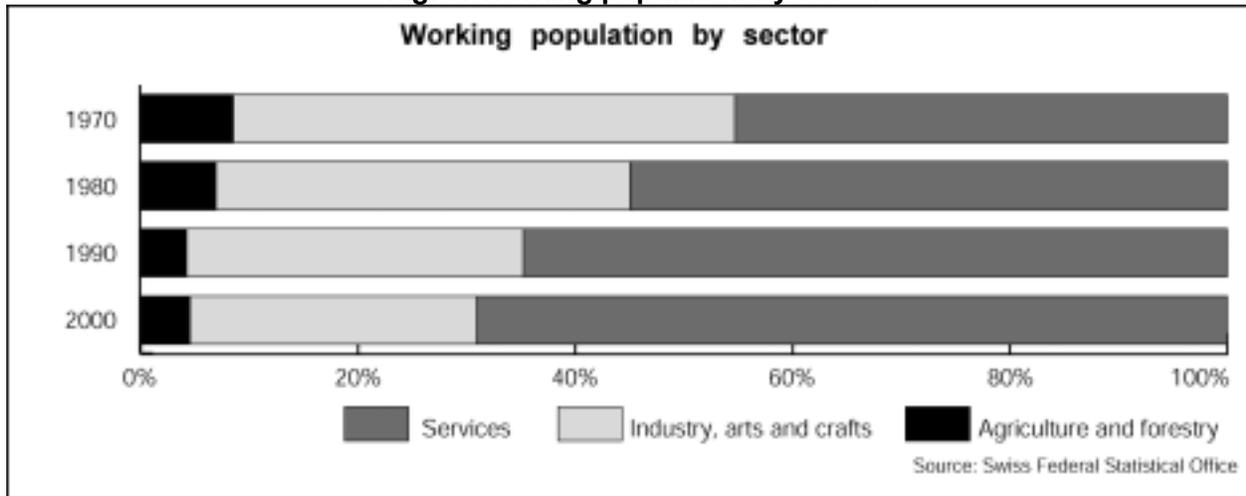


Fig.4: Breakdown of the permanent resident population aged 15 and up by labour market status in 2000

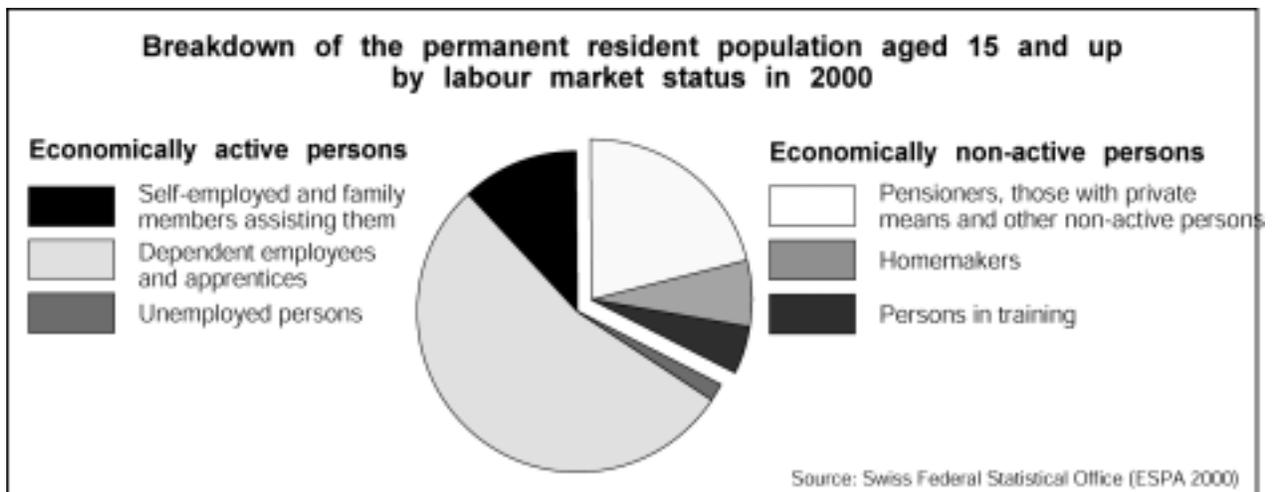
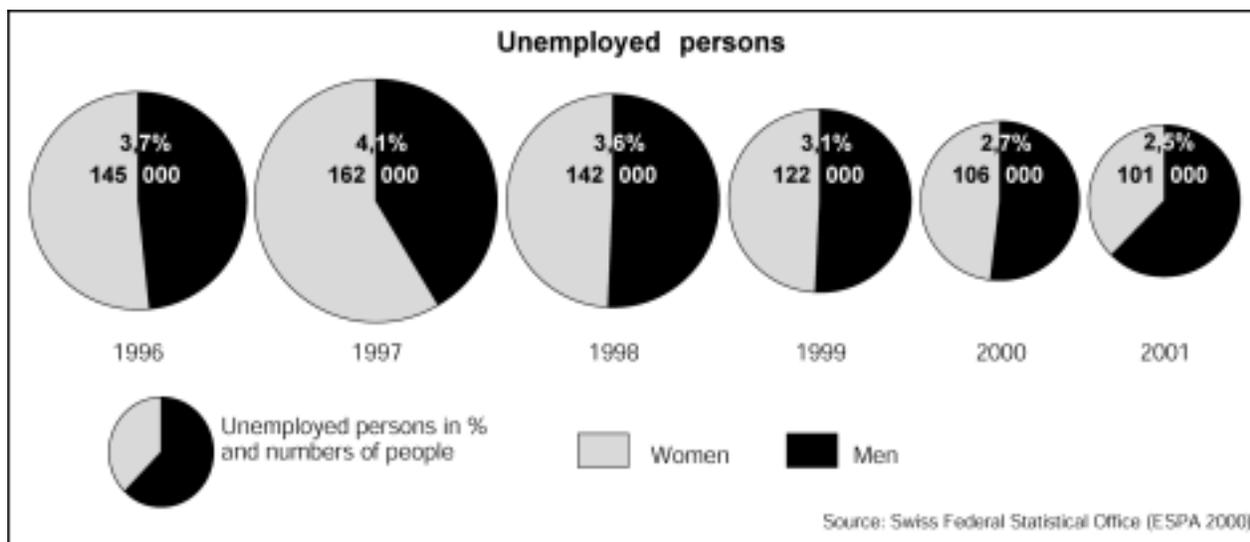


Fig.5: Unemployment rates



An important market

Despite its small size and very limited population, Switzerland possesses a very attractive market for European businesses. The first reason for this is the country's wealth. Gross domestic product (see Figure 6), or GDP, and per capita GDP in particular, is one of the main indicators used for economic analysis, and for spatial comparisons and/or comparisons over time on an international level. It reveals a country's wealth.

Fig. 6: International comparison of per-capita GDP (purchasing power)



History and political organisation

Since the Upper Palaeolithic-the period to which the first evidence of human settlement can be traced-a great many cultures have lived together or in turn on the land of what is now called Switzerland. Among those most significant for the country's history were the Celtic Helvetian tribe, which settled there during the Metal Age, between 2000 and 750 BC. Others included the Burgundians and the Alemanni- Germanic tribes that in the Middle Ages were already laying the foundations for Switzerland's linguistic future.

By 1033, all of present-day Switzerland had become part of the Germanic Holy Roman Empire. A feudal system brought several families to prominence. Foremost among them were the houses of Savoy, Zähringen and Hapsburg. Inhabitants of the cantons of Uri, Schwyz and Unterwald bound together to ensure a certain independence and formed the community of the Waldstätten. The territories obtained imperial immediacy in the early 13th century, meaning that they were no longer subject to the authority of an overlord, but to the emperor directly. When a Hapsburg became emperor in 1273, the Waldstätten's immediacy lapsed, and the territories became frightened. When the emperor died in 1291, their anxiety reached a crescendo and they concluded an alliance that marked the founding of the Swiss Confederation.

A federalist system

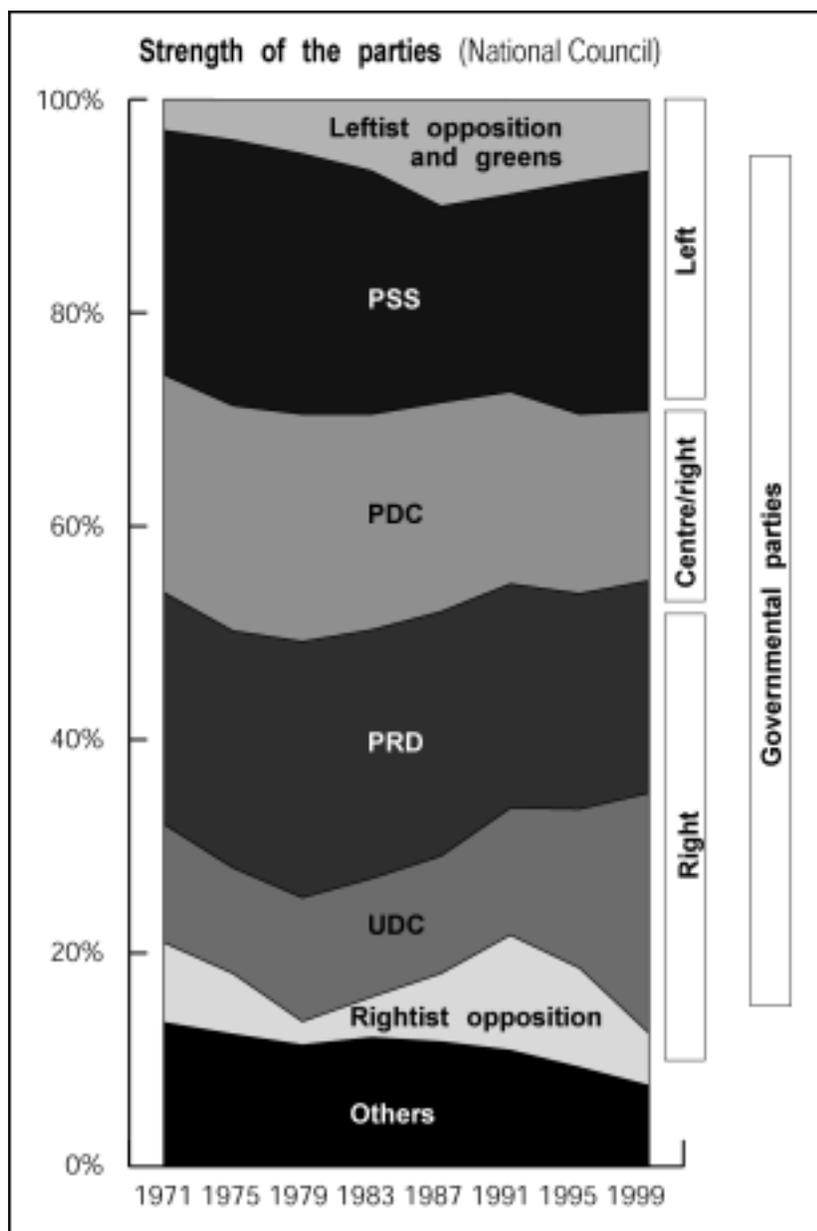
Other cantons later joined the alliance. Today, Switzerland is a confederation comprising 26 cantons and half-cantons. In 1848, Switzerland adopted a new constitution marking the power of the central government while at the same time leaving a relative degree of sovereignty in the hands of the cantons. It constituted a decisive step towards democracy. It promoted centralisation without rejecting liberalism, in line with Swiss traditions. This federalist system is still in force today.

Endowed with their own constitutions, their own governments and their own laws, the cantons have the right to legislate in certain areas. For example, they enjoy broad powers in areas such as education, public health, land-use planning, the preservation of law and order, and judicial organisation. They transfer to the Confederation a whole series of powers to administer areas such as defence, foreign affairs, postal services and the railways. The cantons themselves are divided into communes, which also enjoy a certain autonomy. Communes administer their assets and manage local public services. In addition, they assume such tasks as are devolved to them under cantonal or federal legislation.

Direct democracy is entrenched firmly at each of the three levels. Citizens elect not only the members of their parliaments, but members of their governments as well, except for the Federal Council. Moreover, important questions are submitted to popular elections-for constitutional questions, or following the exercise of the popular right of initiative and referendum. In Switzerland, MPs are not professionals; they fulfil their local or federal mandates along with other jobs.

At the federal level, Parliament is divided into two houses: the National Council and the Council of States. This bicameral system enables both popular delegation and egalitarian representation of all of the cantons-the most populous and the least populous alike. The Government, represented by the Federal Council, is composed of seven members selected by Parliament-since 1959 from among the four major political parties (see Figure 7). The seven take turns assuming the functions of President of the Confederation for one year at a time.

Fig. 7: Composition of the National Council (Parliament)



The cantonal system is based on a similar organisation. Members of both the legislative and the executive bodies are elected directly by the people. Specific details of the structures can vary widely from one canton to another.

Co-operation between the Confederation and the cantons

The federal Constitution stipulates how powers shall be divided between the Confederation and the cantons. Article 3 of the Constitution states that the cantons shall "exercise all rights which are not transferred to the Confederation". The cantons are thus sovereign states, as long as that sovereignty is not limited by the Constitution. They exercise all of the rights that are not assigned

to the Confederation. They themselves decide what measures to enact in their areas of jurisdiction.

Even so, the Confederation and the cantons work together and lend each other mutual support. The cantons are consulted regarding some of the Confederation's undertakings, and lawmaking in particular. In return, the cantons are required to enforce federal law as it is defined in the Constitution and federal legislation. But federal law takes priority over cantonal law. The Confederation monitors the cantons' compliance with federal law.

The expression "co-operative federalism" is used to summarise this system.

2. The Educational System in Switzerland

Very broadly, the Swiss education system (see Figure 8) may be broken down into three levels: primary, secondary and tertiary. A "pre-school" level can be distinguished as a preparation for primary school. For its part, the secondary level is subdivided into two parts, one being compulsory and the other not.

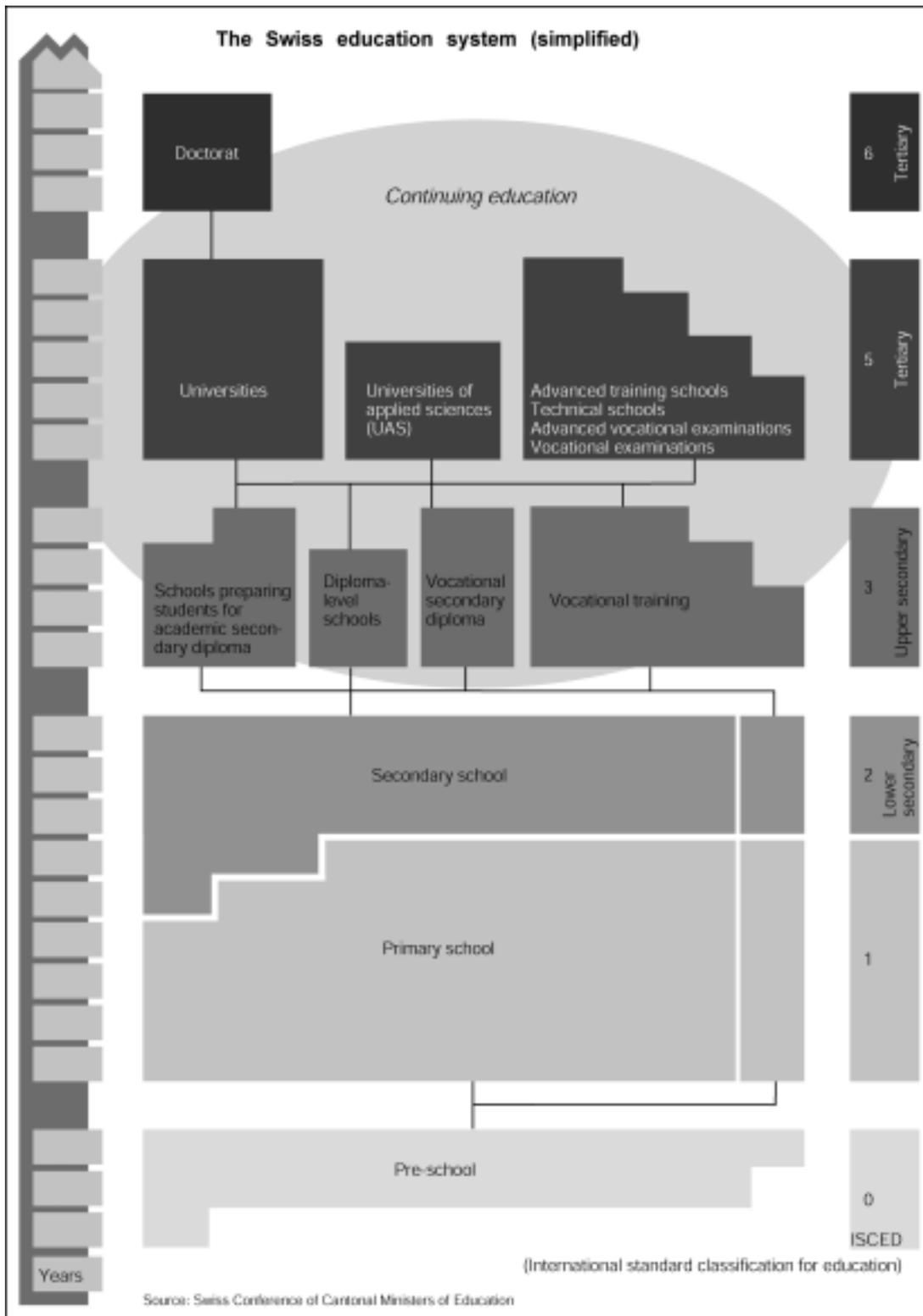
The pre-school level

Pre-school is optional, but it offers preparation for compulsory education and is an entitlement enjoyed by children in every canton. By 1999/2000, children were spending an average of 1.9 years in pre-school institutions. This length of time has increased throughout the country, except in the cantons of central Switzerland, in which it has averaged about 1.3 years for the past 18 years. There are significant differences between the cantons, where approaches to pre-school education differ.

The primary and lower secondary levels

Compulsory schooling is the basis of the Swiss education system. It generally lasts nine years, split between the primary and lower secondary levels. In most of the cantons, primary school lasts six years. It is followed by lower secondary school, which generally lasts three years. With it ends the obligation to attend school.

Figure 8. The educational system in Switzerland (simplified)



Upper secondary level

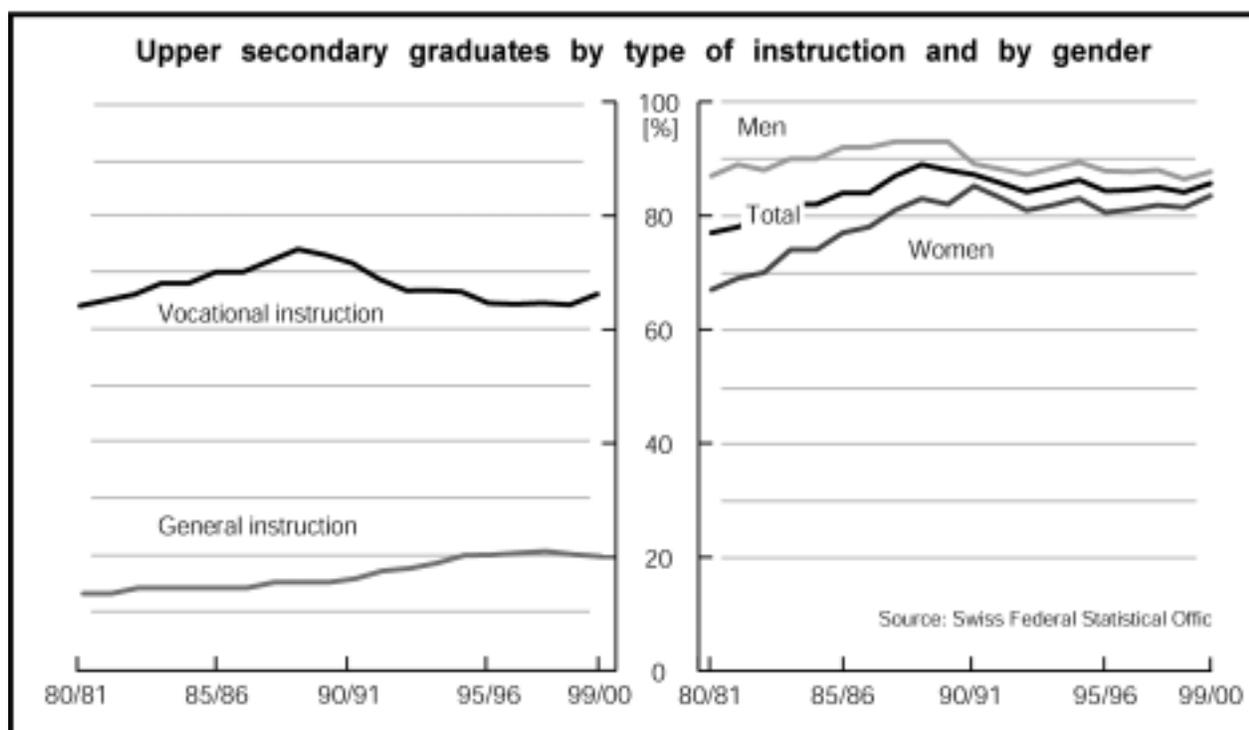
Upper secondary school constitutes the first phase of post-compulsory education. It comprises all instruction of a vocational or general nature. In 2000, 86% of young people of school-leaving age possessed an upper secondary diploma. The remaining 14% had no formal education at that level or had taken a one-year course or had elementary training. Among upper secondary school graduates, three-quarters had received vocational instruction and one-quarter general instruction (see Figure 9). After a sharp decline in the number of vocational diplomas in the late 1980s, the numbers have been stabilising. The recent creation of a vocational diploma (*maturité professionnelle*) should also pave the way for the development of vocational curricula. At the same time, the number of academic diplomas has been rising steadily.

New types of secondary diplomas

In 1995, the Swiss Government and the cantons decided to reform the general secondary school diploma (*maturité gymnasiale*). The new regulations call for a single type of academic diploma (until then there had been five), a reduction in the number of subjects and examinations, and the introduction of a thesis requirement. These reforms should be fully operational by 2003.

Already in 1993, with the introduction of a vocational diploma (*maturité professionnelle*), the Swiss Government and the cantons had expressed their commitment to improving the overall conditions of vocational training. The vocational diploma was based on practical training and enables young people to take up study at a university of applied sciences (UAS). There are currently five distinct vocational diplomas: technical, business, crafts, artistic and technical/agricultural. Revision of the 1978 Vocational Training Act became clearly necessary after the introduction of the vocational diploma and the creation of universities of applied sciences.

Figure 9. Upper secondary graduates by type of instruction and by gender



Upper secondary school graduates have the opportunity to pursue their studies at the tertiary level, the particular course depending on the type of secondary education they have received (see Table 1).

Table 1:

Upper secondary level	Tertiary level
Elementary Training Certificate (<i>Attestation de formation élémentaire</i>)	
Federal Capacity Certificate (<i>Certificat fédéral de capacité</i>)	Advanced Vocational Examinations, Advanced Training Schools, Technical Schools
Diploma from a diploma-level school	Advanced Vocational Examinations, Advanced Training Schools, Technical Schools, Universities of applied sciences, training tracks not regulated by the Confederation
Vocational Maturity Certificate (<i>Certificat de maturité professionnelle</i>)	Universities of applied sciences, Advanced Training Examinations, Advanced Training Schools, Technical Schools, training tracks not regulated by the Confederation
Academic Maturity Certificate (<i>Certificat de maturité gymnasiale</i>)	Universities, Universities of applied sciences (requires completion of a year of practical internship), Teachers' Colleges
Normal School Certificate (<i>Brevet d'Écoles Normales</i>)	Teachers' Colleges

Higher education

Higher education is also referred to as tertiary education. A substantial amount of it is available in Switzerland. It is divided primarily into two areas—that of the more academically-oriented higher education institutions (*hautes écoles*) and that of advanced vocational training.

The higher education institutions comprise the universities (including cantonal universities and federal institutes of technology) and the universities of applied sciences. The realm of advanced vocational training is made up of all other tertiary instruction tracks. It comprises advanced training schools, including technical schools, vocational examinations and advanced vocational examinations. Advanced vocational training in Switzerland features a broad and diverse choice of private institutions.

During the 1999-2000 school year, 156 100 persons were enrolled in tertiary instruction. Of them, 112 400, or over two-thirds, were enrolled in a one of the higher education institutions. The proportion of women in tertiary education was 42%, the figure being lower in universities of applied sciences.

Continuing education

Continuing education (see "Continuing education and training") seeks not only to update, deepen and broaden existing knowledge, abilities and aptitudes, but to acquire and broaden new knowledge, abilities and aptitudes as well. According to a study conducted in 1999 and 2000 by the Swiss Federal Statistics Office (OFS), each year some 1.9 million adults take 2.7 million courses representing 123 million hours of training. As compared with other countries, Switzerland is roughly average in this respect, even though 39% of its population receives continuing training.

Powers in the realm of education

In the spirit of "co-operative federalism", the Confederation and the cantons share powers in the realm of education. On the whole, the 26 cantons and half-cantons enjoy great autonomy. This autonomy varies, however, by type of institution and the level of studies within the Swiss education system (see Figure 8).

At the pre-school ("kindergarten") and compulsory schooling (primary + lower secondary) levels, the cantons have sole responsibility. Nevertheless, the Confederation monitors compliance with the principles that all children shall be entitled to primary education that meets certain standards of quality, and that education shall be dispensed free of charge.

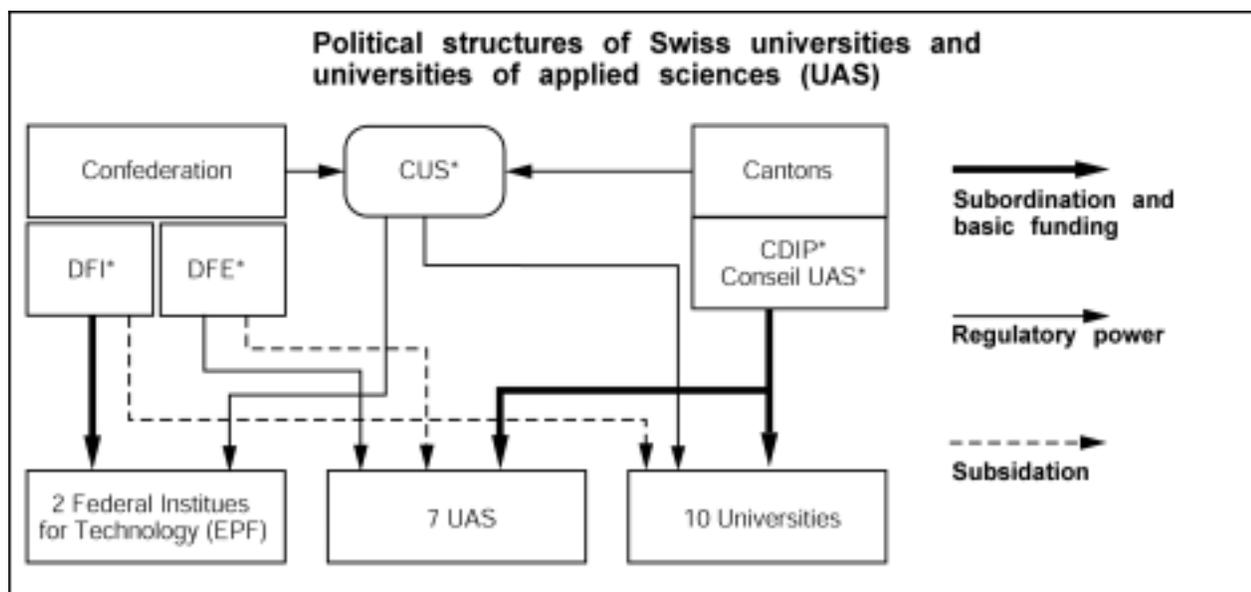
At the upper secondary level, the Confederation is responsible for vocational training, and recognition of the relevant certificates-the Federal Capacity Certificate and the Vocational Maturity Certificate-is handled at the federal level.

General education at the upper secondary level, and in the gymnasias in particular, is the responsibility of the cantons. It is the cantons that regulate the contents of the examination (the Academic Maturity Certificate or *maturité gymnasiale*) that marks the completion of these academically-oriented secondary studies. The Confederation's recognition or non-recognition of these diplomas is governed by a Decree of 15 February 1995. The diplomas certify that their holders possess the general knowledge and aptitudes they need to undertake university-level studies. There are private schools, not recognised by the Confederation, that prepare students directly for the Swiss *maturité* examination.

Shared powers at the tertiary level

At the level of higher, or tertiary, education, powers are also shared (see Figure 10). Under the new (1999) Constitution, the Confederation enacts legislation governing advanced vocational training. The Confederation therefore has responsibility both for advanced vocational training and for universities of applied sciences. In addition, it has jurisdiction over the two Federal Polytechnic Institutes, and over the promotion of research. For their part, the cantons are responsible for their respective universities, of which there are ten. The universities receive financial support from the Confederation.

Figure 10. Political structures of Swiss universities and universities of applied sciences (UAS)



*DFI: Dept. of Home Affairs

*DFE: Dept. of Economic Affairs

*CUS : Swiss University Conference

*CDIP: Conference of Cantonal Ministers of Education

*Conseil HES: Council for Universities of applied sciences

Two new Constitutional articles are being prepared—one on education generally, and the other on higher education institutions. Both seek primarily to lay the foundations for closer co-operation between the Confederation and the cantons (see Co-operation between the Confederation and the cantons).

Table 2: Overview of how powers in the realm of education are divided in Switzerland.

	Confederation	Cantons	Communes / private organisations
<i>Compulsory schooling</i>		R	S
<i>Upper secondary: general education</i>		R, S, E	S
<i>Vocational training</i>	R, E	S, E	S
<i>Tertiary: Advanced vocational training</i>	R, E	S, (R)	S
<i>UAS</i>	R, E	(R), S, E	(S)
<i>Cantonal universities</i>	R, E	R, S	
<i>Federal institutes of technology</i>	R, S		

Regulation (R): Power to make rules.

Encouragement (E): Subsidies to encourage various projects.

Supervisory authority (S): Primary responsibility and funding.

Letters in parentheses signify an exception or an exceptional case.

Educational level of the population

Looking at the educational level of the resident population by age, region and gender (see Figures 11 and 12), it can be seen that four-fifths of the Swiss population have completed some form of post-compulsory schooling. Most have completed an upper secondary vocational training course. Only one out of five persons holds a tertiary-level diploma.

As shown clearly in Figure 9, three-quarters of upper secondary school graduates received vocational training and one-quarter engaged in general studies, leading in many cases to an Academic Maturity Certificate. It is interesting to note that the percentage of these certificates depends heavily on the canton of instruction. In 1999, while the proportion was roughly 18% for Switzerland as a whole, it was nearly 32% in Geneva but less than 10% in the half-canton of Obwald and in the canton of Uri (see Table 9, Annexes).

Age is also a significant factor as regards the level of education. Persons below 45 show a sharply higher educational level than older generations: only 12% of young people aged 25 to 34 have received no post-compulsory schooling, as opposed to roughly 38% of pensioners. Despite clear strides forward, women are still under-represented at the tertiary level.

Figure 11. Educational levels in Switzerland in 2000

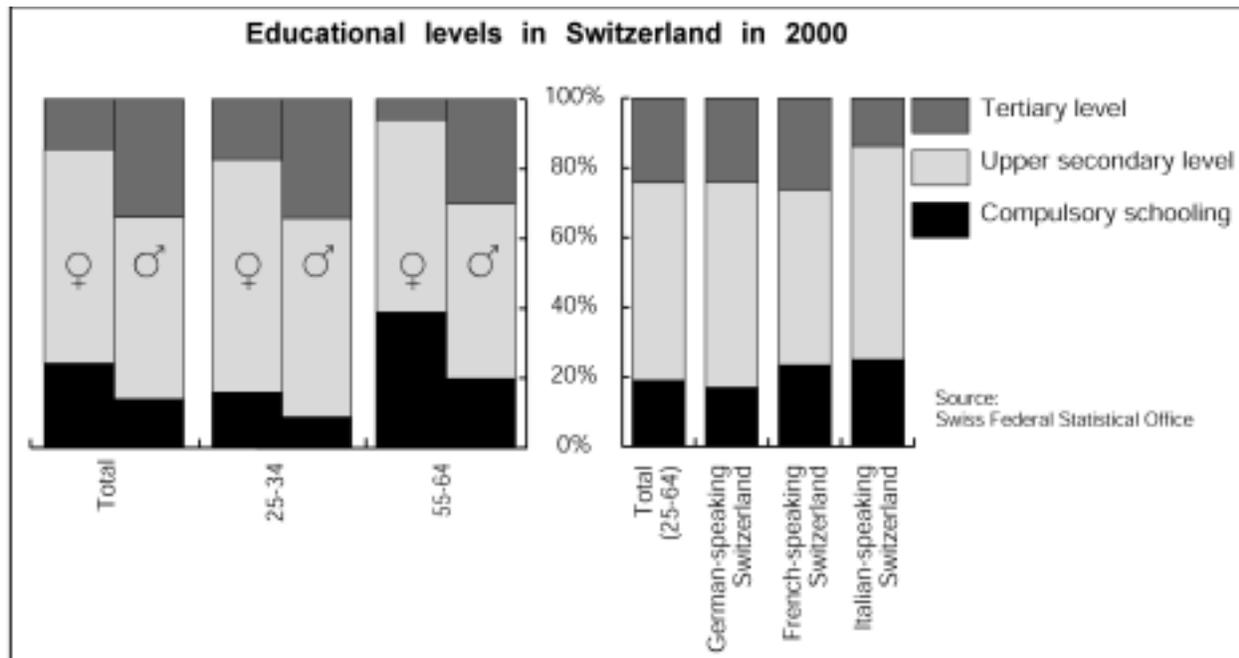
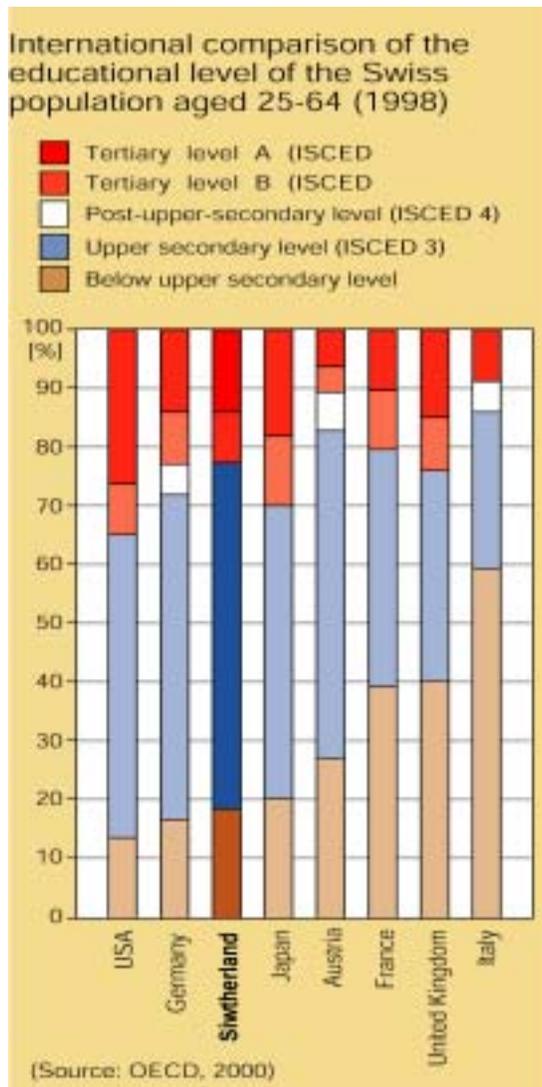


Figure 12. Swiss educational levels: An international comparison

International comparison of the educational level of the Swiss population aged 25-64 (1998)



3. Tertiary Education in Switzerland

In Switzerland, tertiary education is highly diverse and encompasses several different types of institutions, including advanced vocational training schools, universities of applied sciences, cantonal universities and federal institutes of technology. These various institutions are generally grouped into two broad categories: (1) those that dispense advanced vocational training; and (2) higher education institutions (cantonal universities, federal institutes of technology and universities of applied sciences).

Advanced vocational training

Advanced vocational training provides a whole range of courses in two types of institution, one offering initial training and the other vocational proficiency courses for upper-secondary graduates. The first group are the advanced training schools, including technical schools. The second group prepares students for vocational and advanced vocational examinations.

In the current Vocational Training Act dating back to 1978, advanced vocational training institutions are a marginal feature under the general heading of "continuing education". The Act was drafted at a time when the policy focus was elsewhere. Since then, however, higher education has evolved under the influence of personal initiative and federal efforts to broaden its scope.

A host of institutions

Advanced vocational training is characterised by strong specialisation and a host of institutions, some of them very small. The institutions differ in terms of the type and level of training provision, their educational mission, entrance requirements, length of course, the authorities (cantonal/federal) to which they report, and their sources of funding.

Of more than 300 institutions providing advanced vocational training, around half are in the public sector. One-third are private but subsidised, while the remainder are private and unsubsidised. Qualifications may be awarded by the canton, the school, associations or other institutions, and many of them are recognised at either federal or cantonal level.

In 1999, 27 000 advanced vocational qualifications were awarded. The figure has been rising sharply but steadily since 1980 (see Figure 13). The great majority of these qualifications - two-thirds - are awarded to male students. This predominantly masculine enrolment is particularly high on technical courses. Another feature of advanced vocational training is the higher graduation rate in German-speaking regions than in the rest of Switzerland (see Figure 14).

Figure 13. Increase in advanced vocational qualifications (as a % of upper secondary graduates)

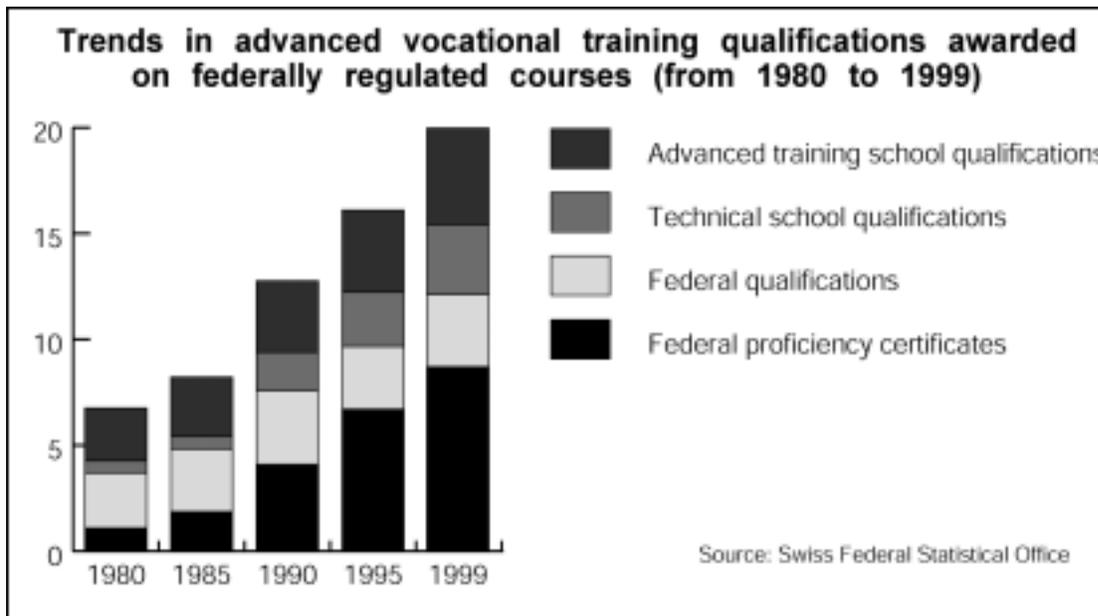
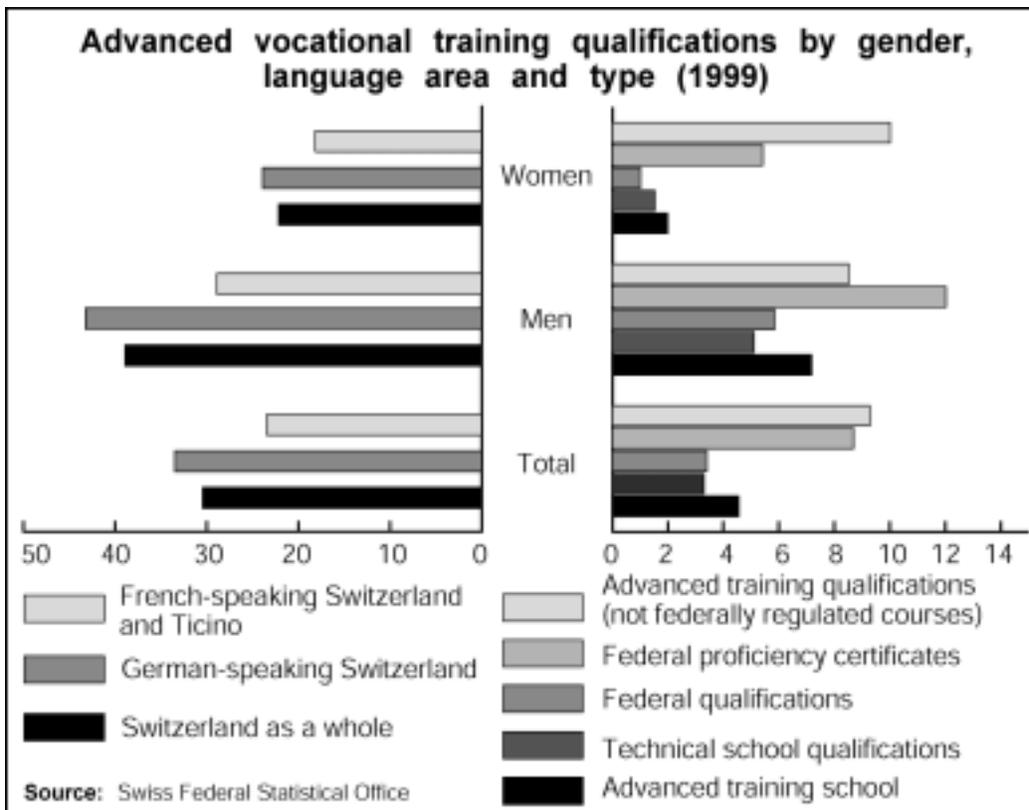


Figure 14. Breakdown of advanced vocational training qualifications



One very important point is that a number of advanced vocational training institutions have acquired the status of *haute école spécialisée*, or university of applied sciences (UAS) (see p. 46). Institutions fall into the following categories:

- **Advanced training schools, including advanced technical schools.** Advanced training school courses cover business management, catering and hotel management, tourism, business computing, forestry, and droguerie or over-the-counter pharmacy). Technical colleges provide courses on computing, mechanics, electronics, photography, multimedia and construction. Full-time courses last two years, while part-time courses last three. A combination of theory and practice, they prepare students for posts in middle management. Qualifications are recognised at federal level.
- **Vocational or professional examinations.** These lead to a proficiency certificate and establish whether candidates have the skills and knowledge to take up management posts or occupations with higher-than-average requirements. The certificate is recognised at federal level. Awards of federal proficiency certificates have risen sharply, quadrupling even since 1985. Advanced vocational examinations are mainly for craft industries, industry, technology, management and agriculture. 31% of these certificates are awarded in the service sector, 25% in management and 12% in metallurgy and machine engineering. 32% are awarded to women.
- **Advanced vocational or professional examinations.** Successful students are entitled by the federal authorities to use the title of *maître* (master) or the word *diplômé* (qualified) with regard to their profession. The examination establishes whether candidates have the skills and knowledge to manage an enterprise independently or meet high standards in their profession. Advanced vocational examinations are mainly for craft industries, industry, technology, management and agriculture. Most students enrolled on preparatory courses for advanced vocational examinations, as for vocational examinations, are already in employment. The number of advanced vocational examinations has risen by some 60% over the past ten years, but appears to be levelling out. The percentage of women graduates is still particularly low. From 8.5% in 1985 it rose to 15% in 1999. The breakdown of these qualifications is as follows: 27% are awarded in the service sector, 19% in management, 12% in sales and 11% in metallurgy and machine engineering.
- **Other tertiary-level qualifications.** These courses are not regulated at federal level. They accordingly cover all advanced vocational courses not referred to above, such as pastoral studies and advanced social work courses.

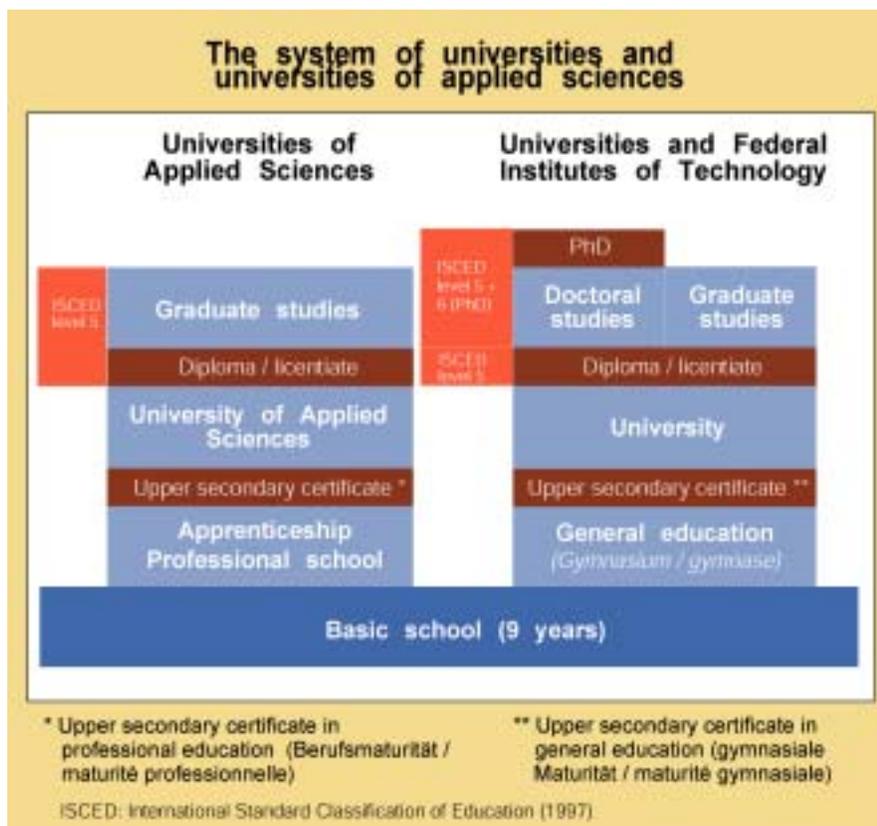
Switzerland's two-track system:

Universities and Universities of Applied Sciences

The system of universities and universities of applied sciences

When a number of advanced training schools (*écoles spécialisées supérieures*) were converted into universities of applied sciences (UAS, *hautes écoles spécialisées*), the Swiss system of higher education institutions became a two-track one, comprising universities-including cantonal universities and federal institutes of technology-and universities of applied sciences (see Figure 15).

Figure 15. The two-track system of Swiss higher education system



Powers

Powers in the realm of higher education institutions are shared between the cantons and the Confederation. Ten cantons each possess their own cantonal university. In addition, a canton or group of cantons may have primary responsibility for a university of applied sciences. Under the Constitution, the Confederation plays a dual role in the administration of the higher education institutions: first, it subsidises cantonal universities and universities of applied sciences; and second, it is responsible for the institutions of the domain of federal institutes of technology (ETH domain). With regard to universities of applied sciences, the Confederation is empowered to regulate the following fields of study: technical and architectural studies, economics and administration, agriculture, and applied arts.

The Federal Commission for universities of applied sciences (*Commission fédérale des hautes écoles spécialisées, CFUAS, www.bbt.admin.ch/fachhoch/efhk/f/*) was instituted by the Federal Council for the purpose of advising the operational authorities on any issues involving universities of applied sciences. It lays the groundwork for decisions of the Federal Council and the Department of Economic Affairs relating, *inter alia*, to UAS certification and quality management. Accordingly, it provides advisory opinions in response to inquiries concerning the creation and management of UAS, the awarding of federal subsidies, UAS compliance with required conditions, requests for recognition of UAS diplomas, admissions requirements, etc.

Bodies subsidiary to the Federal Department of Home Affairs

The group of federal agencies for Science and Research (GSR, *Groupement de la science et de la recherche - Gruppe für Wissenschaft und Forschung*)

This grouping of several offices and agencies (www.gwf-gsr.ch) within the Federal Department of Home Affairs consists of the State Secretariat for Science and Research, of the Space-Agency and of the Federal Office for Education and Science. The group's task is to work on all questions of national and international policy of science and technology, of university education and research.

State Secretariat for Science and Research

One of the tasks of the State Secretariat for Science and Research is to prepare and implement decisions conducive to a coherent policy in the realm of science, research and university instruction. It must also maintain contacts with foreign partners and develop international relations, with the European Union in particular. The State Secretariat is headed by a Secretary of State, one of whose responsibilities is to head the policy sector for science, research and university instruction. He advises the head of the Federal Department of Home Affairs regarding all policy matters in the areas of science, research, training and university instruction.

Federal Office for Education and Science

The Federal Office for Education and Science (*Office fédéral de l'éducation et de la science, OFES, www.admin.ch/bbw*) is the Confederation's competent authority for national and international issues involving education in general, university instruction and research. *Inter alia*, the Office has responsibility for implementing policies in the realms of science, research, university instruction and education. It also lends encouragement to cantonal and other universities, cantonal projects, agencies that encourage research, research institutes and related scientific services. It recognises cantonal "maturity certificates" (*certificats de maturité*) and foreign diplomas, sets up federal maturity examinations and awards training subsidies.

ETH Board

The ETH Board (*Conseil des écoles polytechniques fédérales, CEPF, www.ethrat.ch/index.fr.html*) administers the domain of federal institutes of technology, which comprise the two federal institutes of technology, in Lausanne (EPFL) and in Zurich (ETHZ), along with four research institutes [the Paul Scherrer Institute (*Institut Paul Scherrer, IPS*), the Federal Institute for Woodland, Snow and Landscape Research (*Institut fédéral de recherches sur la forêt, la neige et le paysage, FNP*), the Federal Laboratory for Materials Testing and Research

(Laboratoire fédéral d'essai des matériaux, LFEM), and the Federal Institute for Water Supplies, Waste Water Treatment and Water Resources Protection (Institut fédéral pour l'aménagement, l'épuration et la protection des eaux, IFAEPE)]. The Council's main responsibilities are to coordinate and develop strategic plans, appoint teaching staff and senior officials, and allocate resources.

Since 1 January 2000, the ETH Board has been concluding annual agreements and overall budgets with each of the six institutes. Each establishment is then free to use those resources as it sees fit. For its part, every four years the Board prepares a report to the Federal Council on the institutes' activities.

Bodies subsidiary to the Federal Department of Economic Affairs

Federal Office for Professional Education and Technology

The Federal Office for Professional Education and Technology (Office fédéral de la formation professionnelle et de la technologie, OFFT, www.admin.ch/bbt) is the body that implements federal government policy in the areas of vocational and advanced vocational training, universities of applied sciences, technology and innovation. Its primary strategic missions are to keep vocational training up to date, integrate universities of applied sciences into the Swiss system of higher education institutions, encourage applied research and development, and set up networks of excellence in promising sectors of the economy. It acts through the universities of applied sciences and the Commission for Technology and Innovation (Commission pour la technologie et l'innovation, CTI).

Bodies common to the Confederation and the cantons

Swiss University Conference

The Swiss University Conference (Conférence universitaire suisse, CUS, www.cus.ch) is a joint body in which the Confederation and the cantons work together on policy for the universities. Its membership includes the ministers of education of cantons that have universities, representatives of the other cantons, the State Secretary for Science and Research and the President of the ETH Board. Since 1 January 2001, the Conference has enjoyed real decision-making power in a number of areas. These decisions cover all Swiss universities and may involve the length of studies, recognition of previous studies, financial support for national projects, recognition of institutions and courses of study, and evaluation of teaching and research.

Accreditation and Quality Assurance Body

In 2001, a new independent Accreditation and Quality Assurance Body (Organe d'accréditation et d'assurance qualité, OAQ, www.oaq.ch) came into being in Switzerland. The body's tasks are to set quality assurance-related requirements and to check compliance on a regular basis. It makes proposals for nation-wide implementation of a procedure for certifying institutions wishing to obtain accreditation for themselves or for one of their particular courses of study. In the light of directives of the Swiss University Conference, it verifies the legitimacy of accreditation. It performs its tasks on behalf of the Swiss University Conference.

Bodies subsidiary to the cantons

Swiss Conference of Cantonal Ministers of Education (EDK/CDIP)

Bringing together all of the country's cantonal ministers of education, the Swiss Conference of Cantonal Ministers of Education (Conférence suisse des directeurs cantonaux de l'instruction publique, CDIP, www.cdip.ch) has overall responsibility for education policies at the primary and secondary levels, and, with respect to the tertiary level, for professions not regulated at the federal level and for universities of applied sciences subject to cantonal authority. The Conference and the Confederation work together in particular on matters concerning vocational training and universities of applied sciences, recognition of secondary school diplomas, aid to universities, development of scholarship programmes, specialised instruction, the promotion of culture and sport as well as public health. With regard to certain particular issues, it consults with the Conference of Cantonal Ministers of Public Health (Conférence des directeurs cantonaux des affaires sanitaires, CDS), the Conference of Cantonal Ministers of Economic Affairs (Conférence des directeurs cantonaux de l'économie publique, CDEP) and the Conference of Cantonal Ministers of Social Affairs (Conférence des directeurs cantonaux des affaires sociales, CDAS).

Council for universities of applied sciences

The Council for universities of applied sciences (Conseil des hautes écoles spécialisées, CUAS) was created in 1995 by the Swiss Conference of Cantonal Ministers of Education. It is comprised by the ministers of education of the cantons responsible for universities of applied sciences. Jointly with the Confederation, this intercantonal body performs development and co-ordination functions. It regularly holds joint sessions with the Swiss University Conference.

Executive bodies of universities and of universities of applied sciences

Rectors' Conference of the Swiss Universities

The Rectors' Conference of the Swiss Universities (Conférence des recteurs des universités suisses, CRUS, www.crus.ch) was founded in 1904 by Switzerland's universities. Since 2001, the Conference has had new by-laws. Its mission, carried out through periodic sessions, is to deal with all matters requiring mutual agreement or joint positions. Primarily, these involve curricula, syllabi, examination rules, diploma requirements and harmonisation of higher education admissions requirements. Pursuant to the Co-operation Agreement, the Conference performs its duties on behalf of the Swiss University Conference.

Swiss Conference of universities of applied sciences

The Swiss Conference of universities of applied sciences (Conférence suisse des hautes écoles spécialisées, CSUAS) brings together the administrators of the seven universities of applied sciences. An independent body, it harmonises the UAS' development at the operational level. It also works with the Confederation on technical matters via the Federal Office for Professional Education and Technology. Through its representation on the Council for universities of applied sciences, the Conference can advocate its position in that forum and carry out particular mandates for the Council.

Legal foundations

Specific laws and legal instruments regulate the creation, organisation, operation and administration of the various institutions of Switzerland's higher education system.

Aid to Universities Act

Known formally as the *Federal Act on Aid to Universities and Co-operation in Higher Education (Loi fédérale sur l'aide aux universités et la coopération dans le domaine des hautes écoles, LAU)*, this law of 8 October 1999 does more than just govern subsidies to cantonal universities. Inter alia, it delegates decision-making powers in certain areas to the Swiss University Conference. It also calls for the creation of an independent accreditation and quality assurance body. This new Act altered the mechanism for subsidising universities. Basic subsidies are calculated according to services provided. The number of students is an indicator of the level of service. The system is predicated on the principle that funding should "follow" students. The Act also provides for "project-related contributions", which also corresponds to a principle that is one of the pillars of the legislation—that of awarding priority to excellence. This funding should encourage innovation and co-operation amongst universities.

The federal parliament deliberately restricted the validity of the Act to a maximum of two subsidy periods, or eight years (i.e. to 2007). This limitation, which effectively applies time pressure, should be conducive to further innovation, in particular on the basis of the new Constitutional article on higher education institutions.

Federal Institutes of Technology Act

The *Federal Institutes of Technology Act (Loi sur les écoles polytechniques fédérales, Loi sur les EPF)*, which entered into force on 1 February 1993, underscored the autonomy and responsibilities of these six establishments, which enjoy full control over their own management resources.

The Act provides a very succinct statement of the objectives pursued by the Confederation, and of the missions of the six institutes of technology. It states that the scientific disciplines to be covered by the institutes are engineering, natural sciences, architecture, mathematics and related fields.

The Act also guarantees that the federal institutes of technology and research institutes shall be autonomous in their administration and operations. On 19 December 1997, the Federal Council made that autonomy a reality with a view to management by service mandates and independent accounting; since 1 January 1999, the institutes have been solely responsible for their buildings (investment and upkeep). Insofar as the legal foundations for this are partially insufficient, and because, in addition, the issue of the institutes' autonomy is once again under discussion, the Act is being revised.

The aim of this revision is to update the organisational structure to bring it in line with today's requirements, and to lay the legal foundations for the institutes to take part in private or publicly-owned undertakings in order to promote technology transfers, which are vital for the Swiss economy. Moreover, the principles of the new regime for federal employees are to be incorporated into the legislation governing the federal institutes of technology in a manner tailored to their needs.

Universities of applied sciences Act

In respect of fields within the Confederation's jurisdiction, the universities of applied sciences are governed by the Federal Universities of applied sciences Act (Loi fédérale sur les hautes écoles spécialisées, LUAS) of 6 October 1995. Under the Act, the Confederation must encourage the creation and development of UAS in the fields of industry, arts and crafts, services, agriculture and forestry economics, in particular by regulating the schools' tasks, recognising their diplomas and providing them with financial support. Together with the cantons, the Confederation facilitates the division of tasks and co-operation across the broad spectrum of universities of applied sciences, at the national and regional levels. It takes account of international co-operation.

It is this legal foundation that the cantons have used to enact their own laws governing the creation and management of universities of applied sciences, whether they fall under the regulatory authority of the Confederation or the cantons.

Cantonal laws governing universities

In recent years, all of the cantons having a university have overhauled the relevant legislation, regulations and by-laws, either wholly or in part. These provisions incorporate-albeit to varying extents-the principles already formulated in the early 1990s, by the Council for Science in particular, that the required increase in efficiency in university administration and management, along with the attendant spirit of enterprise, is possible only if universities are afforded greater freedom of action.

Clearly, the universities' autonomy and individual responsibility are being strengthened by these legislative amendments in the realms of university organisation and administration (consolidation and professionalisation of management), personnel (recruitment, promotion and compensation) and finance (autonomous internal allocation of financial resources).

Intercantonal Concordat and Co-operation Agreement

In order to give the Swiss University Conference real decision-making authority, the Confederation delegated certain powers to it in the Aid to Universities Act. For their part, the parliaments of university cantons took similar action by concluding a university co-operation concordat on 9 December 1999. This paved the way for an agreement between the Confederation and the university cantons on co-operation in the realm of universities. It was signed on 14 December 2000 by the Federal Council and the relevant cantonal ministers of education. The Convention instituted the Swiss University Conference and the Accreditation and Quality Assurance Body; it officially recognised and delegated certain tasks to the Rectors' Conference of the Swiss Universities.

Intercantonal University Agreement

The Intercantonal University Agreement (Accord intercantonal universitaire, AIU) regulates intercantonal admission to universities on the basis of equal treatment, and it sets the compensation that the cantons pay to the university cantons. In addition, it provides for implementation of a co-ordinated Swiss university policy.

Intercantonal Agreement on universities of applied sciences

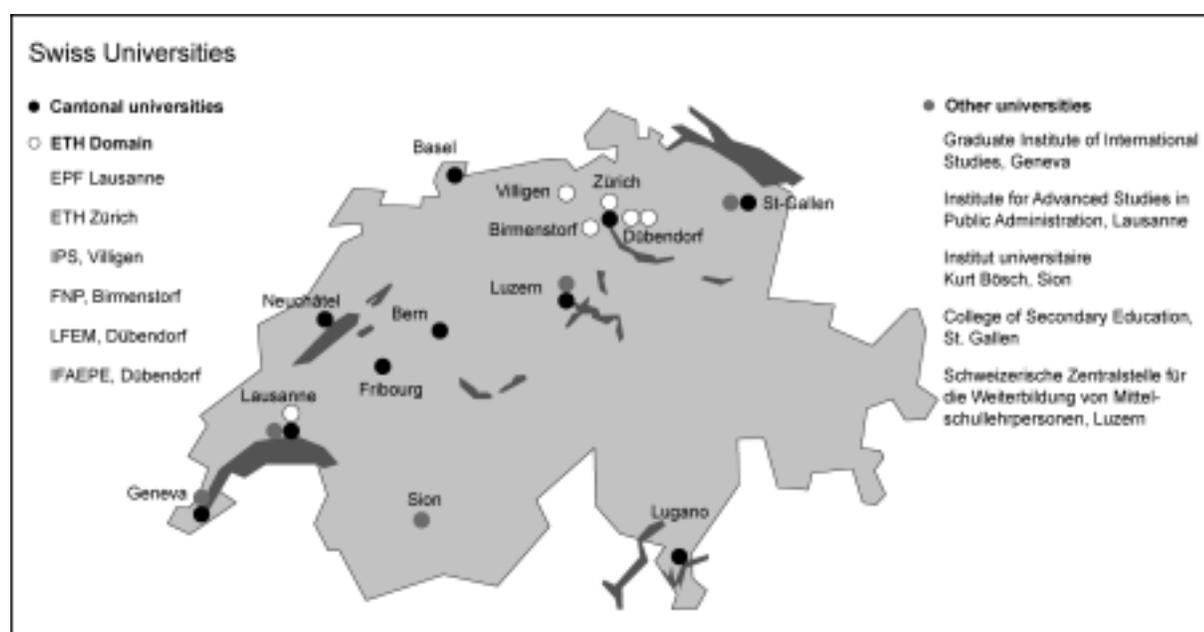
The Intercantonal Agreement on universities of applied sciences (Accord intercantonal sur les hautes écoles spécialisées, AUAS) regulates admissions to the UAS on an intercantonal level

and sets the contributions to be paid to UAS authorities by the cantons in which students reside. The purpose of the Agreement is thus to promote balance in the financial burden between the cantons, along with free access to studies, and to optimise the training on offer from the UAS. In addition, it helps harmonise policy for higher education institutions.

Universities

There are three types of universities in Switzerland: cantonal universities, federal institutes of technology, and other educational institutions classified as universities (see Figure 17).

Figure 17. Swiss Universities and their institutions



Cantonal universities

There are ten cantonal universities in Switzerland: those of Basel, Bern, Fribourg, Geneva, Lausanne, Lucerne, Neuchâtel, St. Gallen, Italian-speaking Switzerland and Zurich. Most of them have been evolving over a number of centuries in step with societal and economic needs, always in harmony with a humanist ideal.

The oldest Swiss university is that of Basel. It was founded in 1460 and has thus been in existence for over half a millennium. The Universities of Italian-speaking Switzerland and Lucerne are the most recent. The former was created in 1996 and comprises three faculties-architecture, economics and communication sciences. In Lucerne, while the Faculty of Theology has been in existence since the 16th century, the school was not classified as a university until May 2000.

Federal institutes of technology

Since the mid-19th century, the Confederation has played an active role in national science policy. While it began by creating its own polytechnic in Zurich, the Confederation now has six schools comprising the federal institutes of technology: the two federal institutes of technology, in Lausanne (EPFL) and in Zurich (ETHZ), and four research institutes-the Paul Scherrer Institute, the Federal Institute for Woodland, Snow and Landscape Research, the Federal Laboratory for Materials Testing and Research, and the Federal Institute for Water Supplies, Waste Water Treatment and Water Resources Protection.

Other higher education institutions

In addition to the cantonal universities and federal institutes of technology, Switzerland has five other educational institutions that may be considered universities insofar as they meet the federal subsidy requirements laid down in Article 11 of the Aid to Universities Act.

These institutions are the Graduate Institute of International Studies (Institut universitaire de hautes études internationales, IUHEI), the Institute for Advanced Studies in Public Administration (Institut de hautes études en administration publique, IDHEAP), the Institut Universitaire Kurt Bösch (IUKB), the College of Secondary Education of St. Gallen and the Schweizerische Zentralstelle für die Weiterbildung von Mittelschullehrpersonen.

Admissions requirements

Generally, the requirements for admission to Swiss universities include being at least 18 years old, mastering the language of instruction and possessing an Academic Maturity Certificate or equivalent secondary diploma recognised by the university. Such diplomas are obtained after a general course of upper secondary school studies. On an exceptional basis, and depending on the university, other criteria may be possible (e.g., dossier, examination, secondary diploma not recognised by the federal examining board, etc.).

Admission to medical and veterinary schools has been restricted to a limited number of places in the Universities of Basel, Bern, Fribourg and Zurich because of increasing enrolments and a lack of teaching capacity.

Who does what? (see Table 3)

Although each cantonal university has its own particularities, most have similar structures. As a rule, they have faculties of law, natural and exact sciences, economics and social sciences, humanities and letters. There are special cases, however. For example, not all of the universities have faculties of medicine, theology and architecture. Likewise, the psychology and education sciences department of the University of Geneva and the communications sciences department of the University of Italian-speaking Switzerland are the only ones of their kind. There are other examples as well. In line with the spirit of the times, the new universities of Italian-speaking Switzerland and of Lucerne have a more "targeted", and less "universal", structure. The University of St. Gallen also has this type of targeted structure, with courses in the fields of law, economics and political science.

Table 3. Fields of study in Swiss universities

Who offers what? Overview of the main fields of study

Fields of study	Uni BS	Uni BE	Uni FR	Uni GE	Uni LS	Uni LU	Uni TI	Uni NE	Uni SG	Uni ZH	EPFL	ETHZ
Theology	•	•	•	•	•	•		•		•		
Law	•	•	•	•	•	•		•	•	•		x
Economics	•	•	•	•	•		•	•	•	•		x
Social and political science	•	•	•	•	•	•	•	•	•	•		x
Psychology and pedagogy	•	•	•	•	•			•	x	•		x
Philosophy, languages, literature, ethnology	•	•	•	•	•	•	x	•		•		X
History	•	•	•	•	•	•	x	•		•		x
Exact and natural sciences	•	•	•	•	•		x	•		•	•	•
Medicine and pharmacy	•	•	•(1)	•	•			•(1-2)		•		•
Architecture and engineering				•			•	•(1)			•	•

• Major
x Minor

1 First cycle only

2 First year of study only

A more detailed version of this table can be found in the Annex to this report.

On the whole, the federal institutes of technology in Lausanne and Zurich are focused on the exact sciences, technical sciences and architecture. They have, however, developed special areas of competence, such as natural sciences and engineering in Zurich and microtechnics in Lausanne. In order to increase the selection of course offerings, there are a number of co-operative programmes between the universities and the federal institutes of technology.

Particular aspects of Swiss universities

Rising enrolments

In the winter semester of 2000, nearly 100 000 students were enrolled in Swiss universities—a nearly 60% rise from 1980 (see Figure 18). Of all the students enrolled in 2000, just under 20 000, or nearly 20%, were first-year students. Dividing this number of first-year students in 2000 by the aggregate permanent resident population of the same age (21) yields the proportion

of young people embarking upon university studies, which comes to nearly 20% (see Figure 19). A majority of students were enrolled in a faculty of human and social sciences (see Figure 20).

Figure 18. University enrolments by gender

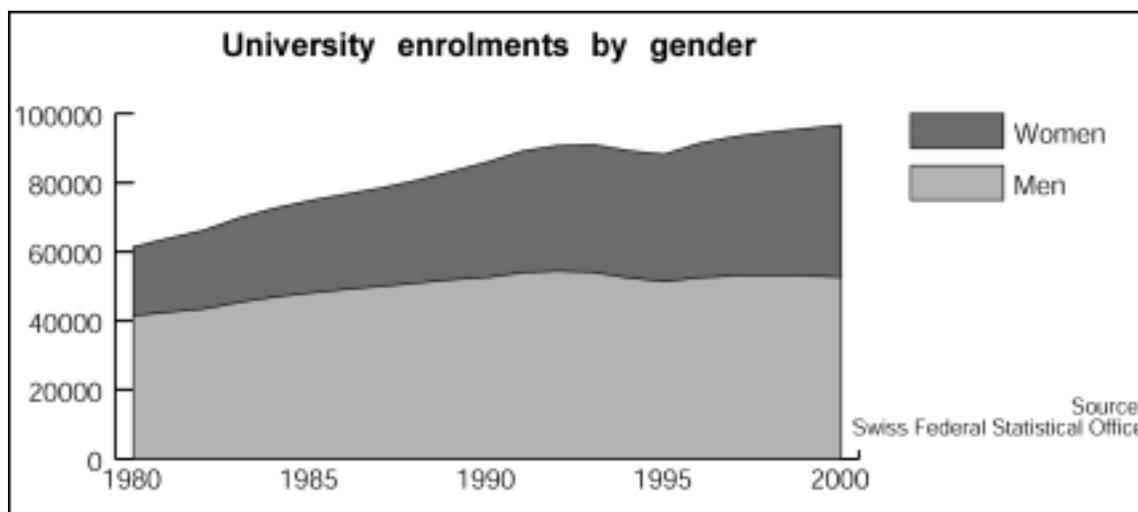


Figure 19. Proportion of young people beginning university studies by gender

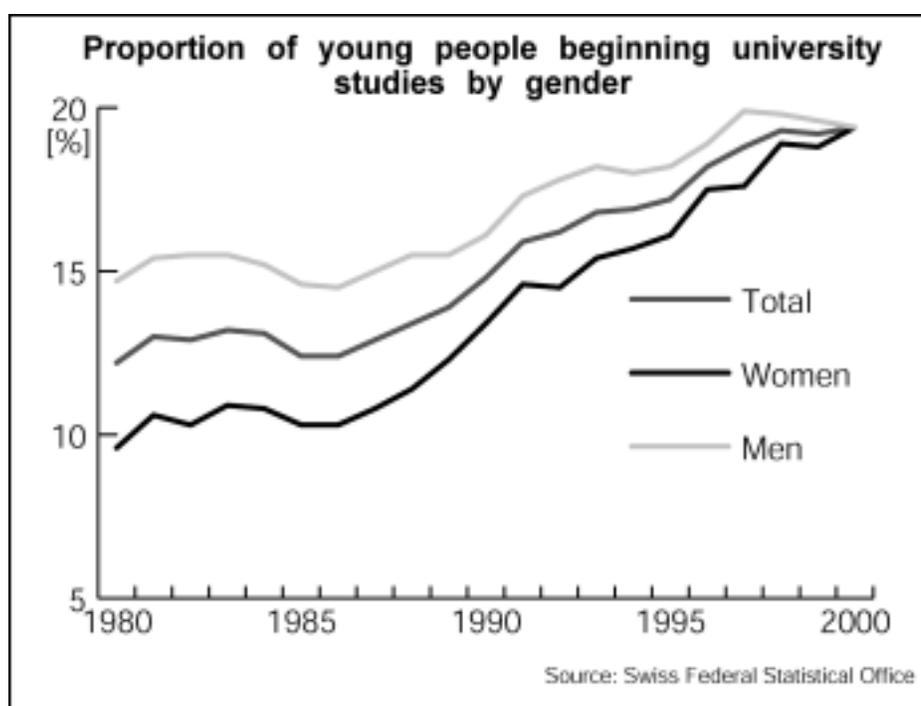
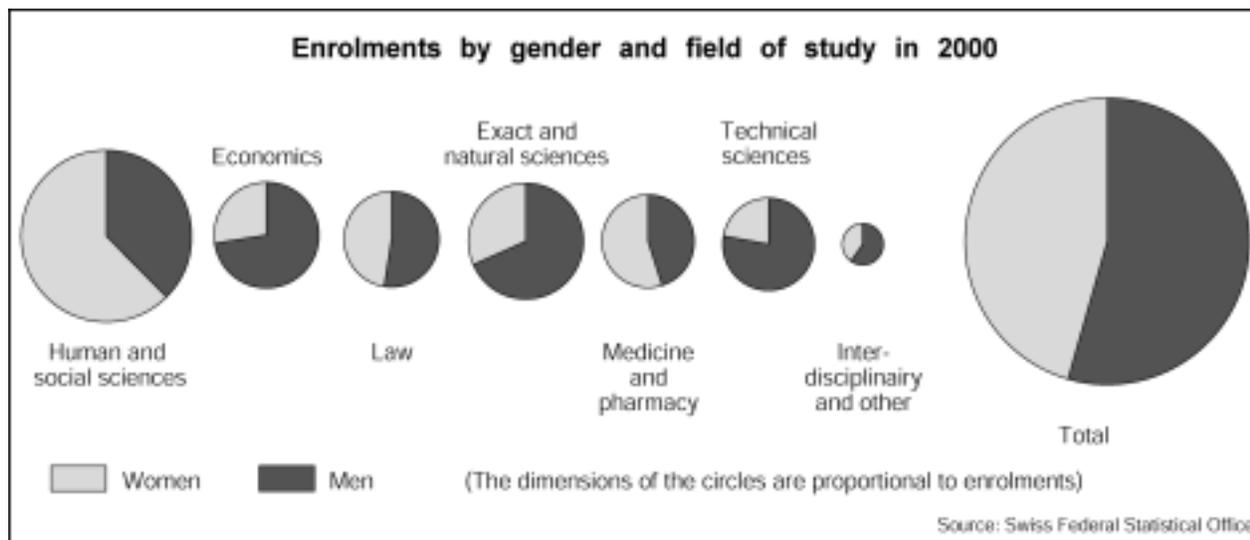
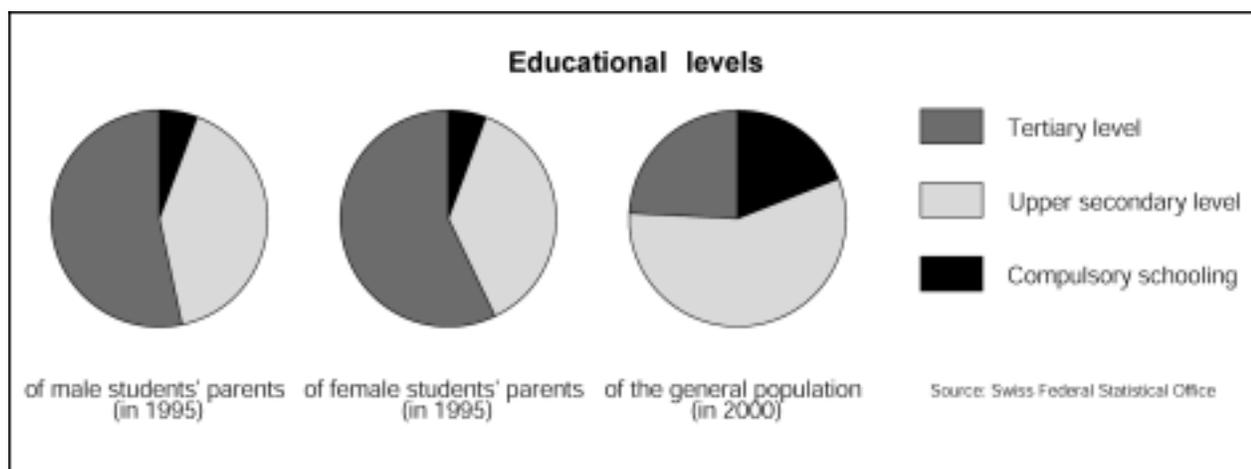


Figure 20. Enrolments by gender and field of study in 2000



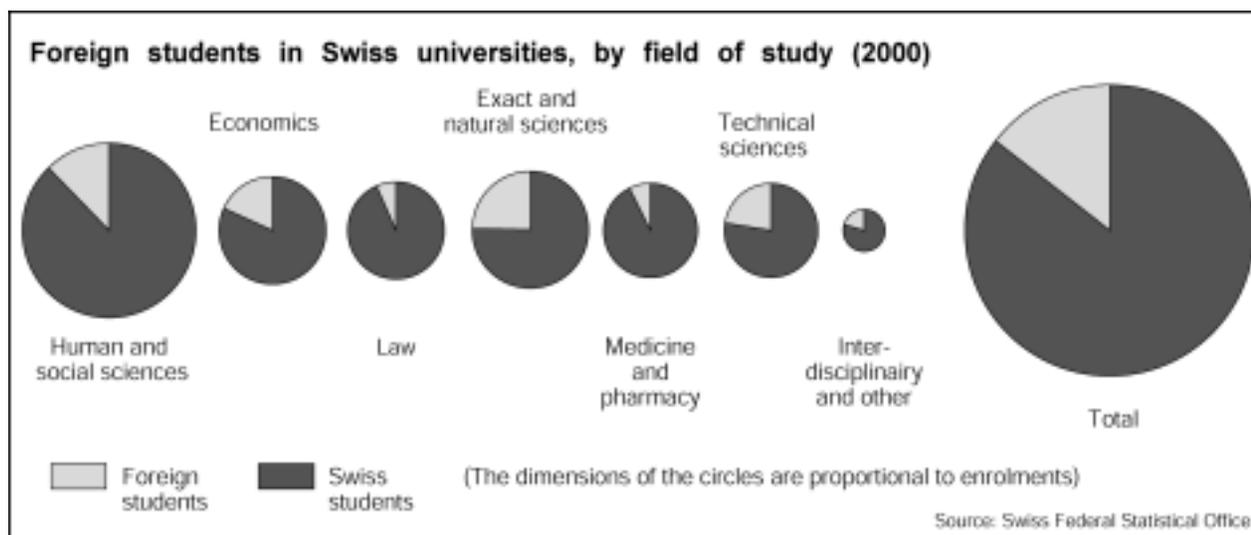
While the proportions of male and female students are not yet equal, they are getting close. While in 1980 nearly 70% of students were male, the proportion of men dropped to "only" 55% in 2000. Other parameters also help determine whether or not young people go to university. For example, a student's social background plays a decisive role (see Figure 21).

Figure 21. Students' social background by parents' educational level

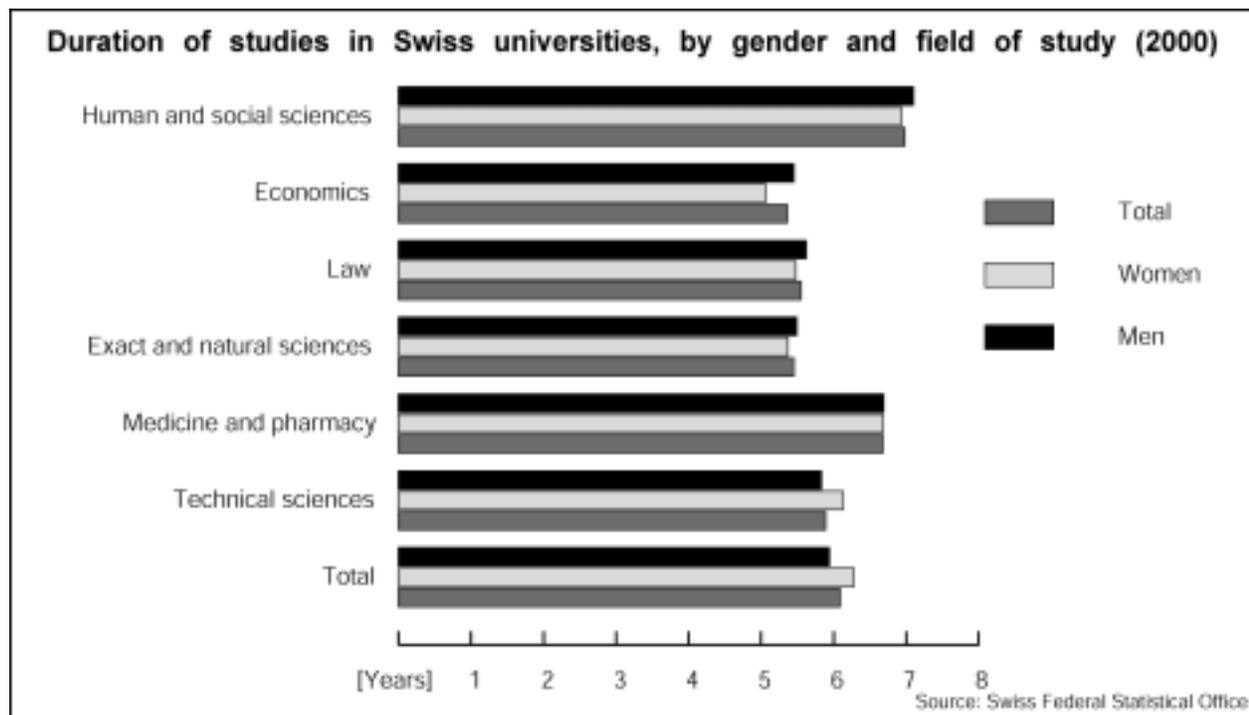


Foreign students account for roughly one-fifth of total university enrolments (see Figure 22). This proportion has varied only slightly since 1980. Three-quarters of these students hold European passports. Seventy per cent of the foreign students have come to Switzerland especially to study, while the remaining 30% were already living in the country and attended school there. The proportion of foreign university students tends to be higher in French- and Italian-speaking Switzerland than in German-speaking parts of the country.

Figure 22. Foreign students in Swiss universities, by field of study (2000)



On average, it takes six years for a Swiss university student to obtain a diploma or bachelor's degree, although the length of time varies by field of study. While a student of human sciences will take nearly seven years, a student of economics will require less than five and a half (see Figure 23). In any given field, male and female students will take practically the same number of semesters to complete their studies. Overall, however, the average length of studies is slightly longer for women than for men (at 6.3, versus 5.9, years). This is due primarily to the fact that nearly 50% of all female students are enrolled in human and social sciences, where studies are longer, whereas only a quarter of male students are engaged in that type of studies.

Figure 23. Duration of studies in Swiss universities, by gender and field of study (2000)

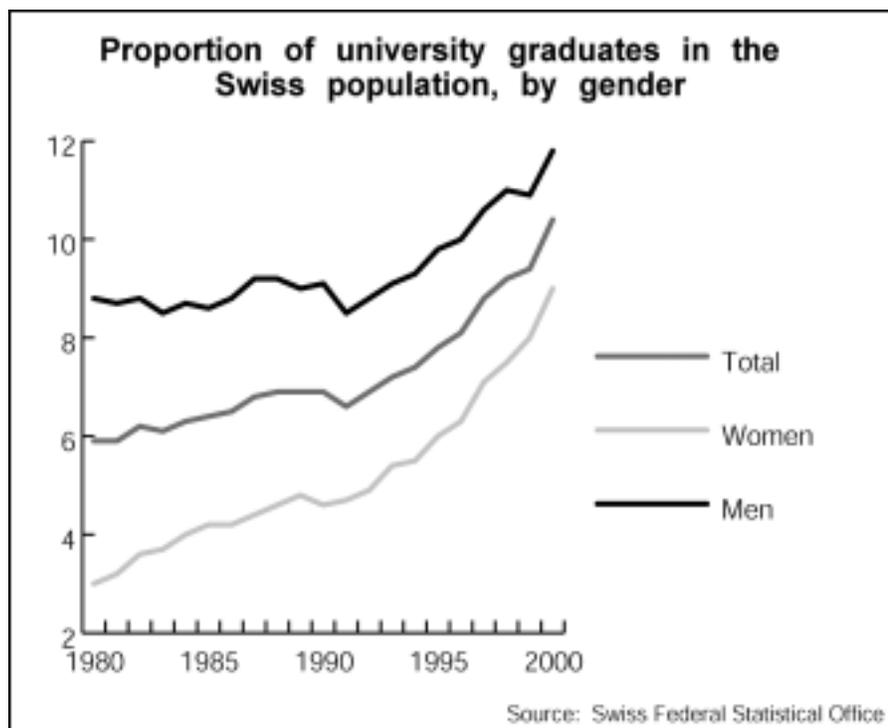
Structure of studies

University studies are generally divided into a first and a second cycle. The first cycle—which varies in length, depending on the school and field of study, from two to six semesters; as a rule, it lasts four semesters—is generally more structured than the second. In other words, the curriculum is regulated more strictly, and student achievement is tested more regularly. The first cycle is an introduction to the chosen field of study, conveying basic knowledge and methodology valid for the entire field, irrespective of subsequent specialisation. In many cases, it also involves selection. The second cycle generally lasts four semesters as well and imparts more extensive knowledge of the field in question, and it often involves an initial specialisation. Theoretically, university studies culminate after eight semesters or four years in the award of a bachelor's degree or a diploma.

The number of examinations varies from one school and field of study to another. The first cycle generally ends with an examination that must be passed for admission to the second cycle. Successful completion of the final examination qualifies a student for a degree.

Proportion of university graduates

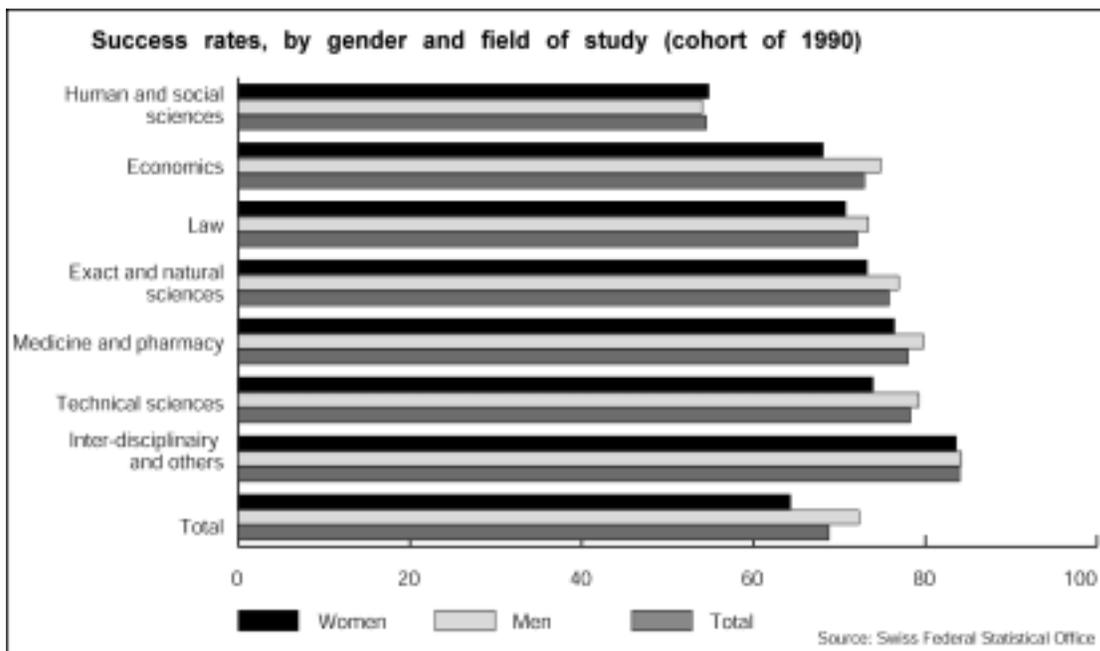
In 2000, nearly 10 000 students received a diploma or a bachelor's degree. This represents an 80% rise from 1980, and it also corresponds to a proportion of university graduates that is slightly over 10% of the population (see Figure 24)—calculated as the ratio of university graduates in a given year to the permanent resident population of 27-year-olds. The number of doctorates awarded in 2000 was slightly over 2 700—an increase of about 55% over 1980.

Figure 24. Proportion of university graduates in the Swiss population, by gender

Success rates and dropping out

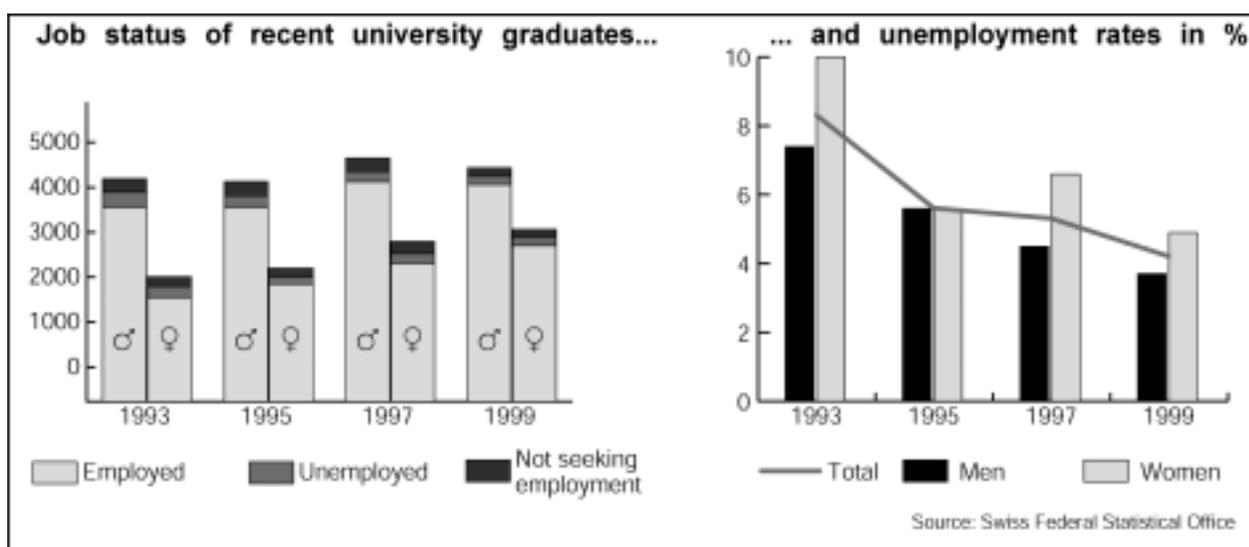
Observations conducted in 2000 on a cohort of students undertaking university studies in 1990 show that the success rate is approximately 70%. This figure represents the proportion of the cohort, to date, having completed their studies by receiving a bachelor's degree or a diploma. The success rate is slightly lower for women than for men, at 64% versus 72%, stemming in great part from the fact that women are highly represented in human and social sciences, where the success rate is least high (see Figure 25).

Figure 25. Success rates, by gender and field of study (cohort of 1990)



An indicator of the difficulty of entering into work, and of the attractiveness of university degrees in the labour market, the unemployment rate of new graduates has been declining steadily over the past ten years (see Figure 26).

Figure 26. University graduates in the labour market



Even so, the entry level for people beginning to work varies from one field of study to another. For many graduates, their education does not end with an initial university degree; on the contrary, they continue their studies in pursuit of a higher degree or seek other-often vocational-training outside the system of higher education institutions. Such is the case for a majority of theologians, jurists and medical graduates.

The situation is very different for graduates in the social and human sciences, who tend not to be oriented towards clearly defined occupational fields, and there are practically no related professions that are regulated at the federal level. These graduates must find their own way in some occupational category.

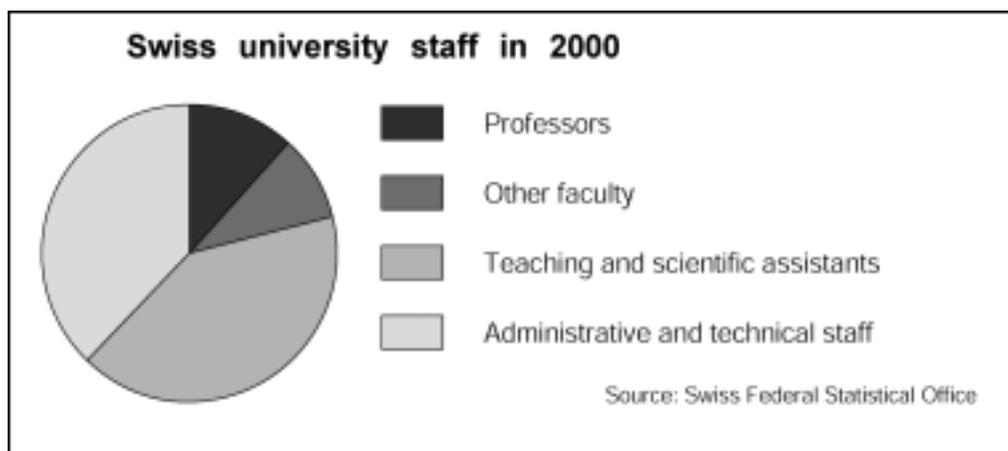
Another option for post-graduate training open to all university graduates is to become a teaching assistant in a UAS or university; such posts are generally given to students planning to write a doctoral dissertation. On the whole, roughly one-fifth of new graduates remain at university after obtaining their first degree. Among graduates in the natural sciences, the proportion is far greater still.

It is also interesting to note that in response to the question "Do you think that your job matches your training from the standpoint of being able to use your knowledge or your abilities?", over 60% of graduates responded "yes", 25% "more or less", and the remaining 15% "no" or "not really". This question was asked in connection with a 1999 survey of new graduates by the Federal Statistical Office. The response gauges new graduates' subjective perceptions of their jobs relative to the qualifications they obtained at school.

University staff

In 2000, Switzerland's universities employed a staff of some 45 000 people, corresponding to roughly 26 000 full-time equivalents. Of these, 10% were professors and 35% were administrative and technical staff (see Figure 27). The remaining positions were filled by other faculty members, and by teaching and scientific assistants. These last two categories belong to what is known as the *corps intermédiaire*, or middle-level teaching staff. The former is also sometimes known as the "upper middle-level teaching staff" (*corps intermédiaire supérieur*) and comprises privatdocents, instructors, lecturers, guest professors and teaching and research fellows. The category of teaching and scientific assistants is sometimes called the "lower middle-level teaching staff" (*corps intermédiaire inférieur*).

Figure 27. Swiss university staff in 2000



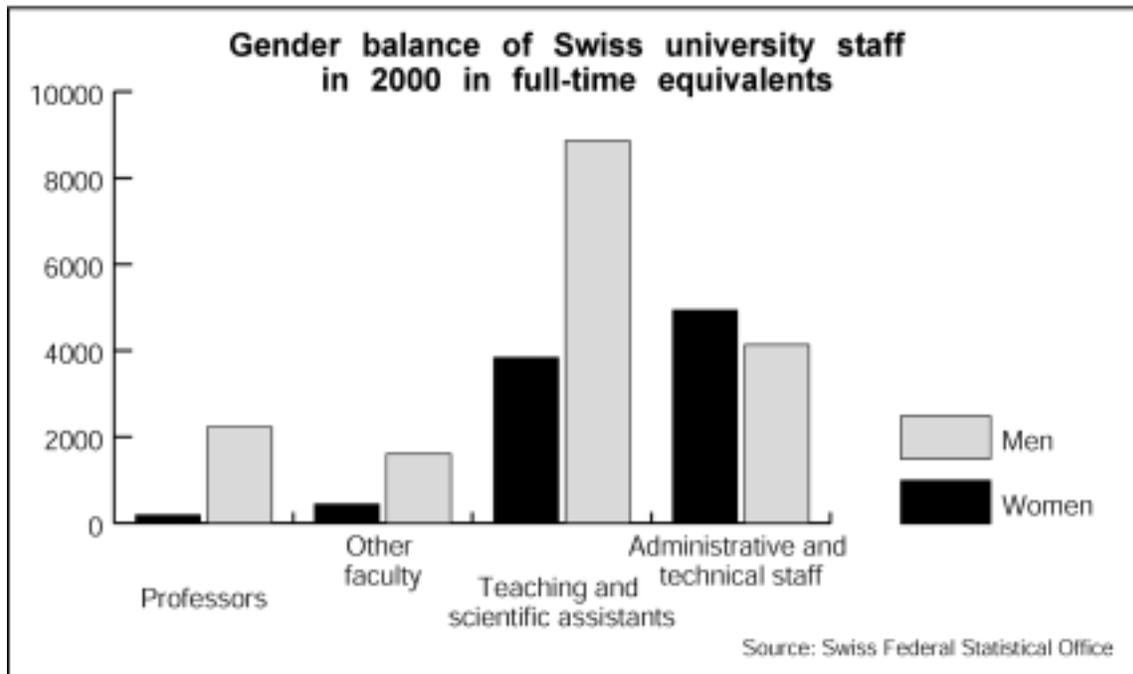
A 1997 study profiling middle-level teaching staff in the fields of biology, history and business administration shows that these people are active primarily in research and teaching. On average, lower middle-level teaching staff devote half of their time to research. In comparison, the average upper middle-level teacher devotes more time to teaching.

Lower middle-level teachers are considered still in training. They themselves view their status as temporary and are consequently more willing to accept low wages. In some fields, the low levels of compensation diminishes the appeal to graduate students of middle-level teaching positions.

In contrast, upper middle-level teachers consider that they have completed their training period. On average, they are 45 years old and have been working for over 13 years. As a result, many of them hold long-term appointments in a university.

The percentage of women on the teaching staff of Swiss universities is low. In 2000, only 8% of professors were women (see Figure 28). Even so, the percentage has almost quadrupled since 1985, when it was scarcely more than 2%. In all, women accounted for 35% of the staff of Swiss universities in 2000. The highest proportion was for administrative and technical personnel, where women had attained parity with men.

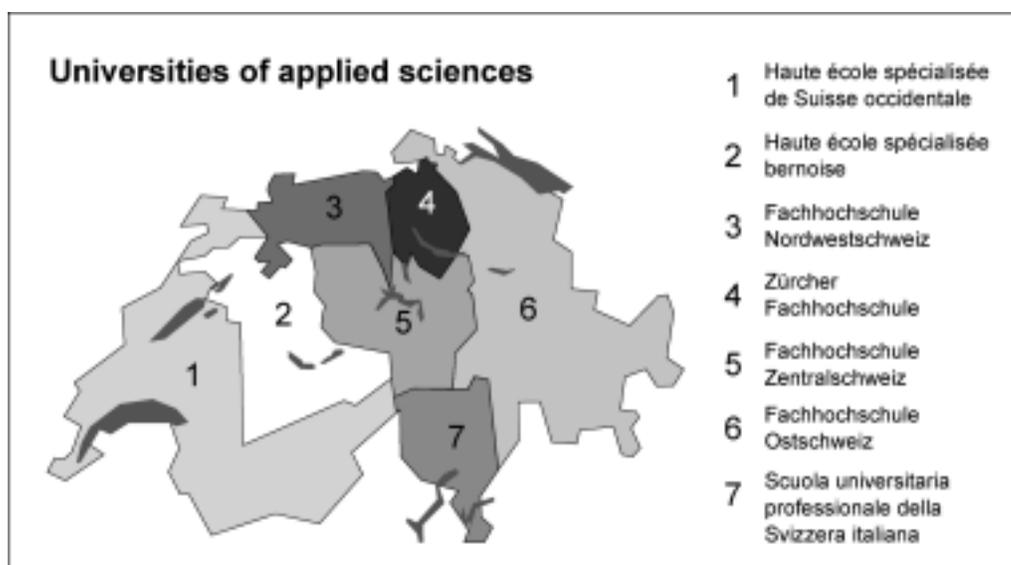
Figure 28. Gender balance of Swiss university staff in 2000 in full-time equivalents



Universities of applied sciences

When the universities of applied sciences Act entered into force on 6 October 1995, the Federal Council approved the creation of seven universities of applied sciences. This authorisation was for a limited amount of time, expiring at the end of 2003. It was subject to specifications for the multi-stage introduction of a system of UAS (see Figure 29).

Figure 29. Switzerland's universities of applied sciences



These schools stemmed from the transformation and adaptation of the requirements of certain advanced training schools, in an attempt to harmonise and modernise the advanced training available, giving it more of a pragmatic orientation. The seven universities of applied sciences are: Haute école spécialisée de Suisse occidentale (UAS-SO), Haute école spécialisée bernoise (UAS-BE), Fachhochschule Nordwestschweiz (FHNW), Zürcher Fachhochschule (ZFH), Fachhochschule Zentralschweiz (FHZ), Fachhochschule Ostschweiz (FHO) and Scuola universitaria professionale della Svizzera italiana (SUPSI). Each UAS corresponds to a particular region and in fact consolidates a number of partner institutions.

In the past, it had long been considered in Switzerland that vocational and academic instruction were mutually exclusive. Today, the dichotomy between practical, trade-related training and scientific training or "pure" research has become thoroughly outmoded. The missions of the universities of applied sciences are broader than those of their predecessors, which were devoted to teaching. They include teaching, applied research and development, vocational development, services to third parties and joint endeavours with other training and research institutions in Switzerland and abroad.

Universities of applied sciences are thus open to research and play an active role in the country's economic and social life by acting as an intermediary in transferring knowledge and technologies. National networks of UAS competencies should give significant impetus to co-operation among them, as well as with universities and the economy.

Within Switzerland's two-track system of tertiary education, universities of applied sciences can boast the following advantages:

- Short courses of study, of three to four years;
- Scientific instruction closely tied in with a corresponding profession and field of activity, enabling students to make a seamless transition to working life;
- A scientific teaching staff in constant contact with the world of labour;
- Students who are generally more familiar than university students with the world of work, and who have clear ideas of their career objectives.

The set-up phase for the universities of applied sciences will be completed in 2003, at which time the Confederation will have to renew their licences.

Division of powers

The Confederation and the cantons play different roles in the building and administration of universities of applied sciences. The Confederation makes the laws and licences, and subsidises training tracks in six fields of study: construction sciences, technical sciences, chemical engineering, agriculture, economics and administration, and applied arts. Formally, under the new Constitution which entered into force on 1 January 2000, it is the Confederation that regulates all vocational training tracks, and this principle is now being put into practice.

Other fields are therefore devolved to the cantons. They include: social work, teacher training, public health, pedagogy, visual arts, music and the performing arts, applied linguistics and applied psychology. In the field, the cantons administer the universities of applied sciences-regardless of the field of study concerned-and in addition they regulate training tracks not under federal authority. They also provide most of the funding for UAS.

Table 4 Overview of the main fields of study taught in the various universities of applied sciences.

Fields regulated by the Confederation	UAS-BE	FH NW			FHO	FHZ	UAS-SO	SUPSI	ZFH
		FHBB	FHA	FHSO					
Architecture and civil engineering	•	•	•		•	•	•	•	•
Electrical engineering and electronics	•	•	•	•	•	•	•	•	•
Mechanical engineering	•	•	•	•	•	•	•		•
Computer science	•	•	•	•	•	•	•	•	•
Chemistry and biotechnology	•	•			•		•		•
Economics	•	•	•	•	•	•	•	•	•
Information and documentation					•		•		
Agriculture and agronomy	•						•		
Applied arts (design)	•	•	•			•	•	•	•
Sport	•								
Fields regulated by the cantons	BFH	FH NW			FHO	FHZ	UAS-SO	SUPSI	ZFH
		FHBB	FHAG	FHSO					
Visual arts (fine arts)	•	•	•			•	•		•
Teaching of applied arts and visual arts	•	•				•			•
Music	•	•				•		*	•
Performing arts	•							*	•
Applied linguistics (translation, interpretation)									•
Applied psychology									•
Social work	•	•	•	•	•	•	**	•	•
Public health							**		

* Conservatorio della Svizzera italiana (not incorporated into SUPSI).

** La Haute école spécialisée santé-social romande (UAS-S2) opens in October 2002.

Recognition at national level of diplomas in tracks regulated by the cantons is governed by the Intercantonal Agreement on School-leaving Diplomas (Accord intercantonal sur la reconnaissance des diplômes de fin d'études) of 18 February 1993.

Teachers' Colleges (Pedagogical UAS, Hautes écoles pédagogiques)

Switzerland's teachers' colleges (hautes écoles pédagogiques, HEP) are cantonal institutions that train primary school teachers at university level and have mandates similar to universities of applied sciences—a category to which they in fact belong, although they are not necessarily associated with existing universities of applied sciences. Teachers' colleges have

opened or are being created in the following regions or cantons: Argovia (PH Aarau), Central Switzerland (PHZ), Basel-Town and Basel-Country (HPSA, with social studies), Fribourg (HEP FR), Grisons (PH GR), St. Gallen (PH St. Gall, incorporated into the university, and PH Rorschach), Solothurn (PH SO), Vaud (HEP VD), Valais (HEP VS), Thurgovia (PH TG) and Zurich (PH ZH). The cantons of Bern (French-speaking part), Jura and Neuchâtel share a teachers' college (HEP BE JU NE). The cantons of Bern (German-speaking part) and Geneva have incorporated teacher training into their respective universities.

Admission to universities of applied sciences

Admissions policies make a distinction between fields that are regulated by the Confederation and those regulated by the cantons.

Admission to a course of study in a field administered by the Confederation generally requires a vocational maturity certificate. This is the easiest way to be admitted to a university of applied sciences, since holders of a vocational maturity certificate may enrol without taking an entrance examination.

Holders of a federally recognised Academic Maturity Certificate may also be admitted to a UAS programme in fields administered by the Confederation, although they are required to have completed at least one year's practical experience in the field in question.

Admission to a programme of study in a field administered by the cantons requires a general knowledge diploma certifying that the holder has completed a course of instruction of a length and level that are at least equivalent to those of the vocational maturity certificate. Generally, this involves an academic or vocational maturity certificate or a diploma marking the completion of a three-year course in a diploma-level school or a recognised business school. Situations can differ. For artistic fields, for example, an aptitude test is still indispensable.

Special aspects of UAS studies

Since the autumn of 1997, the universities of applied sciences have been in a development phase. This must be borne in mind when looking at statistics presenting various aspects of studies (e.g., enrolment figures). For the same reason, certain statistics are not yet available. Among them, primarily, are the length of studies, success and failure rates, etc.

In winter semester 2000, nearly 25 000 students were enrolled in a UAS. In comparison with the semester when they were created, three years earlier, the increase was over 400% (see Figure 30). The proportion of first-year students is about one-third. The majority of students are enrolled in fields involving the economy. The number of students enrolled in technical courses is also substantial (see Figure 31).

Figure 30. Enrolments in Swiss universities of applied sciences

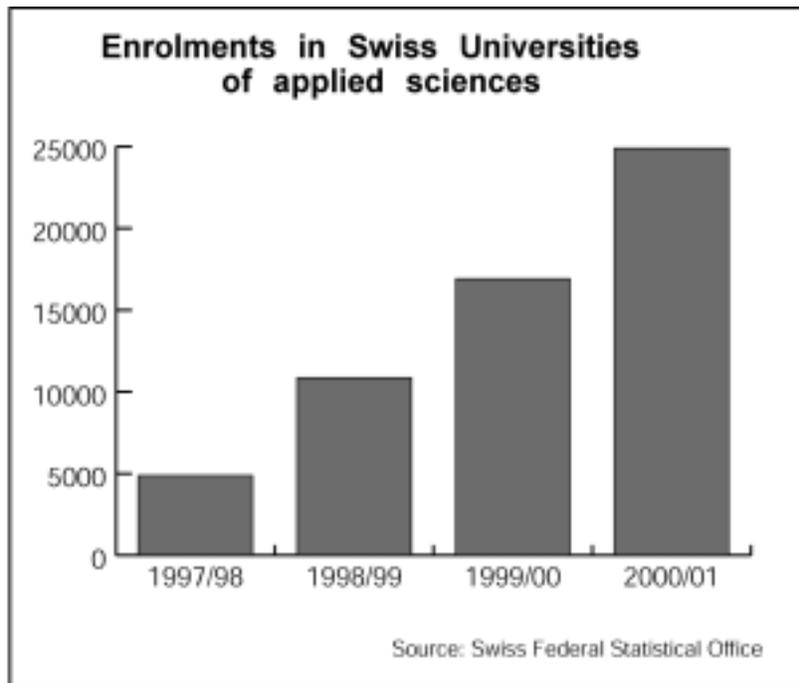
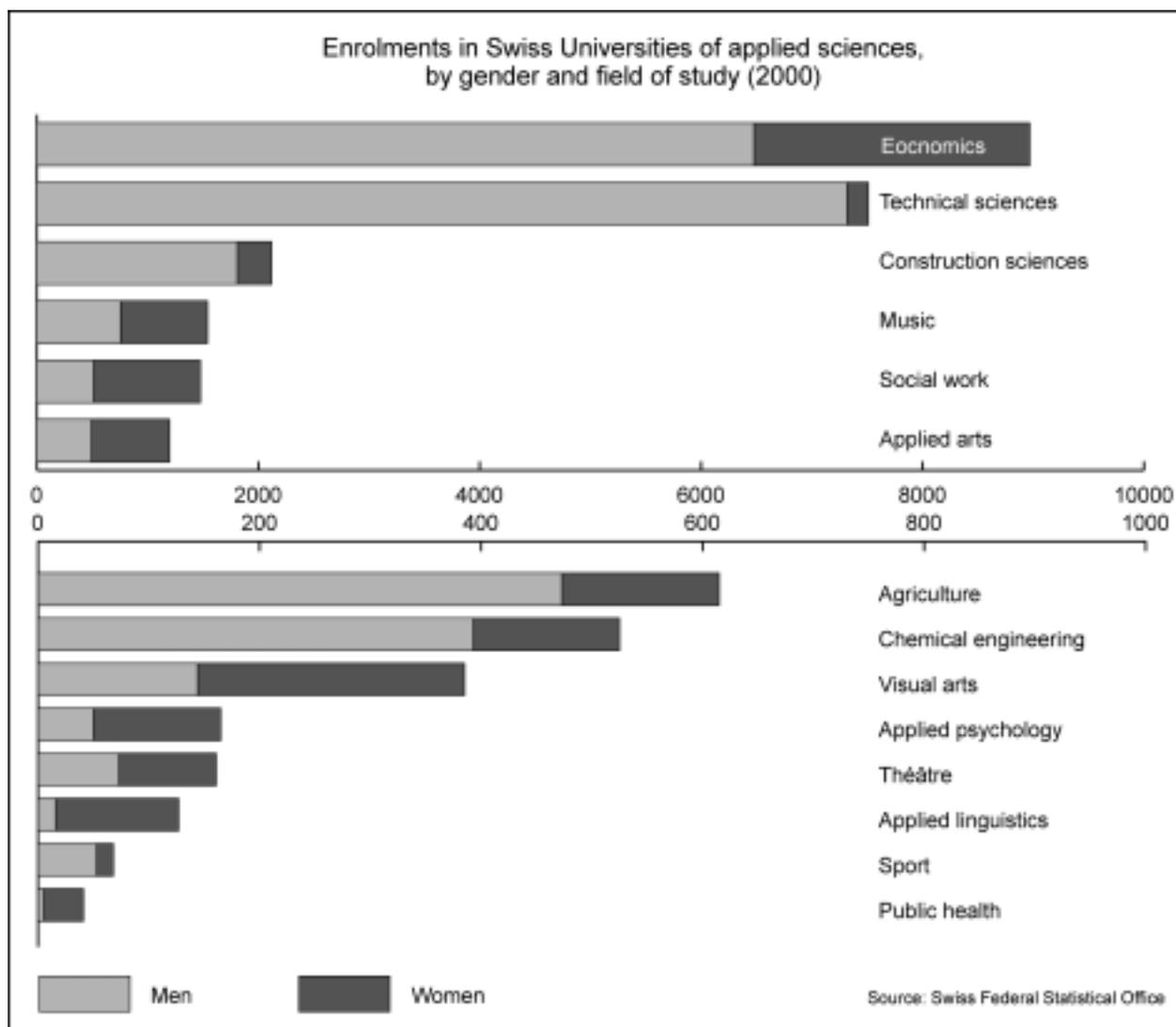


Figure 31. Enrolments in Swiss universities of applied sciences, by gender and field of study (2000)



The proportion of female students, which barely exceeded 25% in 2000, is relatively low in the universities of applied sciences. In any event, it is significantly lower than the proportion of women students in Switzerland's universities (45%). One of the main reasons for this is that the representation of women is very low (less than 5%) in technical fields, which account for a substantial share of all students in the universities of applied sciences.

Foreign students account for roughly 15% of the UAS' total enrolment.

In 2000, universities of applied sciences employed over 13 000 people, corresponding to roughly 5 000 full-time equivalents-one for every seven students. Half of that was teaching staff (see Figure 32). In terms of headcount, the proportion of women was slightly more than 25%. Women accounted for nearly 50% of administrative and technical staff but for only about 20% of the teaching staff (see Figure 33).

Figure 32. UAS staff in 2000

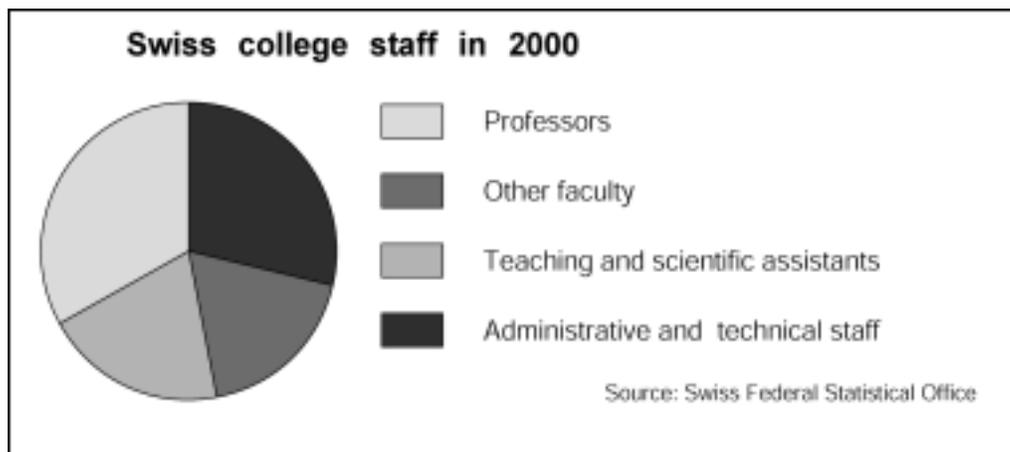
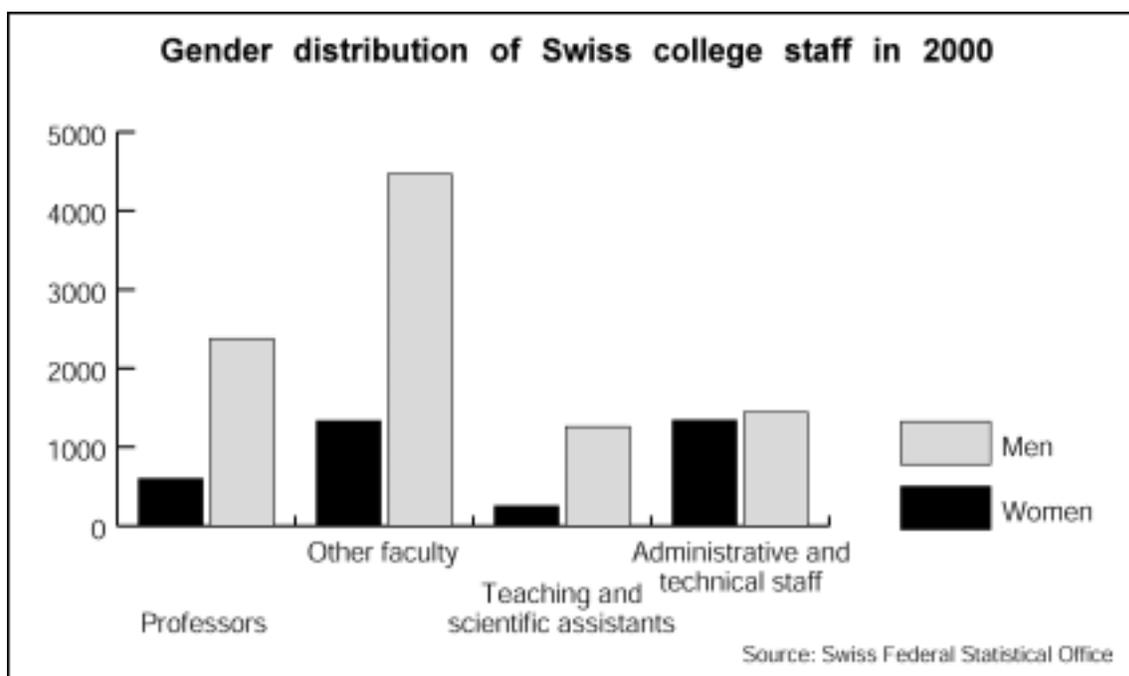


Figure 33. Gender distribution of UAS staff in 2000



Structure of studies

UAS are generally full-time schools, although some offer variations for working students that prolong their studies by one year. The curricula are highly structured, with a large proportion of required courses. Options are only marginal, in the form of elective courses in the area of general education.

Under the Federal universities of applied sciences Act, studies generally last three years on a full-time basis and four years if alternated with work experience. Any practical internships are not included in the duration of studies.

Theoretically, examinations in universities of applied sciences take place regularly throughout the academic year, and promotion from one class to another hinges on certification that the learning objectives of the previous year have been attained. The Act itself provides only for a final examination.

Students in the labour market

Unlike new graduates of Swiss universities, graduates of universities of applied sciences have undertaken a course of study oriented towards work. For graduates in technical and economic fields, the situation is very comparable to that of university graduates in economics or engineering. A glance at the help wanted ads shows that jobs filled by means of competitive examinations are open to university and UAS graduates alike. Regarding entry-level salaries, graduates in the aforementioned fields start off on an equal footing.

Graduates in social work undergo training that is geared to clearly defined professional profiles (e.g., social assistant, social educator, socio-cultural organiser, etc.). For persons having completed such training, there is a job market explicitly aimed at them.

Graduates in the fields of visual and applied arts face a plight similar to that of university graduates in human sciences. For many of them, there are no clearly defined career paths. As a result, when they leave school they themselves must try to find a way to break into the world of work.

Relations between universities of applied sciences and the universities

Alongside the cantonal universities and federal institutes of technology, the universities of applied sciences constitute a pillar of the Swiss system of higher education institutions that could be described by the motto "equivalent but different". The equivalence involves the training mandates with joint elements of general vocational training, and the difference stems from the close link in universities of applied sciences between the scientific spirit and the practical approach-teaching and research geared towards practicality.

This division of tasks is important if the network of higher education institutions is to be harmonised. But working together and horizontal and vertical possibilities for transferring between the two (see Table 5) are also essential. This co-operation and division of tasks are also part of the missions of Switzerland's universities and UAS.

Table 5. Possible transfer tracks between universities and UAS

Type of studies/diploma	Change within the same field of study	Change to a new field of study
Graduates of universities of applied sciences	Federal Institutes of Technology: admission to 5 th semester; examination	Federal Institutes of Technology: admission to 1 st semester without an examination
	Cantonal universities: variable (depends on department)	Cantonal universities: admitted to 1 st semester without examination in all departments (except medicine, for the moment)
	Cantonal universities in economics, computer science or business information systems: admission to 5 th semester or depending on credit equivalence; possibly examination	
Federal institutes of technology students without diplomas	UAS: admitted to 1 st semester without examination if work experience	UAS: admitted to 1 st semester without examination if work experience
Federal institutes of technology students with diplomas	UAS: admitted to 3 rd semester without examination if work experience	UAS: admitted to 1 st semester without examination if work experience
University students without propaedeutic examinations	UAS: admitted to 1 st semester without examination if work experience	UAS: admitted to 1 st semester without examination if work experience
University students with propaedeutic examinations	UAS: variable (depends on department)	UAS: admitted to 1 st semester without examination if work experience
Post-graduate studies		
Graduates of universities of applied sciences	Federal Institutes of Technology:	
	a) post-graduate without diploma: no particular conditions (certificate of specific knowledge in some cases) b) post-graduate with diploma: admission on application (certificate of technical knowledge in some cases)	
	Cantonal universities: conditions differ, depending on the institutions	
University diploma or bachelor's degree	UAS: as a rule, admitted with no further requirement, if work experience	

The Rectors' Conference of the Swiss Universities and the Swiss Conference of universities of applied sciences encourage exchange programmes and work together readily. In

addition, there has traditionally been close co-operation between the federal institutes of technology and the universities of applied sciences that used to be engineering schools.

Scholarships

Under the federal Constitution, education is a cantonal task. Logically, then, the allocation of training subsidies is also a cantonal responsibility. The cantons make sovereign decisions regarding the requirements, amounts and procedures for awarding scholarships.

However, the Confederation aids the cantons financially in that task. Each year, it pays them a total of some SF 100 million to subsidise scholarships granted to Swiss and foreign citizens undertaking upper secondary or tertiary (university, UAS or federal institutes of technology) studies. The federal contribution varies, depending on the financial capabilities of the cantons.

Cantons award two types of scholarships:

- *Scholarship grants are lump-sum or instalment subsidies with no reimbursement requirements.*
- *Scholarship loans are lump-sum or instalment subsidies that have to be paid back after the completion of the recipient's schooling, generally with interest.*

In most cantons, educational subsidies are awarded primarily in the form of grants

Educational subsidies are also awarded by foundations and by private funds. Such organisations have limited resources, however, and applicants may claim no entitlement to any assistance.

Lastly, the Federal Office of Education and Science provides scholarships for foreign postgraduate scholars wishing to study at a Swiss university.

Encouraging mobility within Switzerland

Between 1991 and 1995, the Confederation financed a programme to encourage mobility of academic university students within Switzerland. The aim was to spur collaboration among universities and to foster better understanding between the various linguistic areas of the country.

Today, a framework agreement on student mobility between Swiss universities ensures the principle of mutual recognition of semesters, educational programmes and examinations. In addition, a number of administrative barriers have been removed. Students who spend one or two semesters at another university remain enrolled at, and continue to pay tuition to, their original school.

Each university has a mobility office to answer the questions of students wishing to spend some time in another institution.

Encouraging mobility internationally

Switzerland participates as a "silent partner" in the European Union's education programmes (Leonardo da Vinci, Socrates, Youth Programme). Swiss participation and scholarships awarded to foreign students who come to Switzerland temporarily are financed by the Federal Office for Education and Science.

The "Erasmus Office" liaises with the EU's "Socrates" programme. Inter alia, it is responsible for awarding student scholarships.

The higher education institutions are introducing the European Credit Transfer System (ECTS), which seeks to foster student mobility by ensuring the recognition of credits obtained elsewhere. The system is currently under review in connection with the Bologna Process, to which Swiss higher education institutions have given official support.

In addition, the Swiss National Science Foundation has concluded a number of agreements with foreign institutions in connection with exchange programmes for scientists. The goal is to encourage international scientific co-operation.

Lastly, with the entry into force of the bilateral agreements between Switzerland and the EU, Swiss scientists will have access to EU programmes to encourage mobility for researchers.

Research in Switzerland

As research is an integral part of the university system, the presentation of "higher education policy" would not be complete without a substantial description of research policy and infrastructure in Switzerland.

Switzerland is a country that, by international standards, invests heavily in research. As it is poor in natural resources, it places great importance on R&D as a means of ensuring its long-term prosperity and social security system.

Switzerland is an attractive country for research for the following reasons:

- on an international comparative basis, the share of gross national product (GNP) devoted to research expenditure is among the highest in the world.
- in summer 1998, the scientific journal "Science" published a ranking of the ten European regions that produce the most research, based on the number of scientific papers published in English per inhabitant. No fewer than three Swiss or cross-border regions were listed (cf. Table 6).
- more than two-thirds of Swiss research is financed by private industry. The largest share of research is funded by the chemical, pharmaceutical, electrical and metal industries. The fact that the Swiss economy did not reduce the volume of its national R&D investments even during the recession of the 1990s shows the importance given to research in Switzerland.

Table 6. Switzerland's ranking in the top ten research countries

	<i>City or region</i>	<i>Total publications</i>	<i>Publications per person</i>
1	Cambridge	17 764	81
2	Oxford, Reading	18 876	41
3	Geneva, Lausanne	13 405	29
4	Basel, Mulhouse, Fribourg en Br.	13 918	20
5	Bristol, Cardiff	10 633	15
6	Zürich	11 951	13
7	Stockholm, Uppsala	20 195	12
8	Helsinki	10 287	12
9	Copenhagen, Lund	21 631	11
10	Munich	15 947	10

Research actors

In private industry, researchers are primarily engaged in applied research. Basic research is mainly carried out in cantonal universities, federal institutes of technology and the four federal research institutes (the Paul Scherrer Institute, IPS; the Federal Institute for Woodland, Snow and Landscape Research, FNP; the Federal Laboratory for Materials Testing and Research, LFEM; and the Federal Institute for Water Supplies, Waste Water Treatment and Water Resources Protection, IFAEPE, cf., Figure 17). The six research stations of the Federal Office for Agriculture must also be added to this list. The universities of applied sciences focus on applied research and development activities closely related to the needs of the market. One of the reasons why they were established was to forge a closer link between Swiss universities and businesses, especially SMEs.

A number of other research institutes receive public subsidies, such as the Swiss Institute of Bioinformatics (ISB, www.isb-sib.ch), the Swiss Institute for Experimental Cancer Research (ISREC, www.isrc.ch) in Epalinges near Lausanne and the Swiss Centre for Electronics and Microtechnology (CSEM, www.cesem.ch) in Neuchâtel.

Figure 34 shows the research actors in Switzerland and Figure 35 shows the Confederation's expenditure in the research and development field

Figure 34. Chart of research actors in Switzerland

(see following pages)

Public research decision-making and funding on the national level

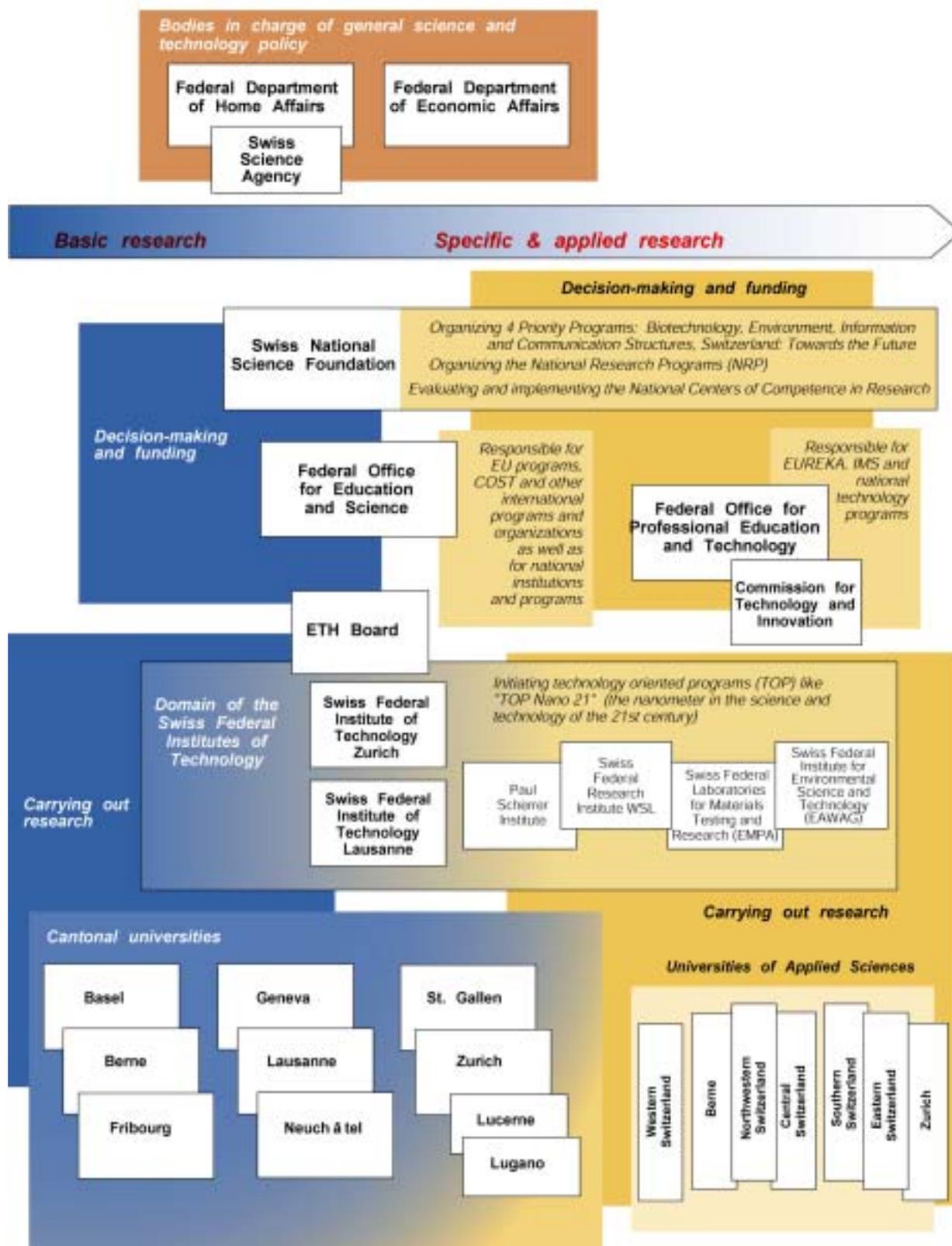
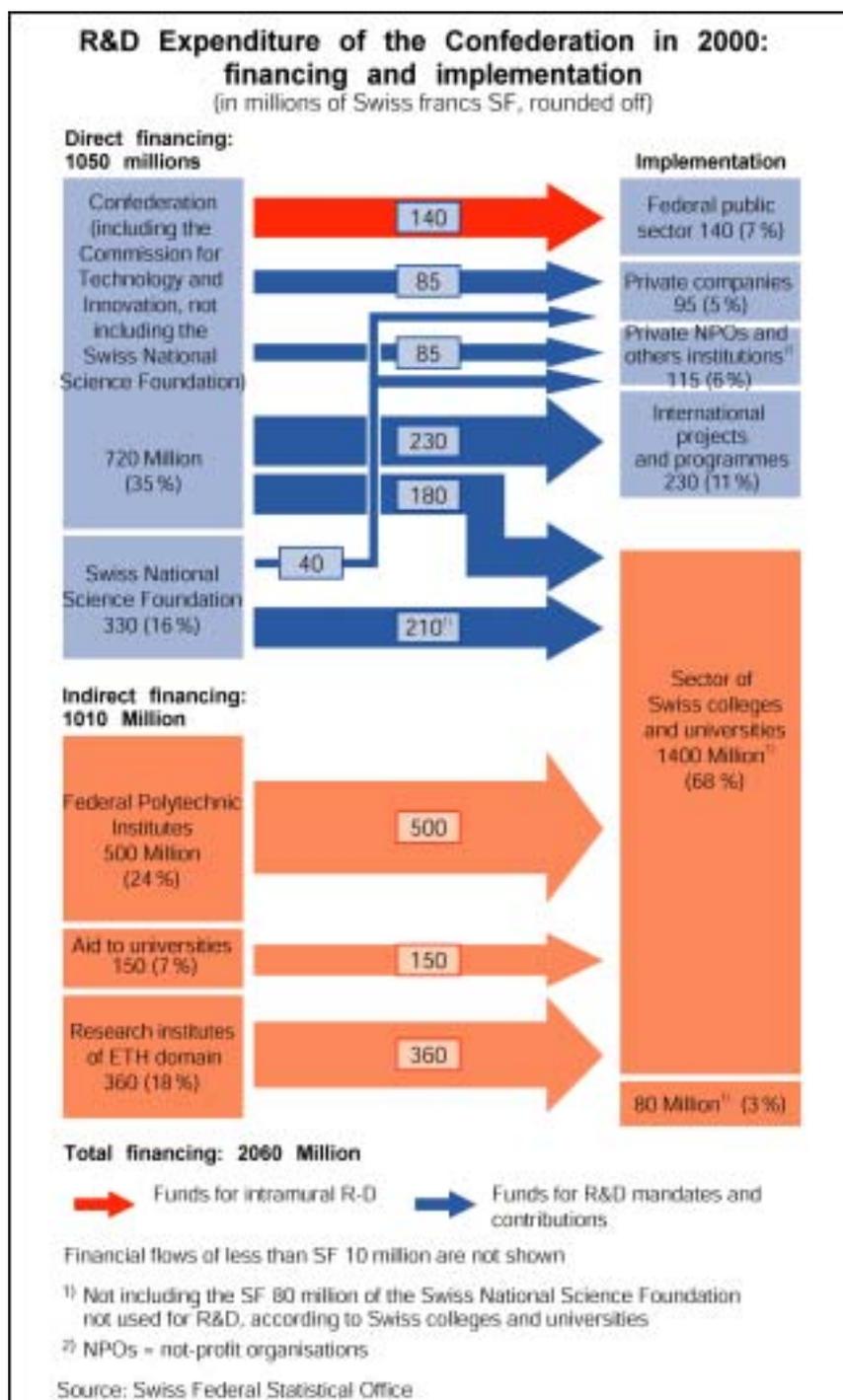


Figure 35. The Confederation's expenditure on research and development

(see following pages)



Private industry's key contribution of to research

Many highly research-oriented major international corporations also have their headquarters or operate research laboratories in Switzerland. These include the chemical-pharmaceutical firms Novartis and Hoffmann-La Roche, the agri-food giant Nestlé, the technology firms ABB and Sulzer and the IBM research centre in Rüschlikon near Zurich.

The new orientation of research policy

In order to maintain the long-term international competitiveness of Swiss research, in 1999 the federal government decided to give a new orientation to research policy. The basic idea underlying this new policy is to create nation-wide networks in which the cantonal universities, federal institutes of technology and universities of applied sciences co-operate closely. According to the guidelines for this policy, these networks should make it possible to develop recognised competencies and strive for excellence in important, future-oriented fields rather than trying to be exhaustive in all fields. The Swiss government also wishes to reinforce its international co-operation in research.

As regards targeted research, the federal government has defined the following priority fields:

- *life sciences;*
- *social and human sciences;*
- *sustainable development and the environment;*
- *Information and communication technologies;*
- *nanotechnologies.*

Other key technical disciplines can also play an important role, such as microtechnology, materials science and medical technology.

Legal basis

The Constitution

The promotion of scientific research by the federal government is governed by Article 64 of the Constitution, which states that the Confederation may make its support conditional, in particular, upon taking co-ordination measures. It may also create, operate or take over research institutions.

The Research Act

The Federal Research Act, which entered into force in 1983, also makes it possible to finance basic and targeted research, the latter of which has gained in importance in recent years (National Research Programmes, Priority Programmes and National Centres of Competence in Research), and international research co-operation programmes. It also provides the legal basis for the grants given by the Confederation to institutions responsible for promoting research (such as the Swiss National Science Foundation, the four scientific academies and non-university research institutes).

Institutions responsible for promoting research

The Swiss National Science Foundation

The main institution responsible for promoting research in Switzerland is the Swiss National Science Foundation (FNS, www.snf.ch). It is a private-law foundation, financed primarily with public funds. It does not conduct any research of its own, but, under the terms of reference set by the Confederation, it promotes non-profit research work inside and outside higher education institutions. Its purpose is to promote basic research, but also the employment of highly qualified young scientists.

In addition to promoting projects involving basic research, the Foundation is also responsible for implementing the various national research programmes: National Research Programmes (programmes nationaux de recherche), Priority Programmes (programmes prioritaires de recherches) and the National Centres of Competence in Research (pôles de recherche nationaux).

The organisation of National Research Programmes is based on a top-down approach. Their objective is to help solve contemporary problems of national importance. Federal government departments and any natural or legal person may submit programme proposals. The Foundation then examines the issues raised from a scientific standpoint and evaluates whether Switzerland has the necessary research potential. The Swiss Science Agency then assesses the relevance and interest of the programme.

The aim of the Priority Programmes is to enable Swiss research to remain in the forefront of international scientific progress and to support the development of centres of competence in strategically important research fields.

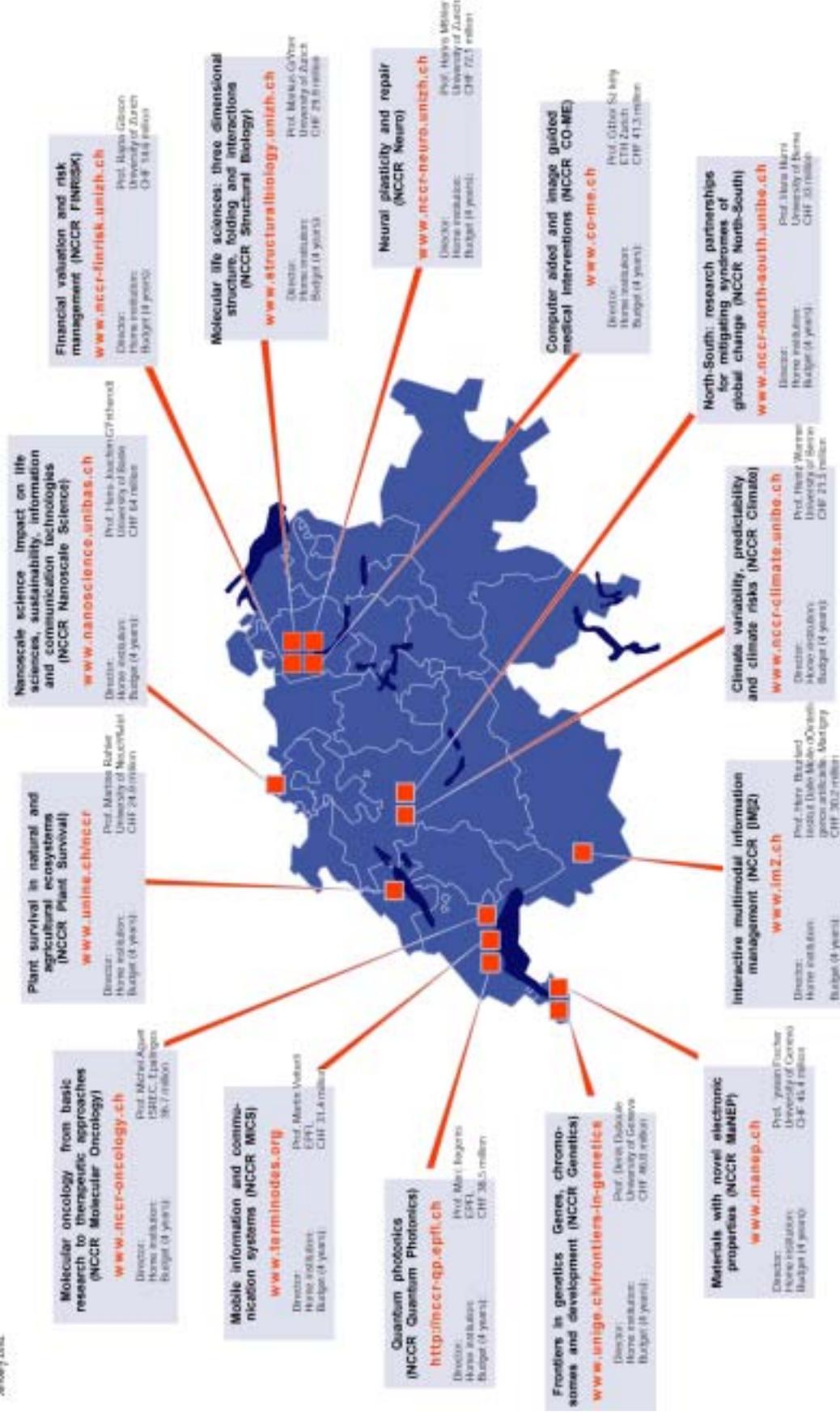
The Priority Programmes are currently being replaced by the National Centres of Competence in Research, which are the most recently introduced tools for promoting research. The purpose of this new tool is to maintain and strengthen Switzerland's position in strategically important fields of research. It is generally used to promote very high-level research projects. This scheme functions as follows: a "leading house" in a university or federal institute of technology joins with other partners in applying to the Foundation to establish a National Centre of Competence in Research (bottom-up approach). In 2001, the Foundation launched 14 National Centres (cf. Figure 36). The maximum duration is 12 years. At the end of the fourth and eighth years, the National Centres will be evaluated and renewed for further four-years if they have achieved the objectives set. The total funding of the National Centres for the first four years amounts to SF 529, if federal grants (SF 224 million, of which SF 161 million were provided for the 2000-2003 period, the remainder being carried over to the 2004-2007 period) are combined with the resources invested by higher education institutions themselves and the contributions of corporate partners.

Figure 36. National Centres of Competence in Research

(see following pages)

The Swiss National Centres of Competence in Research

January 2002



Commission for Technology and Innovation

The Commission for Technology and Innovation (Commission pour la technologie et l'innovation, CTI), which is under the supervision of the Federal Office for Professional Education and Technology (Office fédéral de la formation professionnelle et de la technologie, OFFT), is another important institution for the promotion of research in Switzerland. The legal basis of the CTI is derived from the Federal Act of 1954 on preparatory measures aimed at combating crises and creating jobs. One of the provisions of this act lays down that the Confederation may take active measures to support the competitive capacity of the Swiss economy.

The CTI's primary task is to promote applied research and development by providing financial support to research projects carried out jointly by corporate partners and higher education institutions. In the same spirit, the CTI supports competency building in applied research and development in the new universities of applied sciences and implements technologically oriented programmes as mandated by the ETH Board. It also supports start-ups in their initial stages in an advisory capacity.

Lastly, in conjunction with the establishment of the universities of applied sciences, the CTI helps to set up national networks of competence, for example in biotechnology, communication technologies, microelectronics and wood processing.

Swiss scientific academies

Swiss scientific academies also contribute to the promotion of research in Switzerland by financing publications and promoting the dissemination of scientific discoveries. There are four such academies:

- *The Swiss Academy of Human and Social Sciences (Académie suisse des sciences humaines et sociales, ASSH, www.sagw.ch);*
- *The Swiss Academy of Sciences (Académie suisse des sciences naturelles, ASSN, www.assn.ch);*
- *The Swiss Academy of Medical Sciences (Académie suisse des sciences médicales, ASSM, www.assm.ch);*
- *The Swiss Academy of Engineering Sciences (Académie suisse des sciences techniques, SATW, www.satw.ch).*

The four academies are supervised by the Council of Swiss Scientific Academies (Conseil des académies scientifiques suisses, CASS, www.cass.ch), which is responsible for organising and facilitating co-operation between the academies.

In addition to these institutions, there are some 400 other foundations active in R&D in Switzerland. Even though their contribution only amounts to between 1 and 2% of all private and public research spending, they do play an important role in certain fields, such as medicine (for example, the Maurice E. Müller Foundation in Bern).

Swiss research in the international arena

Switzerland and EU research

With the ratification of the bilateral agreements between Switzerland and the EU, Switzerland will be authorised to participate in EU research projects as an associate member, which was previously only possible for the EURATOM Fusion Programme.

If the EU complies with its timetable, Switzerland will be a full participant in the 6th framework programme from its inception. This is a significant development, for it will enable Swiss researchers to be responsible for co-ordinating projects and parts of programmes, and they will only need to have a single research partner from an EU country or another associated country.

To prepare Swiss researchers in higher education institutions and industry for their new role, in February 2001 the Confederation established Euresearch, a firm in the Swiss Network for Innovation SNI-RSI, financed by the Confederation (www.euresearch.ch). Euresearch supervises in particular the "European Consumer Infocentres" available to researchers in higher education institutions.

Active participation in international research

At the same time, Switzerland is also stepping up its research co-operation with other countries. For example, in autumn 2000, it opened up in the Boston area, in the heart of one of the major scientific centres of the United States, the Swiss House for Advanced Research and Education SHARE (www.creativeswitzerland.com). In addition to North America, Switzerland also co-operates with other countries in the field of scientific research, and is particularly active with Asian countries such as Japan and Korea.

Switzerland's active role in international research is also shown by its membership in many programmes and organisations, such as the Initiative EUREKA, the "Human Frontier Science Programme (HFSP)" in the field of neurobiology, the European Laboratory for Particle Physics (CERN), the European Space Agency (ESA) and the European Southern Observatory (ESO), to mention only a few.

Knowledge and technology transfer

There are a large number of institutions and tools in Switzerland for promoting and supporting research and establishing contacts to promote exchanges between Swiss universities, UAS and businesses.

Cantonal universities and federal institutes of technology

During the last ten years, the cantonal universities, federal institutes of technology and the four research institutes have either created technology transfer departments or designated officers responsible for relations with industry.

An example of the close relations that higher education institutions maintain with industry is the co-operation contract signed in 1999 between Novartis and Zurich University's Neuroscience Centre and the federal institute of technology Zurich. Under the terms of this contract, the pharmaceutical group will provide SF 40 million in financing over a ten-year period.

The higher education institutions also promote technology transfer by providing initial and further education in the fields of technology and innovation management, intellectual property

rights and enterprise creation. To this must be added a whole series of activities aimed at informing firms about R&D activities. Lastly, the two federal institutes of technology and the cantonal universities house the EU research network's European Consumer Infocentres responsible for promoting and supporting the participation of Swiss researchers in European research programmes.

Universities of applied sciences

The new universities of applied sciences, which carry out R&D and provide services to economic actors, act as a transmission belt between research and industry. Many universities of applied sciences already have a technology transfer service.

In German-speaking Switzerland and Ticino, CIM Centres (computer-integrated manufacturing) were created under a Confederation action programme, which is now complete. Some of these centres have been incorporated into the activities of the technical universities of applied sciences, and their role is to support innovation in SMEs.

Technology and innovation management is also an important aspect of the training provided by some business-oriented universities of applied sciences.

Institutions active in technology transfer

The main institutions responsible for promoting technology transfer in Switzerland are as follows:

- **The Commission for Technology and Innovation.** The CTI (see p.??) is the Confederation's main tool for promoting industrial innovation.
- **The Swiss Federal Institute of Intellectual Property.** The Institute ensures the legal protection of intellectual property rights (www.ige.ch). It provides information search, patent registration and training services.
- **The Swiss Network for Innovation.** This national technology transfer network includes cantonal universities, federal institutes of technology, universities of applied sciences and businesses. Its purpose is to step up technology transfer by supporting existing activities.
- **The technology transfer services of higher education institutions.** They provide information, support, contact and in some cases training services, generally in three fields: co-operation in research projects, protection of intellectual property rights and enterprise creation.
- **Technology parks.** They have been designed to house spin-offs and start-ups in their initial development phase. Often located near a higher education institution, they provide not only premises but also services to help firms in the creation and start-up phase.

The international relations of universities, universities of applied sciences and the administration

The Swiss higher education system's openness to the outside world is shown by the high proportion of foreign students (cf. Figure 21) and the large number of teachers from outside the country. At the tertiary level, Swiss policy still makes a distinction between co-operation in the fields of education and research. In the field of education, emphasis is currently placed on the

identification and development of indicators, higher education, lifelong learning, adult education, school-to-work transition, learning technologies and distance learning. This chapter will deal only with international relations in the field of education. International co-operation in the field of research is presented in the chapter on research (see p. ?).

It should be pointed out that the international relations of universities are generally managed both by rectorates and their international officers and by faculties, depending on the type of co-operation. This may be bilateral (with another institution) or multilateral (with other university administrations, teaching and research departments, scientific NGOs or private institutions).

International relations and co-operation

European Union

Switzerland participated fully in the EU COMETT and ERASMUS programmes until 1994-1995. It has no longer been able to do so officially since then, as no bilateral agreement has been negotiated with the EU for the Leonardo da Vinci and Socrates programmes that succeeded them. Nevertheless, thanks to interim measures, the Federal Office for Education and Science (Office fédéral de l'éducation et de la science, OFES) is financing the indirect participation of Switzerland in both programmes. The Swiss government has set the objective of reaching a bilateral agreement with the EU in the field of education and youth as soon as possible.

Other international co-operation

Switzerland is a member of the Council of Europe, the OECD, UNESCO and the OIF (International Organisation of the Francophonie), and participates in the current programmes, projects and initiatives of these organisations. For the 2000-2003 period, Switzerland has appropriated SF 10 million for its participation in the selected educational projects of multilateral organisations outside the EU. It participates in projects for skills assessment and comparison of performance in the field of education (such as the OECD's PISA Study). It has also participated in international comparative studies aimed at improving the transition from initial education to working life and cross-national studies on how to manage education systems more effectively.

It should be pointed out that this work consists mainly of educational research involving researchers from higher education institutions rather than the institutions themselves. Furthermore, this research is only rarely devoted to higher education as a subject of study. Traditionally, the main exceptions to this rule -- but which are the responsibility of the federal government -- are the research related to the OECD's IMHE Programme and UNESCO's CEPES Programme.

Switzerland also co-operates actively with the European University Association (EUA), which is headquartered in Geneva. The Rectors' Conference of the Swiss Universities (CRUS, Conférence des recteurs des universités suisses) and all Swiss universities are members of the EUA, and the Conference of Universities of applied sciences is an associate member.

Some scientific co-operation outside Europe goes through European organisations, which have more weight in international agreements than one country alone. However, Switzerland also intends further to develop its contacts throughout the world on a bilateral basis with neighbouring countries, the United States and above all the Far East. In this regard, co-operation has been established with South Korea.

Higher education institutions already have numerous bilateral agreements with countries throughout the world.

Recognition of diplomas

In neighbouring countries...

In addition to these multilateral relations, Switzerland also attaches great importance to bilateral agreements, in particular with neighbouring countries, in order to ensure student mobility and mutual recognition of programmes and diplomas. It has concluded bilateral agreements with Austria, Germany and Italy. These agreements govern the recognition of the programmes and diplomas of all higher education institutions, but not the recognition of vocational diplomas, which are governed by the bilateral agreement between the EU and Switzerland on the free movement of persons.

The case of France is somewhat different. As the French government has explicitly decided not to negotiate a governmental bilateral agreement, in 1994 the rectors' conferences of both countries concluded a framework agreement on the recognition of diplomas and programmes. The French "grandes écoles", the Swiss universities of applied sciences and certain fields, such as medicine, are not covered by this agreement.

...and elsewhere

Switzerland acceded to the university conventions of the Council of Europe and UNESCO in 1991 and ratified a new joint convention, the Lisbon Convention, in 1998. Among other measures, this Convention provides for a "Diploma Supplement" (DS), which is a description of the qualification to be attached to each diploma awarded by a university or UAS. In general, foreign universities recognise the Swiss maturity certificate as a qualification giving access to university studies. The Rectors' Conference of the Swiss Universities recommends ultimately introducing the Diploma Supplement, i.e. a description of the qualification attached to each diploma awarded by a university or a UAS as a means of evaluation for admission services and employers in partner countries. Both the Lisbon Convention and the Bologna Declaration recommend the introduction of the Diploma Supplement. Since the first diplomas were awarded in 2000, the universities of applied sciences have introduced Diploma Supplements.

In all programmes offered by Swiss networks of higher education institutions, steps are being taken, inasmuch as possible, to introduce the European Credit Transfer System (ECTS).

The Bologna Declaration

The Rectors' Conference of the Swiss Universities agrees with the general objectives of the Bologna Declaration and supports their implementation. Swiss universities are prepared to make fundamental changes in their programmes of study and, if need be, reorganise them so that they will be better integrated into the European educational context, and to promote mobility, transparency and harmonisation more actively. However, any standardisation and uniformisation must be avoided.

With a view to integrating universities of applied sciences into the Bologna process, the Swiss Conference of universities of applied sciences and the Rectors' Conference of the Swiss Universities have set up a "Bologna" working group. The ongoing revision of the Federal universities of applied sciences Act (*loi sur les hautes écoles spécialisées, LUAS*) should lay the legal framework for introducing master's degree programmes.

Maintaining the two-track system

Switzerland will maintain its two-track system. Both universities and universities of applied sciences will grant bachelor's and master's degrees, although doctorates will only be awarded by universities.

Although universities of applied sciences are only in the discussion stage, several universities and the federal institute of technology Zurich introduced the bachelor's/master's system for part of their programme in autumn 2001, and the University of St. Gallen even applied it to all its course offerings. All universities must have prepared a reform strategy by 2005 and have implemented it by 2010.

Quality assurance

Switzerland also wishes to pursue another goal of the Bologna Declaration, i.e. the introduction of quality assurance and accreditation procedures that will reflect the criteria and standards being developed in Europe. Currently, the preparatory work is mainly aimed at establishing the new Swiss Accreditation and Quality Assurance Body (see p.?). In most universities, quality assessment processes have already been implemented in recent years. The universities of applied sciences have also launched an evaluation process, consisting of a self-evaluation and a peer review, with a view to recognition by the Confederation. This process is under way in all institutions, whether they are under the supervision of the Confederation or the Cantons.

Support programmes

The Swiss government supports university projects in fields of national importance and has appropriated SF 187 million to cantonal universities for this purpose during the 2000-2003 period. The Swiss University Conference (CUS) is responsible for allocating these funds. These support programmes for higher education institutions include measures in the following fields: promotion of young scientific talent, equal opportunities for men and women, the Swiss virtual campus, the SWITCH computer network, the innovation network and university co-operation projects.

It should be pointed out that federal grants are only intended for cantonal universities. The federal institutes of technology and universities of applied sciences participate in these measures using their own resources.

Promotion of young scientific talent

The Confederation has had special measures to promote young scientific talent in cantonal universities since 1992. Between 2000 and 2003, the Swiss University Conference will allocate some SF 59 million for this purpose. One of the uses of these funds will be to finance approximately 150 assistant professor and assistant lecturer posts. The cantonal universities and the Graduate Institute of International Studies (IUHEI) in Geneva are authorised to receive grants. Through the various measures to promote young scientific talent, the Confederation is particularly interested in promoting the careers of women.

Swiss National Science Foundation Professorships

Acting on a mandate issued by the federal government, the Swiss National Science Foundation (FNS) supports young researchers through a vast programme of fellowships and grants.

Since 1999, the FNS has had a new tool for promoting young scientific talent: the professorship grant. Awarded yearly through a competitive selection process, these grants are normally limited to four years, but may be extended for a further two years. This financing covers the grant recipient's salary, a research grant making it possible to form a small research team and a contribution to infrastructure costs. The maximum amount granted per professorship is SF 1.6 million for four years, although the average figure for grants is SF 1.2 million.

These professorships are intended for qualified persons who have already done post-doctoral studies abroad, have teaching and independent research experience and wish to pursue a university career. The level is that of assistant professor, and posts may be tenure-track, depending on the higher education institution.

Promoting new scientific talent in the National Centres of Competence in Research

In the National Centres of Competence in Research (PRN, see p.?), the promotion of young scientific talent plays a key role. The directors of centres must ensure that young researchers have an opportunity to interact in doctoral schools or university summer programmes in order to broaden their scientific horizon.

Because of the size and duration of National Centres of Competence in Research (a maximum of twelve years), research directors are able to plan the careers of the new generation of top researchers more easily. For the Swiss National Science Foundation, the promotion of women's careers is an important aspect. No quota has been set, but the directors of centres are required to prepare a list of measures taken in this regard.

Federal institutes of technology: tenure-track career plan

In the ETH domain, the federal institutes of technology Zurich and Lausanne have established a career plan based on the US tenure-track system. Since the beginning of 2001, assistant professors have had their work evaluated with a view to promotion to a post of permanent professor.

Holders of tenure-track positions enjoy the same academic freedom as full professors, in particular as regards their research and the management of their team, and have considerable financial autonomy.

The probation period is a maximum of six years. Every year, there is an evaluation meeting between the assistant professor and the department head. If the evaluation shows that there is a serious prospect of obtaining a post of permanent professor, the candidate may apply for this position.

The "Do-Re" Programme in universities of applied sciences

In 2001, the Swiss National Science Foundation and the Commission for Technology and Innovation (CTI) launched a joint programme aimed at promoting the creation and consolidation of competence in applied research in the universities of applied sciences under the sole supervision of cantons. Named "Do-Re" (i.e. "Do Research"), this programme has an annual budget of SF 2 million. These funds make it possible to co-finance applied research projects by paying

researchers' salaries. Priority is given to projects that promote the emergence of young scientific talent and that cannot obtain grants through the usual funding channels.

In principle, this programme contributes 50% of the total costs of the project, as for the CTI's projects. In order to ensure that the research is oriented towards practical applications, the projects must involve partners from outside the university.

The Confederation's "equal opportunity" programme

Between 2000 and 2003, the Swiss government is contributing SF 4 million yearly to the promotion of equal opportunities in cantonal universities. The stated goal of this project is to increase substantially the share of women teachers in Swiss universities. This share, which currently stands at 8% (cf. Figure 27), is to be raised to 14% by 2006. This programme is organised around three modules: financial incentives, mentoring and childcare.

Equal opportunity in the ETH domain...

The ETH Board, which oversees the ETH domain, also manages an equal opportunity programme. It provides both the two federal institutes of technology and their research institutes with the funds required for these projects. The institutes promote in particular careers for women in the tenure-track system. For example, women may take a maternity leave for a specific time and return to their post after this leave expires.

...and in the universities of applied sciences

In the universities of applied sciences, SF 10 million have been allocated through 2003 both to create posts of equal opportunity officer and to launch concrete projects. To meet the main goals of this programme, the following steps must be taken: to set up a network of competence for promoting equal opportunity, to raise awareness and encourage women and others to enrol in universities of applied sciences, to propose flexible models for attending regular or continuing training programmes, to facilitate returning to school for students who have interrupted their education for family-related or other reasons through scholarships and course credit managed by the universities of applied sciences, to propose flexible childcare for young children, to introduce mentoring at all levels by teaching staff in co-operation with the universities and federal polytechnic institutes and to develop gender research and apply the results obtained. In spring 2001, the equal opportunity officers of universities of applied sciences formed an association for promoting the exchange of ideas and information. This association also wishes to establish a dialogue with industry and professional associations.

...and in the Swiss National Science Foundation

For a two-year period starting in January 2002, the National Science Foundation will no longer apply the age limit criterion in awarding research grants to women. It has also employed an equal opportunity officer since June 2001. She is assisted by a working group composed of experts, which has been asked to develop a long-term strategy for promoting equal opportunity in research.

Since 1991, the first year of the Marie Heim-Vögtlin Programme, named after the Swiss first woman to receive a medical degree, the Swiss National Science Foundation has provided grants to enable women with a degree or doctorate in biology, medicine, mathematics, natural

sciences or engineering to resume a scientific activity after interrupting their career or reducing their working time, generally for family-related reasons.

The National Science Foundation's statistics show that its programmes on behalf of women in science are gradually bearing fruit, for women now account for some 30% of those working in research projects.

The Confederation's "Swiss Virtual Campus" programme

The aim of the federal "Swiss Virtual Campus" programme (www.virtualcampus.ch) is to encourage higher education institutions to take greater advantage of new information and communication technologies in education. In this regard, it is important to recognise the high quality of interactive virtual courses and to include them in ordinary programmes of study, for example through the ECTS system.

Financing by the Confederation and cantons

Between 2000 and 2003, the Swiss government is providing SF 30 million in grants to universities. The federal institutes of technology and universities of applied sciences may participate in the Swiss Virtual Campus (SVC), but must pay costs themselves.

The SVC comprises some 50 projects. An initial series of 27 projects was approved in spring 2000, followed by a second series of 23 projects in the following year. 37 projects are managed by universities, 11 by universities of applied sciences and 2 by federal institutes of technology.

The SVC is funded in equal amounts by the universities and the Confederation. The ETH Board has allocated approximately SF 2 million to fund the participation of federal institutes of technology, while the Federal Office for Professional Education and Technology (OFFT) has provided some SF 12 million to finance the participation of universities of applied sciences.

Applications have been approved thus far in the following fields: physics, mathematics and computer science (4); educational sciences (4); human sciences (7); medicine (11); engineering and information technologies (8); environmental and life sciences (6); and economics and law (10).

The potential use of the Swiss Virtual Campus is estimated at a total 10 000 course visits. The list of all projects may be consulted at the site www.virtualcampus.ch.

Development of the SWITCH Next Generation computer network

The SWITCH Foundation, located in Zurich, was established in 1987 with the initial assistance of the Confederation. SWITCH is a remote data-processing network linking higher education institutions and Swiss public research institutions with each other and with the world at large. All data sent or received by researchers transits through the SWITCH network. The foundation provides network infrastructure by purchasing transmission capacity from network operators and making it available in services such as E-mail and Internet applications.

SWITCH was a pioneering initiative and because the lack of other providers, customers from outside Swiss higher education institutions also used this information highway. However, as there are now many commercial Internet access providers, SWITCH is once again solely a research network.

Modernisation of the data-processing network

SWITCH was a pace-setting initiative in Europe until the mid-1990s, when it began to lag behind. If it has now lost ground to international competition, this is largely because insufficient funds have been available to make the necessary innovations.

The Swiss government has decided to correct this situation by allocating SF 6 million per year for modernisation of the network between 2000 and 2003. Because of the gains derived from managing domain names, SWITCH has thus far been able to do without these grants.

Establishment of a Swiss Innovation Network

With the Swiss Network for Innovation (RSI), the Confederation has launched a national technology transfer network linking the cantonal universities, federal institutes of technology and universities of applied sciences with enterprises with a view to giving new momentum to existing activities. Priority is given to future-oriented fields, such as computer science, information and communication systems, biomedical engineering, biotechnologies, microtechnology and nanotechnology.

During the initial phase of the project between 2000 and 2003, the Confederation is investing SF 2 million per year in the network. It will gradually reduce its aid as from 2004, the objective being for the network ultimately to become self-financing.

With regard to EU research projects, the Swiss Network for Innovation promotes, organises and acts as a clearing house for European projects that involve or interest Swiss researchers in universities or industry. The goal is to foster the broadest possible participation of Swiss researchers in initiating and co-ordinating projects.

In addition to these primary missions, the Network also engages in other activities, such as promotion of Swiss technology in Europe and throughout the world (for example, in co-operation with the scientific consulate in Boston), continuing training in the technology transfer field, fostering of informal relations between representatives of universities and business and legislative and government lobbying activities to promote innovation and technology transfer.

Support for innovation and co-operation projects

Some SF 74 million have been appropriated for the 2000-2003 period to promote co-operation projects between universities. Projects are approved by the Swiss University Conference (www.cus.ch).

The Conference requires that at least two higher education institutions participate in these projects, one of which must be a cantonal university. The schools must also provide matching funds equivalent to the federal grant.

Co-operation projects must contribute to creating an environment that will attract the best students, researchers and teachers. These projects are aimed in particular at achieving the two following objectives: firstly, to set a medium and long-term course for higher education by leading Swiss higher education institutions to co-operate increasingly with each other and with their foreign counterparts in cross-border regions; and, secondly, to improve the distribution of tasks nation-wide and foster the creation of centres of competence providing high-quality services at a reasonable cost.

The projects supported thus far can be classified as follows: projects involving networking and the creation of centres of competence, cross-border co-operation projects and projects to develop infrastructure (facilities, tools, joint initiatives) for all higher education institutions.

Co-operation and innovation projects of the federal institutes of technology

Just as the Confederation supports projects for co-operation between cantonal universities, the ETH Board has decided to support co-operation and innovation projects by allocating SF 122 million to the institutes for the 2000-2003 period.

The following are some of the fields to which this funding is being allocated: information sciences, life sciences, computer science, genomics, centres of competence in human and social sciences, green areas in urban communities and materials sciences.

Universities of applied sciences: co-operation in six national competence networks

In 2001, the Swiss government recognised six national competence networks of universities of applied sciences. The goal of the national competence networks is to give a major boost to co-operation of universities of applied sciences with each other and with other higher education institutions and businesses. In particular, the networks should create the capacities necessary to supply services that go beyond what each partner can currently provide.

The six competence networks encompass the following fields: information and communication technology, integrated production and logistics, microelectronics, wood construction and technology, biotechnology and e-business and e-government.

Continuing education and training

The debate on continuing education and training began relatively late in Switzerland, in the 1970s. A popular referendum aimed at introducing an article on education as a whole into the Constitution, which would have guaranteed the right to what was then known as nation-wide recurrent education, failed to pass in 1973. Rarely used today, the term recurrent education refers to the right of all working adults to take paid leave periodically for training purposes. The generally used term is continuing education/training, which originally designated adult education and training taking place outside working time.

Shared responsibilities

Since the failure of the 1973 referendum, continuing education has been a responsibility which is divided among different federal departments, governed by various federal and cantonal laws and often implemented by professional associations, whose policies and courses are not well co-ordinated. At the Confederation level, the legislation on continuing education concerns vocational training and higher education institutions, while other provisions covers the promotion of culture and retraining measures in the unemployment insurance act.

However, the following concepts are contained in the legislation: "general training of adults", "adult education" and "job-related continuing training". Job-related continuing training falls under the heading of vocational training, as does adult education and also the general training of adults.

Adult education that is not directly job related is first and foremost the responsibility of the cantons. Job-related continuing training in the strict sense of job retraining is the responsibility of the Confederation.

Preference for a free market

In the field of continuing training, Switzerland gives preference to a free market rather than to strict government regulation. It is therefore not surprising that this field is the least well co-

ordinated and regulated of all education and training fields. Consequently, continuing training is dominated by the private sector, which until recently met 80% of the demand.

Federal initiatives

In 1990, the Confederation launched its continuing training offensive on the basis of a Federal message to Parliament proposing special measures on continuing training. This initiative has two main objectives. At the economic level, it is aimed at combating the shortage of trained specialists. At the social level, it is aimed at ensuring an effective supply of continuing training during a period of rapid technological change and increasing rapid accumulation of new knowledge, which makes lifelong learning a necessity.

To ensure the development of continuing training in universities and to create continuing training services, a special appropriation of SF 77.5 million was provided to the eight (now ten) cantonal universities and the two federal institutes of technology for the 1990-1996 period. In 1996, in order to ensure the continuity of the activities provided by university continuing training services, the Confederation decided to continue to subsidise them until 1999, and an additional SF 11.5 million was provided to universities.

Co-ordinating group

A working group of the continuing training services of higher education institutions was created within the former Swiss University Conference (CUS). With financial support from the Federal Office for Education and Science (OFES), this group established swissUNI, a database making it possible to find on the web all university continuing training courses offered. The purpose of this group is to co-ordinate activities between continuing training services, promote continuing training in universities and facilitate exchange of information on continuing training. Now that federal measures have ended, the universities continue to provide many continuing training courses, which are self-financed in most cases.

Universities of applied sciences: numerous post-graduate programmes

The development of continuing training in universities of applied sciences has generally followed similar patterns as in the universities. In 1996, in connection with the reform and reorganisation of vocational training, professional development (or continuing training) and post-graduate education were also included in the legislation as part of the UAS' new educational missions (together with applied R&D and service provision). The goal is to make an additional contribution to technology and knowledge transfer. Today, the USA offer some 140 recognised post-graduate programmes. The full list is available on the Internet site of the Federal Office for Professional Education and Technology (OFFT), www.admin.ch/bbt.

Labour force survey

A recent study carried out by the Swiss Federal Statistical Office provided a relatively full picture of the behaviour of the adult population with respect to continuing training during the period between spring 1995 and spring 2000. In April 2000, 39% of Swiss residents between the ages of 20 and 74 said that they had participated in continuing training courses during the 12 months prior to the interview. This annual proportion remained virtually unchanged throughout the entire period covered. Most of those who participate in training do so for professional reasons. In this regard, it

is interesting to note that nine out of ten of those who took courses also work. Participation in continuing training only declines significantly slightly before retirement.

This study also shows that people with high education levels are substantially over-represented in all types of knowledge acquisition, whether it is self-learning or learning in an institutional setting. They participate three times as often in continuing training courses as people with no post-compulsory education and five times as often as the latter in job-oriented training courses. However, it should be pointed out that the likelihood of participating in continuing training courses increases significantly once a course has already been taken, regardless of the level of initial training.

Both men and women prefer to learn by taking courses, but generally not for the same reasons, for unlike men, who mainly take courses for job-related reasons, women chiefly take courses for reasons that are not job-related. This difference is explained by the fact that women's participation in the labour force differs from men's. It is less frequent for women to work on a full-time basis and have high professional status than men. However, when their professional status is the same, women's rate of participation in professional development is similar to men's.

Continuing Training Forum

With the creation of the Continuing Training Forum in 2000, a Swiss co-ordination and information body was established to address issues related to continuing training (vocational and general training). Employers, employees, associations, the cantons and the Confederation are all represented in this forum.

The relation between Swiss higher education institutions, the economy and society

The relations between Swiss higher education institutions and the private sector have deep roots in history and in the evolution of ideas, and are an integral part of higher education and its mission to society.

Cantonal and federal higher education institutions have strong roots within their respective regions and among the local population, and play an important role in ensuring continuity and renewing local cultural life and identity. This justifies the relatively high degree of confidence that the parliaments that finance them have in these institutions, and has provided a basis for strengthening their autonomy. Swiss universities have been the focal point around which many fields and institutions have developed, such as the Swiss legal system, major public libraries, the health care sector, and the historical and theological foundations of Swiss religious communities, and they continue to play this role today. Swiss higher educational institutions make a substantial contribution to what is now known as "social capital" in fields that go well beyond technical and economic sciences alone. Lastly, Swiss higher education institutions are a window onto Europe and the world, as well as being a part of Europe and the world inside Switzerland.

The mission of higher education institutions

Teaching, research and the provision of services to the business community, society and government institutions are an integral part of the basic mission of higher education institutions.

Universities: expanding the scope of knowledge

The cantonal universities and federal institutes of technology follow the traditional principle of the "unity of teaching and research" defined by Humboldt. The acquisition of new knowledge and its transmission to students and the scientific community are closely intertwined.

In accordance with various cantonal laws and the federal act on the federal institutes of technology, universities transmit academic knowledge and thereby lay the necessary foundation for exercising academic activities and professions. Through their research work, universities increase scientific knowledge, develop new methods and technologies and promote new academic talent. They are responsible for university-level continuing education and provide services related to their education and research missions.

Universities of applied sciences: practically oriented teaching and research

In the universities of applied sciences, students pursue studies leading to degrees that prepare them to work in professions requiring the use of scientific knowledge and methods. These UAS also do applied research and development work and provide services to third parties. Through knowledge and technology transfer, the UAS make the full range of their know-how available to their partners in the business community and society at large. In return, the teaching staff receives up-to-date feedback from practitioners.

In the view of Economiesuisse (www.economiesuisse.ch), the country's largest employers' association, the universities of applied sciences can only be successfully integrated into the system of higher education institutions if they fully put into practice their new service provision mandate. According to Economiesuisse, they must acquire specific competencies in applied research and development in order to become innovative partners for the business community, particularly for small and medium-sized enterprises.

Building bridges between the scientific community and society

In Switzerland as elsewhere, there is a growing apprehension about scientific progress and concern over the ethical questions that it raises, in connection with biotechnology, for example. For this reason, efforts have recently been made to promote better understanding between the scientific community, higher education institutions and society. In this regard, the referendum on the so-called "genetic protection initiative" played an important role, for it made researchers aware of the need to communicate more fully and openly with the public.

If the scientific community is not to be isolated in its "ivory tower", it must not only transmit its knowledge and know-how to the outside world, but also understand the economy -- its needs, expectations and progress being made -- and recognise the hopes and fears of the population. Thus, although higher education institutions contribute to the world outside, they also receive the feedback of practical suggestions that enrich their understanding of problems and enable them to broaden their scientific and technical programmes.

Promotion of dialogue by the "Science et Cité" Foundation

The "Science et Cité" Foundation (www.science-et-cite.ch) was established in 1998 to promote the flow of information between the scientific community and society at large and to enable them to know each other better. The Foundation receives support from the Confederation, the business community, scientific academies, public and private organisations and private citizens. It promotes constructive dialogue and helps the scientific community and society to have a deeper understanding of each other by building a climate of critical trust within society. It also assists universities with their information mission and supports initiatives to make the scientific

community more aware of society's concerns and to enable society to understand scientific discoveries better.

In May 2001, the Foundation organised a festival held in Switzerland's ten university regions. This event, which brought together the research community and the population, attracted over 300 000 visitors, making this first festival a success. The next festival will probably be held in 2004.

A challenge for the knowledge and information society

A number of new developments have contributed to promoting closer relations between higher education institutions and the business community and society, such as new information and communication technologies and the globalisation of the economy. These developments have heightened competition between countries and made it more necessary for societies to be able to transmit and use knowledge and skills in an even more rapid and targeted way. These closer ties are also due to the stagnation of government subsidies and the growing interest shown by higher education institutions in raising funds from third parties.

National competence networks

The universities of applied sciences were created in the 1990s to reinforce the scientific and practical orientation of education programmes and to promote knowledge and technology transfer from higher education institutions to the economy. The creation of national competence networks in universities of applied sciences is a further step in this direction (see p. ?). To be recognised by the Confederation, these networks are required to maintain close ties with the business sector and society. Recognition also entails additional requirements, including:

- * a clearly defined strategy, particularly as regards market positioning and knowledge and technology transfer;
- * proven leadership in the field in question and presence of active leaders within the network;
- * staff with technical and social competencies in charge of the network;
- * a network of relations and the ability to raise funds from third parties.
- * A reputation for excellence in the field and region concerned.

Promoting technology transfer

In the 1980s and the early 1990s, many socio-economic studies reached the conclusion that Switzerland had a very high level of scientific performance, but that it failed to capitalise sufficiently on the knowledge and know-how present within its education and research institutions.

Mentalities changed in the mid-1990s, as Swiss and European higher education institutions realised that they had to open up to the outside world. As a result, higher education institutions began to look outward and develop closer relations with the business community and society, for example by adding knowledge and know-how transfer to their list of objectives and by opening up technology transfer, advice and service centres (see p. ?). The Confederation supports this effort through the Swiss Network for Innovation (RSI, see p. ?). The federal institute of technology Zurich alone has created over 100 spin-offs during the past 15 years. What is more, these new companies are on the whole solid, as is shown by their extraordinarily high survival rate. Only 10% of new companies failed, as compared with a rate that can be as high as 50% in the United States.

4. The financing of Tertiary Education

The structure of the financing of universities

Originally, the cantons financed their universities independently, while the Confederation was responsible for the federal institutes of technology. Later the Confederation gradually began to contribute funds to promote research and then started granting subsidies to the universities. However, the cantons in which universities are located still bear the bulk of the costs, although these have been partially shared with the other cantons for the past two decades.

In addition to financing its own higher education institutions - the federal institutes of technology - the Confederation is increasingly focusing on the role of providing incentives, promoting research and covering needs that the cantons cannot meet.

Table 7 shows the various sources of financing of the costs of universities:

- The majority of financing is provided by the cantons themselves. The bulk of this financing is borne by the cantons in which universities are located, although the other cantons contribute proportionately to the number of their students enrolled (under the Intercantonal University Agreement, which guarantees equal access of Swiss students to universities in exchange for a financial contribution from their canton of origin).
- The universities receive financing from the Confederation under the Federal Act on Aid to Universities (Loi sur l'aide aux universités, LAU). The Confederation contributes by providing basic subsidies (which have been decreasing proportionately over the past two decades) and special appropriations for incentive and innovation projects and programmes. The Confederation also grants subsidies for investments (building programmes and major investments) under federal act. The Confederation's share in the financing of universities varies significantly across cantons. This financing has not kept up with the increase in university staff over the past twenty-five years.
- The universities receive indirect financing from the Confederation through the Swiss National Science Foundation, which manages the main scientific research programmes, and through the Federal Office for Education and Science, which manages participation in international and European programmes.
- Universities also receive financing from third parties, and although the amount of funds raised is small, it is by no means negligible and is on the rise.

Table 7. Main financial indicators for universities (Year 2000, x SF 1000)

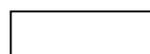
(see following pages)

Table 7. Main financial indicators for universities (Year 2000, x SF 1000)

	Number of students	Total budget	Contribution of canton where university is located	% of Budget	Contribution of other cantons (AIU)	% of Budget	Total contribution of cantons % of budget	Basic contributions of Confederation	% of Budget	Funds provided by the FNS	% of Budget
Basel	7'606	277'512	68'898	25	35'617	13	38	52'867	19	30'852	11
Berne	10'193	505'171	245'708	49	56'702	11	60	56'902	11	32'702	6
Fribourg	8'849	178'213	40'931	23	47'238	27	49	41'858	23	11'019	6
Geneva	13'178	541'095	298'839	55	30'109	6	61	59'334	11	44'871	8
Lausanne	9'893	326'767	137'034	42	37'631	12	53	45'833	14	32'244	10
Lucerne	256	9'144	5'450	60	881	10	69	1'345	15	121	1
Neuchâtel	3'136	105'504	41'891	40	11'543	11	51	18'078	17	11'428	11
St-Gallen	4'705	126'209	16'763	13	22'696	18	31	16'908	13	858	1
Zurich	20'598	706'458	356'557	50	99'341	14	65	72'417	10	36'555	5
Italian-speaking Switzerland	1'410	28'877	7'998	28	3'501	12	40	5'778	20	702	2
Combined total	79'824	2'804'950	1'220'069	43	345'259	12	56	371'320	13	201'352	7
EPF Lausanne	5'095	428'620								20'614	5
ETH Zurich	11'459	885'689								30'650	3
Total	96'378	4'119'259								252'616	6



Federal funds



Cantonal funds

Sources: OFS; CDIP (AIU)

The federal institutes of technology are entirely financed by the Confederation and are increasingly managed independently. They also receive funds from the Swiss National Science Foundation and international programmes.

The structure of the financing of universities of applied sciences

The universities of applied sciences are also jointly financed. Like the cantonal universities, they are mainly financed by cantons or by groups of cantons in regions that manage their own universities of applied sciences. The fields of study not covered by the Federal universities of applied sciences Act (LUAS), such as teacher training, social work, health, the fine arts, music, etc., are financed independently by the cantons. The Confederation's share of the joint financing of the UAS governed by the federal act is set at one-third of ordinary administrative expenses; consequently, the Confederation plays a more active role with the universities of applied sciences within its sphere. The Confederation is also promotes research -- in this case applied research -- through the funds provided by the Commission for Technology and Innovation of the Federal Department of Economic Affairs. As for the universities, an intercantonal agreement ensures financial equalisation, encourages free access to all students and guarantees equal treatment.

The apportionment of costs between the cantons and the Confederation and among the cantons themselves is more equitable for the universities of applied sciences than for the universities, for two main reasons. Firstly, the rate of the Confederation's subsidy is much higher (one-third) for universities of applied sciences, and, secondly, nearly all cantons participate fully in either a cantonal or regional UAS.

Like the universities, the UAS also receive subsidies for investments (building projects and major investments) from the Confederation under the Federal universities of applied sciences Act (the rate of subsidy is also one-third).

The criteria for subsidies

Approximately 80% of the SF 215 million allocated by the Confederation is used to finance education programmes. As in universities, these funds are apportioned differently among programmes depending on how they stand in relation to the Swiss average (e.g., the number of students enrolled). Some 10% of federal subsidies to universities of applied sciences are matching funds to contributions provided by research promotion institutions, businesses and other levels of government. The remaining 10% is provided to specific programmes or joint projects, in some cases to enable universities of applied sciences to participate in programmes developed by universities.

This type of subsidy is aimed at improving each UAS' potential individually by increasing competition between them and promoting higher quality education.

Education, research and technology 2000-2003

In December 1999, the Federal Parliament approved the SF 6.8 billion financial framework requested by the government for the promotion of education, research and technology for the 2000-2003 period (Education, Research and Training Message).

This does not include the budget of the federal institutes of technology for this period (SF 6.23 billion), grants paid by Switzerland to international organisations and the financial resources provided for the research projects of the federal administration.

If all budget items are added together, the total amount that the Confederation is investing in education, research and training during the 2000-2003 period comes to approximately SF 13.76 billion.

Cantonal universities: new criteria for basic subsidies

The basic subsidies of SF 1.6 billion provided to the cantonal universities constitute most of the total direct resources of SF 2 billion allocated by the Confederation to these universities over a four-year period. Since 2000, the apportionment of these subsidies, which until then had been based on categories such as the teachers' salaries, student enrolments and the financial capacity of cantons, has been based on new criteria that take into account the services provided by universities. The key factor is now the number of students enrolled for the legal duration of studies, which is weighted by academic disciplines. This duration is sixteen semesters in medicine and twelve semesters in other disciplines. Some 70% of basic subsidies are distributed among the different universities on the basis of this criterion. It should be pointed out that the expenditure on foreign students is treated separately, and 10% of the 70% is set aside for this purpose.

The importance of funds from third parties

The remaining 30% of basic subsidies are distributed as matching funds to the contributions that each university obtains from third parties. The research grants awarded by the Swiss National Science Foundation (FNS) are relevant in this respect, as are projects assigned through the Commission for Technology and Innovation (CTI), participation in EU projects and private funds obtained (i.e., for research projects).

To counterbalance and reward

The new legislation on basic subsidies no longer takes into account the size of the teaching staff other than indirectly through research. It is based on the principle that universities that are able to attract large numbers of students should be rewarded. The ability of universities to attract students and funds for research from third parties are the only criteria used to assess performance.

The Swiss government is also providing SF 250 million in financial aid to investment to help universities to finance building projects costing over SF 3 million. Project grants (see p.?) are the third major category of federal support, together with basic subsidies and aid to investment. The Swiss University Conference (CUS) decides how these grants are apportioned.

5. Reforms in Tertiary Education

The upheavals caused by globalisation are also affecting the education systems of the industrialised countries. This is particularly true of higher education systems, which transform data into new knowledge that they then make available to society.

Because of this knowledge producing function, higher education institutions play a key role in the modern knowledge-based society and economy, since they provide knowledge as a factor of production that is crucial to the vitality of companies and the prosperity of countries.

Pressure for reform of education, research and technology systems

It is therefore not surprising that the education, research and technology systems of industrial countries face pressure for reform. Higher education institutions are subject to new constraints that will have considerable impact on their development:

- The financing of higher education institutions will be increasingly oriented towards promoting competition and co-operation in science and technology. This means that these institutions must have a certain autonomy in order to make strategic decisions and adapt to the development of knowledge as rapidly as possible.
- The cost of state-of-the-art research based on increasingly sophisticated data processing is rising continually. This means that there is a growing need to set priorities for the development of education, research and technology systems, especially in small countries with limited resources that must make choices in order to maintain their performance.
- Society is increasingly reluctant to accept scientific and technological progress and its ability to manipulate the natural world. The best way of mastering science is to ensure that it is fully integrated into a society's culture so that it can be questioned and better understood. Building a climate of critical confidence is now an integral part of science policy.
- Knowledge and technology transfer to business and industry is a major development. Modern innovation policy combines many different approaches, and one of the key measures is to promote and support ties between the private sector and science.

The process of reform of Swiss higher education institutions, 2000-2007

The goal and policy orientation of reform

For the past several years, a process of reform of higher education institutions has been under way in Switzerland. The Swiss government and parliament have set a timetable for the reforms, which will cover the 2000-2007 period. This should make it possible to avoid endless reforms that would destabilise the education, research and technology system.

Through this reform, the government wishes to develop a creative environment, which is recognised internationally and able to attract the best teachers and researchers, train the best students, co-operate with the best private and public corporations and be open to society.

This reform is focused primarily on higher education institutions. However, it will not be successful unless it goes hand in hand with an improved framework for vocational training, primary and secondary education and the innovation system.

The cantons, with the support of the Confederation and the new instruments available (the Swiss University Conference, Rectors' Conference of the Swiss Universities, Council for universities of applied sciences, Swiss Conference of universities of applied sciences), are also rising to the challenge of reforming their higher education institutions. These reforms, made possible by the complete revamping of cantonal legislation in the 1990s, are currently being implemented, and new types of management and a reorganisation are beginning to bear fruit. The higher education institutions are now beginning to pool their resources, to provide a more balanced supply of education in their respective regions and to form genuine networks.

First stage: the 2000-2003 Message

In the first stage of the reform, in order to ensure the transparency and consistency of policy regarding the education, research and technology system, in 1999 the Federal Council submitted a message to Parliament presenting legislative measures aimed at promoting the education, research and technology system for the 2000-2003 period. The Swiss Parliament accepted the message without serious opposition.

Network excellence

The measures proposed in the message on the education, research and technology system go well beyond merely continuing the policy implemented until the end of the 1990s. The Federal Council has summarised its ideas under the theme "To reform and invest". Two main ideas stand out in the proposals contained in the message:

- Higher education institutions must co-operate with each other more than in the past. The goal is to create networks in tertiary education that will make it possible to take full advantage of the existing potential.
- Quality must be more important than quantity. Priority must be given to promoting recognised competencies and future-oriented fields. The pursuit of excellence in the fields in which Swiss science is already active must be given priority over covering a broad range of themes. Promotion of young scientific talent and of women in particular is of special importance in this regard.

The Federal Council has summed up its policy orientations for the 2000-2003 subsidy period in five strategic objectives:

1. *to create networks of higher education institutions;*
2. *to integrate these networks into international co-operation programmes;*
3. *to promote excellence in education and research;*
4. *to apply knowledge more effectively;*
5. *to improve and develop the effectiveness of networks of higher education institution.*
- 6.

The new operating rules

To achieve the goals of the reform, in the message on the education, research and technology system the Swiss government has proposed a series of innovations, some of which are substantial. One of the key aspects is the revision of the Act on Aid to Universities (LAU), which will introduce new operating rules for universities.

Competition and co-operation

The basic concept is to make higher education institutions more autonomous and to enable them to compete with each other while co-operating more closely in certain fields. In this system

of networks combining competition and co-ordination, the Swiss University Conference plays a key role (see p.?).

Performance-based subsidies

The new legal basis also includes major new aspects in the field of financing. The introduction of subsidies based on the quality of the services provided marks the end of the "automatic payment" policy. The allocation of subsidies is based more on the quality of education and research, according to the principle that funding should "follow students", who choose the best education available.

The awarding of contributions in connection with specific projects and the attribution of national centres of competence in research "reward" those research institutions that provide services recognised as being of particularly high quality. For universities of applied sciences, the creation of national networks of competence should make it possible to concentrate financial resources.

Preparing the integration of universities of applied sciences

Regarding universities of applied sciences, the main thrust of the Federal Council's message is the continuing establishment of these schools at a steady pace during the 2000-2003 period, to be followed by a second stage in which they will be fully integrated into higher education institutions.

Quality assessment

Quality assessment is an indispensable condition for healthy competition between higher education institutions. Under the new Act on Aid to Universities (LAU), this assessment will be carried out nation-wide using uniform criteria. An accreditation and quality assurance body, funded jointly by the Confederation and the cantons, has been created for this purpose (see p. ?).

Although the universities of applied sciences are not yet represented in the Swiss University Conference, their programmes are also to be accredited by this body. Furthermore, in 2001 the programmes of UAS under federal supervision underwent a peer review aimed at assessing the scientific quality of these schools. Each of these individual reports is currently being evaluated by a group of scientists. Through this peer review, the Confederation is seeking to determine the quality level attained at a given time and to suggest ways of improving it.

The second stage of the reform: a new article of the Constitution

At the end of 2001, the Swiss government launched a project, which will soon be ready, of a new article of the Constitution aimed at improving co-operation between the Confederation and the cantons in the field of higher education.

Third stage: the Federal Council's 2004-2007 Message

In the 2000-2003 period, the Federal Council's objective is to establish, in co-operation with the cantons, the indispensable framework for the effective functioning of higher education institutions. The Federal Council will propose specific objectives in the 2004-2007 Message. Two laws are currently being revised, i.e. the act on federal institutes of technology, which is aimed at giving them greater autonomy, and the act on universities of applied sciences, which is aimed primarily at broadening the scope of this law to the fields of health, social work, art, applied psychology and applied linguistics. The new law should lay the legal basis for applying the Bologna Declaration to universities of applied sciences.

Fourth stage: the Message on the laws reflecting the new constitutional basis

The objective for the 2004-2007 period is to unify the tertiary education system and create knowledge networks on the basis of the article to the Constitution being prepared and the new Act on Aid to Universities (LAU) of 8 October 1999. Consequently, the 2003-2007 message will request a considerable increase in financial resources for concrete projects and ask for certain legislative amendments. Parliament will state its position in autumn 2003.

Glossary

AIU	Accord intercantonal universitaire (Intercantonal University Agreement)
ASSH	Académie suisse des sciences humaines et sociales (Swiss Academy of Human and Social Sciences)
ASSM	Académie suisse des sciences médicales (Swiss Academy of Medical Sciences)
ASSN	Académie suisse des sciences naturelles (Swiss Academy of Sciences)
ASST	Académie suisse des sciences techniques (The Swiss Academy of Engineering Sciences)
CASS	Conseil des académies scientifiques suisses (Council of Swiss Scientific Academies)
CDEP	Conférence des directeurs cantonaux de l'économie publique (Conference of Cantonal Ministers of Economic Affairs)
CDIP	Conférence suisse des directeurs cantonaux de l'instruction publique (Conference of cantonal Ministers of Education)
CDS	Conférence des directeurs cantonaux des affaires sanitaires (Conference of Cantonal Ministers of Public Health)
CEPES Education)	Centre européen pour l'enseignement supérieur (European Centre for Higher Education)
CEPF	Conseil des écoles polytechniques fédérales (Board of Federal Institutes of Technology)
CERN	European Organisation for Nuclear Research
CFHES	Commission fédérale des hautes écoles spécialisées (Federal Commission for Universities of applied sciences)
CHES	Conseil des hautes écoles spécialisées (Council for Universities of applied sciences)
COST	European Co-operation in the field of Scientific and Technical Research
CRUS	Conférence des recteurs des universités suisses (Rectors' Conference of the Swiss Universities)
CSHES	Conférence suisse des hautes écoles spécialisées (Swiss Conference of Universities of applied sciences)
CSST	Conseil suisse de la science et de la technologie (Swiss Science and Technology Council)
CTI	Commission pour la technologie et l'innovation (Commission for Technology and Innovation)
CUS	Conférence universitaire suisse (Swiss University Conference)
DS	Diploma Supplement
ECTS	European Community Course Credit Transfer System
EPF	Ecole polytechnique fédérale (Federal institute of technology)
EPFL	Ecole polytechnique fédérale de Lausanne (Federal Institute of technology Lausanne)
ESA	European Space Agency

ESPA	Enquête suisse sur la population active (Swiss Labour Force Survey)
ETHZ	Ecole polytechnique fédérale de Zurich (Federal Institute of technology Zurich)
EU	European Union
EUA	European University Association
FHA	Fachhochschule Aargau Nordwestschweiz
FHBB	Fachhochschule beider Basel Nordwestschweiz
FHNW	Fachhochschule Nordwestschweiz
FHO	Fachhochschule Ostschweiz
FHSO	Fachhochschule Solothurn Nordwestschweiz
FHZ	Fachhochschule Zentralschweiz
FNP	Institut fédéral de recherches sur la forêt, la neige et le paysage (Federal Institute for Woodland, Snow and Landscape Research)
FNS	Fonds national suisse de la recherche scientifique (Swiss National Science Foundation)
FRT	Formation, recherche et technologie (education, research and technology)
GDP	Gross domestic product
GSR	Groupement de la science et de la recherche (Swiss Science Agency)
HEP	Haute école pédagogique (Teacher's College)
HES	Haute école spécialisée (university of applied sciences)
HESBE	Haute école spécialisée bernoise
HESSO	Haute école spécialisée de Suisse occidentale
IDHEAP	Institut de hautes études en administration publique (Institute for Advanced Studies in Public Administration)
IFAEPE	Institut fédéral pour l'aménagement, l'épuration et la protection des eaux (Federal Institute for Water Supplies, Waste Water Treatment and Water Resources Protection)
IMHE	Institutional Management in Higher Education
IPS	Institut Paul Scherrer (Paul Scherrer Institute)
ISB	Institut suisse de bioinformatique (Swiss Institute of Bioinformatics)
ISREC	Institut suisse de recherche expérimentale sur le cancer (Swiss Institute for Experimental Cancer Research)
IUHEI	Institut universitaire de hautes études internationales (Graduate Institute of International Studies)
LAU	Loi fédérale sur l'aide aux universités et la coopération dans le domaine des hautes écoles (Federal Act on Aid to Universities and Co-operation in Higher Education)
LFEM	Laboratoire fédéral d'essai des matériaux (Federal Laboratory for Materials Testing and Research)
LHES	Loi fédérale sur les hautes écoles spécialisées (Federal universities of applied sciences Act)

OAQ	Organe d'accréditation et d'assurance qualité (Accreditation and Quality Assurance Body)
OECD	Organisation for Economic Co-operation and Development
OFES Science)	Office fédéral de l'éducation et de la science (Federal Office for Education and Science)
OFFT	Office fédéral de la formation professionnelle et de la technologie (Federal Office for Professional Education and Technology)
OFS	Office fédéral de la statistique (Federal Statistical Office)
OIF	Organisation internationale de la francophonie (International Organisation of the Francophonie)
PDC	Parti démocrate-chrétien suisse
PNR	Programme national de recherche (National Research Programme)
PP	Programme prioritaire (Priority Programme)
PRD	Parti radical-démocratique suisse
PRN	Pôle de recherche national (National Centre of Competence in Research)
PSS	Parti socialiste suisse
SHARE	Swiss House for Advanced Research and Education
SMEs	Small and medium-sized enterprises
SNI-RSI	Réseau suisse d'innovation (Swiss Network for Innovation)
SSO	Bureau des affaires spatiales (Swiss Space Office)
SUPSI	Scuola universitaria professionale della Svizzera italiana
UDC	Union démocratique du centre
UNESCO	United Nations Educational, Scientific and Cultural Organisation
ZFH	Zürcher Fachhochschule

Fields of study	Uni BS	Uni BE	Uni FR	Uni GE	Uni LS	Uni LU	Uni TI	Uni NE	Uni SG	Uni ZH	EPFL	ETHZ
Philosophy, languages, literature, Anthropology												
Philosophy/Logic	•	•	•	•	•	•	X	•		•		x
History and philosophy of science		•										
Linguistics and Indo-European languages	X	•	•	•	•		X	•		•		
Classical philology	•	•	•	•	•			•		•		
German language and literature	•	•	•	•	•			•		•		x
Romance philology	•	•	•					•		•		x
French language and literature	•	•	•	•	•			•		•		x
French as a foreign language				•	•			•				x
Italian language and literature	•	•	•	•	•			•		•		x
Iberian languages and literatures	•	•	•	•	•			•		•		x
Rhaeto-Romanic languages and Literatures			•	x						x		x
English language and literatures	•	•	•	•	•			•		•		x
Slavic languages and literatures	•	•	•	•	•					•		x
Nordic philology	•									•		
Chinese and Japanese languages and literatures				•						•		x
Modern Greek language and literature				•								
Near and Middle Eastern languages and civilisations	•	•		•	•					•		x
Translation and interpretation				•								
Anthropology	•	•	•					•		•		
Popular traditions	•									•		
Historical sciences												
Classical archaeology	•	•	x	•	•			•		•		
Palaeochristian archaeology			•	•								
Prehistoric archaeology	•	•	x	•				•		•		
History	•	•	•	•	•	•		•		•		x
History and science of religions	x	•	•	•	•	x						
Judaism	x		x			•						
Art history	•	•	•	•	•		x	•		•		x
History and aesthetics of cinema					•		x			x		
Theatre		•										
Musicology	•	•	•	•						•		x

Exact and natural sciences													
Mathematics	•	•	•	•	•			•		•	•	•	
Computer sciences	x	•	•	•	•(3)			•		x	•	•	
Computer sciences and mathematical methods in human sciences	x			•	•		x						
Mathematical statistics	•	•			•								x
Physics	•	•	•	•	•			•		•			•
Astronomy	•	•		•	x					•			x
Chemistry	•	•	•	•	•			•		•			•
Biology	•	•	•	•	•			•		•			•
Biochemistry	•	•(1)	•	•	x					•			•
Earth science	•	•	•	•	•			•		•			•
Environmental sciences	x	X	x	•						x			•
Geography	•	•	•	•	•			•		•			•
Natural sciences	x		•	•									•
Computer-based sciences													•
Medicine and pharmacy													
Human medicine	•	•	•(3)	•	•			•(4)		•			
Dentistry	•	•	•(3)	•				•(4)		•			
Veterinary medicine		•								•			
Pharmacy	•	•(3)	•(3)	•	•			•(3)					•
Health-care science	•												
Architecture and engineering sciences													
Architecture				•(6)				•				•	•
Civil engineering												•	•
Agricultural engineering												•	•
Surveying													•
Environmental engineering (2)													•
Mechanics													•
Forestry													•
Agronomy													•
Food technology													•
Mechanics												•	•
Microtechnology								•(3)				•	x
Electricity												•	•
Communications systems				•								•	•
Materials sciences												•	•

Production and business management				•								•
Chemical engineering											•	•
Physical engineering											•	

• Major

x Minor

1 Major in chemistry or biology, with a degree in biochemistry

2 Agricultural engineering degree, with a specialisation in environmental engineering

3 First cycle only

4 First year only

5 Programme not recognised by the Confederation

6 2nd cycle only

Table 9. Rates of academic maturity certificate granted in 1999 by canton

Rates of <i>academic maturity certificate</i>	
GE	31.69%
TI	28.87%
NE	24.36%
JU	23.75%
BS	21.86%
VD	21.34%
FR	21.02%
VS	19.52%
ZH	19.25%
BL	19.10%
GL	15.95%
AR	15.93%
SH	15.65%
AG	15.59%
SO	15.31%
ZG	15.30%
GR	14.72%
NW	14.07%
SZ	13.38%
BE	12.59%
SG	11.83%
AI	11.46%
LU	11.24%
TG	10.71%
UR	9.44%
OW	8.86%
CH	17.86%

Table 10. Rate of *maturités professionnelles* (vocational secondary certificates) granted in 2000 by canton

	Number of <i>maturités professionnelles</i>	Permanent resident population 21 years of age	Rate of <i>maturités professionnelles</i>
ZH	1172	14'135	8.3%
BE	998	10'229	9.8%
LU	376	4277	8.8%
UR	41	420	9.8%
SZ	88	1589	5.5%
OW	12	392	3.1%
NW	24	351	6.8%
GL	36	421	8.6%
ZG	97	1185	8.2%
FR	264	2947	9.0%
SO	194	2736	7.1%
BS	84	2060	4.1%
BL	256	2661	9.6%
SH	116	778	14.9%
AR	65	492	13.2%
AI	6	175	3.4%
SG	469	5302	8.8%
GR	188	2140	8.8%
AG	429	6379	6.7%
TG	191	2533	7.5%
TI	322	3260	9.9%
VD	437	7'076	6.2%
VS	251	3'505	7.2%
NE	157	1'957	8.0%
GE	110	4'728	2.3%
JU	77	775	9.9%
Total	6460	82'503	7.8%

Table 11. Number of men and women university students in 2000 by university

	Men	Women	Total
Basel	4029	3577	7606
Berne	5280	4913	10'193
Fribourg	4210	4639	8849
Geneva	5599	7579	13'178
Lausanne	4765	5128	9893
Lucerne	137	119	256
Neuchâtel	1553	1583	3136
St-Gallen	3525	1180	4705
Zurich	10'077	10'521	20'598
Italian-speaking Switzerland	695	715	1410
EPF Lausanne	4182	913	5095
EPF Zurich	8441	3018	11'459
Total	52'493	43'885	96'378

Table 12. Number of men and women students in colleges of higher education in 2000 by institution

	Men	Women	Total
Berner Fachhochschule	3398	788	4186
Haute école spécialisée de Suisse occidentale	4325	1336	5661
Fachhochschule Nordwestschweiz	2516	881	3397
Fachhochschule Zentralschweiz	1446	460	1906
Scuola universitaria professionale della Svizzera italiana	644	218	862
Fachhochschule Ostschweiz	2098	340	2438
Zürcher Fachhochschule	3720	2114	5834
Other schools (not integrated into the system)	365	253	618
Total	18'512	6390	24'902

Table 13. Activity rate (%) in 2000 by university

	Teaching	R-D	Other activities
Basel	31.3	54.8	13.9
Berne	31.4	45.5	23.1
Fribourg	37.9	41.3	20.8
Geneva	34.6	52.8	12.6
Lausanne	32.7	47.7	19.6
Lucerne	54.3	33.5	12.1
Neuchâtel	37.0	48.8	14.2
St-Gallen	52.1	32.5	15.4
Zurich	34.6	40.5	24.9
Italian-speaking Switzerland	72.3	27.7	0.0
EPF Lausanne	35.6	48.5	15.9
EPF Zurich	32.8	55.2	12.0
Total	34.5	48.3	17.2

Table 14. Breakdown of staff by university in 2000 (individuals)

	Permanent faculty		Other teaching staff		Assistants and other scientific staff		Administrative and technical staff		Total
	Number	%	Number	%	Number	%	Number	%	
BS	261	8.9	761	25.9	1097	37.4	818	27.8	2937
BE	262	7.1	489	13.3	1510	41.1	1413	38.5	3674
FR	224	13.2	324	19.0	612	36.0	542	31.8	1702
GE	371	9.4	781	19.9	1365	34.7	1413	36.0	3930
LS	339	14.6	513	22.0	944	40.5	532	22.9	2328
LU	16	15.5	47	45.6	15	14.6	25	24.3	103
NE	117	13.3	158	18.0	471	53.8	131	14.9	877
HSG	76	10.2	199	26.7	323	42.3	148	19.8	746
ZH	395	5.2	2023	26.8	3024	40.2	2096	27.8	7538
USI	112	31.2	56	15.6	151	42.1	40	11.1	359
EPFL	155	6.8	85	3.7	1180	51.9	854	37.64	2274
ETHZ	347	4.6	510	6.8	4533	60.5	2103	28.1	7493
Total	2675	7.9	5946	17.5	15'225	44.8	10'115	29.8	33'961

Table 15. Staff of colleges of higher education in 2000 by institution (full-time equivalents)

	Permanent faculty		Other teaching staff		Assistants and other scientific staff		Administrative and technical staff		Total
	Number	%	Number	%	Number	%	Number	%	
Haute école spécialisée bernoise	385	44.4	111	12.8	166	19.1	206	23.7	868
Haute école spécialisée de Suisse occidentale	500	39.8	77	6.1	226	18.0	451	35.9	1255
Fachhochschule Nordwestschweiz	180	29.0	138	22.2	106	17.1	198	31.9	621
Fachhochschule Zentralschweiz	114	28.7	102	25.7	65	16.4	117	29.5	397
Scuola universitaria professionale della Svizzera italiana	30	13.4	59	26.3	71	31.7	63	28.1	224
Fachhochschule Ostschweiz	149	25.9	107	18.6	171	29.7	149	25.9	575
Zürcher Fachhochschule	372	34.0	247	22.6	123	11.2	351	32.1	1094
Total	1730	34.4	841	16.7	928	18.4	1535	30.5	5034

Table 16. Rate of men and women receiving university degrees by canton in 2000

	Men	Women	Total
ZH	8.9%	7.6%	8.3%
BE	9.6%	5.9%	7.7%
LU	9.4%	5.8%	7.6%
UR	9.7%	5.2%	7.5%
SZ	8.3%	5.3%	6.8%
OW	16.0%	4.3%	10.0%
NW	12.8%	5.8%	9.3%
GL	6.2%	4.1%	5.2%
ZG	10.8%	7.5%	9.1%
FR	11.5%	9.0%	10.3%
SO	10.2%	6.7%	8.5%
BS	11.2%	6.2%	8.7%
BL	14.7%	10.2%	12.5%
SH	11.8%	7.5%	9.7%
AR	13.3%	7.8%	10.3%
AI	12.0%	1.0%	6.5%
SG	10.1%	5.3%	7.7%
GR	9.4%	6.6%	7.9%
AG	9.4%	7.0%	8.2%
TG	7.9%	3.9%	5.8%
TI	13.1%	11.2%	12.1%
VD	11.4%	10.6%	11.0%
VS	11.2%	9.3%	10.3%
NE	13.9%	10.7%	12.3
GE	17.8%	17.7%	17.7%
JU	11.3%	7.1%	9.2%
Total	11.8%	9.0%	10.4%